Supporting Information for “A model for calculating the density of aqueous electrolyte solutions”, by Marc Laliberté and W. Edward Cooper

Part 1: Solutions of one electrolyte in Water

326 pages including this one

Density of aqueous solutions of **AICI3**

References (23) Dolian, F. E. The Viscosities of Solutions of Chlorides in Certain Solvents. *J. Phys. Chem.* **1937**, *41*, 1129-1138
 (70) Mason, C. M., The activity and osmotic coefficient of trivalent metal chlorides in aqueous solution from vapor pressure measurements at 25°C, *J Am Chem Soc*, **1938**, *60*, 1638-1647

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		25	0.0023	999.5	(23)	-0.000064	0.000131	999.04	0.4470	-0.000195	0.200			997.0449
		25	0.0047	1001.6	(23)	0.000039	0.000132	1001.13	0.4382	-0.000093	0.192			997.0449
0.05		25	0.00662	1003.0	(70)	0.000104	0.000133	1002.81	0.1920	-0.000029	0.037			997.0449
		25	0.0093	1005.9	(23)	0.000059	0.000134	1005.15	0.7039	-0.000075	0.496			997.0449
0.1		25	0.01316	1008.8	(70)	0.000115	0.000135	1008.52	0.2755	-0.000021	0.076			997.0449
0.2		25	0.02598	1020.0	(70)	0.000134	0.000141	1019.82	0.1777	-0.000007	0.032			997.0449
0.3		25	0.03846	1031.0	(70)	0.000144	0.000145	1030.95	0.0531	-0.000001	0.003			997.0449
0.4		25	0.05064	1041.6	(70)	0.000156	0.000150	1041.91	-0.3062	0.000006	0.094			997.0449
0.5		25	0.06250	1052.3	(70)	0.000160	0.000154	1052.71	-0.4075	0.000006	0.166			997.0449
0.6		25	0.07408	1063.0	(70)	0.000163	0.000159	1063.36	-0.3574	0.000004	0.128			997.0449
0.7		25	0.08537	1073.9	(70)	0.000162	0.000163	1073.86	0.0382	0.000000	0.001			997.0449
0.8		25	0.09639	1084.5	(70)	0.000164	0.000166	1084.23	0.2736	-0.000002	0.075			997.0449
0.9		25	0.10715	1094.3	(70)	0.000171	0.000170	1094.46	-0.1562	0.000001	0.024			997.0449
1		25	0.11765	1104.8	(70)	0.000172	0.000173	1104.56	0.2440	-0.000002	0.060			997.0449
1.1		25	0.12791	1114.7	(70)	0.000175	0.000176	1114.53	0.1698	-0.000001	0.029			997.0449
1.2		25	0.13794	1124.5	(70)	0.000179	0.000179	1124.38	0.1170	-0.000001	0.014			997.0449
1.3		25	0.14773	1134.1	(70)	0.000183	0.000182	1134.12	-0.0180	0.000000	0.000			997.0449
1.4		25	0.15731	1143.7	(70)	0.000185	0.000185	1143.74	-0.0389	0.000000	0.002			997.0449
1.5		25	0.16667	1153.2	(70)	0.000188	0.000188	1153.25	-0.0491	0.000000	0.002			997.0449
1.6		25	0.17583	1162.5	(70)	0.000191	0.000190	1162.65	-0.1515	0.000001	0.023			997.0449
1.8		25	0.19356	1181.2	(70)	0.000195	0.000195	1181.15	0.0548	0.000000	0.003			997.0449
								Average Res	0.0810	-0.000019	1.6551	Sum Chi sqr		
								Std dev Res	0.2755	0.000048				
								Avg - 4std	-1.0209	-0.000210				
								Avg + 4std	1.1828	0.000172				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	221.6811
c1	160.896
c2	0.151254
c3	0.0025
c4	1500
Min T	25
Max T	25
Min w	0.0023
Max w	0.193556
Avg dens res	0.080954

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
Std dens res		0.275452												
Avg app vol res *10 ³	-0.019434													
Std app vol res	0.047748													
No of points in corr	21													
No of inconsistent pair	2													
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)														
		25	0.0184	1015.4	(23)	0.000020	0.000138	1013.13	2.2294	-0.000118	4.970	!		997.0449
		25	0.0361	1033.0	(23)	0.000037	0.000145	1028.83	4.1376	-0.000108	17.119	!		997.0449

Density of aqueous solutions of **Al₂(SO₄)₃**

- References (18) Cupples, H. L. Surface Tension of Aluminium Sulfate Solutions. *J. Phys. Chem.* **1946**, 50, 256-260.
 (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
 (121) Silva, J. W.; Chenevey, J. E. Specific Gravity of Aluminum Sulfate Solutions. *Ind. Eng. Chem.* **1945**, 37, 1016-1018.

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m ³
0.0287		15	0.0097	1009.0	(18)	-0.000009	0.000010	1008.81	0.1876	-0.000019	0.035			999.0996
		15	0.0100	1009.3	(90)	-0.000011	0.000010	1009.09	0.2098	-0.000021	0.044			999.0996
0.0585		15	0.0196	1019.1	(18)	0.000000	0.000012	1018.84	0.2564	-0.000013	0.066			999.0996
		15	0.0200	1019.5	(90)	-0.000001	0.000013	1019.23	0.2709	-0.000013	0.073			999.0996
		15	0.0400	1040.4	(90)	0.000008	0.000018	1039.96	0.4429	-0.000010	0.196			999.0996
0.1218		15	0.0400	1040.4	(18)	0.000008	0.000018	1039.96	0.4371	-0.000010	0.191			999.0996
0.1863		15	0.0599	1061.7	(18)	0.000016	0.000023	1061.21	0.4920	-0.000007	0.242			999.0996
0.2517		15	0.0793	1082.9	(18)	0.000024	0.000029	1082.45	0.4469	-0.000005	0.200			999.0996
		15	0.0800	1083.7	(90)	0.000024	0.000029	1083.24	0.4555	-0.000005	0.207			999.0996
0.3242		15	0.0998	1106.0	(18)	0.000032	0.000035	1105.64	0.3600	-0.000003	0.130			999.0996
		15	0.1200	1129.3	(90)	0.000039	0.000041	1129.01	0.2934	-0.000002	0.086			999.0996
0.4761		15	0.1401	1153.0	(18)	0.000047	0.000048	1152.91	0.0944	-0.000001	0.009			999.0996
		15	0.1600	1177.0	(90)	0.000055	0.000054	1177.23	-0.2301	0.000001	0.053			999.0996
0.636		15	0.1787	1200.0	(18)	0.000063	0.000061	1200.61	-0.6110	0.000002	0.373			999.0996
		15	0.2000	1227.2	(90)	0.000071	0.000069	1227.81	-0.6144	0.000002	0.378			999.0996
0.829		15	0.2210	1254.7	(18)	0.000078	0.000077	1255.20	-0.4961	0.000001	0.246			999.0996
		15	0.2400	1280.3	(90)	0.000085	0.000084	1280.53	-0.2337	0.000001	0.055			999.0996
		15	0.2600	1307.9	(90)	0.000092	0.000093	1307.58	0.3236	-0.000001	0.105			999.0996
1.063		15	0.2667	1317.2	(18)	0.000095	0.000096	1316.72	0.4813	-0.000001	0.232			999.0996
0.0287		25	0.0097	1006.8	(18)	0.000004	0.000018	1006.65	0.1467	-0.000015	0.022			997.0449
0.0585		25	0.0196	1016.8	(18)	0.000010	0.000021	1016.58	0.2234	-0.000011	0.050			997.0449
0.1218		25	0.0400	1037.8	(18)	0.000018	0.000026	1037.47	0.3306	-0.000008	0.109			997.0449
0.1863		25	0.0599	1058.8	(18)	0.000027	0.000031	1058.49	0.3121	-0.000005	0.097			997.0449
0.2517		25	0.0793	1079.8	(18)	0.000034	0.000037	1079.51	0.2915	-0.000003	0.085			997.0449
0.3242		25	0.0998	1102.5	(18)	0.000042	0.000043	1102.45	0.0463	0.000000	0.002			997.0449
0.4761		25	0.1401	1149.0	(18)	0.000056	0.000055	1149.24	-0.2427	0.000001	0.059			997.0449
0.636		25	0.1787	1195.8	(18)	0.000070	0.000067	1196.50	-0.6983	0.000003	0.488			997.0449
0.829		25	0.2210	1250.3	(18)	0.000084	0.000083	1250.63	-0.3255	0.000001	0.106			997.0449
1.063		25	0.2667	1312.3	(18)	0.000100	0.000101	1311.74	0.5634	-0.000001	0.317			997.0449
		34.9	0.0493	1044.0	(121)	0.000030	0.000035	1043.71	0.2850	-0.000005	0.081			994.0662
		34.9	0.0985	1098.0	(121)	0.000039	0.000048	1096.92	1.0819	-0.000009	1.171			994.0662
		34.9	0.1479	1153.9	(121)	0.000064	0.000063	1154.10	-0.1983	0.000001	0.039			994.0662
		34.9	0.1977	1214.7	(121)	0.000082	0.000079	1215.50	-0.8022	0.000003	0.644			994.0662
		34.9	0.2460	1278.5	(121)	0.000096	0.000096	1278.39	0.1066	0.000000	0.011			994.0662
		45	0.0493	1039.9	(121)	0.000031	0.000041	1039.37	0.5288	-0.000010	0.280			990.2132
		45	0.0985	1093.0	(121)	0.000046	0.000054	1092.08	0.9195	-0.000008	0.845			990.2132
		45	0.1479	1148.4	(121)	0.000069	0.000067	1148.78	-0.3845	0.000002	0.148			990.2132
		45	0.1977	1209.2	(121)	0.000085	0.000083	1209.77	-0.5656	0.000002	0.320			990.2132
		45	0.2460	1272.6	(121)	0.000099	0.000100	1272.36	0.2445	-0.000001	0.060			990.2132
		55	0.0493	1034.7	(121)	0.000040	0.000046	1034.39	0.3055	-0.000006	0.093			985.6952
		55	0.0985	1087.9	(121)	0.000047	0.000058	1086.65	1.2487	-0.000011	1.559			985.6952
		55	0.1479	1142.6	(121)	0.000073	0.000071	1142.93	-0.3313	0.000002	0.110			985.6952

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		55	0.1977	1203.3	(121)	0.000087	0.000086	1203.55	-0.2547	0.000001	0.065			985.6952
		55	0.2460	1266.6	(121)	0.000100	0.000102	1265.92	0.6803	-0.000002	0.463			985.6952
		65.2	0.0493	1028.8	(121)	0.000048	0.000049	1028.70	0.0982	-0.000002	0.010			980.4461
		65.2	0.0985	1080.5	(121)	0.000061	0.000061	1080.53	-0.0290	0.000000	0.001			980.4461
		65.2	0.1479	1136.1	(121)	0.000075	0.000073	1136.42	-0.3175	0.000002	0.101			980.4461
		65.2	0.1977	1196.4	(121)	0.000089	0.000088	1196.73	-0.3275	0.000001	0.107			980.4461
		65.2	0.2460	1260.3	(121)	0.000099	0.000103	1258.92	1.3765	-0.000004	1.895			980.4461
		65.2	0.3450	1396.8	(121)	0.000139	0.000140	1395.84	0.9576	-0.000001	0.917			980.4461
		75.2	0.0493	1022.2	(121)	0.000060	0.000052	1022.57	-0.3702	0.000007	0.137			974.7294
		75.2	0.0985	1074.2	(121)	0.000061	0.000063	1074.00	0.1979	-0.000002	0.039			974.7294
		75.2	0.1479	1128.1	(121)	0.000083	0.000075	1129.54	-1.4390	0.000008	2.071			974.7294
		75.2	0.1977	1188.1	(121)	0.000094	0.000089	1189.58	-1.4814	0.000005	2.195			974.7294
		75.2	0.2460	1251.3	(121)	0.000104	0.000103	1251.66	-0.3579	0.000001	0.128			974.7294
		75.2	0.3450	1388.0	(121)	0.000141	0.000139	1389.13	-1.1277	0.000002	1.272			974.7294
		85.4	0.0985	1066.5	(121)	0.000068	0.000065	1066.84	-0.3434	0.000003	0.118			968.3608
		85.4	0.1479	1121.3	(121)	0.000080	0.000076	1122.05	-0.7469	0.000004	0.558			968.3608
		85.4	0.1977	1181.1	(121)	0.000092	0.000089	1181.85	-0.7467	0.000003	0.558			968.3608
		85.4	0.2460	1244.6	(121)	0.000101	0.000103	1243.84	0.7648	-0.000002	0.585			968.3608
		85.4	0.3450	1380.9	(121)	0.000138	0.000137	1381.95	-1.0506	0.000002	1.104			968.3608
		95	0.1977	1175.1	(121)	0.000086	0.000089	1174.16	0.9393	-0.000003	0.882			961.9004
		95	0.2460	1238.1	(121)	0.000097	0.000102	1236.09	2.0128	-0.000005	4.051			961.9004
		95	0.3980	1454.2	(121)	0.000155	0.000156	1454.02	0.1798	0.000000	0.032			961.9004
Average Res									0.0667	-0.000003	26.9037	Sum Chi sqr		
Std dev Res									0.6500	0.000006				
Avg - 4std									-2.5334	-0.000026				
Avg + 4std									2.6668	0.000021				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0 -0.00172
 c1 0.001897
 c2 -0.030904
 c3 0.004087
 c4 3804.163
 Min T 15
 Max T 95
 Min w 0.009724
 Max w 0.398
 Avg dens res 0.066671
 Std dens res 0.650021
 Avg app vol res $\cdot 10^3$ -0.002555
 Std app vol res 0.005859
 No of points in corr 64
 No of inconsistent pair 4

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

85.4	0.0493	1029.6	(121)	-0.000213	0.000055	1015.79	13.8054	-0.000268	190.589	!	!	968.3608
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molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		95	0.1479	1120.6	(121)	0.000044	0.000077	1114.57	6.0298	-0.000033	36.359	!	!	961.9004
		106.2	0.3980	1433.2	(121)	0.000167	0.000151	1446.54	-13.3422	0.000016	178.013	!		953.8187
		106.2	0.4430	1501.4	(121)	0.000185	0.000171	1516.27	-14.8718	0.000015	221.170	!		953.8187

Density of aqueous solutions of **BaCl2**

- References (45) Isono, T. Densities, Viscosities, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions at Several Temperatures. Alkaline-Earth Chlorides, LaCl_3 , Na_2SO_4 , NaNO_3 , NaBr , KNO_3 , KBr , and $\text{Cd}(\text{NO}_3)_2$. *J. Chem. Eng. Data* **1984**, 29, 45-52.
- (67) Manohar, S.; Puchalska, D.; Atkinson, G. Pressure-Volume-Temperature Properties of Aqueous Mixed Electrolyte Solutions: $\text{NaCl} + \text{BaCl}_2$ from 25 °C to 140 °C *J. Chem. Eng. Data* **1994**, 39, 150-154
- (87) Perron, G.; Desnoyers, J. E. Apparent Molal Volumes and Heat Capacities of Alkaline Earth Chlorides in Water at 25°C. *Can. J. Chem.* **1974**, 52, 3738-3741.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (129) Vasilev, Y. A.; Fedayinov, N. V.; Kurenkov, V. V. Specific Heats and Specific Volumes of Isopiestic Aqueous Solutions of Beryllium-Subgroup Metal Chlorides. *Russ. J. Phys. Chem.* **1973**, 47, 2799-2803.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
		0	0.0200	1018.10	(90)	0.000103	0.000114	1017.89	0.2148	-0.000010	0.046				999.8395
		0	0.0400	1036.80	(90)	0.000109	0.000115	1036.51	0.2871	-0.000007	0.082				999.8395
		0	0.0800	1076.00	(90)	0.000115	0.000119	1075.62	0.3847	-0.000004	0.148				999.8395
		0	0.1200	1117.80	(90)	0.000121	0.000124	1117.36	0.4382	-0.000003	0.192				999.8395
		0	0.1600	1162.70	(90)	0.000125	0.000128	1161.99	0.7115	-0.000003	0.506				999.8395
		0	0.2000	1210.50	(90)	0.000130	0.000132	1209.75	0.7461	-0.000003	0.557				999.8395
0.05		15	0.0103	1008.33	(45)	0.000112	0.000124	1008.20	0.1330	-0.000013	0.018				999.0996
0.1		15	0.0204	1017.34	(45)	0.000121	0.000125	1017.25	0.0898	-0.000004	0.008				999.0996
0.5		15	0.0943	1088.46	(45)	0.000130	0.000133	1088.08	0.3846	-0.000003	0.148				999.0996
0.7		15	0.1272	1122.09	(45)	0.000139	0.000137	1122.42	-0.3253	0.000002	0.106				999.0996
1		15	0.1723	1172.52	(45)	0.000142	0.000142	1172.58	-0.0617	0.000000	0.004				999.0996
1.2		15	0.1999	1205.13	(45)	0.000145	0.000145	1205.13	-0.0031	0.000000	0.000				999.0996
1.5		15	0.2380	1251.60	(45)	0.000153	0.000150	1252.63	-1.0311	0.000003	1.063				999.0996
0.05		20	0.0103	1007.37	(45)	0.000117	0.000127	1007.26	0.1065	-0.000010	0.011				998.2041
		20	0.0200	1015.90	(90)	0.000129	0.000128	1015.92	-0.0191	0.000001	0.000				998.2041
0.1		20	0.0204	1016.31	(45)	0.000127	0.000128	1016.28	0.0318	-0.000002	0.001				998.2041
		20	0.0400	1034.10	(90)	0.000132	0.000130	1034.19	-0.0890	0.000002	0.008				998.2041
		20	0.0800	1072.10	(90)	0.000139	0.000134	1072.49	-0.3856	0.000004	0.149				998.2041
0.5		20	0.0943	1087.09	(45)	0.000133	0.000136	1086.78	0.3145	-0.000003	0.099				998.2041
		20	0.1200	1112.80	(90)	0.000142	0.000139	1113.29	-0.4880	0.000003	0.238				998.2041
0.7		20	0.1272	1120.55	(45)	0.000142	0.000140	1120.94	-0.3889	0.000002	0.151				998.2041
		20	0.1600	1156.40	(90)	0.000145	0.000143	1156.81	-0.4066	0.000002	0.165				998.2041
1		20	0.1723	1170.82	(45)	0.000145	0.000145	1170.83	-0.0065	0.000000	0.000				998.2041
1.2		20	0.1999	1203.20	(45)	0.000148	0.000148	1203.18	0.0168	0.000000	0.000				998.2041
		20	0.2000	1203.10	(90)	0.000149	0.000148	1203.27	-0.1693	0.000001	0.029				998.2041
1.5		20	0.2380	1249.35	(45)	0.000156	0.000153	1250.38	-1.0269	0.000003	1.054				998.2041
		20	0.2400	1253.10	(90)	0.000153	0.000153	1252.92	0.1787	0.000000	0.032				998.2041
		20	0.2600	1279.30	(90)	0.000155	0.000156	1279.02	0.2754	-0.000001	0.076				998.2041
0.00388		25	0.0008	997.76	(87)	0.000113	0.000129	997.75	0.0131	-0.000016	0.000			0.715	997.0449
0.01562		25	0.0032	999.92	(87)	0.000115	0.000129	999.87	0.0471	-0.000015	0.002			2.871	997.0449
0.02736		25	0.0057	1002.05	(87)	0.000118	0.000129	1001.99	0.0655	-0.000012	0.004			5.009	997.0449
0.03879		25	0.0080	1004.13	(87)	0.000119	0.000130	1004.05	0.0833	-0.000010	0.007			7.088	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
0.05		25	0.0103	1006.16	(45)	0.000121	0.000130	1006.07	0.0911	-0.000009	0.008				997.0449
0.07881		25	0.0161	1011.39	(87)	0.000122	0.000131	1011.25	0.1379	-0.000008	0.019			14.341	997.0449
0.1		25	0.0204	1015.07	(45)	0.000130	0.000131	1015.05	0.0223	-0.000001	0.000				997.0449
0.1569		25	0.0316	1025.43	(87)	0.000125	0.000132	1025.21	0.2233	-0.000007	0.050			28.389	997.0449
0.166667		25	0.0335	1027.18	(67)	0.000126	0.000132	1026.95	0.2328	-0.000007	0.054			30.137	997.0449
0.23647		25	0.0469	1039.55	(87)	0.000129	0.000134	1039.32	0.2229	-0.000004	0.050			42.502	997.0449
0.31614		25	0.0618	1053.60	(87)	0.000131	0.000135	1053.34	0.2590	-0.000004	0.067			56.554	997.0449
0.333333		25	0.0649	1056.65	(67)	0.000131	0.000135	1056.35	0.3055	-0.000004	0.093			59.61	997.0449
0.38688		25	0.0746	1065.96	(87)	0.000133	0.000136	1065.69	0.2771	-0.000003	0.077			68.92	997.0449
0.5		25	0.0943	1085.49	(45)	0.000136	0.000139	1085.24	0.2464	-0.000002	0.061				997.0449
0.504		25	0.0950	1085.51	(129)	0.000142	0.000139	1085.93	-0.4209	0.000004	0.177				997.0449
0.7		25	0.1272	1118.85	(45)	0.000145	0.000142	1119.25	-0.3973	0.000002	0.158				997.0449
0.8317		25	0.1476	1140.92	(129)	0.000146	0.000145	1141.24	-0.3200	0.000002	0.102				997.0449
0.833333		25	0.1479	1142.19	(67)	0.000141	0.000145	1141.51	0.6811	-0.000004	0.464			145.147	997.0449
1		25	0.1723	1168.80	(45)	0.000148	0.000147	1168.88	-0.0847	0.000000	0.007				997.0449
1.2		25	0.1999	1201.02	(45)	0.000151	0.000151	1201.07	-0.0484	0.000000	0.002				997.0449
1.2538		25	0.2070	1209.63	(129)	0.000152	0.000152	1209.60	0.0275	0.000000	0.001				997.0449
1.5		25	0.2380	1247.01	(45)	0.000158	0.000156	1247.99	-0.9838	0.000003	0.968				997.0449
1.5		25	0.2380	1249.45	(67)	0.000152	0.000156	1247.99	1.4561	-0.000004	2.120			252.405	997.0449
1.503		25	0.2384	1248.76	(129)	0.000155	0.000156	1248.45	0.3051	-0.000001	0.093				997.0449
1.6226		25	0.2526	1267.20	(129)	0.000156	0.000158	1266.71	0.4913	-0.000001	0.241				997.0449
0.05		30	0.0103	1004.73	(45)	0.000123	0.000132	1004.64	0.0917	-0.000009	0.008				995.6473
0.1		30	0.0204	1013.59	(45)	0.000133	0.000133	1013.58	0.0061	0.000000	0.000				995.6473
0.5		30	0.0943	1083.73	(45)	0.000139	0.000141	1083.50	0.2262	-0.000002	0.051				995.6473
0.7		30	0.1272	1116.95	(45)	0.000147	0.000144	1117.36	-0.4133	0.000003	0.171				995.6473
1		30	0.1723	1166.67	(45)	0.000150	0.000150	1166.78	-0.1078	0.000000	0.012				995.6473
1.2		30	0.1999	1198.76	(45)	0.000153	0.000153	1198.81	-0.0486	0.000000	0.002				995.6473
1.5		30	0.2380	1244.60	(45)	0.000160	0.000158	1245.50	-0.8995	0.000002	0.809				995.6473
0.05		35	0.0103	1003.08	(45)	0.000125	0.000134	1002.99	0.0877	-0.000008	0.008				994.0319
0.1		35	0.0204	1011.91	(45)	0.000135	0.000135	1011.91	0.0029	0.000000	0.000				994.0319
0.166667		35	0.0335	1023.95	(67)	0.000130	0.000136	1023.72	0.2235	-0.000006	0.050			29.914	994.0319
0.333333		35	0.0649	1053.18	(67)	0.000136	0.000139	1052.90	0.2788	-0.000004	0.078			59.151	994.0319
0.5		35	0.0943	1081.83	(45)	0.000140	0.000143	1081.57	0.2551	-0.000002	0.065				994.0319
0.7		35	0.1272	1114.92	(45)	0.000149	0.000146	1115.30	-0.3850	0.000002	0.148				994.0319
0.833333		35	0.1479	1138.03	(67)	0.000145	0.000149	1137.38	0.6469	-0.000003	0.419			143.998	994.0319
1		35	0.1723	1164.46	(45)	0.000152	0.000151	1164.52	-0.0617	0.000000	0.004				994.0319
1.2		35	0.1999	1196.34	(45)	0.000155	0.000155	1196.42	-0.0788	0.000000	0.006				994.0319
1.5		35	0.2380	1242.04	(45)	0.000162	0.000160	1242.91	-0.8665	0.000002	0.751				994.0319
		40	0.0200	1009.60	(90)	0.000140	0.000136	1009.68	-0.0800	0.000004	0.006				992.2158
		40	0.0400	1027.50	(90)	0.000143	0.000138	1027.69	-0.1850	0.000004	0.034				992.2158
		40	0.0800	1064.80	(90)	0.000149	0.000142	1065.40	-0.6050	0.000007	0.366				992.2158
		40	0.1200	1104.70	(90)	0.000153	0.000147	1105.56	-0.8605	0.000006	0.740				992.2158
		40	0.1600	1147.80	(90)	0.000154	0.000151	1148.35	-0.5516	0.000003	0.304				992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
		40	0.2000	1193.80	(90)	0.000157	0.000156	1193.99	-0.1941	0.000001	0.038				992.2158
		40	0.2400	1243.00	(90)	0.000161	0.000161	1242.72	0.2811	-0.000001	0.079				992.2158
		40	0.2600	1268.80	(90)	0.000163	0.000164	1268.31	0.4867	-0.000001	0.237				992.2158
0.05		45	0.0103	999.18	(45)	0.000130	0.000136	999.12	0.0612	-0.000006	0.004				990.2132
0.1		45	0.0204	1007.97	(45)	0.000138	0.000137	1007.98	-0.0088	0.000000	0.000				990.2132
0.166667		45	0.0335	1019.86	(67)	0.000135	0.000139	1019.72	0.1353	-0.000004	0.018			29.643	990.2132
0.333333		45	0.0649	1048.75	(67)	0.000142	0.000142	1048.72	0.0257	0.000000	0.001			58.532	990.2132
0.5		45	0.0943	1077.47	(45)	0.000143	0.000145	1077.21	0.2624	-0.000002	0.069				990.2132
0.7		45	0.1272	1110.36	(45)	0.000151	0.000149	1110.72	-0.3586	0.000002	0.129				990.2132
0.833333		45	0.1479	1132.91	(67)	0.000150	0.000151	1132.65	0.2572	-0.000001	0.066			142.695	990.2132
1		45	0.1723	1159.47	(45)	0.000155	0.000154	1159.61	-0.1385	0.000001	0.019				990.2132
1.2		45	0.1999	1191.21	(45)	0.000158	0.000157	1191.29	-0.0792	0.000000	0.006				990.2132
1.5		45	0.2380	1236.67	(45)	0.000164	0.000162	1237.46	-0.7853	0.000002	0.617				990.2132
1.5		45	0.2380	1238.11	(67)	0.000160	0.000162	1237.46	0.6519	-0.000002	0.425			247.894	990.2132
0.05		55	0.0103	994.62	(45)	0.000131	0.000138	994.55	0.0666	-0.000007	0.004				985.6952
0.1		55	0.0204	1003.35	(45)	0.000139	0.000139	1003.37	-0.0163	0.000001	0.000				985.6952
0.166667		55	0.0335	1015.29	(67)	0.000133	0.000140	1015.05	0.2411	-0.000007	0.058			29.592	985.6952
0.333333		55	0.0649	1044.14	(67)	0.000140	0.000143	1043.89	0.2502	-0.000004	0.063			58.447	985.6952
0.5		55	0.0943	1072.51	(45)	0.000144	0.000146	1072.23	0.2786	-0.000003	0.078				985.6952
0.7		55	0.1272	1105.18	(45)	0.000152	0.000150	1105.57	-0.3896	0.000003	0.152				985.6952
0.833333		55	0.1479	1127.90	(67)	0.000149	0.000152	1127.39	0.5141	-0.000003	0.264			142.209	985.6952
1		55	0.1723	1154.11	(45)	0.000156	0.000155	1154.21	-0.1018	0.000000	0.010				985.6952
1.2		55	0.1999	1185.67	(45)	0.000159	0.000158	1185.74	-0.0652	0.000000	0.004				985.6952
1.5		55	0.2380	1230.94	(45)	0.000165	0.000163	1231.68	-0.7375	0.000002	0.544				985.6952
1.5		55	0.2380	1232.88	(67)	0.000160	0.000163	1231.68	1.2057	-0.000003	1.454			247.188	985.6952
		60	0.0200	1000.40	(90)	0.000143	0.000139	1000.48	-0.0772	0.000004	0.006				983.1989
		60	0.0400	1018.10	(90)	0.000145	0.000141	1018.29	-0.1913	0.000005	0.037				983.1989
		60	0.0800	1055.10	(90)	0.000151	0.000145	1055.61	-0.5143	0.000006	0.265				983.1989
		60	0.1200	1094.80	(90)	0.000153	0.000149	1095.35	-0.5527	0.000004	0.305				983.1989
		60	0.1600	1137.30	(90)	0.000156	0.000154	1137.71	-0.4065	0.000002	0.165				983.1989
		60	0.2000	1182.80	(90)	0.000159	0.000159	1182.89	-0.0921	0.000000	0.008				983.1989
		60	0.2400	1231.60	(90)	0.000162	0.000164	1231.14	0.4583	-0.000001	0.210				983.1989
		60	0.2600	1257.10	(90)	0.000165	0.000166	1256.49	0.6077	-0.000001	0.369				983.1989
		80	0.0200	989.00	(90)	0.000134	0.000138	988.93	0.0673	-0.000003	0.005				971.7978
0.166667		80	0.0335	1001.13	(67)	0.000130	0.000139	1000.84	0.2889	-0.000009	0.083			29.33	971.7978
		80	0.0400	1006.60	(90)	0.000140	0.000139	1006.60	-0.0048	0.000000	0.000				971.7978
0.333333		80	0.0649	1029.71	(67)	0.000137	0.000142	1029.40	0.3142	-0.000005	0.099			57.915	971.7978
		80	0.0800	1043.40	(90)	0.000146	0.000143	1043.65	-0.2510	0.000003	0.063				971.7978
		80	0.1200	1082.70	(90)	0.000151	0.000148	1083.13	-0.4266	0.000003	0.182				971.7978
0.833333		80	0.1479	1112.51	(67)	0.000149	0.000151	1112.18	0.3303	-0.000002	0.109			140.712	971.7978
		80	0.1600	1124.90	(90)	0.000154	0.000152	1125.24	-0.3391	0.000002	0.115				971.7978
		80	0.2000	1170.20	(90)	0.000157	0.000157	1170.21	-0.0145	0.000000	0.000				971.7978
1.5		80	0.2380	1216.39	(67)	0.000160	0.000161	1215.83	0.5534	-0.000002	0.306			244.588	971.7978

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
		80	0.2400	1218.60	(90)	0.000161	0.000162	1218.30	0.3030	-0.000001	0.092				971.7978
		80	0.2600	1244.00	(90)	0.000163	0.000164	1243.58	0.4151	-0.000001	0.172				971.7978
		100	0.0200	975.50	(90)	0.000127	0.000133	975.38	0.1236	-0.000006	0.015				958.3637
0.166667		100	0.0335	987.52	(67)	0.000125	0.000135	987.20	0.3207	-0.000010	0.103			29.16	958.3637
		100	0.0400	993.10	(90)	0.000131	0.000135	992.93	0.1681	-0.000004	0.028				958.3637
0.333333		100	0.0649	1015.89	(67)	0.000133	0.000138	1015.59	0.2979	-0.000004	0.089			57.524	958.3637
		100	0.0800	1029.90	(90)	0.000137	0.000139	1029.77	0.1343	-0.000002	0.018				958.3637
		100	0.1200	1069.20	(90)	0.000142	0.000143	1069.06	0.1350	-0.000001	0.018				958.3637
0.833333		100	0.1479	1098.48	(67)	0.000143	0.000146	1098.02	0.4578	-0.000003	0.210			140.117	958.3637
		100	0.1600	1111.30	(90)	0.000146	0.000147	1111.05	0.2503	-0.000001	0.063				958.3637
		100	0.2000	1156.30	(90)	0.000150	0.000152	1155.96	0.3390	-0.000001	0.115				958.3637
1.5		100	0.2380	1201.41	(67)	0.000157	0.000156	1201.60	-0.1875	0.000001	0.035			243.044	958.3637
		100	0.2400	1204.50	(90)	0.000155	0.000156	1204.06	0.4370	-0.000001	0.191				958.3637
		100	0.2600	1229.80	(90)	0.000158	0.000159	1229.40	0.4005	-0.000001	0.160				958.3637
0.166667		120	0.0335	972.08	(67)	0.000117	0.000129	971.73	0.3511	-0.000011	0.123			28.994	943.0825
0.333333		120	0.0649	1000.28	(67)	0.000126	0.000131	999.95	0.3302	-0.000005	0.109			57.198	943.0825
0.833333		120	0.1479	1082.36	(67)	0.000138	0.000139	1082.10	0.2565	-0.000001	0.066			139.275	943.0825
1.5		120	0.2380	1182.83	(67)	0.000157	0.000149	1185.75	-2.9248	0.000009	8.554	!		239.745	943.0825
0.166667		140	0.0335	955.18	(67)	0.000097	0.000121	954.45	0.7244	-0.000024	0.525		!	29.149	926.026
0.333333		140	0.0649	983.40	(67)	0.000109	0.000124	982.49	0.9023	-0.000014	0.814			57.371	926.026
0.833333		140	0.1479	1065.68	(67)	0.000123	0.000131	1064.33	1.3553	-0.000008	1.837			139.655	926.026
1.5		140	0.2380	1167.67	(67)	0.000141	0.000140	1168.05	-0.3823	0.000001	0.146			241.643	926.026
Average									0.0380	-0.000002	33.9022	Sum Chi sqr			
Std dev									0.492388	0.000005					
Avg - 4std									-1.9315	-0.000021					
Avg + 4std									2.0076	0.000017					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0 -0.00305
 c1 0.005267
 c2 4.178544
 c3 0.068274
 c4 3971.864
 Min T 0
 Max T 140
 Min w 0.000807
 Max w 0.26
 Avg dens res 0.038011
 Std dens res 0.492388
 Avg app vol res *10³ -0.00186
 Std app vol res *10³ 0.004818
 No of points in corr 140
 No of inconsistent pair 1

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m ³	Density of water / kg/m ³
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)															
1.5		35	0.2380	1244.6	(67)	0.000155	0.000160	1242.91	1.6963	-0.000005	2.878			250.571	994.0319

Density of aqueous solutions of **CaCl₂**

- References (28) Gates, J. A.; Wood, R. H. Densities of Aqueous Solutions of NaCl, MgCl₂, KCl, NaBr, LiCl, and CaCl₂ from 0.05 to 5.0 mol kg⁻¹ and 0.1013 to 40 MPa at 298.15K. *J. Chem. Eng. Data* **1985**, *30*, 44-49.
- (45) Isono, T. Densities, Viscosities, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions at Several Temperatures. Alkaline-Earth Chlorides, LaCl₃, Na₂SO₄, NaNO₃, NaBr, KNO₃, KBr, and Cd(NO₃)₂. *J. Chem. Eng. Data* **1984**, *29*, 45-52.
- (57) Kumar, A.; Atkinson, G.; Howell, R. D. Thermodynamics of Concentrated Electrolyte Mixtures. II. Densities and Compressibilities of Aqueous NaCl-CaCl₂ at 25°C. *J. Sol. Chem.* **1982**, *11*, 857-870.
- (87) Perron, G.; Desnoyers, J. E. Apparent Molal Volumes and Heat Capacities of Alkaline Earth Chlorides in Water at 25°C. *Can. J. Chem.* **1974**, *52*, 3738-3741.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.
- (113) Saluja, P. P. S.; LeBlanc, J. C. Apparent Molar Heat Capacities and Volumes of Aqueous Solutions of MgCl₂, CaCl₂, and SrCl₂ at Elevated Temperatures. *J. Chem. Eng. Data* **1987**, *32*, 72-76.
- (123) Spitzer, J. J.; Singh, P. P.; McCurdy, K. G.; Hepler, L. G. Apparent Molar Heat Capacities and Volumes of Aqueous Electrolytes: CaCl₂, Cd(NO₃)₂, CoCl₂, Cu(ClO₄)₂, Mg(ClO₄)₂, and NiCl₂. *J. Sol. Chem.* **1978**, *7*, 81-86.
- (133) Wimby, J. M.; Berntsson, T. S. Viscosity and Density of Aqueous Solutions of LiBr, LiCl, ZnBr₂, CaCl₂, and LiNO₃. 1. Single Salt Solutions. *J. Chem. Eng. Data* **1994**, *39*, 68-72.
- (136) Zhang, H.-L.; Chen, G.-H.; Han, S.-J. Viscosity and Density of H₂O+NaCl+CaCl₂ and H₂O+KCl+CaCl₂ at 298.15K. *J. Chem. Eng. Data* **1997**, *42*, 526-530.

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	App molal volume / cm ³ /mole	Delta density / kg/m ³	Density of water / kg/m ³
		0	0.0200	1017.10	(90)	0.000152	0.000187	1016.37	0.7337	-0.000035	0.538					999.8395
		0	0.0400	1034.60	(90)	0.000160	0.000190	1033.30	1.2995	-0.000030	1.689					999.8395
		0	0.0800	1070.30	(90)	0.000177	0.000198	1068.42	1.8822	-0.000021	3.543					999.8395
		0	0.1200	1107.20	(90)	0.000192	0.000205	1105.24	1.9634	-0.000013	3.855					999.8395
		0	0.1600	1145.40	(90)	0.000206	0.000213	1143.78	1.6152	-0.000008	2.609					999.8395
		0	0.2000	1185.30	(90)	0.000218	0.000222	1184.07	1.2340	-0.000004	1.523					999.8395
		0	0.2500	1237.60	(90)	0.000232	0.000234	1236.80	0.7957	-0.000002	0.633					999.8395
		0	0.3000	1292.20	(90)	0.000246	0.000246	1292.04	0.1639	0.000000	0.027					999.8395
0.05		15	0.0055	1003.70	(45)	0.000170	0.000196	1003.55	0.1469	-0.000026	0.022					999.0996
0.1		15	0.0110	1008.28	(45)	0.000171	0.000197	1007.99	0.2936	-0.000026	0.086					999.0996
0.5		15	0.0526	1043.62	(45)	0.000189	0.000204	1042.73	0.8938	-0.000016	0.799					999.0996
1		15	0.0999	1085.34	(45)	0.000205	0.000213	1084.33	1.0076	-0.000009	1.015					999.0996
2		15	0.1817	1161.89	(45)	0.000229	0.000230	1161.53	0.3591	-0.000001	0.129					999.0996
3		15	0.2498	1229.87	(45)	0.000249	0.000246	1230.92	-1.0501	0.000003	1.103					999.0996
4		15	0.3075	1290.63	(45)	0.000266	0.000261	1292.89	-2.2575	0.000004	5.096					999.0996
6		15	0.3997	1391.93	(45)	0.000294	0.000288	1396.57	-4.6441	0.000006	21.568	!				999.0996
		18.4	0.3471	1333.25	(133)	0.000277	0.000275	1334.79	-1.5422	0.000002	2.378					998.5208
		18.73	0.1945	1172.50	(133)	0.000237	0.000236	1172.91	-0.4120	0.000002	0.170					998.4577
		19.26	0.4651	1466.46	(133)	0.000314	0.000313	1467.19	-0.7253	0.000001	0.526					998.354
		19.67	0.2461	1224.17	(133)	0.000251	0.000248	1224.99	-0.8187	0.000002	0.670					998.2717
		19.74	0.5132	1516.43	(133)	0.000335	0.000332	1519.59	-3.1557	0.000003	9.958					998.2574
		19.76	0.3958	1388.21	(133)	0.000291	0.000290	1388.60	-0.3905	0.000001	0.153					998.2534
		19.76	0.4954	1500.08	(133)	0.000325	0.000325	1500.27	-0.1913	0.000000	0.037					998.2534
		19.78	0.2978	1278.92	(133)	0.000264	0.000262	1279.80	-0.8842	0.000002	0.782					998.2493
		19.82	0.427	1423.84	(133)	0.000301	0.000301	1423.82	0.0162	0.000000	0.000					998.2411
0.05		20	0.0055	1002.77	(45)	0.000175	0.000199	1002.64	0.1320	-0.000024	0.017					998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	App molal volume / cm³ /mole	Delta density / kg/m³	Density of water / kg/m³
0.1		20	0.0110	1007.29	(45)	0.000179	0.000200	1007.05	0.2384	-0.000021	0.057					998.2041
		20	0.0200	1014.80	(90)	0.000183	0.000202	1014.41	0.3902	-0.000019	0.152					998.2041
		20	0.0400	1031.60	(90)	0.000191	0.000205	1031.00	0.6013	-0.000014	0.362					998.2041
0.5		20	0.0526	1042.40	(45)	0.000194	0.000207	1041.63	0.7706	-0.000013	0.594					998.2041
		20	0.0800	1065.90	(90)	0.000206	0.000213	1065.35	0.5541	-0.000006	0.307					998.2041
1		20	0.0999	1083.87	(45)	0.000209	0.000216	1083.02	0.8465	-0.000007	0.717					998.2041
		20	0.1200	1101.50	(90)	0.000219	0.000220	1101.28	0.2247	-0.000002	0.050					998.2041
		20	0.1600	1138.60	(90)	0.000230	0.000229	1138.80	-0.1972	0.000001	0.039					998.2041
2		20	0.1817	1159.97	(45)	0.000233	0.000234	1159.77	0.1985	-0.000001	0.039					998.2041
		20	0.2000	1177.50	(90)	0.000239	0.000238	1177.89	-0.3950	0.000001	0.156					998.2041
3		20	0.2498	1227.54	(45)	0.000253	0.000249	1228.69	-1.1457	0.000003	1.313					998.2041
		20	0.2500	1228.40	(90)	0.000251	0.000250	1228.90	-0.4988	0.000001	0.249					998.2041
		20	0.3000	1281.60	(90)	0.000263	0.000262	1282.07	-0.4672	0.000001	0.218					998.2041
4		20	0.3075	1287.93	(45)	0.000269	0.000264	1290.17	-2.2351	0.000004	4.996					998.2041
		20	0.3500	1337.30	(90)	0.000276	0.000276	1337.02	0.2759	0.000000	0.076					998.2041
6		20	0.3997	1388.68	(45)	0.000297	0.000292	1392.87	-4.1940	0.000005	17.590	!				998.2041
		20	0.4000	1395.70	(90)	0.000289	0.000292	1393.17	2.5304	-0.000003	6.403					998.2041
		20.11	0.0987	1082.68	(133)	0.000210	0.000216	1081.91	0.7666	-0.000007	0.588					998.1814
0.02976		24.04	0.0033	999.97	(113)	0.000184	0.000201	999.92	0.0539	-0.000016	0.003			20.47		997.2867
0.0994		24.04	0.0109	1006.19	(113)	0.000190	0.000202	1006.05	0.1348	-0.000012	0.018			21.08		997.2867
0.10213		24.04	0.0112	1006.37	(113)	0.000195	0.000202	1006.29	0.0788	-0.000007	0.006			21.67		997.2867
0.19769		24.04	0.0215	1014.75	(113)	0.000199	0.000204	1014.64	0.1136	-0.000005	0.013			22.07		997.2867
0.21251		24.04	0.0230	1016.03	(113)	0.000200	0.000204	1015.93	0.1031	-0.000004	0.011			22.19		997.2867
0.42541		24.04	0.0451	1034.39	(113)	0.000205	0.000208	1034.23	0.1568	-0.000003	0.025			22.75		997.2867
0.66613		24.04	0.0688	1054.40	(113)	0.000214	0.000213	1054.49	-0.0828	0.000001	0.007			23.72		997.2867
0.88035		24.04	0.0890	1071.80	(113)	0.000220	0.000216	1072.11	-0.3149	0.000003	0.099			24.37		997.2867
0.01256		25	0.0014	998.20	(87)	0.000169	0.000201	998.16	0.0449	-0.000032	0.002				1.156	997.0449
0.0203		25	0.0022	998.94	(123)	0.000154	0.000201	998.84	0.1049	-0.000047	0.011			17.13		997.0449
0.022		25	0.0024	999.10	(136)	0.000156	0.000201	998.99	0.1097	-0.000045	0.012					997.0449
0.02235		25	0.0025	999.10	(87)	0.000171	0.000201	999.02	0.0747	-0.000030	0.006				2.051	997.0449
0.0239		25	0.0026	999.30	(136)	0.000147	0.000201	999.16	0.1419	-0.000054	0.020					997.0449
0.03287		25	0.0036	1000.05	(87)	0.000174	0.000201	999.95	0.0979	-0.000027	0.010				3.003	997.0449
0.0334		25	0.0037	1000.08	(57)	0.000179	0.000201	1000.00	0.0832	-0.000023	0.007					997.0449
0.037		25	0.0041	1000.47	(123)	0.000163	0.000201	1000.31	0.1555	-0.000038	0.024			18.14		997.0449
0.045		25	0.0050	1001.20	(136)	0.000165	0.000202	1001.02	0.1801	-0.000036	0.032					997.0449
0.0469		25	0.0052	1001.40	(136)	0.000161	0.000202	1001.19	0.2126	-0.000041	0.045					997.0449
0.05		25	0.0055	1001.59	(45)	0.000178	0.000202	1001.46	0.1295	-0.000023	0.017					997.0449
0.0505		25	0.0056	1001.65	(28)	0.000175	0.000202	1001.50	0.1473	-0.000026	0.022				4.607	997.0449
0.059		25	0.0065	1002.50	(136)	0.000164	0.000202	1002.25	0.2468	-0.000038	0.061					997.0449
0.0594		25	0.0065	1002.50	(136)	0.000170	0.000202	1002.29	0.2116	-0.000032	0.045					997.0449
0.06635		25	0.0073	1003.09	(87)	0.000176	0.000202	1002.90	0.1919	-0.000026	0.037				6.047	997.0449
0.0667		25	0.0073	1003.18	(123)	0.000168	0.000202	1002.93	0.2517	-0.000034	0.063			18.64		997.0449
0.0685		25	0.0075	1003.30	(136)	0.000174	0.000202	1003.09	0.2108	-0.000028	0.044					997.0449
0.0724		25	0.0080	1003.70	(136)	0.000169	0.000202	1003.43	0.2679	-0.000033	0.072					997.0449
0.0816		25	0.0090	1004.50	(136)	0.000174	0.000202	1004.24	0.2593	-0.000029	0.067					997.0449
0.0832		25	0.0091	1004.70	(123)	0.000168	0.000202	1004.38	0.3163	-0.000034	0.100			18.65		997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	App molal volume / cm³ /mole	Delta density / kg/m³	Density of water / kg/m³
0.0837		25	0.0092	1004.60	(136)	0.000183	0.000202	1004.43	0.1748	-0.000019	0.031					997.0449
0.0975		25	0.0107	1005.90	(136)	0.000178	0.000203	1005.64	0.2635	-0.000024	0.069					997.0449
0.0999		25	0.0110	1006.13	(57)	0.000177	0.000203	1005.85	0.2830	-0.000025	0.080					997.0449
0.1		25	0.0110	1006.10	(45)	0.000181	0.000203	1005.86	0.2442	-0.000022	0.060					997.0449
0.101		25	0.0111	1006.21	(28)	0.000179	0.000203	1005.94	0.2654	-0.000024	0.070				9.164	997.0449
0.1208		25	0.0132	1008.13	(123)	0.000169	0.000203	1007.68	0.4507	-0.000034	0.203			18.81		997.0449
0.1301		25	0.0142	1009.00	(123)	0.000168	0.000203	1008.49	0.5078	-0.000035	0.258			18.66		997.0449
0.13065		25	0.0143	1008.85	(87)	0.000182	0.000203	1008.54	0.3128	-0.000022	0.098				11.808	997.0449
0.1317		25	0.0144	1009.00	(136)	0.000178	0.000203	1008.63	0.3681	-0.000025	0.136					997.0449
0.1406		25	0.0154	1009.70	(136)	0.000185	0.000203	1009.41	0.2902	-0.000019	0.084					997.0449
0.1439		25	0.0157	1010.10	(136)	0.000178	0.000203	1009.70	0.4019	-0.000025	0.162					997.0449
0.1666		25	0.0182	1012.04	(57)	0.000184	0.000204	1011.68	0.3613	-0.000019	0.131					997.0449
0.1854		25	0.0202	1013.80	(136)	0.000181	0.000204	1013.32	0.4842	-0.000023	0.234					997.0449
0.1891		25	0.0206	1014.10	(136)	0.000182	0.000204	1013.64	0.4623	-0.000022	0.214					997.0449
0.1948		25	0.0212	1014.60	(136)	0.000183	0.000204	1014.13	0.4667	-0.000021	0.218					997.0449
0.19623		25	0.0213	1014.67	(87)	0.000186	0.000204	1014.26	0.4083	-0.000019	0.167				17.621	997.0449
0.2023		25	0.0220	1015.45	(123)	0.000175	0.000205	1014.79	0.6610	-0.000029	0.437			19.46		997.0449
0.2046		25	0.0222	1015.50	(136)	0.000182	0.000205	1014.98	0.5151	-0.000023	0.265					997.0449
0.2515		25	0.0272	1019.58	(28)	0.000187	0.000205	1019.05	0.5308	-0.000019	0.282				22.535	997.0449
0.2535		25	0.0274	1019.70	(136)	0.000189	0.000206	1019.22	0.4780	-0.000017	0.228					997.0449
0.2629		25	0.0284	1020.83	(123)	0.000179	0.000206	1020.03	0.7921	-0.000027	0.627			19.85		997.0449
0.26325		25	0.0284	1020.55	(87)	0.000189	0.000206	1020.06	0.4843	-0.000016	0.235				23.504	997.0449
0.2633		25	0.0284	1020.60	(136)	0.000188	0.000206	1020.07	0.5311	-0.000018	0.282					997.0449
0.2926		25	0.0315	1023.20	(136)	0.000188	0.000206	1022.60	0.6040	-0.000018	0.365					997.0449
0.328		25	0.0351	1026.18	(87)	0.000192	0.000207	1025.64	0.5399	-0.000015	0.292				29.135	997.0449
0.3334		25	0.0357	1026.59	(57)	0.000194	0.000207	1026.10	0.4866	-0.000013	0.237					997.0449
0.3372		25	0.0361	1027.37	(123)	0.000182	0.000207	1026.43	0.9397	-0.000025	0.883			20.24		997.0449
0.3488		25	0.0373	1028.00	(136)	0.000193	0.000207	1027.42	0.5763	-0.000015	0.332					997.0449
0.3936		25	0.0419	1032.00	(136)	0.000191	0.000208	1031.25	0.7463	-0.000017	0.557					997.0449
0.4007		25	0.0426	1032.50	(136)	0.000194	0.000208	1031.86	0.6408	-0.000014	0.411					997.0449
0.406		25	0.0431	1033.37	(123)	0.000185	0.000208	1032.31	1.0623	-0.000023	1.129			20.56		997.0449
0.4164		25	0.0442	1033.90	(136)	0.000194	0.000209	1033.20	0.7034	-0.000015	0.495					997.0449
0.4869		25	0.0513	1039.80	(136)	0.000199	0.000210	1039.18	0.6226	-0.000011	0.388					997.0449
0.4993		25	0.0525	1040.68	(57)	0.000202	0.000210	1040.23	0.4549	-0.000008	0.207					997.0449
0.5		25	0.0526	1041.00	(45)	0.000197	0.000210	1040.28	0.7158	-0.000013	0.512					997.0449
0.5026		25	0.0528	1041.26	(28)	0.000197	0.000210	1040.50	0.7581	-0.000013	0.575				44.217	997.0449
0.5295		25	0.0555	1043.50	(136)	0.000199	0.000211	1042.77	0.7284	-0.000012	0.530					997.0449
0.5542		25	0.0579	1045.50	(136)	0.000201	0.000211	1044.85	0.6511	-0.000010	0.424					997.0449
0.5734		25	0.0598	1047.20	(136)	0.000200	0.000211	1046.46	0.7399	-0.000011	0.547					997.0449
0.5843		25	0.0609	1048.10	(136)	0.000201	0.000212	1047.37	0.7265	-0.000011	0.528					997.0449
0.5942		25	0.0619	1049.00	(136)	0.000200	0.000212	1048.20	0.7978	-0.000012	0.636					997.0449
0.6043		25	0.0629	1049.70	(136)	0.000203	0.000212	1049.05	0.6531	-0.000009	0.427					997.0449
0.6139		25	0.0638	1050.60	(136)	0.000201	0.000212	1049.85	0.7510	-0.000011	0.564					997.0449
0.6665		25	0.0689	1054.96	(57)	0.000204	0.000213	1054.23	0.7297	-0.000010	0.532					997.0449
0.6696		25	0.0692	1055.20	(136)	0.000204	0.000213	1054.49	0.7122	-0.000009	0.507					997.0449
0.7154		25	0.0736	1059.00	(136)	0.000205	0.000214	1058.28	0.7167	-0.000009	0.514					997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	App molal volume / cm³ /mole	Delta density / kg/m³	Density of water / kg/m³
0.7754		25	0.0792	1063.90	(136)	0.000208	0.000215	1063.23	0.6704	-0.000007	0.449					997.0449
0.789		25	0.0805	1065.10	(136)	0.000207	0.000215	1064.35	0.7533	-0.000008	0.568					997.0449
0.8528		25	0.0865	1070.30	(136)	0.000209	0.000216	1069.57	0.7330	-0.000007	0.537					997.0449
0.8673		25	0.0878	1071.40	(136)	0.000210	0.000217	1070.75	0.6511	-0.000006	0.424					997.0449
0.9929		25	0.0993	1081.11	(57)	0.000217	0.000219	1080.91	0.1955	-0.000002	0.038					997.0449
1		25	0.0999	1082.22	(45)	0.000213	0.000219	1081.49	0.7347	-0.000006	0.540					997.0449
1.005		25	0.1004	1082.47	(28)	0.000214	0.000219	1081.89	0.5799	-0.000005	0.336				85.422	997.0449
1.0913		25	0.1080	1089.40	(136)	0.000216	0.000221	1088.79	0.6109	-0.000005	0.373					997.0449
1.1578		25	0.1139	1094.70	(136)	0.000217	0.000222	1094.07	0.6335	-0.000005	0.401					997.0449
1.1607		25	0.1141	1094.90	(136)	0.000218	0.000222	1094.30	0.6041	-0.000004	0.365					997.0449
1.1891		25	0.1166	1097.10	(136)	0.000218	0.000222	1096.54	0.5619	-0.000004	0.316					997.0449
1.3226		25	0.1280	1107.50	(136)	0.000222	0.000225	1106.99	0.5091	-0.000003	0.259					997.0449
1.44		25	0.1378	1116.50	(136)	0.000224	0.000227	1116.06	0.4355	-0.000003	0.190					997.0449
1.4754		25	0.1407	1119.20	(136)	0.000225	0.000227	1118.78	0.4212	-0.000002	0.177					997.0449
1.5001		25	0.1427	1121.11	(57)	0.000225	0.000228	1120.67	0.4433	-0.000002	0.196					997.0449
1.5227		25	0.1446	1122.70	(136)	0.000227	0.000228	1122.39	0.3102	-0.000002	0.096					997.0449
1.5406		25	0.1460	1124.10	(136)	0.000227	0.000229	1123.75	0.3483	-0.000002	0.121					997.0449
1.6663		25	0.1561	1133.60	(57)	0.000229	0.000231	1133.24	0.3569	-0.000002	0.127					997.0449
1.6825		25	0.1574	1134.70	(136)	0.000230	0.000231	1134.46	0.2429	-0.000001	0.059					997.0449
1.71		25	0.1595	1136.80	(136)	0.000230	0.000231	1136.51	0.2867	-0.000001	0.082					997.0449
1.7557		25	0.1631	1140.00	(136)	0.000232	0.000232	1139.92	0.0831	0.000000	0.007					997.0449
1.7575		25	0.1632	1140.20	(136)	0.000231	0.000232	1140.05	0.1494	-0.000001	0.022					997.0449
1.7818		25	0.1651	1142.10	(136)	0.000231	0.000233	1141.85	0.2467	-0.000001	0.061					997.0449
1.8788		25	0.1725	1149.10	(136)	0.000234	0.000234	1149.00	0.0973	0.000000	0.009					997.0449
1.9034		25	0.1744	1150.90	(136)	0.000234	0.000235	1150.80	0.0960	0.000000	0.009					997.0449
1.9407		25	0.1772	1153.60	(136)	0.000235	0.000235	1153.53	0.0739	0.000000	0.005					997.0449
1.979		25	0.1801	1156.30	(136)	0.000236	0.000236	1156.31	-0.0098	0.000000	0.000					997.0449
1.9995		25	0.1816	1157.96	(57)	0.000236	0.000236	1157.80	0.1650	-0.000001	0.027					997.0449
2		25	0.1817	1157.99	(45)	0.000236	0.000236	1157.83	0.1588	-0.000001	0.025					997.0449
2.006		25	0.1821	1158.21	(28)	0.000237	0.000236	1158.27	-0.0524	0.000000	0.003				161.168	997.0449
2.0929		25	0.1885	1164.50	(136)	0.000238	0.000238	1164.52	-0.0201	0.000000	0.000					997.0449
2.1063		25	0.1895	1165.40	(136)	0.000238	0.000238	1165.48	-0.0794	0.000000	0.006					997.0449
2.1167		25	0.1902	1166.20	(136)	0.000238	0.000238	1166.22	-0.0229	0.000000	0.001					997.0449
2.2115		25	0.1971	1172.80	(136)	0.000240	0.000240	1172.96	-0.1614	0.000001	0.026					997.0449
2.2261		25	0.1981	1173.90	(136)	0.000240	0.000240	1173.99	-0.0929	0.000000	0.009					997.0449
2.4106		25	0.2111	1186.60	(136)	0.000244	0.000243	1186.89	-0.2863	0.000001	0.082					997.0449
2.5		25	0.2172	1192.27	(57)	0.000247	0.000244	1193.04	-0.7693	0.000002	0.592					997.0449
2.5073		25	0.2177	1193.20	(136)	0.000246	0.000244	1193.54	-0.3390	0.000001	0.115					997.0449
2.5885		25	0.2232	1198.70	(136)	0.000247	0.000246	1199.07	-0.3700	0.000001	0.137					997.0449
2.638		25	0.2265	1202.10	(136)	0.000248	0.000247	1202.42	-0.3170	0.000001	0.100					997.0449
2.787		25	0.2363	1212.00	(136)	0.000250	0.000249	1212.38	-0.3795	0.000001	0.144					997.0449
2.8391		25	0.2396	1215.40	(136)	0.000251	0.000250	1215.82	-0.4235	0.000001	0.179					997.0449
2.9091		25	0.2441	1220.10	(136)	0.000252	0.000251	1220.42	-0.3185	0.000001	0.101					997.0449
2.9583		25	0.2472	1223.20	(136)	0.000253	0.000252	1223.63	-0.4262	0.000001	0.182					997.0449
3		25	0.2498	1225.24	(45)	0.000255	0.000252	1226.33	-1.0908	0.000003	1.190					997.0449
3.017		25	0.2509	1227.01	(28)	0.000254	0.000253	1227.43	-0.4227	0.000001	0.179				229.962	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	App molal volume / cm³ /mole	Delta density / kg/m³	Density of water / kg/m³
3.0368		25	0.2521	1227.49	(57)	0.000256	0.000253	1228.71	-1.2168	0.000003	1.481					997.0449
3.1438		25	0.2587	1235.10	(136)	0.000256	0.000254	1235.56	-0.4582	0.000001	0.210					997.0449
3.2268		25	0.2637	1240.30	(136)	0.000257	0.000256	1240.81	-0.5146	0.000001	0.265					997.0449
3.3332		25	0.2700	1247.32	(57)	0.000258	0.000257	1247.48	-0.1591	0.000000	0.025					997.0449
3.4443		25	0.2766	1254.00	(136)	0.000260	0.000259	1254.35	-0.3500	0.000001	0.123					997.0449
3.5941		25	0.2852	1263.20	(136)	0.000262	0.000261	1263.47	-0.2732	0.000001	0.075					997.0449
3.6237		25	0.2868	1265.00	(136)	0.000262	0.000262	1265.26	-0.2568	0.000001	0.066					997.0449
3.8589		25	0.2999	1279.10	(136)	0.000265	0.000265	1279.21	-0.1086	0.000000	0.012					997.0449
3.9093		25	0.3026	1282.00	(136)	0.000266	0.000266	1282.15	-0.1475	0.000000	0.022					997.0449
3.9571		25	0.3052	1284.80	(136)	0.000267	0.000267	1284.92	-0.1185	0.000000	0.014					997.0449
3.9661		25	0.3057	1285.30	(136)	0.000267	0.000267	1285.44	-0.1384	0.000000	0.019					997.0449
4		25	0.3075	1285.25	(45)	0.000271	0.000267	1287.39	-2.1419	0.000004	4.588					997.0449
4		25	0.3075	1288.69	(57)	0.000265	0.000267	1287.39	1.2981	-0.000003	1.685					997.0449
4.2137		25	0.3187	1299.60	(136)	0.000270	0.000270	1299.52	0.0767	0.000000	0.006					997.0449
4.6976		25	0.3427	1326.89	(57)	0.000275	0.000277	1325.85	1.0386	-0.000002	1.079					997.0449
4.7625		25	0.3458	1329.70	(136)	0.000277	0.000278	1329.26	0.4355	-0.000001	0.190					997.0449
4.8394		25	0.3494	1333.90	(136)	0.000278	0.000279	1333.27	0.6268	-0.000001	0.393					997.0449
4.8583		25	0.3503	1334.90	(136)	0.000278	0.000279	1334.25	0.6474	-0.000001	0.419					997.0449
4.98		25	0.3560	1341.48	(28)	0.000280	0.000281	1340.50	0.9720	-0.000002	0.945			344.431		997.0449
5.0004		25	0.3569	1343.08	(57)	0.000279	0.000281	1341.54	1.5375	-0.000002	2.364					997.0449
5.3599		25	0.3730	1360.40	(136)	0.000285	0.000286	1359.41	0.9854	-0.000001	0.971					997.0449
5.3683		25	0.3734	1360.90	(136)	0.000285	0.000286	1359.82	1.0774	-0.000002	1.161					997.0449
5.6189		25	0.3841	1372.90	(136)	0.000288	0.000290	1371.80	1.1048	-0.000002	1.221					997.0449
5.7097		25	0.3879	1377.20	(136)	0.000289	0.000291	1376.04	1.1605	-0.000002	1.347					997.0449
5.8689		25	0.3944	1384.60	(136)	0.000291	0.000293	1383.36	1.2372	-0.000002	1.531					997.0449
6		25	0.3997	1385.50	(45)	0.000299	0.000295	1389.28	-3.7817	0.000005	14.301					997.0449
6.1506		25	0.4057	1397.30	(136)	0.000295	0.000297	1395.96	1.3418	-0.000002	1.801					997.0449
6.2514		25	0.4096	1401.80	(136)	0.000296	0.000298	1400.35	1.4455	-0.000002	2.090					997.0449
6.2858		25	0.4110	1403.04	(57)	0.000297	0.000298	1401.84	1.1984	-0.000001	1.436					997.0449
6.6584		25	0.4250	1419.00	(136)	0.000301	0.000303	1417.53	1.4722	-0.000002	2.167					997.0449
6.8525		25	0.4320	1426.80	(136)	0.000304	0.000305	1425.40	1.4005	-0.000002	1.961					997.0449
7.0766		25	0.4399	1435.70	(136)	0.000306	0.000308	1434.24	1.4604	-0.000002	2.133					997.0449
7.333		25	0.4487	1445.40	(136)	0.000310	0.000311	1444.04	1.3649	-0.000001	1.863					997.0449
7.3414		25	0.4490	1445.80	(136)	0.000310	0.000311	1444.35	1.4496	-0.000002	2.101					997.0449
7.4589		25	0.4529	1450.20	(136)	0.000311	0.000313	1448.72	1.4768	-0.000002	2.181					997.0449
7.8783		25	0.4665	1465.00	(136)	0.000316	0.000317	1463.78	1.2219	-0.000001	1.493					997.0449
		28.47	0.3471	1327.35	(133)	0.000282	0.000280	1328.56	-1.2052	0.000002	1.453					996.0989
		28.92	0.1945	1168.13	(133)	0.000243	0.000241	1168.73	-0.6016	0.000002	0.362					995.9682
		29.31	0.4651	1459.53	(133)	0.000318	0.000319	1458.74	0.7932	-0.000001	0.629					995.8535
		29.65	0.2461	1219.33	(133)	0.000256	0.000254	1220.25	-0.9168	0.000003	0.841					995.7524
		29.68	0.5132	1509.46	(133)	0.000338	0.000338	1510.23	-0.7712	0.000001	0.595					995.7434
		29.75	0.3958	1381.79	(133)	0.000295	0.000296	1381.60	0.1946	0.000000	0.038					995.7225
		29.78	0.2978	1273.59	(133)	0.000268	0.000267	1274.36	-0.7734	0.000002	0.598					995.7135
		29.78	0.4954	1493.08	(133)	0.000329	0.000331	1491.25	1.8315	-0.000002	3.354					995.7135
		29.87	0.427	1417.08	(133)	0.000305	0.000306	1416.20	0.8818	-0.000001	0.778					995.6864
0.05		30	0.0055	1000.17	(45)	0.000181	0.000204	1000.05	0.1240	-0.000022	0.015					995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	App molal volume / cm³ /mole	Delta density / kg/m³	Density of water / kg/m³
0.1		30	0.0110	1004.65	(45)	0.000184	0.000205	1004.42	0.2257	-0.000020	0.051					995.6473
		30	0.0200	1012.00	(90)	0.000193	0.000206	1011.72	0.2770	-0.000014	0.077					995.6473
		30	0.0400	1028.60	(90)	0.000200	0.000210	1028.17	0.4251	-0.000010	0.181					995.6473
0.5		30	0.0526	1039.37	(45)	0.000201	0.000212	1038.72	0.6544	-0.000012	0.428					995.6473
		30	0.0800	1062.60	(90)	0.000213	0.000217	1062.22	0.3752	-0.000004	0.141					995.6473
1		30	0.0999	1080.40	(45)	0.000216	0.000221	1079.74	0.6580	-0.000006	0.433					995.6473
		30	0.1200	1097.80	(90)	0.000226	0.000225	1097.82	-0.0228	0.000000	0.001					995.6473
		30	0.1600	1134.50	(90)	0.000236	0.000234	1134.98	-0.4753	0.000002	0.226					995.6473
2		30	0.1817	1155.85	(45)	0.000238	0.000239	1155.73	0.1177	0.000000	0.014					995.6473
		30	0.2000	1173.00	(90)	0.000245	0.000243	1173.66	-0.6615	0.000002	0.438					995.6473
3		30	0.2498	1222.81	(45)	0.000257	0.000255	1223.87	-1.0643	0.000003	1.133					995.6473
		30	0.2500	1223.60	(90)	0.000256	0.000255	1224.08	-0.4849	0.000001	0.235					995.6473
		30	0.3000	1276.40	(90)	0.000268	0.000268	1276.59	-0.1912	0.000000	0.037					995.6473
4		30	0.3075	1282.51	(45)	0.000274	0.000270	1284.58	-2.0727	0.000004	4.296					995.6473
		30	0.3500	1331.60	(90)	0.000280	0.000282	1330.80	0.8041	-0.000001	0.647					995.6473
6		30	0.3997	1382.30	(45)	0.000302	0.000297	1385.80	-3.5016	0.000005	12.262					995.6473
		30	0.4000	1389.50	(90)	0.000293	0.000297	1386.09	3.4075	-0.000004	11.611					995.6473
		30.22	0.0987	1079.10	(133)	0.000217	0.000221	1078.59	0.5077	-0.000004	0.258					995.5806
0.05		35	0.0055	998.55	(45)	0.000181	0.000206	998.41	0.1350	-0.000025	0.018					994.0319
0.1		35	0.0110	1003.02	(45)	0.000185	0.000207	1002.78	0.2423	-0.000022	0.059					994.0319
0.5		35	0.0526	1037.60	(45)	0.000203	0.000214	1036.94	0.6564	-0.000012	0.431					994.0319
1		35	0.0999	1078.50	(45)	0.000217	0.000223	1077.81	0.6870	-0.000006	0.472					994.0319
2		35	0.1817	1153.68	(45)	0.000240	0.000240	1153.49	0.1884	-0.000001	0.036					994.0319
3		35	0.2498	1220.37	(45)	0.000259	0.000256	1221.33	-0.9598	0.000003	0.921					994.0319
4		35	0.3075	1279.80	(45)	0.000275	0.000272	1281.75	-1.9470	0.000004	3.791					994.0319
6		35	0.3997	1379.11	(45)	0.000303	0.000299	1382.43	-3.3236	0.000004	11.046					994.0319
		38.56	0.3471	1321.38	(133)	0.000286	0.000284	1322.40	-1.0233	0.000002	1.047					992.7585
		39.06	0.1945	1163.44	(133)	0.000247	0.000245	1164.01	-0.5655	0.000002	0.320					992.5718
		39.37	0.4651	1452.66	(133)	0.000321	0.000323	1451.28	1.3754	-0.000001	1.892					992.4551
		39.66	0.5132	1502.58	(133)	0.000341	0.000341	1502.32	0.2644	0.000000	0.070					992.3453
		39.67	0.2461	1214.26	(133)	0.000259	0.000257	1215.11	-0.8523	0.000002	0.726					992.3415
		39.77	0.3958	1375.32	(133)	0.000299	0.000299	1374.99	0.3332	0.000000	0.111					992.3035
		39.79	0.4954	1486.16	(133)	0.000332	0.000334	1483.53	2.6311	-0.000002	6.923					992.2959
		39.81	0.2978	1268.11	(133)	0.000272	0.000270	1268.75	-0.6385	0.000001	0.408					992.2883
		39.89	0.427	1410.39	(133)	0.000308	0.000309	1409.25	1.1362	-0.000001	1.291					992.2578
		40	0.0200	1008.40	(90)	0.000199	0.000210	1008.18	0.2187	-0.000011	0.048					992.2158
		40	0.0400	1024.90	(90)	0.000204	0.000213	1024.52	0.3816	-0.000009	0.146					992.2158
		40	0.0800	1058.60	(90)	0.000218	0.000221	1058.32	0.2751	-0.000003	0.076					992.2158
		40	0.1200	1093.70	(90)	0.000229	0.000229	1093.66	0.0403	0.000000	0.002					992.2158
		40	0.1600	1130.10	(90)	0.000239	0.000237	1130.53	-0.4280	0.000002	0.183					992.2158
		40	0.2000	1168.40	(90)	0.000248	0.000246	1168.91	-0.5079	0.000002	0.258					992.2158
		40	0.2500	1218.60	(90)	0.000259	0.000258	1218.92	-0.3157	0.000001	0.100					992.2158
		40	0.3000	1270.90	(90)	0.000271	0.000271	1270.97	-0.0698	0.000000	0.005					992.2158
		40	0.3500	1325.50	(90)	0.000284	0.000285	1324.69	0.8137	-0.000001	0.662					992.2158
		40	0.4000	1382.60	(90)	0.000296	0.000301	1379.46	3.1379	-0.000004	9.847					992.2158
		40.39	0.0987	1074.90	(133)	0.000221	0.000225	1074.48	0.4174	-0.000004	0.174					992.0661

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	App molal volume / cm³ /mole	Delta density / kg/m³	Density of water / kg/m³
0.05		45	0.0055	994.73	(45)	0.000179	0.000209	994.57	0.1612	-0.000030	0.026					990.2132
0.1		45	0.0110	999.16	(45)	0.000186	0.000209	998.90	0.2561	-0.000023	0.066					990.2132
0.5		45	0.0526	1033.57	(45)	0.000204	0.000217	1032.85	0.7178	-0.000013	0.515					990.2132
1		45	0.0999	1074.27	(45)	0.000219	0.000226	1073.46	0.8133	-0.000007	0.662					990.2132
2		45	0.1817	1149.04	(45)	0.000241	0.000243	1148.63	0.4066	-0.000002	0.165					990.2132
3		45	0.2498	1215.31	(45)	0.000261	0.000259	1216.01	-0.7024	0.000002	0.493					990.2132
4		45	0.3075	1274.28	(45)	0.000278	0.000274	1276.02	-1.7365	0.000003	3.015					990.2132
6		45	0.3997	1372.74	(45)	0.000306	0.000302	1376.02	-3.2768	0.000004	10.737					990.2132
		48.65	0.3471	1315.31	(133)	0.000288	0.000286	1316.36	-1.0550	0.000002	1.113					988.6406
0.02976		48.75	0.0033	991.23	(113)	0.000195	0.000209	991.19	0.0461	-0.000014	0.002			21.6		988.5963
0.0994		48.75	0.0109	997.34	(113)	0.000199	0.000210	997.22	0.1260	-0.000012	0.016			22.04		988.5963
0.10213		48.75	0.0112	997.53	(113)	0.000203	0.000210	997.45	0.0778	-0.000007	0.006			22.56		988.5963
0.19769		48.75	0.0215	1005.76	(113)	0.000207	0.000212	1005.66	0.1005	-0.000005	0.010			23.02		988.5963
0.21251		48.75	0.0230	1007.03	(113)	0.000208	0.000212	1006.93	0.0999	-0.000004	0.010			23.09		988.5963
0.42541		48.75	0.0451	1025.07	(113)	0.000213	0.000216	1024.93	0.1385	-0.000003	0.019			23.68		988.5963
0.66613		48.75	0.0688	1044.75	(113)	0.000222	0.000221	1044.83	-0.0856	0.000001	0.007			24.62		988.5963
0.88035		48.75	0.0890	1061.85	(113)	0.000228	0.000225	1062.15	-0.3057	0.000003	0.093			25.26		988.5963
		49.1	0.1945	1158.43	(133)	0.000248	0.000247	1158.87	-0.4364	0.000002	0.190					988.4405
		49.51	0.4651	1445.81	(133)	0.000323	0.000325	1444.68	1.1312	-0.000001	1.280					988.257
		49.62	0.5132	1495.78	(133)	0.000343	0.000343	1495.71	0.0652	0.000000	0.004					988.2076
		49.77	0.2978	1262.48	(133)	0.000274	0.000272	1263.06	-0.5791	0.000001	0.335					988.1401
		49.81	0.3958	1368.79	(133)	0.000301	0.000301	1368.75	0.0376	0.000000	0.001					988.1221
		49.82	0.4954	1479.29	(133)	0.000334	0.000336	1476.94	2.3510	-0.000002	5.527					988.1176
		49.85	0.427	1403.69	(133)	0.000310	0.000311	1402.94	0.7517	-0.000001	0.565					988.104
		49.88	0.2461	1208.97	(133)	0.000261	0.000259	1209.57	-0.5984	0.000002	0.358					988.0905
		50.51	0.0987	1070.17	(133)	0.000223	0.000227	1069.74	0.4257	-0.000004	0.181					987.8049
0.05		55	0.0055	990.19	(45)	0.000180	0.000210	990.03	0.1625	-0.000030	0.026					985.6952
0.1		55	0.0110	994.64	(45)	0.000183	0.000211	994.34	0.3003	-0.000028	0.090					985.6952
0.5		55	0.0526	1028.97	(45)	0.000203	0.000218	1028.11	0.8601	-0.000015	0.740					985.6952
1		55	0.0999	1069.58	(45)	0.000218	0.000227	1068.51	1.0718	-0.000009	1.149					985.6952
2		55	0.1817	1144.13	(45)	0.000241	0.000245	1143.33	0.8017	-0.000003	0.643					985.6952
3		55	0.2498	1210.19	(45)	0.000261	0.000260	1210.42	-0.2343	0.000001	0.055					985.6952
4		55	0.3075	1268.72	(45)	0.000278	0.000275	1270.22	-1.4957	0.000003	2.237					985.6952
6		55	0.3997	1366.38	(45)	0.000307	0.000303	1369.98	-3.5980	0.000005	12.946					985.6952
		58.48	0.0987	1066.13	(133)	0.000223	0.000227	1065.61	0.5216	-0.000005	0.272					983.9737
		58.63	0.3471	1309.24	(133)	0.000289	0.000287	1310.48	-1.2430	0.000002	1.545					983.8979
		58.79	0.0987	1065.99	(133)	0.000223	0.000227	1065.44	0.5493	-0.000005	0.302					983.8168
		59.12	0.1945	1153.15	(133)	0.000248	0.000248	1153.34	-0.1855	0.000001	0.034					983.6492
		59.51	0.4651	1439.05	(133)	0.000325	0.000325	1438.92	0.1250	0.000000	0.016					983.4502
		59.59	0.5132	1489.06	(133)	0.000344	0.000343	1490.22	-1.1630	0.000001	1.353					983.4092
		59.67	0.2461	1203.50	(133)	0.000261	0.000260	1203.99	-0.4878	0.000001	0.238					983.3683
		59.8	0.3958	1362.26	(133)	0.000302	0.000301	1362.87	-0.6124	0.000001	0.375					983.3016
		59.84	0.2978	1256.66	(133)	0.000274	0.000273	1257.20	-0.5381	0.000001	0.290					983.2811
		59.86	0.4954	1472.51	(133)	0.000335	0.000336	1471.33	1.1846	-0.000001	1.403					983.2708
		59.94	0.427	1396.95	(133)	0.000312	0.000312	1397.05	-0.0969	0.000000	0.009					983.2297
		60	0.0200	999.40	(90)	0.000193	0.000213	998.99	0.4053	-0.000020	0.164					983.1989

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	App molal volume / cm³ /mole	Delta density / kg/m³	Density of water / kg/m³
		60	0.0400	1015.80	(90)	0.000201	0.000217	1015.16	0.6399	-0.000016	0.409					983.1989
		60	0.0800	1049.20	(90)	0.000217	0.000224	1048.62	0.5818	-0.000007	0.338					983.1989
		60	0.1200	1084.00	(90)	0.000229	0.000232	1083.60	0.3992	-0.000003	0.159					983.1989
		60	0.1600	1120.20	(90)	0.000240	0.000240	1120.12	0.0832	0.000000	0.007					983.1989
		60	0.2000	1158.10	(90)	0.000249	0.000249	1158.15	-0.0497	0.000000	0.002					983.1989
		60	0.2500	1207.90	(90)	0.000260	0.000261	1207.74	0.1581	0.000000	0.025					983.1989
		60	0.3000	1259.70	(90)	0.000273	0.000274	1259.42	0.2827	-0.000001	0.080					983.1989
		60	0.3500	1313.70	(90)	0.000286	0.000287	1312.82	0.8843	-0.000001	0.782					983.1989
		60	0.4000	1370.00	(90)	0.000299	0.000303	1367.37	2.6349	-0.000004	6.943					983.1989
		68.83	0.3471	1303.03	(133)	0.000289	0.000286	1304.52	-1.4919	0.000003	2.226					978.4337
		69.21	0.1945	1147.62	(133)	0.000246	0.000247	1147.39	0.2308	-0.000001	0.053					978.2188
		69.59	0.5132	1482.46	(133)	0.000345	0.000342	1485.65	-3.1930	0.000003	10.195					978.0032
		69.69	0.4651	1432.32	(133)	0.000325	0.000324	1433.70	-1.3841	0.000001	1.916					977.9463
		69.73	0.2461	1197.84	(133)	0.000260	0.000259	1197.99	-0.1520	0.000000	0.023					977.9235
		69.91	0.3958	1355.75	(133)	0.000302	0.000300	1357.17	-1.4228	0.000002	2.024					977.821
		69.92	0.2978	1250.77	(133)	0.000273	0.000272	1251.21	-0.4364	0.000001	0.190					977.8153
		69.92	0.4954	1465.84	(133)	0.000335	0.000335	1466.52	-0.6799	0.000001	0.462					977.8153
		69.99	0.427	1390.31	(133)	0.000312	0.000310	1391.58	-1.2736	0.000002	1.622					977.7753
0.04975		75	0.0055	979.23	(113)	0.000189	0.000210	979.12	0.1091	-0.000021	0.012			21.03		974.849
0.05108		75	0.0056	979.34	(113)	0.000191	0.000210	979.24	0.1063	-0.000020	0.011			21.15		974.849
0.10015		75	0.0110	983.55	(113)	0.000200	0.000211	983.44	0.1163	-0.000011	0.014			22.22		974.849
0.20271		75	0.0220	992.28	(113)	0.000207	0.000213	992.15	0.1294	-0.000006	0.017			22.98		974.849
0.49449		75	0.0520	1016.68	(113)	0.000215	0.000218	1016.48	0.2031	-0.000004	0.041			23.81		974.849
0.98452		75	0.0985	1055.02	(113)	0.000235	0.000227	1055.85	-0.8331	0.000008	0.694			26.03		974.849
		80	0.0200	988.10	(90)	0.000180	0.000212	987.48	0.6241	-0.000032	0.389					971.7978
		80	0.0400	1004.60	(90)	0.000189	0.000216	1003.53	1.0712	-0.000027	1.147					971.7978
		80	0.0800	1038.20	(90)	0.000206	0.000223	1036.78	1.4190	-0.000016	2.014					971.7978
		80	0.1200	1073.00	(90)	0.000220	0.000230	1071.59	1.4094	-0.000010	1.986					971.7978
		80	0.1600	1109.20	(90)	0.000232	0.000239	1107.98	1.2227	-0.000006	1.495					971.7978
		80	0.2000	1147.10	(90)	0.000243	0.000247	1145.94	1.1622	-0.000004	1.351					971.7978
		80	0.2500	1196.50	(90)	0.000256	0.000259	1195.54	0.9559	-0.000003	0.914					971.7978
		80	0.3000	1247.80	(90)	0.000270	0.000271	1247.39	0.4142	-0.000001	0.172					971.7978
		80	0.3500	1301.30	(90)	0.000285	0.000285	1301.15	0.1496	0.000000	0.022					971.7978
		80	0.4000	1357.10	(90)	0.000299	0.000300	1356.32	0.7770	-0.000001	0.604					971.7978
0.02976		98.67	0.0033	962.04	(113)	0.000144	0.000206	961.86	0.1869	-0.000061	0.035		!	16.03		959.3157
0.0994		98.67	0.0109	968.25	(113)	0.000161	0.000207	967.78	0.4731	-0.000046	0.224			17.84		959.3157
0.10213		98.67	0.0112	968.46	(113)	0.000164	0.000207	968.01	0.4535	-0.000043	0.206			18.19		959.3157
0.19769		98.67	0.0215	976.79	(113)	0.000174	0.000209	976.08	0.7096	-0.000035	0.504			19.32		959.3157
0.21251		98.67	0.0230	978.06	(113)	0.000176	0.000209	977.32	0.7376	-0.000033	0.544			19.48		959.3157
0.42541		98.67	0.0451	996.31	(113)	0.000184	0.000213	995.02	1.2882	-0.000029	1.659			20.41		959.3157
0.66613		98.67	0.0688	1016.16	(113)	0.000195	0.000217	1014.64	1.5203	-0.000021	2.311			21.69		959.3157
0.88035		98.67	0.0890	1033.41	(113)	0.000203	0.000220	1031.73	1.6834	-0.000018	2.834			22.5		959.3157
0.0752		98.81	0.0083	965.93	(113)	0.000168	0.000207	965.63	0.3007	-0.000039	0.090			18.6		959.2159
0.2106		98.81	0.0228	977.72	(113)	0.000179	0.000209	977.06	0.6564	-0.000030	0.431			19.85		959.2159
0.4699		98.81	0.0496	1000.22	(113)	0.000180	0.000213	998.58	1.6371	-0.000033	2.680			20.02		959.2159
		100	0.0200	974.80	(90)	0.000164	0.000208	973.96	0.8429	-0.000044	0.711					958.3637

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	App molal volume / cm³ /mole	Delta density / kg/m³	Density of water / kg/m³
		100	0.0400	991.50	(90)	0.000172	0.000211	989.94	1.5646	-0.000040	2.448					958.3637
		100	0.0800	1025.70	(90)	0.000187	0.000218	1023.07	2.6257	-0.000031	6.894					958.3637
		100	0.1200	1061.00	(90)	0.000202	0.000226	1057.83	3.1702	-0.000024	10.050					958.3637
		100	0.1600	1097.30	(90)	0.000218	0.000234	1094.24	3.0625	-0.000016	9.379					958.3637
		100	0.2000	1135.20	(90)	0.000231	0.000242	1132.31	2.8870	-0.000011	8.335					958.3637
		100	0.2500	1184.60	(90)	0.000246	0.000253	1182.23	2.3695	-0.000007	5.615					958.3637
		100	0.3000	1235.90	(90)	0.000262	0.000265	1234.62	1.2791	-0.000003	1.636					958.3637
		100	0.3500	1289.30	(90)	0.000278	0.000278	1289.24	0.0617	0.000000	0.004					958.3637
		100	0.4000	1345.00	(90)	0.000294	0.000293	1345.65	-0.6474	0.000001	0.419					958.3637
								Average Res	0.2071	-0.000008	399.298	Sum Chi sqr				
								Std dev Res	1.0386	0.000012						
								Avg - 4std	-3.9471	-0.000058						
								Avg + 4std	4.3614	0.000042						

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0 -0.63254
 c1 0.939949
 c2 4.278471
 c3 0.048319
 c4 3180.906
 Min T 0
 Max T 100
 Min w 0.001392
 Max w 0.5132
 Avg dens res 0.207136
 Std dens res 1.038555
 Avg app vol res $\cdot 10^3$ -0.00841
 Std app vol res $\cdot 10^3$ 0.012498
 No of points in corr 357
 No of inconsistent pair 2

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

6.6668	25	0.4253	1423.15	(57)	0.000297	0.000303	1417.87	5.2774	-0.000006	27.851	!					997.0449
7.4	25	0.4509	1453.22	(57)	0.000305	0.000312	1446.54	6.6802	-0.000007	44.625	!					997.0449

Density of aqueous solutions of **CdCl2**

- References (9) Call, T. G.; Ballerat-Busserolles, K.; Origlia, M. L.; Ford, T. D.; Woolley, E. M. Apparent Molar Volumes and Heat Capacities of Aqueous Magnesium Chloride and Cadmium Chloride at Temperatures from 278.15 K to 393.15 K at the Pressure 0.35 MPa: a Comparison of Ion-Ion Interactions. *J. Chem. Thermodynamics* **2000**, 32, 1525-1538.
- (23) Dolian, F. E. The Viscosities of Solutions of Chlorides in Certain Solvents. *J. Phys. Chem.* **1937**, 41, 1129-1138.
- (37) Herrington, Thelma M.; Roffey, Michael G.; Smith, David P.; Densities of Aqueous Electrolytes MnCl₂, CoCl₂, NiCl₂, ZnCl₂ and CdCl₂ from 25 to 72°C at 1 atm, *J. Chem. Eng. Data*, **1986**, 31, 221-225
- (104) Rard, J. A.; Miller, D. G. Densities and Apparent Molal Volumes of Aqueous Manganese, Cadmium, and Zinc Chlorides at 25 °C. *J. Chem. Eng. Data* **1984**, 29, 151-156.
- (107) Reilly, P. J.; Stokes, R. H. The Diffusion Coefficients of Cadmium Chloride and Cadmium Perchlorate in Water at 25 °C. *Aust. J. Chem.* **1971**, 24, 1361-1367.

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm ³ /mol	Delta density / kg/m ³	Density of water / kg/m ³
		25	0.0019	998.79	(23)	0.000081	0.000151	998.66	0.1328	-0.000070	0.018		!			997.0449
		25	0.0038	1000.47	(23)	0.000095	0.000151	1000.26	0.2128	-0.000056	0.045					997.0449
		25	0.0076	1002.84	(23)	0.000240	0.000151	1003.52	-0.6825	0.000089	0.466		!			997.0449
	0.05	25	0.0091	1004.89	(107)	0.000144	0.000151	1004.83	0.0665	-0.000007	0.004				7.85	997.0449
		25	0.0150	1010.55	(23)	0.000109	0.000152	1009.90	0.6469	-0.000042	0.418					997.0449
	0.1	25	0.0181	1012.74	(107)	0.000144	0.000152	1012.60	0.1458	-0.000008	0.021				15.70	997.0449
		25	0.0296	1023.06	(23)	0.000141	0.000153	1022.71	0.3510	-0.000011	0.123					997.0449
	0.2	25	0.0357	1028.40	(107)	0.000145	0.000153	1028.10	0.3019	-0.000008	0.091				31.36	997.0449
0.2288		25	0.0403	1032.66	(37)	0.000144	0.000153	1032.24	0.4188	-0.000010	0.175					997.0449
0.24987		25	0.0438	1035.96	(104)	0.000143	0.000154	1035.45	0.5121	-0.000011	0.262					997.0449
	0.3	25	0.0527	1044.02	(107)	0.000146	0.000154	1043.56	0.4671	-0.000008	0.218				46.98	997.0449
	0.4	25	0.0692	1059.57	(107)	0.000148	0.000156	1058.97	0.6083	-0.000008	0.370				62.53	997.0449
0.4453		25	0.0755	1065.55	(37)	0.000149	0.000156	1064.92	0.6339	-0.000007	0.402					997.0449
0.49994		25	0.0840	1073.76	(104)	0.000149	0.000157	1073.07	0.6931	-0.000007	0.480					997.0449
	0.5	25	0.0853	1075.05	(107)	0.000149	0.000157	1074.33	0.7231	-0.000007	0.523				78.01	997.0449
	0.6	25	0.1009	1090.48	(107)	0.000151	0.000158	1089.65	0.8307	-0.000007	0.690				93.44	997.0449
	0.7	25	0.1161	1105.75	(107)	0.000153	0.000159	1104.95	0.8077	-0.000006	0.652				108.71	997.0449
	0.8	25	0.1308	1120.95	(107)	0.000156	0.000160	1120.21	0.7486	-0.000005	0.560				123.91	997.0449
0.9005		25	0.1417	1132.33	(37)	0.000157	0.000161	1131.66	0.6706	-0.000004	0.450					997.0449
	0.9	25	0.1452	1136.05	(107)	0.000158	0.000161	1135.44	0.6167	-0.000003	0.380				139.01	997.0449
0.99934		25	0.1548	1146.47	(104)	0.000159	0.000162	1145.81	0.6623	-0.000003	0.439					997.0449
	1	25	0.1593	1151.14	(107)	0.000160	0.000162	1150.63	0.5119	-0.000002	0.262				154.10	997.0449
1.3618		25	0.1998	1197.00	(37)	0.000164	0.000165	1196.67	0.3343	-0.000001	0.112					997.0449
1.5093		25	0.2167	1217.39	(104)	0.000165	0.000167	1216.91	0.4816	-0.000002	0.232					997.0449
1.627		25	0.2297	1232.95	(37)	0.000168	0.000168	1232.88	0.0734	0.000000	0.005					997.0449
1.8475		25	0.2530	1262.22	(37)	0.000170	0.000170	1262.36	-0.1364	0.000000	0.019					997.0449
2.0004		25	0.2683	1282.74	(104)	0.000170	0.000171	1282.47	0.2696	-0.000001	0.073					997.0449
2.1395		25	0.2817	1300.19	(37)	0.000173	0.000172	1300.54	-0.3494	0.000001	0.122					997.0449
2.3412		25	0.3003	1325.93	(37)	0.000175	0.000174	1326.36	-0.4276	0.000001	0.183					997.0449
2.4884		25	0.3133	1345.01	(104)	0.000175	0.000175	1344.92	0.0917	0.000000	0.008					997.0449
2.6401		25	0.3261	1363.40	(37)	0.000177	0.000176	1363.80	-0.4023	0.000001	0.162					997.0449
2.8474		25	0.3430	1388.97	(37)	0.000178	0.000177	1389.21	-0.2433	0.000000	0.059					997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
3.0042		25	0.3551	1408.05	(104)	0.000179	0.000178	1408.14	-0.0870	0.000000	0.008					997.0449
3.5665		25	0.3953	1473.77	(104)	0.000182	0.000182	1473.96	-0.1910	0.000000	0.036					997.0449
4.1037		25	0.4293	1533.81	(104)	0.000185	0.000185	1534.00	-0.1875	0.000000	0.035					997.0449
4.498		25	0.4519	1576.12	(104)	0.000188	0.000187	1576.38	-0.2636	0.000000	0.070					997.0449
5.8582		25	0.5178	1712.59	(104)	0.000194	0.000194	1712.54	0.0498	0.000000	0.002					997.0449
6.3608		25	0.5383	1759.52	(104)	0.000196	0.000196	1759.21	0.3086	0.000000	0.095					997.0449
0.2288		35	0.0403	1029.36	(37)	0.000148	0.000156	1029.01	0.3484	-0.000008	0.121					994.0319
0.4453		35	0.0755	1061.99	(37)	0.000153	0.000159	1061.47	0.5191	-0.000006	0.269					994.0319
0.9005		35	0.1417	1128.22	(37)	0.000162	0.000164	1127.73	0.4918	-0.000003	0.242					994.0319
1.3618		35	0.1998	1192.35	(37)	0.000168	0.000169	1192.20	0.1497	-0.000001	0.022					994.0319
1.627		35	0.2297	1228.01	(37)	0.000172	0.000171	1228.09	-0.0766	0.000000	0.006					994.0319
1.8475		35	0.2530	1257.04	(37)	0.000174	0.000173	1257.29	-0.2477	0.000001	0.061					994.0319
2.1395		35	0.2817	1294.69	(37)	0.000177	0.000176	1295.09	-0.3995	0.000001	0.160					994.0319
2.3412		35	0.3003	1320.22	(37)	0.000178	0.000178	1320.64	-0.4171	0.000001	0.174					994.0319
2.6401		35	0.3261	1357.40	(37)	0.000180	0.000180	1357.67	-0.2705	0.000000	0.073					994.0319
2.8474		35	0.3430	1382.78	(37)	0.000181	0.000181	1382.79	-0.0096	0.000000	0.000					994.0319
0.2288		45	0.0403	1025.25	(37)	0.000153	0.000159	1024.97	0.2789	-0.000007	0.078					990.2132
0.4453		45	0.0755	1057.60	(37)	0.000157	0.000162	1057.21	0.3883	-0.000005	0.151					990.2132
0.9005		45	0.1417	1123.26	(37)	0.000166	0.000167	1122.98	0.2773	-0.000002	0.077					990.2132
1.3618		45	0.1998	1186.87	(37)	0.000172	0.000172	1186.93	-0.0580	0.000000	0.003					990.2132
1.627		45	0.2297	1222.24	(37)	0.000175	0.000175	1222.50	-0.2572	0.000001	0.066					990.2132
1.8475		45	0.2530	1251.05	(37)	0.000178	0.000177	1251.43	-0.3773	0.000001	0.142					990.2132
2.1395		45	0.2817	1288.44	(37)	0.000180	0.000179	1288.86	-0.4209	0.000001	0.177					990.2132
2.3412		45	0.3003	1313.81	(37)	0.000182	0.000181	1314.15	-0.3381	0.000001	0.114					990.2132
2.6401		45	0.3261	1350.78	(37)	0.000183	0.000183	1350.79	-0.0074	0.000000	0.000					990.2132
2.8474		45	0.3430	1376.03	(37)	0.000184	0.000185	1375.63	0.4023	-0.000001	0.162					990.2132
0.2288		55	0.0403	1020.49	(37)	0.000155	0.000161	1020.23	0.2582	-0.000006	0.067					985.6952
0.4453		55	0.0755	1052.59	(37)	0.000160	0.000164	1052.26	0.3339	-0.000004	0.111					985.6952
0.9005		55	0.1417	1117.74	(37)	0.000169	0.000170	1117.55	0.1877	-0.000001	0.035					985.6952
1.3618		55	0.1998	1180.82	(37)	0.000175	0.000175	1180.99	-0.1702	0.000001	0.029					985.6952
1.627		55	0.2297	1215.90	(37)	0.000178	0.000177	1216.26	-0.3568	0.000001	0.127					985.6952
1.8475		55	0.2530	1244.48	(37)	0.000181	0.000180	1244.93	-0.4496	0.000001	0.202					985.6952
2.1395		55	0.2817	1281.58	(37)	0.000183	0.000182	1282.02	-0.4352	0.000001	0.189					985.6952
2.3412		55	0.3003	1306.75	(37)	0.000184	0.000184	1307.06	-0.3075	0.000001	0.095					985.6952
2.6401		55	0.3261	1343.46	(37)	0.000186	0.000186	1343.33	0.1324	0.000000	0.018					985.6952
2.8474		55	0.3430	1368.55	(37)	0.000187	0.000188	1367.91	0.6421	-0.000001	0.412					985.6952
0.2288		65	0.0403	1015.12	(37)	0.000157	0.000163	1014.88	0.2446	-0.000006	0.060					980.5548
0.4453		65	0.0755	1047.01	(37)	0.000162	0.000166	1046.69	0.3191	-0.000004	0.102					980.5548
0.9005		65	0.1417	1111.68	(37)	0.000171	0.000172	1111.53	0.1461	-0.000001	0.021					980.5548
1.3618		65	0.1998	1174.29	(37)	0.000178	0.000177	1174.49	-0.2043	0.000001	0.042					980.5548
1.627		65	0.2297	1209.11	(37)	0.000181	0.000180	1209.48	-0.3688	0.000001	0.136					980.5548
1.8475		65	0.2530	1237.49	(37)	0.000183	0.000182	1237.91	-0.4233	0.000001	0.179					980.5548
2.1395		65	0.2817	1274.34	(37)	0.000185	0.000185	1274.68	-0.3381	0.000001	0.114					980.5548
2.3412		65	0.3003	1299.37	(37)	0.000187	0.000186	1299.50	-0.1258	0.000000	0.016					980.5548

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
2.6401		65	0.3261	1335.89	(37)	0.000188	0.000189	1335.43	0.4613	-0.000001	0.213					980.5548
2.8474		65	0.3430	1360.88	(37)	0.000189	0.000191	1359.77	1.1077	-0.000002	1.227					980.5548
0.2288		75	0.0403	1009.13	(37)	0.000160	0.000164	1008.96	0.1666	-0.000004	0.028					974.849
0.4453		75	0.0755	1040.77	(37)	0.000165	0.000167	1040.58	0.1885	-0.000002	0.036					974.849
0.9005		75	0.1417	1104.98	(37)	0.000173	0.000173	1105.00	-0.0221	0.000000	0.000					974.849
1.3618		75	0.1998	1167.16	(37)	0.000180	0.000178	1167.52	-0.3649	0.000001	0.133					974.849
1.627		75	0.2297	1201.73	(37)	0.000183	0.000181	1202.25	-0.5237	0.000002	0.274					974.849
1.8475		75	0.2530	1229.90	(37)	0.000185	0.000183	1230.47	-0.5734	0.000001	0.329					974.849
2.1395		75	0.2817	1266.46	(37)	0.000187	0.000186	1266.95	-0.4912	0.000001	0.241					974.849
2.3412		75	0.3003	1291.28	(37)	0.000189	0.000188	1291.57	-0.2888	0.000001	0.083					974.849
2.6401		75	0.3261	1327.47	(37)	0.000190	0.000191	1327.20	0.2670	0.000000	0.071					974.849
2.8474		75	0.3430	1352.20	(37)	0.000191	0.000192	1351.34	0.8619	-0.000001	0.743					974.849
Average Res									0.105	-0.000003	15.707	Sum Chi sqr				
Std dev Res									0.412	0.000015						
Avg - 4std									-1.5410	-0.000061						
Avg + 4std									1.7513	0.000055						
Curve fit for the model App vol=(w+c2+c3*t °C)/(c0*w + c1)/e^(0.000001*(t °C+c4)^2)																
c0				-0.09088												
c1				0.291159												
c2				7.382645												
c3				-0.03186												
c4				-3477.52												
Min T				25												
Max T				75												
Min w				0.0019												
Max w				0.538333												
Avg dens res				0.105116												
Std dens res				0.411537												
Avg app vol res *10^3				-0.0028												
Std app vol res *10^3				0.014553												
No of points in corr				88												
No of inconsistent poir				90												
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)																
0.01013		5	0.0019	1001.64	(9)	0.000097	0.000144	1001.55	0.0865	-0.000047	0.007			17.85		999.9638
0.02015		5	0.0037	1003.31	(9)	0.000093	0.000144	1003.12	0.1882	-0.000051	0.035			17.09		999.9638
0.04991		5	0.0091	1008.67	(9)	0.000048	0.000144	1007.78	0.8897	-0.000097	0.792		!	8.77		999.9638
0.1		5	0.0180	1017.53	(9)	0.000041	0.000145	1015.60	1.9306	-0.000104	3.727	!	!	7.55		999.9638
0.16987		5	0.0302	1029.95	(9)	0.000036	0.000146	1026.44	3.5072	-0.000110	12.301	!	!	6.584		999.9638
0.2483		5	0.0435	1043.51	(9)	0.000041	0.000147	1038.55	4.9653	-0.000105	24.654	!	!	7.592		999.9638
0.49935		5	0.0839	1086.61	(9)	0.000049	0.000149	1076.78	9.8265	-0.000100	96.561	!	!	9.024		999.9638
0.74558		5	0.1202	1128.94	(9)	0.000050	0.000152	1113.52	15.4207	-0.000102	237.798	!	!	9.142		999.9638
0.9986		5	0.1547	1171.94	(9)	0.000052	0.000154	1150.52	21.4246	-0.000103	459.013	!	!	9.466		999.9638
0.01013		15	0.0019	1000.88	(9)	0.000038	0.000147	1000.68	0.2034	-0.000110	0.041		!	6.94		999.0996

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
0.02015		15	0.0037	1002.58	(9)	0.000056	0.000148	1002.24	0.3396	-0.000092	0.115		!	10.22		999.0996
0.04991		15	0.0091	1007.85	(9)	0.000043	0.000148	1006.88	0.9671	-0.000105	0.935		!	7.85		999.0996
0.1		15	0.0180	1016.62	(9)	0.000043	0.000149	1014.65	1.9661	-0.000106	3.866	!	!	7.82		999.0996
0.16987		15	0.0302	1028.82	(9)	0.000044	0.000149	1025.45	3.3705	-0.000106	11.360	!	!	7.99		999.0996
0.2483		15	0.0435	1042.38	(9)	0.000046	0.000150	1037.49	4.8930	-0.000104	23.942	!	!	8.5		999.0996
0.49935		15	0.0839	1084.86	(9)	0.000057	0.000153	1075.50	9.3673	-0.000096	87.746	!	!	10.52		999.0996
0.74558		15	0.1202	1126.49	(9)	0.000060	0.000156	1112.01	14.4813	-0.000096	209.708	!	!	10.924		999.0996
0.9986		15	0.1547	1169.09	(9)	0.000060	0.000158	1148.75	20.3413	-0.000098	413.767	!	!	11.069		999.0996
0.01013		25	0.0019	998.83	(9)	0.000034	0.000151	998.62	0.2160	-0.000117	0.047		!	6.21		997.0449
0.02015		25	0.0037	1000.61	(9)	0.000031	0.000151	1000.17	0.4405	-0.000120	0.194		!	5.73		997.0449
0.04991		25	0.0091	1005.76	(9)	0.000045	0.000151	1004.78	0.9747	-0.000106	0.950		!	8.22		997.0449
0.1		25	0.0180	1014.44	(9)	0.000048	0.000152	1012.51	1.9252	-0.000104	3.706	!	!	8.75		997.0449
0.16987		25	0.0302	1026.48	(9)	0.000051	0.000153	1023.24	3.2375	-0.000102	10.482	!	!	9.285		997.0449
0.2483		25	0.0435	1040.00	(9)	0.000052	0.000154	1035.21	4.7865	-0.000102	22.911	!	!	9.45		997.0449
0.49935		25	0.0839	1082.18	(9)	0.000062	0.000157	1072.98	9.2020	-0.000094	84.677	!	!	11.385		997.0449
0.74558		25	0.1202	1123.11	(9)	0.000067	0.000159	1109.24	13.8681	-0.000093	192.323	!	!	12.234		997.0449
0.9986		25	0.1547	1165.34	(9)	0.000067	0.000162	1145.70	19.6424	-0.000095	385.825	!	!	12.258		997.0449
0.01013		35	0.0019	995.81	(9)	0.000034	0.000154	995.60	0.2190	-0.000119	0.048		!	6.32		994.0319
0.02015		35	0.0037	997.52	(9)	0.000049	0.000154	997.14	0.3841	-0.000105	0.148		!	8.96		994.0319
0.04991		35	0.0091	1002.68	(9)	0.000049	0.000154	1001.72	0.9541	-0.000105	0.910		!	9.06		994.0319
0.1		35	0.0180	1011.30	(9)	0.000052	0.000155	1009.41	1.8901	-0.000103	3.573	!	!	9.53		994.0319
0.16987		35	0.0302	1023.26	(9)	0.000055	0.000156	1020.07	3.1880	-0.000101	10.163	!	!	10.01		994.0319
0.2483		35	0.0435	1036.58	(9)	0.000058	0.000157	1031.96	4.6147	-0.000099	21.296	!	!	10.566		994.0319
0.49935		35	0.0839	1078.53	(9)	0.000066	0.000160	1069.48	9.0563	-0.000094	82.017	!	!	12.126		994.0319
0.74558		35	0.1202	1118.89	(9)	0.000072	0.000163	1105.48	13.4134	-0.000090	179.920	!	!	13.271		994.0319
0.9986		35	0.1547	1160.75	(9)	0.000072	0.000165	1141.66	19.0924	-0.000093	364.519	!	!	13.235		994.0319
0.01013		45	0.0019	991.99	(9)	0.000035	0.000156	991.77	0.2207	-0.000121	0.049		!	6.46		990.2132
0.02015		45	0.0037	993.69	(9)	0.000051	0.000156	993.30	0.3842	-0.000106	0.148		!	9.28		990.2132
0.04991		45	0.0091	998.81	(9)	0.000051	0.000157	997.86	0.9544	-0.000106	0.911		!	9.38		990.2132
0.1		45	0.0180	1007.37	(9)	0.000055	0.000157	1005.49	1.8754	-0.000103	3.517	!	!	10.01		990.2132
0.16987		45	0.0302	1019.24	(9)	0.000058	0.000158	1016.09	3.1537	-0.000101	9.946	!	!	10.55		990.2132
0.2483		45	0.0435	1032.47	(9)	0.000061	0.000159	1027.90	4.5681	-0.000099	20.868	!	!	11.098		990.2132
0.49935		45	0.0839	1074.17	(9)	0.000069	0.000163	1065.16	9.0057	-0.000094	81.104	!	!	12.594		990.2132
0.74558		45	0.1202	1114.01	(9)	0.000077	0.000165	1100.90	13.1082	-0.000089	171.826	!	!	14.038		990.2132
0.9986		45	0.1547	1155.58	(9)	0.000076	0.000168	1136.81	18.7697	-0.000092	352.300	!	!	13.923		990.2132
0.01013		55	0.0019	987.44	(9)	0.000048	0.000158	987.24	0.1990	-0.000110	0.040		!	8.84		985.6952
0.02015		55	0.0037	989.18	(9)	0.000043	0.000159	988.77	0.4174	-0.000116	0.174		!	7.8		985.6952
0.04991		55	0.0091	994.22	(9)	0.000055	0.000159	993.29	0.9336	-0.000104	0.872		!	10.02		985.6952
0.1		55	0.0180	1002.75	(9)	0.000056	0.000160	1000.88	1.8689	-0.000103	3.493	!	!	10.3		985.6952
0.16987		55	0.0302	1014.58	(9)	0.000058	0.000161	1011.40	3.1762	-0.000102	10.088	!	!	10.65		985.6952
0.2483		55	0.0435	1027.69	(9)	0.000062	0.000162	1023.14	4.5502	-0.000099	20.704	!	!	11.411		985.6952
0.49935		55	0.0839	1069.10	(9)	0.000071	0.000165	1060.15	8.9514	-0.000094	80.127	!	!	12.965		985.6952
0.74558		55	0.1202	1108.57	(9)	0.000079	0.000168	1095.64	12.9310	-0.000089	167.211	!	!	14.549		985.6952
0.9986		55	0.1547	1149.80	(9)	0.000079	0.000171	1131.27	18.5330	-0.000092	343.473	!	!	14.435		985.6952

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
0.01013		65	0.0019	982.30	(9)	0.000040	0.000160	982.09	0.2146	-0.000120	0.046		!	7.33		980.5548
0.02015		65	0.0037	983.93	(9)	0.000069	0.000160	983.61	0.3253	-0.000091	0.106		!	12.61		980.5548
0.04991		65	0.0091	989.02	(9)	0.000057	0.000161	988.10	0.9141	-0.000103	0.836		!	10.52		980.5548
0.1		65	0.0180	997.49	(9)	0.000058	0.000161	995.64	1.8458	-0.000103	3.407	!	!	10.64		980.5548
0.16987		65	0.0302	1009.31	(9)	0.000058	0.000162	1006.10	3.2048	-0.000105	10.271	!	!	10.59		980.5548
0.2483		65	0.0435	1022.25	(9)	0.000064	0.000163	1017.77	4.4813	-0.000099	20.082	!	!	11.811		980.5548
0.49935		65	0.0839	1063.37	(9)	0.000073	0.000167	1054.53	8.8362	-0.000094	78.079	!	!	13.338		980.5548
0.74558		65	0.1202	1102.47	(9)	0.000082	0.000170	1089.77	12.7004	-0.000088	161.300	!	!	15.016		980.5548
0.9986		65	0.1547	1143.37	(9)	0.000081	0.000173	1125.15	18.2167	-0.000092	331.848	!	!	14.908		980.5548
0.01013		75	0.0019	976.58	(9)	0.000046	0.000161	976.37	0.2036	-0.000115	0.041		!	8.4		974.849
0.02015		75	0.0037	978.21	(9)	0.000067	0.000161	977.88	0.3321	-0.000094	0.110		!	12.25		974.849
0.04991		75	0.0091	983.30	(9)	0.000053	0.000162	982.35	0.9489	-0.000108	0.900		!	9.76		974.849
0.1		75	0.0180	991.74	(9)	0.000055	0.000162	989.85	1.8952	-0.000107	3.592	!	!	10.1		974.849
0.16987		75	0.0302	1003.45	(9)	0.000058	0.000163	1000.25	3.2072	-0.000106	10.286	!	!	10.55		974.849
0.2483		75	0.0435	1016.32	(9)	0.000064	0.000164	1011.84	4.4848	-0.000100	20.113	!	!	11.789		974.849
0.49935		75	0.0839	1057.16	(9)	0.000073	0.000168	1048.38	8.7886	-0.000095	77.239	!	!	13.453		974.849
0.74558		75	0.1202	1095.97	(9)	0.000083	0.000171	1083.39	12.5789	-0.000088	158.228	!	!	15.222		974.849
0.9986		75	0.1547	1136.60	(9)	0.000082	0.000174	1118.53	18.0743	-0.000092	326.680	!	!	15.099		974.849
0.01013		85	0.0019	970.36	(9)	0.000032	0.000161	970.14	0.2253	-0.000129	0.051		!	5.9		968.6203
0.02015		85	0.0037	971.93	(9)	0.000077	0.000161	971.64	0.2943	-0.000085	0.087		!	14.08		968.6203
0.04991		85	0.0091	977.03	(9)	0.000052	0.000162	976.08	0.9498	-0.000110	0.902		!	9.55		968.6203
0.1		85	0.0180	985.44	(9)	0.000054	0.000163	983.54	1.9023	-0.000109	3.619	!	!	9.84		968.6203
0.16987		85	0.0302	997.09	(9)	0.000056	0.000164	993.87	3.2164	-0.000107	10.345	!	!	10.318		968.6203
0.2483		85	0.0435	1009.90	(9)	0.000063	0.000165	1005.40	4.4973	-0.000102	20.226	!	!	11.581		968.6203
0.49935		85	0.0839	1050.42	(9)	0.000074	0.000168	1041.73	8.6898	-0.000095	75.512	!	!	13.525		968.6203
0.74558		85	0.1202	1088.90	(9)	0.000084	0.000172	1076.53	12.3696	-0.000088	153.008	!	!	15.4		968.6203
0.9986		85	0.1547	1129.29	(9)	0.000083	0.000175	1111.46	17.8281	-0.000092	317.841	!	!	15.245		968.6203
0.01013		95	0.0019	963.62	(9)	0.000037	0.000161	963.41	0.2131	-0.000124	0.045		!	6.79		961.9004
0.02015		95	0.0037	965.19	(9)	0.000076	0.000161	964.90	0.2909	-0.000085	0.085		!	13.96		961.9004
0.04991		95	0.0091	970.28	(9)	0.000049	0.000162	969.32	0.9572	-0.000112	0.916		!	9.03		961.9004
0.1		95	0.0180	978.66	(9)	0.000051	0.000162	976.74	1.9188	-0.000112	3.682	!	!	9.31		961.9004
0.16987		95	0.0302	990.22	(9)	0.000055	0.000163	987.02	3.1924	-0.000108	10.191	!	!	10.122		961.9004
0.2483		95	0.0435	1002.93	(9)	0.000063	0.000165	998.49	4.4347	-0.000102	19.666	!	!	11.52		961.9004
0.49935		95	0.0839	1043.15	(9)	0.000074	0.000168	1034.63	8.5218	-0.000094	72.621	!	!	13.577		961.9004
0.74558		95	0.1202	1081.29	(9)	0.000085	0.000172	1069.25	12.0408	-0.000087	144.980	!	!	15.579		961.9004
0.9986		95	0.1547	1121.40	(9)	0.000084	0.000175	1103.99	17.4044	-0.000091	302.915	!	!	15.402		961.9004

Density of aqueous solutions of **CdSO4**

- References (6) Asmus, A., "The viscosities of aqueous solutions of strong electrolytes of high valence type", *Ann. der Physik, ser 5*, **1939**, 35, 1-22
- (7) Bakeev, M. I.; Zharmenov, A. A.; Baikenova, N. A.; Abdygalimova, S. Sh.; Electrical conductivity and viscosity of the binary systems MeSO4-H2O (Me=Mn2+, Fe2+, Co2+, Zn2+, Cd2+) at 25-75 degree and the structure of electrolyte solutions, *Izv. Nats. Akad. Nauk Resp. Kaz., Ser. Khim.*, **1994**, 6, 25-30

(117) Schmelzer, N, Einfeldt, J., "Dichtemessungen an einigen...", *Wiss. Z. Uni. Rostock*, **1989**, 38, 81-82

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density water / kg/m³	Density of
	0.000069	25	0.0000	997.06	(6)	-0.000040	0.000016	997.06	0.0008	-0.000056	0.000			1.000015	997.0449
	0.000118	25	0.0000	997.07	(6)	-0.000054	0.000016	997.07	0.0017	-0.000070	0.000			1.000026	997.0449
	0.000193	25	0.0000	997.09	(6)	-0.000041	0.000016	997.08	0.0023	-0.000057	0.000			1.000042	997.0449
	0.000268	25	0.0001	997.10	(6)	-0.000017	0.000016	997.10	0.0019	-0.000033	0.000			1.000057	997.0449
	0.000343	25	0.0001	997.12	(6)	-0.000004	0.000016	997.12	0.0014	-0.000020	0.000			1.000072	997.0449
	0.000395	25	0.0001	997.13	(6)	-0.000017	0.000016	997.13	0.0027	-0.000033	0.000			1.000084	997.0449
	0.000483	25	0.0001	997.15	(6)	-0.000050	0.000016	997.14	0.0066	-0.000066	0.000			1.000106	997.0449
	0.000577	25	0.0001	997.16	(6)	0.000005	0.000016	997.16	0.0013	-0.000011	0.000			1.00012	997.0449
	0.000677	25	0.0001	997.19	(6)	-0.000031	0.000016	997.18	0.0067	-0.000048	0.000			1.000146	997.0449
	0.000804	25	0.0002	997.21	(6)	0.000013	0.000016	997.21	0.0006	-0.000004	0.000			1.000166	997.0449
	0.000943	25	0.0002	997.24	(6)	0.000021	0.000016	997.24	-0.0010	0.000005	0.000			1.000193	997.0449
0.000968		25	0.0002	997.24	(117)	0.000030	0.000016	997.24	-0.0028	0.000014	0.000				997.0449
	0.001108	25	0.0002	997.27	(6)	0.000025	0.000016	997.27	-0.0019	0.000008	0.000			1.000226	997.0449
	0.001362	25	0.0003	997.32	(6)	0.000017	0.000016	997.32	-0.0002	0.000001	0.000			1.00028	997.0449
	0.001622	25	0.0003	997.38	(6)	0.000021	0.000016	997.38	-0.0016	0.000005	0.000			1.000332	997.0449
0.001631		25	0.0003	997.38	(117)	0.000011	0.000016	997.38	0.0016	-0.000005	0.000				997.0449
	0.001997	25	0.0004	997.45	(6)	0.000016	0.000016	997.45	0.0002	-0.000001	0.000			1.000411	997.0449
	0.002357	25	0.0005	997.52	(6)	0.000024	0.000016	997.53	-0.0038	0.000008	0.000			1.000481	997.0449
0.002721		25	0.0006	997.61	(117)	0.000001	0.000016	997.60	0.0087	-0.000015	0.000				997.0449
	0.002787	25	0.0006	997.61	(6)	0.000025	0.000016	997.62	-0.0052	0.000009	0.000			1.000568	997.0449
	0.003264	25	0.0007	997.71	(6)	0.000026	0.000016	997.71	-0.0063	0.000009	0.000			1.000665	997.0449
	0.003787	25	0.0008	997.81	(6)	0.000030	0.000016	997.82	-0.0109	0.000014	0.000			1.000768	997.0449
0.004254		25	0.0009	997.95	(117)	-0.000024	0.000016	997.91	0.0353	-0.000040	0.001				997.0449
0.004324		25	0.0009	997.96	(117)	-0.000018	0.000016	997.93	0.0311	-0.000035	0.001				997.0449
	0.004410	25	0.0009	997.94	(6)	0.000028	0.000016	997.95	-0.0110	0.000012	0.000			1.000896	997.0449
	0.005315	25	0.0011	998.12	(6)	0.000028	0.000016	998.13	-0.0131	0.000012	0.000			1.00108	997.0449
	0.006294	25	0.0013	998.32	(6)	0.000027	0.000016	998.34	-0.0144	0.000011	0.000			1.00128	997.0449
	0.007247	25	0.0015	998.51	(6)	0.000031	0.000016	998.53	-0.0213	0.000014	0.000			1.001469	997.0449
	0.008176	25	0.0017	998.69	(6)	0.000033	0.000017	998.72	-0.0283	0.000017	0.001			1.001653	997.0449
0.018249		25	0.0038	1000.76	(117)	0.000021	0.000017	1000.77	-0.0138	0.000004	0.000				997.0449
0.019681		25	0.0041	1001.10	(117)	0.000009	0.000017	1001.07	0.0338	-0.000008	0.001				997.0449
0.16032		25	0.0323	1029.99	(117)	0.000011	0.000023	1029.59	0.4023	-0.000012	0.162				997.0449
0.20177		25	0.0404	1038.73	(117)	0.000006	0.000025	1037.92	0.8125	-0.000019	0.660				997.0449
		25	0.1699	1184.90	(7)	0.000067	0.000062	1186.08	-1.1792	0.000005	1.391				997.0449
		25	0.2100	1237.60	(7)	0.000075	0.000079	1236.21	1.3855	-0.000004	1.920				997.0449
		25	0.2967	1345.20	(7)	0.000128	0.000132	1343.37	1.8341	-0.000003	3.364				997.0449
		50	0.0050	993.20	(7)	-0.000040	0.000027	992.87	0.3295	-0.000067	0.109				988.0363

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Density of water / kg/m³
		50	0.1699	1174.00	(7)	0.000068	0.000067	1174.42	-0.4202	0.000002	0.177				988.0363
		50	0.2100	1225.70	(7)	0.000078	0.000082	1224.39	1.3070	-0.000004	1.708				988.0363
		50	0.2967	1332.10	(7)	0.000131	0.000129	1333.33	-1.2335	0.000002	1.521				988.0363
		75	0.0050	979.80	(7)	-0.000011	0.000031	979.60	0.2002	-0.000042	0.040				974.849
		75	0.1699	1158.00	(7)	0.000071	0.000066	1159.09	-1.0941	0.000005	1.197				974.849
		75	0.2100	1210.20	(7)	0.000076	0.000079	1209.15	1.0496	-0.000003	1.102				974.849
		75	0.2242	1227.30	(7)	0.000084	0.000085	1227.24	0.0624	0.000000	0.004				974.849
		75	0.2967	1321.00	(7)	0.000120	0.000120	1320.68	0.3175	-0.000001	0.101				974.849
									Average Res	0.0839	-0.000011	13.460	Sum Chi sqr		
									Std dev Res	0.5465	0.000025				
									Avg - 4std	-2.1023	-0.000110				
									Avg + 4std	2.2701	0.000087				
Curve fit for the model App vol=(w+c2+c3*t °C)/(c0*w + c1)/e^(0.000001*(t °C+c4)^2)															
c0		-1E-07													
c1		6.11E-08													
c2		-0.00376													
c3		0.004108													
c4		5007.691													
Min T		25													
Max T		75													
Min w		1.44E-05													
Max w		0.29671													
Avg dens res		0.0839													
Std dens res		0.5465													
Avg app vol res *10^3		-0.01114													
Std app vol res *10^3		0.024634													
No of points in corr		45													
No of inconsistent pair		24													
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)															
		25	0.0005	998.20	(7)	-0.001318	0.000016	997.54	0.6644	-0.001335	0.441		!		997.0449
		25	0.0050	999.30	(7)	0.000550	0.000017	1001.97	-2.6690	0.000533	7.123	!	!		997.0449
		25	0.0150	1006.70	(7)	0.000360	0.000019	1011.89	-5.1938	0.000341	26.976	!	!		997.0449
		25	0.0299	1013.60	(7)	0.000456	0.000022	1027.11	-13.5145	0.000434	182.642	!	!		997.0449
		25	0.0699	1081.80	(7)	-0.000121	0.000031	1069.50	12.2974	-0.000152	151.227	!	!		997.0449
		25	0.0990	1141.00	(7)	-0.000275	0.000039	1101.89	39.1134	-0.000314	1529.857	!	!		997.0449
		25	0.1300	1148.40	(7)	-0.000014	0.000048	1137.84	10.5573	-0.000062	111.457	!			997.0449
		25	0.2242	1249.20	(7)	0.000100	0.000086	1254.10	-4.9030	0.000014	24.040	!			997.0449
		25	0.2699	1309.10	(7)	0.000117	0.000112	1311.44	-2.3420	0.000005	5.485	!			997.0449
		50	0.0005	990.40	(7)	-0.003819	0.000026	988.52	1.8820	-0.003845	3.542		!		988.0363
		50	0.0150	996.20	(7)	0.000458	0.000028	1002.62	-6.4161	0.000429	41.167	!	!		988.0363
		50	0.0299	1009.50	(7)	0.000293	0.000031	1017.57	-8.0671	0.000262	65.078	!	!		988.0363

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Density of water / kg/m ³
		50	0.0699	1069.60	(7)	-0.000091	0.000039	1059.25	10.3539	-0.000131	107.203	!	!		988.0363
		50	0.0990	1321.00	(7)	-0.001565	0.000046	1091.14	229.8568	-0.001611	52834.15	!	!		988.0363
		50	0.1300	1137.70	(7)	-0.000012	0.000054	1126.63	11.0656	-0.000066	122.447	!			988.0363
		50	0.2242	1238.00	(7)	0.000100	0.000088	1242.33	-4.3293	0.000013	18.743	!			988.0363
		50	0.2699	1288.60	(7)	0.000138	0.000111	1300.40	-11.7988	0.000026	139.212	!			988.0363
		75	0.0005	976.50	(7)	-0.002443	0.000030	975.32	1.1777	-0.002473	1.387		!		974.849
		75	0.0150	983.30	(7)	0.000436	0.000032	989.18	-5.8802	0.000404	34.576	!	!		974.849
		75	0.0299	993.70	(7)	0.000376	0.000035	1003.89	-10.1856	0.000341	103.747	!	!		974.849
		75	0.0699	1055.70	(7)	-0.000097	0.000042	1044.94	10.7596	-0.000139	115.770	!	!		974.849
		75	0.0990	1119.00	(7)	-0.000309	0.000048	1076.43	42.5664	-0.000357	1811.898	!	!		974.849
		75	0.1300	1122.90	(7)	-0.000015	0.000055	1111.57	11.3278	-0.000070	128.318	!			974.849
		75	0.2699	1272.10	(7)	0.000138	0.000105	1286.44	-14.3415	0.000032	205.677	!			974.849

Density of aqueous solutions of **CoCl2**

- References (37) Herrington, Thelma M.; Roffey, Michael G.; Smith, David P.; Densities of Aqueous Electrolytes MnCl₂, CoCl₂, NiCl₂, ZnCl₂ and CdCl₂ from 25 to 72°C at 1 atm, *J. Chem. Eng. Data*, **1986**, 31, 221-225
- (93) Phang, S. The density, Viscosity and Transference Number of Aqueous Cobalt Chloride at 298.15 K. *Aust. J. Chem.* **1980**, 33, 641-645.
- (99) Pogue, R. F.; Atkinson, G. Solution Thermodynamics of First-Row Transition Elements. 2. Apparent Molal Volumes of Aqueous MnCl₂, Mn(ClO₄)₂, CoCl₂, Co(ClO₄)₂, FeCl₂, and Fe(ClO₄)₂, from 15 to 55°C. *J. Chem. Eng. Data* **1989**, 34, 227-232.
- (123) Spitzer, J. J.; Singh, P. P.; McCurdy, K. G.; Hepler, L. G. Apparent Molar Heat Capacities and Volumes of Aqueous Electrolytes: CaCl₂, Cd(NO₃)₂, CoCl₂, Cu(ClO₄)₂, Mg(ClO₄)₂, and NiCl₂. *J. Sol. Chem.* **1978**, 7, 81-86.

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Relative density	Density of water / kg/m ³
0.01009		15	0.0013	1000.30	(99)	0.000084	0.000111	1000.26	0.0355	-0.000027	0.001				1.2	999.0996
0.01993		15	0.0026	1001.47	(99)	0.000084	0.000111	1001.40	0.0705	-0.000027	0.005				2.37	999.0996
0.02966		15	0.0038	1002.63	(99)	0.000083	0.000111	1002.52	0.1089	-0.000028	0.012				3.53	999.0996
0.04971		15	0.0064	1004.99	(99)	0.000085	0.000112	1004.82	0.1699	-0.000026	0.029				5.9	999.0996
0.0744		15	0.0096	1007.90	(99)	0.000087	0.000112	1007.66	0.2404	-0.000025	0.058				8.81	999.0996
0.1		15	0.0128	1010.90	(99)	0.000089	0.000112	1010.60	0.3009	-0.000023	0.091				11.81	999.0996
0.2044		15	0.0259	1023.02	(99)	0.000096	0.000114	1022.53	0.4924	-0.000018	0.242				23.94	999.0996
0.4014		15	0.0495	1045.69	(99)	0.000101	0.000117	1044.82	0.8724	-0.000016	0.761				46.63	999.0996
0.5822		15	0.0703	1066.02	(99)	0.000107	0.000119	1065.02	1.0028	-0.000013	1.006				66.98	999.0996
0.798		15	0.0939	1089.86	(99)	0.000113	0.000123	1088.80	1.0570	-0.000009	1.117				90.84	999.0996
1.0045		15	0.1154	1112.18	(99)	0.000119	0.000126	1111.22	0.9589	-0.000007	0.920				113.18	999.0996
1.5012		15	0.1631	1164.32	(99)	0.000130	0.000133	1163.73	0.5889	-0.000003	0.347				165.37	999.0996
2.0051		15	0.2066	1215.08	(99)	0.000140	0.000140	1214.90	0.1863	-0.000001	0.035				216.18	999.0996
2.4983		15	0.2449	1262.90	(99)	0.000147	0.000147	1262.85	0.0534	0.000000	0.003				264.04	999.0996
2.9898		15	0.2796	1308.89	(99)	0.000154	0.000155	1308.48	0.4142	-0.000001	0.172				310.07	999.0996
3.3516		15	0.3032	1341.76	(99)	0.000158	0.000160	1340.66	1.1004	-0.000002	1.211				342.97	999.0996
0.01009		25	0.0013	998.23	(99)	0.000092	0.000116	998.20	0.0314	-0.000024	0.001				1.19	997.0449
0.01993		25	0.0026	999.39	(99)	0.000092	0.000116	999.33	0.0622	-0.000024	0.004				2.35	997.0449
0.02966		25	0.0038	1000.53	(99)	0.000091	0.000116	1000.44	0.0963	-0.000025	0.009				3.5	997.0449
0.04971		25	0.0064	1002.88	(99)	0.000093	0.000116	1002.73	0.1492	-0.000023	0.022				5.85	997.0449
0.0523		25	0.0067	1003.20	(123)	0.000090	0.000117	1003.02	0.1767	-0.000026	0.031			11.75		997.0449
0.07026		25	0.0090	1005.23	(123)	0.000100	0.000117	1005.07	0.1566	-0.000017	0.025			12.94		997.0449
0.0744		25	0.0096	1005.75	(99)	0.000096	0.000117	1005.54	0.2046	-0.000021	0.042				8.73	997.0449
0.08615		25	0.0111	1007.06	(93)	0.000101	0.000117	1006.88	0.1769	-0.000016	0.031					997.0449
0.08728		25	0.0112	1007.24	(123)	0.000097	0.000117	1007.01	0.2294	-0.000020	0.053			12.58		997.0449
0.1		25	0.0128	1008.71	(99)	0.000098	0.000117	1008.46	0.2507	-0.000019	0.063				11.7	997.0449
0.1044		25	0.0134	1009.25	(123)	0.000096	0.000117	1008.96	0.2878	-0.000021	0.083			12.49		997.0449
0.1175		25	0.0150	1010.69	(123)	0.000102	0.000118	1010.45	0.2364	-0.000015	0.056			13.26		997.0449
0.1408		25	0.0180	1013.38	(123)	0.000103	0.000118	1013.10	0.2819	-0.000015	0.079			13.32		997.0449
0.1742		25	0.0221	1017.28	(123)	0.000101	0.000118	1016.88	0.4020	-0.000018	0.162			13.09		997.0449
0.1886		25	0.0239	1018.76	(93)	0.000109	0.000119	1018.51	0.2491	-0.000010	0.062					997.0449
0.2044		25	0.0259	1020.69	(99)	0.000104	0.000119	1020.30	0.3976	-0.000015	0.158				23.72	997.0449
0.2349		25	0.0296	1024.17	(123)	0.000106	0.000119	1023.74	0.4257	-0.000014	0.181			13.71		997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Relative density	Density of water / kg/m³
0.2419		25	0.0305	1024.88	(37)	0.000108	0.000119	1024.53	0.3509	-0.000011	0.123					997.0449
0.4014		25	0.0495	1043.11	(99)	0.000109	0.000122	1042.41	0.6994	-0.000013	0.489				46.2	997.0449
0.4483		25	0.0550	1047.86	(93)	0.000119	0.000123	1047.63	0.2308	-0.000004	0.053					997.0449
0.464		25	0.0568	1049.86	(37)	0.000115	0.000123	1049.37	0.4872	-0.000008	0.237					997.0449
0.5822		25	0.0703	1063.23	(99)	0.000115	0.000125	1062.44	0.7905	-0.000010	0.625				66.38	997.0449
0.6948		25	0.0827	1075.27	(37)	0.000121	0.000126	1074.78	0.4882	-0.000005	0.238					997.0449
0.798		25	0.0939	1086.83	(99)	0.000120	0.000128	1086.01	0.8230	-0.000007	0.677				90.05	997.0449
0.8694		25	0.1014	1093.50	(93)	0.000131	0.000129	1093.72	-0.2208	0.000002	0.049					997.0449
0.9215		25	0.1069	1099.71	(37)	0.000127	0.000130	1099.32	0.3858	-0.000003	0.149					997.0449
1.0045		25	0.1154	1108.93	(99)	0.000126	0.000131	1108.20	0.7285	-0.000005	0.531				112.22	997.0449
1.1498		25	0.1299	1123.82	(37)	0.000132	0.000133	1123.61	0.2062	-0.000001	0.042					997.0449
1.351		25	0.1492	1143.65	(93)	0.000141	0.000136	1144.66	-1.0085	0.000005	1.017					997.0449
1.3886		25	0.1528	1148.53	(37)	0.000137	0.000137	1148.55	-0.0232	0.000000	0.001					997.0449
1.5012		25	0.1631	1160.64	(99)	0.000136	0.000139	1160.14	0.4959	-0.000002	0.246				164.08	997.0449
1.6373		25	0.1753	1173.74	(37)	0.000142	0.000141	1174.01	-0.2680	0.000001	0.072					997.0449
1.661		25	0.1774	1174.76	(93)	0.000148	0.000141	1176.41	-1.6457	0.000007	2.708					997.0449
1.8878		25	0.1969	1198.62	(37)	0.000146	0.000144	1199.10	-0.4819	0.000002	0.232					997.0449
2.0051		25	0.2066	1211.01	(99)	0.000145	0.000146	1210.66	0.3490	-0.000001	0.122				214.6	997.0449
2.132		25	0.2168	1222.41	(37)	0.000150	0.000148	1223.03	-0.6191	0.000002	0.383					997.0449
2.162		25	0.2192	1223.61	(93)	0.000156	0.000149	1225.93	-2.3217	0.000007	5.390					997.0449
2.314		25	0.2310	1237.96	(93)	0.000158	0.000151	1240.51	-2.5530	0.000007	6.518					997.0449
2.3727		25	0.2355	1245.44	(37)	0.000154	0.000152	1246.09	-0.6480	0.000002	0.420					997.0449
2.4983		25	0.2449	1258.47	(99)	0.000152	0.000154	1257.91	0.5590	-0.000001	0.312				262.2	997.0449
2.6227		25	0.2540	1268.95	(37)	0.000157	0.000156	1269.48	-0.5286	0.000001	0.279					997.0449
2.824		25	0.2683	1285.27	(93)	0.000165	0.000159	1287.89	-2.6239	0.000006	6.885					997.0449
2.8825		25	0.2723	1292.97	(37)	0.000160	0.000160	1293.18	-0.2051	0.000000	0.042					997.0449
2.9898		25	0.2796	1304.16	(99)	0.000158	0.000161	1302.78	1.3858	-0.000003	1.920				308.03	997.0449
3.29		25	0.2993	1326.97	(93)	0.000170	0.000166	1329.07	-2.1046	0.000004	4.429					997.0449
3.3516		25	0.3032	1336.74	(99)	0.000162	0.000167	1334.37	2.3726	-0.000004	5.629				340.7	997.0449
3.68		25	0.3233	1360.70	(93)	0.000174	0.000172	1361.97	-1.2659	0.000002	1.603					997.0449
4.048		25	0.3445	1391.69	(93)	0.000177	0.000177	1391.68	0.0138	0.000000	0.000					997.0449
0.01009		35	0.0013	995.20	(99)	0.000100	0.000118	995.18	0.0241	-0.000019	0.001				1.18	994.0319
0.01993		35	0.0026	996.36	(99)	0.000096	0.000119	996.30	0.0575	-0.000022	0.003				2.34	994.0319
0.02966		35	0.0038	997.49	(99)	0.000097	0.000119	997.41	0.0843	-0.000022	0.007				3.48	994.0319
0.04971		35	0.0064	999.81	(99)	0.000100	0.000119	999.68	0.1226	-0.000019	0.015				5.81	994.0319
0.0744		35	0.0096	1002.65	(99)	0.000102	0.000119	1002.49	0.1649	-0.000017	0.027				8.67	994.0319
0.1		35	0.0128	1005.60	(99)	0.000103	0.000120	1005.38	0.2181	-0.000017	0.048				11.64	994.0319
0.2044		35	0.0259	1017.46	(99)	0.000110	0.000121	1017.16	0.3055	-0.000011	0.093				23.57	994.0319
0.2419		35	0.0305	1021.70	(37)	0.000111	0.000122	1021.36	0.3364	-0.000011	0.113					994.0319
0.4014		35	0.0495	1039.66	(99)	0.000115	0.000124	1039.14	0.5182	-0.000010	0.269				45.9	994.0319
0.464		35	0.0568	1046.53	(37)	0.000118	0.000125	1046.06	0.4679	-0.000008	0.219					994.0319
0.5822		35	0.0703	1059.59	(99)	0.000120	0.000127	1059.05	0.5403	-0.000007	0.292				65.95	994.0319
0.6948		35	0.0827	1071.79	(37)	0.000124	0.000129	1071.31	0.4754	-0.000005	0.226					994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Relative density	Density of water / kg/m³
0.798		35	0.0939	1082.98	(99)	0.000126	0.000131	1082.47	0.5110	-0.000005	0.261				89.48	994.0319
0.9215		35	0.1069	1096.10	(37)	0.000129	0.000133	1095.70	0.4022	-0.000003	0.162					994.0319
1.0045		35	0.1154	1104.91	(99)	0.000131	0.000134	1104.52	0.3874	-0.000003	0.150				111.54	994.0319
1.1498		35	0.1299	1120.10	(37)	0.000134	0.000136	1119.82	0.2782	-0.000002	0.077					994.0319
1.3886		35	0.1528	1144.70	(37)	0.000139	0.000140	1144.58	0.1181	-0.000001	0.014					994.0319
1.5012		35	0.1631	1156.16	(99)	0.000141	0.000142	1156.09	0.0722	0.000000	0.005				163.1	994.0319
1.6373		35	0.1753	1169.81	(37)	0.000144	0.000144	1169.84	-0.0337	0.000000	0.001					994.0319
1.8878		35	0.1969	1194.60	(37)	0.000148	0.000148	1194.74	-0.1368	0.000000	0.019					994.0319
2.0051		35	0.2066	1206.17	(99)	0.000149	0.000149	1206.20	-0.0321	0.000000	0.001				213.41	994.0319
2.132		35	0.2168	1218.31	(37)	0.000152	0.000151	1218.46	-0.1520	0.000000	0.023					994.0319
2.3727		35	0.2355	1241.26	(37)	0.000155	0.000155	1241.32	-0.0561	0.000000	0.003					994.0319
2.4983		35	0.2449	1253.27	(99)	0.000156	0.000157	1253.03	0.2355	-0.000001	0.055				260.79	994.0319
2.6227		35	0.2540	1264.69	(37)	0.000158	0.000159	1264.49	0.2023	0.000000	0.041					994.0319
2.8825		35	0.2723	1288.64	(37)	0.000161	0.000163	1287.95	0.6895	-0.000002	0.475					994.0319
2.9898		35	0.2796	1298.51	(99)	0.000162	0.000165	1297.46	1.0579	-0.000002	1.119				306.31	994.0319
3.3516		35	0.3032	1330.83	(99)	0.000166	0.000170	1328.70	2.1267	-0.000004	4.523				338.82	994.0319
0.01009		45	0.0013	991.39	(99)	0.000092	0.000119	991.36	0.0341	-0.000027	0.001				1.19	990.2132
0.01993		45	0.0026	992.52	(99)	0.000100	0.000119	992.47	0.0477	-0.000019	0.002				2.33	990.2132
0.02966		45	0.0038	993.64	(99)	0.000102	0.000119	993.57	0.0647	-0.000017	0.004				3.46	990.2132
0.04971		45	0.0064	995.94	(99)	0.000105	0.000120	995.84	0.0933	-0.000015	0.009				5.78	990.2132
0.0744		45	0.0096	998.75	(99)	0.000108	0.000120	998.63	0.1161	-0.000012	0.013				8.62	990.2132
0.1		45	0.0128	1001.66	(99)	0.000109	0.000120	1001.52	0.1398	-0.000011	0.020				11.56	990.2132
0.2419		45	0.0305	1017.76	(37)	0.000112	0.000123	1017.44	0.3246	-0.000010	0.105					990.2132
0.4014		45	0.0495	1035.40	(99)	0.000120	0.000125	1035.14	0.2566	-0.000005	0.066				45.63	990.2132
0.464		45	0.0568	1042.50	(37)	0.000118	0.000126	1042.03	0.4656	-0.000008	0.217					990.2132
0.5822		45	0.0703	1055.10	(99)	0.000126	0.000128	1054.97	0.1340	-0.000002	0.018				65.53	990.2132
0.6948		45	0.0827	1067.69	(37)	0.000124	0.000130	1067.18	0.5052	-0.000005	0.255					990.2132
0.798		45	0.0939	1078.25	(99)	0.000132	0.000131	1078.29	-0.0387	0.000000	0.001				88.91	990.2132
0.9215		45	0.1069	1091.94	(37)	0.000129	0.000133	1091.47	0.4711	-0.000004	0.222					990.2132
1.0045		45	0.1154	1099.98	(99)	0.000136	0.000134	1100.25	-0.2756	0.000002	0.076				110.85	990.2132
1.1498		45	0.1299	1115.88	(37)	0.000134	0.000137	1115.49	0.3857	-0.000002	0.149					990.2132
1.3886		45	0.1528	1140.42	(37)	0.000139	0.000140	1140.15	0.2673	-0.000001	0.071					990.2132
1.5012		45	0.1631	1150.72	(99)	0.000146	0.000142	1151.61	-0.8927	0.000004	0.797				162.09	990.2132
1.6373		45	0.1753	1165.46	(37)	0.000144	0.000144	1165.31	0.1499	-0.000001	0.022					990.2132
1.8878		45	0.1969	1190.18	(37)	0.000148	0.000148	1190.10	0.0803	0.000000	0.006					990.2132
2.0051		45	0.2066	1200.34	(99)	0.000154	0.000150	1201.52	-1.1788	0.000004	1.390				212.2	990.2132
2.132		45	0.2168	1213.80	(37)	0.000152	0.000152	1213.73	0.0744	0.000000	0.006					990.2132
2.3727		45	0.2355	1236.66	(37)	0.000155	0.000156	1236.48	0.1767	0.000000	0.031					990.2132
2.4983		45	0.2449	1246.93	(99)	0.000161	0.000158	1248.15	-1.2216	0.000003	1.492				259.25	990.2132
2.6227		45	0.2540	1259.98	(37)	0.000159	0.000160	1259.56	0.4233	-0.000001	0.179					990.2132
2.8825		45	0.2723	1283.78	(37)	0.000162	0.000164	1282.92	0.8607	-0.000002	0.741					990.2132
2.9898		45	0.2796	1291.80	(99)	0.000167	0.000166	1292.38	-0.5813	0.000001	0.338				304.57	990.2132
3.3516		45	0.3032	1323.47	(99)	0.000171	0.000171	1323.50	-0.0263	0.000000	0.001				336.55	990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Relative density	Density of water / kg/m³
0.01009		55	0.0013	986.85	(99)	0.000108	0.000118	986.84	0.0124	-0.000010	0.000				1.17	985.6952
0.01993		55	0.0026	987.98	(99)	0.000105	0.000118	987.95	0.0340	-0.000013	0.001				2.32	985.6952
0.02966		55	0.0038	989.10	(99)	0.000105	0.000118	989.05	0.0490	-0.000013	0.002				3.45	985.6952
0.04971		55	0.0064	991.37	(99)	0.000109	0.000119	991.31	0.0640	-0.000010	0.004				5.76	985.6952
0.0744		55	0.0096	994.19	(99)	0.000108	0.000119	994.09	0.1017	-0.000011	0.010				8.62	985.6952
0.1		55	0.0128	997.06	(99)	0.000112	0.000119	996.97	0.0908	-0.000007	0.008				11.53	985.6952
0.2044		55	0.0259	1008.73	(99)	0.000118	0.000121	1008.66	0.0703	-0.000003	0.005				23.37	985.6952
0.2419		55	0.0305	1013.15	(37)	0.000112	0.000122	1012.84	0.3099	-0.000010	0.096					985.6952
0.4014		55	0.0495	1030.53	(99)	0.000123	0.000124	1030.50	0.0369	-0.000001	0.001				45.49	985.6952
0.464		55	0.0568	1037.85	(37)	0.000117	0.000125	1037.37	0.4756	-0.000008	0.226					985.6952
0.5822		55	0.0703	1050.12	(99)	0.000129	0.000127	1050.28	-0.1556	0.000002	0.024				65.36	985.6952
0.6948		55	0.0827	1063.01	(37)	0.000123	0.000129	1062.46	0.5461	-0.000006	0.298					985.6952
0.798		55	0.0939	1073.11	(99)	0.000134	0.000130	1073.55	-0.4391	0.000004	0.193				88.68	985.6952
0.9215		55	0.1069	1087.22	(37)	0.000128	0.000132	1086.69	0.5253	-0.000004	0.276					985.6952
1.0045		55	0.1154	1094.72	(99)	0.000139	0.000133	1095.46	-0.7389	0.000005	0.546				110.61	985.6952
1.1498		55	0.1299	1111.13	(37)	0.000133	0.000136	1110.67	0.4569	-0.000003	0.209					985.6952
1.3886		55	0.1528	1135.65	(37)	0.000138	0.000139	1135.29	0.3605	-0.000002	0.130					985.6952
1.5012		55	0.1631	1145.03	(99)	0.000149	0.000141	1146.73	-1.6962	0.000008	2.877				161.65	985.6952
1.6373		55	0.1753	1160.65	(37)	0.000142	0.000143	1160.41	0.2392	-0.000001	0.057					985.6952
1.8878		55	0.1969	1185.32	(37)	0.000147	0.000147	1185.17	0.1479	-0.000001	0.022					985.6952
2.0051		55	0.2066	1194.30	(99)	0.000157	0.000149	1196.58	-2.2794	0.000008	5.196				211.63	985.6952
2.132		55	0.2168	1208.88	(37)	0.000151	0.000151	1208.78	0.1017	0.000000	0.010					985.6952
2.3727		55	0.2355	1231.65	(37)	0.000154	0.000155	1231.52	0.1259	0.000000	0.016					985.6952
2.4983		55	0.2449	1241.35	(99)	0.000161	0.000157	1243.19	-1.8400	0.000005	3.386				259.36	985.6952
2.6227		55	0.2540	1254.85	(37)	0.000158	0.000159	1254.59	0.2570	-0.000001	0.066					985.6952
2.8825		55	0.2723	1278.48	(37)	0.000161	0.000163	1277.96	0.5208	-0.000001	0.271					985.6952
2.9898		55	0.2796	1287.74	(99)	0.000164	0.000164	1287.43	0.3141	-0.000001	0.099				306.43	985.6952
3.3516		55	0.3032	1319.61	(99)	0.000168	0.000170	1318.56	1.0455	-0.000002	1.093				338.76	985.6952
0.2419		65	0.0305	1007.96	(37)	0.000109	0.000119	1007.64	0.3151	-0.000010	0.099					980.5548
0.464		65	0.0568	1032.65	(37)	0.000114	0.000123	1032.14	0.5108	-0.000008	0.261					980.5548
0.6948		65	0.0827	1057.81	(37)	0.000120	0.000126	1057.20	0.6123	-0.000007	0.375					980.5548
0.9215		65	0.1069	1082.03	(37)	0.000125	0.000130	1081.41	0.6212	-0.000005	0.386					980.5548
1.1498		65	0.1299	1105.96	(37)	0.000130	0.000133	1105.38	0.5820	-0.000004	0.339					980.5548
1.3886		65	0.1528	1130.49	(37)	0.000134	0.000137	1130.00	0.4936	-0.000003	0.244					980.5548
1.6373		65	0.1753	1155.50	(37)	0.000139	0.000141	1155.13	0.3674	-0.000002	0.135					980.5548
1.8878		65	0.1969	1180.15	(37)	0.000144	0.000144	1179.92	0.2279	-0.000001	0.052					980.5548
2.132		65	0.2168	1203.68	(37)	0.000148	0.000148	1203.57	0.1116	0.000000	0.012					980.5548
2.3727		65	0.2355	1226.39	(37)	0.000152	0.000152	1226.37	0.0241	0.000000	0.001					980.5548
2.6227		65	0.2540	1249.49	(37)	0.000156	0.000156	1249.50	-0.0112	0.000000	0.000					980.5548
2.8825		65	0.2723	1272.97	(37)	0.000160	0.000160	1272.95	0.0198	0.000000	0.000					980.5548
0.2419		75	0.0305	1002.16	(37)	0.000108	0.000116	1001.90	0.2615	-0.000009	0.068					974.849
0.464		75	0.0568	1026.82	(37)	0.000112	0.000120	1026.37	0.4512	-0.000008	0.204					974.849
0.6948		75	0.0827	1052.00	(37)	0.000117	0.000123	1051.42	0.5838	-0.000006	0.341					974.849

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Relative density	Density of water / kg/m³
0.9215		75	0.1069	1076.27	(37)	0.000121	0.000126	1075.63	0.6398	-0.000005	0.409					974.849
1.1498		75	0.1299	1100.24	(37)	0.000126	0.000130	1099.62	0.6236	-0.000004	0.389					974.849
1.3886		75	0.1528	1124.83	(37)	0.000130	0.000133	1124.27	0.5623	-0.000003	0.316					974.849
1.6373		75	0.1753	1149.88	(37)	0.000135	0.000137	1149.45	0.4252	-0.000002	0.181					974.849
1.8878		75	0.1969	1174.55	(37)	0.000140	0.000141	1174.31	0.2375	-0.000001	0.056					974.849
2.132		75	0.2168	1198.05	(37)	0.000144	0.000144	1198.04	0.0081	0.000000	0.000					974.849
2.3727		75	0.2355	1220.68	(37)	0.000149	0.000148	1220.94	-0.2573	0.000001	0.066					974.849
2.6227		75	0.2540	1243.61	(37)	0.000153	0.000152	1244.19	-0.5808	0.000001	0.337					974.849
2.8825		75	0.2723	1266.83	(37)	0.000158	0.000155	1267.78	-0.9503	0.000002	0.903					974.849
Average									0.1156	-0.000006	83.269	Sum chi sqr				
Std dev									0.6902	0.000009						
Avg - 4std									-2.6452	-0.000041						
Avg + 4std									2.8764	0.000028						

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	-8.1E-08
c1	8.03E-08
c2	410.2392
c3	9.180778
c4	5619.75
Min T	15
Max T	75
Min w	0.0013
Max w	0.3445
Avg dens res	0.115629
Std dens res	0.690195
Avg app vol res *10 ³	-0.0061
Std app vol res *10 ³	0.008605
No of points in corr	171
No of inconsistent pair	1

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

0.2044	45	0.0259	1012.30	(99)	0.000157	0.000122	1013.24	-0.9396	0.000035	0.883	!	22.31	990.2132
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molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Relative density water / kg/m³	Density of water / kg/m³
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Phang seems high, Pogue seems low, and Herrington seems average between the two

Density of aqueous solutions of **CoSO4**

References (7) Bakeev, M. I.; Zharmenov, A. A.; Baikenova, N. A.; Abdygalimova, S. Sh.; Electrical conductivity and viscosity of the binary systems MeSO4-H2O (Me=Mn2+, Fe2+, Co2+, Zn2+, Cd2+) at 25-75 degree and the structure of electrolyte solutions, *Izv. Nats. Akad. Nauk Resp. Kaz., Ser. Khim.*, **1994**, 6, 25-30

(117) Schmelzer, N, Einfeldt, J., "Dichtemessungen an einigen...", *Wiss. Z. Uni. Rostock*, **1989**, 38, 81-82

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
0.00051		25	0.0001	997.1	(117)	-0.000207	0.000006	997.12	0.0168	-0.000214	0.000			997.0449
0.001225		25	0.0002	997.3	(117)	-0.000242	0.000007	997.23	0.0470	-0.000249	0.002			997.0449
0.005367		25	0.0008	997.9	(117)	-0.000079	0.000007	997.87	0.0715	-0.000086	0.005			997.0449
		25	0.0015	998.9	(7)	-0.000247	0.000007	998.52	0.3783	-0.000255	0.143			997.0449
0.014905		25	0.0023	999.5	(117)	-0.000079	0.000008	999.33	0.2001	-0.000087	0.040			997.0449
0.05263		25	0.0081	1005.7	(117)	-0.000061	0.000012	1005.08	0.5991	-0.000073	0.359			997.0449
		25	0.0100	1002.5	(7)	0.000456	0.000013	1006.96	-4.4621	0.000443	19.910			997.0449
0.083535		25	0.0128	1010.7	(117)	-0.000059	0.000015	1009.76	0.9727	-0.000075	0.946			997.0449
0.22287		25	0.0334	1035.1	(117)	-0.000102	0.000029	1030.45	4.6691	-0.000131	21.800			997.0449
		25	0.0429	1042.2	(7)	-0.000011	0.000036	1040.02	2.1751	-0.000047	4.731			997.0449
		25	0.0596	1056.2	(7)	0.000060	0.000047	1057.04	-0.8431	0.000013	0.711			997.0449
		25	0.1100	1107.6	(7)	0.000093	0.000082	1109.07	-1.4713	0.000011	2.165			997.0449
		25	0.1600	1162.0	(7)	0.000113	0.000117	1161.20	0.8016	-0.000004	0.643			997.0449
		25	0.2100	1211.7	(7)	0.000157	0.000152	1213.22	-1.5227	0.000005	2.319			997.0449
		25	0.2968	1300.4	(7)	0.000215	0.000214	1300.86	-0.4633	0.000001	0.215			997.0449
		25	0.3305	1334.2	(7)	0.000236	0.000238	1333.12	1.0768	-0.000002	1.159			997.0449
		50	0.0100	996.3	(7)	0.000171	0.000011	997.89	-1.5882	0.000160	2.522			988.0363
		50	0.0429	1031.0	(7)	0.000028	0.000034	1030.74	0.2641	-0.000006	0.070			988.0363
		50	0.0596	1045.8	(7)	0.000074	0.000045	1047.64	-1.8446	0.000028	3.403			988.0363
		50	0.1100	1098.2	(7)	0.000089	0.000081	1099.34	-1.1440	0.000009	1.309			988.0363
		50	0.1600	1150.3	(7)	0.000120	0.000116	1151.15	-0.8491	0.000004	0.721			988.0363
		50	0.2100	1207.6	(7)	0.000136	0.000151	1202.86	4.7422	-0.000016	22.489			988.0363
		50	0.2736	1267.3	(7)	0.000197	0.000197	1267.21	0.0931	0.000000	0.009			988.0363
		50	0.2968	1288.3	(7)	0.000217	0.000214	1289.97	-1.6739	0.000003	2.802			988.0363
		50	0.3305	1321.4	(7)	0.000240	0.000238	1322.04	-0.6403	0.000001	0.410			988.0363
		75	0.0100	983.4	(7)	0.000132	0.000008	984.59	-1.1940	0.000124	1.426			974.849
		75	0.0429	1017.5	(7)	0.000022	0.000031	1017.09	0.4062	-0.000009	0.165			974.849
		75	0.0596	1034.3	(7)	0.000036	0.000043	1033.83	0.4713	-0.000007	0.222			974.849
		75	0.1100	1085.1	(7)	0.000078	0.000079	1085.02	0.0793	-0.000001	0.006			974.849
		75	0.1600	1136.3	(7)	0.000115	0.000115	1136.36	-0.0584	0.000000	0.003			974.849
		75	0.2100	1186.3	(7)	0.000155	0.000151	1187.65	-1.3488	0.000005	1.819			974.849
		75	0.2736	1252.3	(7)	0.000195	0.000197	1251.56	0.7406	-0.000002	0.549			974.849
		75	0.2968	1273.9	(7)	0.000214	0.000214	1274.20	-0.2977	0.000001	0.089			974.849
		75	0.3305	1306.6	(7)	0.000238	0.000239	1306.11	0.4887	-0.000001	0.239			974.849
Average									-0.0326	-0.000013	93.399	Sum chi sq		

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
								Std dev	1.6820	0.000117				
								Avg - 4std	-6.7607	-0.000481				
								Avg + 4std	6.6955	0.000454				
Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$														
c0				-118.3645										
c1				1368.065										
c2				0.013043										
c3				-0.000145										
c4				-294.0194										
Min T				25										
Max T				75										
Min w				7.9E-05										
Max w				0.3305										
Avg dens res				-0.03259										
Std dens res				1.682019										
Avg app vol res *10 ³				-0.013421										
Std app vol res *10 ³				0.116822										
No of points in corr				34										
No of inconsistent pair				7										
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)														
0.000158		25	0.0000	997.1	(117)	-0.000851	0.000006	997.07	0.0209	-0.000858	0.000		!	997.0449
0.37879		25	0.0555	1060.2	(117)	-0.000074	0.000044	1052.85	7.3090	-0.000118	53.421	!		997.0449
0.54945		25	0.0785	1094.3	(117)	-0.000133	0.000060	1076.46	17.8837	-0.000193	319.828	!		997.0449
0.85903		25	0.1175	1147.9	(117)	-0.000119	0.000087	1116.87	31.0581	-0.000206	964.608	!		997.0449
		25	0.2736	1230.1	(7)	0.000308	0.000197	1277.96	-47.8595	0.000111	2290.532	!		997.0449
		50	0.0015	992.0	(7)	-0.001702	0.000005	989.50	2.4967	-0.001707	6.233		!	988.0363
		75	0.0015	979.8	(7)	-0.002453	0.000003	976.30	3.5000	-0.002456	12.250		!	974.849

Density of aqueous solutions of **CrCl3**References (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		18	0.0100	1007.5	(90)	0.000116	0.000110	1007.56	-0.0598	0.000006	0.004			998.5956
		18	0.0200	1016.5	(90)	0.000119	0.000115	1016.60	-0.0980	0.000005	0.010			998.5956
		18	0.0400	1034.7	(90)	0.000128	0.000123	1034.89	-0.1943	0.000005	0.038			998.5956
		18	0.0800	1072.2	(90)	0.000142	0.000140	1072.35	-0.1547	0.000002	0.024			998.5956
		18	0.1200	1111.1	(90)	0.000156	0.000158	1110.94	0.1608	-0.000001	0.026			998.5956
Average Res									-0.0692	0.0000	0.1007	Sum chi sqr		
Std dev Res									0.138535	2.83E-06				
Avg - 4std									-0.6233	-0.000008				
Avg + 4std									0.4849	0.000014				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	3.146896
c1	232.1545
c2	0.201907
c3	0.0025
c4	1500
Min T	18
Max T	18
Min w	0.01
Max w	0.12
Avg dens res	-0.0692
Std dens res	0.1385
Avg app vol res *10 ³	0.003153
Std app vol res *10 ³	0.002832
No of points in corr	5
No of inconsistent poir	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **Cr2(SO4)3**References (6) Asmus, A., "The viscosities of aqueous solutions of strong electrolytes of high valence type", *Ann. der Physik, ser 5*, **1939**, 35, 1-22

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Density of water / kg/m³
	0.0000673	25	0.0000	997.1	(6)	-0.002007	-0.001243	997.07	0.0076	-0.000764	0.000			1.00003	997.0449
	0.000345	25	0.0001	997.2	(6)	-0.001483	-0.001241	997.16	0.0123	-0.000242	0.000			1.000127	997.0449
	0.000497	25	0.0001	997.2	(6)	-0.001429	-0.001239	997.21	0.0139	-0.000190	0.000			1.000179	997.0449
	0.000593	25	0.0001	997.3	(6)	-0.001411	-0.001238	997.24	0.0151	-0.000173	0.000			1.000212	997.0449
	0.000763	25	0.0001	997.3	(6)	-0.001342	-0.001237	997.30	0.0119	-0.000105	0.000			1.000265	997.0449
	0.000954	25	0.0001	997.4	(6)	-0.001340	-0.001235	997.36	0.0147	-0.000104	0.000			1.000331	997.0449
	0.001084	25	0.0002	997.4	(6)	-0.001308	-0.001234	997.40	0.0118	-0.000074	0.000			1.000371	997.0449
	0.00131	25	0.0002	997.5	(6)	-0.001291	-0.001233	997.48	0.0113	-0.000058	0.000			1.000445	997.0449
	0.001727	25	0.0003	997.6	(6)	-0.001277	-0.001229	997.61	0.0121	-0.000047	0.000			1.000583	997.0449
	0.002181	25	0.0003	997.8	(6)	-0.001257	-0.001225	997.76	0.0103	-0.000032	0.000			1.00073	997.0449
	0.002852	25	0.0004	998.0	(6)	-0.001154	-0.001220	997.98	-0.0277	0.000066	0.001			1.000911	997.0449
	0.003348	25	0.0005	998.1	(6)	-0.001216	-0.001216	998.14	0.0000	0.000000	0.000			1.0011	997.0449
	0.004599	25	0.0007	998.5	(6)	-0.001198	-0.001205	998.54	-0.0050	0.000007	0.000			1.001499	997.0449
	0.005956	25	0.0009	999.0	(6)	-0.001185	-0.001194	998.98	-0.0078	0.000009	0.000			1.00193	997.0449
	0.007628	25	0.0011	999.5	(6)	-0.001175	-0.001180	999.50	-0.0062	0.000006	0.000			1.00246	997.0449
	0.01009	25	0.0015	1000.3	(6)	-0.001165	-0.001160	1000.27	0.0081	-0.000005	0.000			1.00324	997.0449
Average Res									0.0051	-0.000107	0.002	Sum chi sqr			
Std dev Res									0.0117	0.000194					
Avg - 4std									-0.0415	-0.000883					
Avg + 4std									0.0518	0.000669					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	1.00452
c1	1.769719
c2	-0.08502
c3	0.0025
c4	1500
Min T	25
Max T	25
Min w	1E-05
Max w	0.001494
Avg dens res	0.005145
Std dens res	0.011674
Avg app vol res *10 ³	-0.10673
Std app vol res *10 ³	0.194055
No of points in corr	16
No of inconsistent point	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **CuCl2**

- References (23) Dolian, F. E. The Viscosities of Solutions of Chlorides in Certain Solvents. *J. Phys. Chem.* **1937**, *41*, 1129-1138.
- (26) Ellis, R. N.; Stokes, R. H.; Wright, A. C.; Spiro, M. Transference Numbers and Conductance in Concentrated Copper (II) Chloride Solutions at 25°C. *Aust. J. Chem.* **1983**, *36*, 1913-1921.
- (74) Motin, M. A., Temperature and Concentration Dependence of Apparent Molar Volumes and Viscosities of NaCl, NH4Cl, CuCl2, and MgSO4 in Pure Water and Water + Urea Mixtures, *J. Chem. Eng. Data*, **2004**, *49*, 94-98
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (97) Pogue, R. F.; Atkinson, G. Solution Thermodynamics of First-Row Transition Elements. 1. Apparent Molal Volumes of Aqueous NiCl2, Ni(ClO4)2, CuCl2, and Cu(ClO4)2, from 15 to 55°C. *J. Chem. Eng. Data* **1988**, *33*, 370-376.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Apparent molar volume / cm³/mol	Density of water / kg/m³
		0	0.0100	1009.5	(90)	0.000043	0.000051	1009.42	0.0793	-0.000008	0.006					999.8395
		0	0.0400	1038.7	(90)	0.000065	0.000066	1038.63	0.0673	-0.000002	0.005					999.8395
		0	0.0800	1078.8	(90)	0.000085	0.000085	1078.84	-0.0353	0.000000	0.001					999.8395
		0	0.1200	1120.8	(90)	0.000101	0.000101	1120.72	0.0769	-0.000001	0.006					999.8395
		0	0.1600	1165.3	(90)	0.000113	0.000116	1164.58	0.7191	-0.000003	0.517					999.8395
		0	0.2000	1212.1	(90)	0.000124	0.000129	1210.71	1.3904	-0.000005	1.933					999.8395
0.01027		15	0.0014	1000.4	(97)	0.000080	0.000069	1000.38	-0.0153	0.000011	0.000			1.27		999.0996
0.02113		15	0.0028	1001.7	(97)	0.000078	0.000070	1001.74	-0.0221	0.000008	0.000			2.62		999.0996
0.0304		15	0.0041	1002.9	(97)	0.000080	0.000070	1002.89	-0.0383	0.000009	0.001			3.76		999.0996
0.04879		15	0.0065	1005.1	(97)	0.000082	0.000072	1005.18	-0.0669	0.000010	0.004			6.02		999.0996
0.07517		15	0.0100	1008.3	(97)	0.000084	0.000073	1008.45	-0.1081	0.000011	0.012			9.25		999.0996
0.09715		15	0.0129	1011.0	(97)	0.000086	0.000075	1011.16	-0.1531	0.000012	0.023			11.92		999.0996
0.2006		15	0.0263	1023.5	(97)	0.000094	0.000081	1023.81	-0.3476	0.000013	0.121			24.38		999.0996
0.3888		15	0.0497	1045.7	(97)	0.000103	0.000092	1046.31	-0.6247	0.000011	0.390			46.63		999.0996
0.6119		15	0.0760	1071.4	(97)	0.000112	0.000103	1072.24	-0.8248	0.000009	0.680			72.38		999.0996
0.8038		15	0.0975	1093.0	(97)	0.000119	0.000111	1093.95	-0.9321	0.000008	0.869			94		999.0996
1.0333		15	0.1220	1118.3	(97)	0.000126	0.000120	1119.25	-0.9502	0.000006	0.903			119.31		999.0996
1.5005		15	0.1679	1167.9	(97)	0.000139	0.000135	1168.79	-0.9270	0.000004	0.859			168.92		999.0996
1.9955		15	0.2115	1218.2	(97)	0.000150	0.000148	1218.75	-0.5877	0.000002	0.345			219.26		999.0996
2.4934		15	0.2511	1265.9	(97)	0.000161	0.000159	1266.70	-0.8016	0.000002	0.642			267.04		999.0996
2.9953		15	0.2871	1312.0	(97)	0.000169	0.000168	1312.96	-0.9347	0.000002	0.874			313.21		999.0996
3.5741		15	0.3246	1362.8	(97)	0.000178	0.000176	1363.99	-1.1937	0.000002	1.425			364.02		999.0996
		20	0.0100	1007.2	(90)	0.000107	0.000081	1007.47	-0.2665	0.000026	0.071					998.2041
		20	0.0400	1036.0	(90)	0.000088	0.000094	1035.73	0.2706	-0.000006	0.073					998.2041
		20	0.0800	1075.4	(90)	0.000103	0.000111	1074.68	0.7235	-0.000008	0.523					998.2041
		20	0.1200	1116.5	(90)	0.000117	0.000125	1115.31	1.1908	-0.000008	1.418					998.2041
		20	0.1600	1159.5	(90)	0.000131	0.000138	1157.90	1.5999	-0.000007	2.560					998.2041
		20	0.2000	1205.2	(90)	0.000141	0.000150	1202.74	2.4615	-0.000008	6.059					998.2041
0.01004		25	0.0013	998.3	(97)	0.000089	0.000084	998.28	-0.0067	0.000005	0.000			1.23		997.0449
0.02007		25	0.0027	999.5	(97)	0.000088	0.000085	999.51	-0.0102	0.000004	0.000			2.46		997.0449
0.0301		25	0.0040	1000.7	(97)	0.000091	0.000085	1000.74	-0.0216	0.000005	0.000			3.68		997.0449
		25	0.0042	1001.0	(23)	0.000067	0.000085	1000.89	0.0790	-0.000019	0.006					997.0449
0.04899		25	0.0065	1003.0	(26)	0.000090	0.000086	1003.04	-0.0228	0.000003	0.001					997.0449
0.05018		25	0.0067	1003.1	(97)	0.000093	0.000087	1003.19	-0.0411	0.000006	0.002			6.12		997.0449
		25	0.0083	1004.8	(23)	0.000072	0.000087	1004.66	0.1318	-0.000016	0.017					997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Apparent molar volume / cm³/mol	Density of water / kg/m³
0.07493		25	0.0100	1006.1	(97)	0.000096	0.000088	1006.20	-0.0819	0.000008	0.007			9.1		997.0449
0.08601		25	0.0114	1007.5	(26)	0.000093	0.000089	1007.54	-0.0445	0.000004	0.002					997.0449
0.09909		25	0.0131	1009.1	(26)	0.000095	0.000089	1009.13	-0.0789	0.000006	0.006					997.0449
0.1003		25	0.0133	1009.2	(97)	0.000097	0.000090	1009.28	-0.1063	0.000008	0.011			12.16		997.0449
		25	0.0165	1011.6	(23)	0.000128	0.000091	1012.23	-0.6215	0.000037	0.386					997.0449
0.14524		25	0.0192	1014.6	(26)	0.000096	0.000092	1014.69	-0.0835	0.000004	0.007					997.0449
0.2006		25	0.0263	1021.1	(97)	0.000104	0.000095	1021.32	-0.2440	0.000009	0.060			24.1		997.0449
0.24295		25	0.0316	1026.2	(26)	0.000102	0.000098	1026.35	-0.1486	0.000004	0.022					997.0449
		25	0.0325	1027.3	(23)	0.000095	0.000098	1027.16	0.0952	-0.000003	0.009					997.0449
0.413		25	0.0526	1045.7	(97)	0.000116	0.000106	1046.25	-0.5252	0.000009	0.276			48.82		997.0449
		25	0.0635	1056.5	(23)	0.000115	0.000111	1056.74	-0.2904	0.000004	0.084					997.0449
0.5081		25	0.0639	1056.9	(26)	0.000115	0.000111	1057.17	-0.2922	0.000004	0.085					997.0449
0.5093		25	0.0641	1057.0	(26)	0.000115	0.000111	1057.31	-0.2792	0.000004	0.078					997.0449
0.6219		25	0.0772	1069.4	(97)	0.000124	0.000116	1070.07	-0.6685	0.000008	0.447			72.57		997.0449
0.7908		25	0.0961	1088.6	(26)	0.000125	0.000123	1088.87	-0.2825	0.000002	0.080					997.0449
0.816		25	0.0989	1090.9	(97)	0.000130	0.000124	1091.64	-0.7382	0.000006	0.545			94.14		997.0449
1.0223		25	0.1208	1113.3	(97)	0.000136	0.000131	1114.04	-0.7350	0.000005	0.540			116.6		997.0449
1.195		25	0.1384	1132.3	(26)	0.000137	0.000137	1132.38	-0.0805	0.000000	0.006					997.0449
1.5704		25	0.1743	1170.8	(97)	0.000149	0.000148	1171.11	-0.2993	0.000001	0.090			174.28		997.0449
2.0791		25	0.2185	1220.7	(97)	0.000162	0.000160	1221.33	-0.5915	0.000002	0.350			224.36		997.0449
2.183		25	0.2269	1231.8	(26)	0.000160	0.000162	1231.30	0.5405	-0.000002	0.292					997.0449
2.6006		25	0.2591	1269.5	(97)	0.000172	0.000170	1270.44	-0.9789	0.000002	0.958			273.22		997.0449
2.767		25	0.2711	1286.5	(26)	0.000171	0.000173	1285.64	0.8294	-0.000002	0.688					997.0449
3.1291		25	0.2961	1317.4	(97)	0.000179	0.000178	1318.00	-0.6092	0.000001	0.371			321.3		997.0449
3.351		25	0.3106	1338.3	(26)	0.000180	0.000181	1337.37	0.9387	-0.000002	0.881					997.0449
3.5741		25	0.3246	1356.2	(97)	0.000185	0.000184	1356.50	-0.3414	0.000001	0.117			360.18		997.0449
3.923		25	0.3453	1386.7	(26)	0.000187	0.000188	1385.76	0.9759	-0.000001	0.952					997.0449
4.487		25	0.3763	1432.4	(26)	0.000193	0.000194	1431.47	0.8794	-0.000001	0.773					997.0449
5.394		25	0.4204	1501.2	(26)	0.000202	0.000202	1501.18	0.0117	0.000000	0.000					997.0449
0.01027		35	0.0014	995.3	(97)	0.000095	0.000098	995.27	0.0045	-0.000003	0.000			1.25		994.0319
0.02113		35	0.0028	996.6	(97)	0.000096	0.000099	996.58	0.0097	-0.000003	0.000			2.57		994.0319
0.0304		35	0.0041	997.7	(97)	0.000100	0.000100	997.69	-0.0008	0.000000	0.000			3.68		994.0319
0.04879		35	0.0065	999.9	(97)	0.000099	0.000101	999.90	0.0109	-0.000002	0.000			5.91		994.0319
0.07517		35	0.0100	1003.0	(97)	0.000102	0.000102	1003.05	0.0000	0.000000	0.000			9.07		994.0319
0.09715		35	0.0129	1005.7	(97)	0.000104	0.000103	1005.66	-0.0123	0.000001	0.000			11.69		994.0319
0.2006		35	0.0263	1017.8	(97)	0.000113	0.000109	1017.87	-0.1058	0.000004	0.011			23.87		994.0319
0.3888		35	0.0497	1039.4	(97)	0.000123	0.000118	1039.60	-0.2337	0.000004	0.055			45.61		994.0319
0.6119		35	0.0760	1064.3	(97)	0.000132	0.000128	1064.67	-0.3425	0.000004	0.117			70.72		994.0319
0.8038		35	0.0975	1085.3	(97)	0.000138	0.000135	1085.68	-0.3683	0.000003	0.136			91.83		994.0319
1.0333		35	0.1220	1109.9	(97)	0.000145	0.000143	1110.20	-0.3386	0.000002	0.115			116.52		994.0319
1.5005		35	0.1679	1158.0	(97)	0.000158	0.000156	1158.24	-0.2754	0.000001	0.076			164.92		994.0319
1.9955		35	0.2115	1206.9	(97)	0.000167	0.000168	1206.76	0.0986	0.000000	0.010			214.1		994.0319
2.4934		35	0.2511	1253.3	(97)	0.000177	0.000177	1253.37	-0.0445	0.000000	0.002			260.85		994.0319
2.9953		35	0.2871	1298.3	(97)	0.000185	0.000185	1298.38	-0.0823	0.000000	0.007			306.09		994.0319
3.5741		35	0.3246	1347.8	(97)	0.000192	0.000192	1348.05	-0.2231	0.000000	0.050			355.92		994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Apparent molar volume / cm³/mol	Density of water / kg/m³
		40	0.0100	1002.0	(90)	0.000024	0.000109	1001.14	0.8577	-0.000086	0.736		!			992.2158
		40	0.0400	1030.5	(90)	0.000072	0.000121	1028.41	2.0911	-0.000049	4.373					992.2158
		40	0.0800	1068.2	(90)	0.000112	0.000135	1066.05	2.1541	-0.000024	4.640					992.2158
		40	0.1200	1107.0	(90)	0.000137	0.000148	1105.38	1.6219	-0.000011	2.631					992.2158
0.01027		45	0.0014	991.4	(97)	0.000103	0.000113	991.43	0.0132	-0.000010	0.000			1.24		990.2132
0.02113		45	0.0028	992.7	(97)	0.000103	0.000113	992.71	0.0280	-0.000010	0.001			2.55		990.2132
0.0304		45	0.0041	993.8	(97)	0.000108	0.000114	993.80	0.0243	-0.000006	0.001			3.65		990.2132
0.04879		45	0.0065	996.0	(97)	0.000109	0.000115	995.97	0.0391	-0.000006	0.002			5.85		990.2132
0.07517		45	0.0100	999.1	(97)	0.000112	0.000116	999.06	0.0451	-0.000005	0.002			8.98		990.2132
0.09715		45	0.0129	1001.7	(97)	0.000115	0.000117	1001.63	0.0318	-0.000002	0.001			11.56		990.2132
0.2006		45	0.0263	1013.5	(97)	0.000126	0.000122	1013.61	-0.0925	0.000003	0.009			23.53		990.2132
0.3888		45	0.0497	1034.9	(97)	0.000132	0.000131	1034.96	-0.0741	0.000001	0.005			45.11		990.2132
0.6119		45	0.0760	1059.4	(97)	0.000143	0.000140	1059.59	-0.2135	0.000003	0.046			69.85		990.2132
0.8038		45	0.0975	1079.8	(97)	0.000151	0.000147	1080.25	-0.4748	0.000004	0.225			90.45		990.2132
1.0333		45	0.1220	1103.7	(97)	0.000159	0.000154	1104.37	-0.6875	0.000005	0.473			114.59		990.2132
1.5005		45	0.1679	1151.0	(97)	0.000169	0.000167	1151.67	-0.6588	0.000003	0.434			162.39		990.2132
1.9955		45	0.2115	1198.9	(97)	0.000179	0.000177	1199.47	-0.5500	0.000002	0.303			210.77		990.2132
2.4934		45	0.2511	1245.2	(97)	0.000186	0.000186	1245.43	-0.2232	0.000001	0.050			257.51		990.2132
2.9953		45	0.2871	1289.4	(97)	0.000194	0.000193	1289.82	-0.4538	0.000001	0.206			302.11		990.2132
3.5741		45	0.3246	1338.4	(97)	0.000200	0.000200	1338.84	-0.4649	0.000001	0.216			351.6		990.2132
0.01027		55	0.0014	986.9	(97)	0.000103	0.000126	986.89	0.0309	-0.000023	0.001			1.24		985.6952
0.02113		55	0.0028	988.2	(97)	0.000107	0.000127	988.14	0.0544	-0.000020	0.003			2.54		985.6952
0.0304		55	0.0041	989.3	(97)	0.000108	0.000127	989.22	0.0764	-0.000019	0.006			3.65		985.6952
0.04879		55	0.0065	991.4	(97)	0.000112	0.000128	991.34	0.1027	-0.000016	0.011			5.83		985.6952
0.07517		55	0.0100	994.5	(97)	0.000116	0.000130	994.37	0.1334	-0.000013	0.018			8.94		985.6952
0.09715		55	0.0129	997.1	(97)	0.000118	0.000131	996.89	0.1666	-0.000013	0.028			11.53		985.6952
0.2006		55	0.0263	1008.9	(97)	0.000127	0.000135	1008.65	0.2207	-0.000008	0.049			23.51		985.6952
0.3888		55	0.0497	1029.9	(97)	0.000137	0.000143	1029.61	0.3299	-0.000006	0.109			44.89		985.6952
0.6119		55	0.0760	1054.2	(97)	0.000147	0.000152	1053.82	0.3890	-0.000005	0.151			69.51		985.6952
0.8038		55	0.0975	1074.6	(97)	0.000154	0.000158	1074.13	0.4605	-0.000004	0.212			90.19		985.6952
1.0333		55	0.1220	1098.2	(97)	0.000163	0.000165	1097.86	0.3243	-0.000002	0.105			114.12		985.6952
1.5005		55	0.1679	1144.7	(97)	0.000175	0.000176	1144.43	0.2808	-0.000001	0.079			161.32		985.6952
1.9955		55	0.2115	1192.0	(97)	0.000184	0.000186	1191.52	0.5198	-0.000002	0.270			209.34		985.6952
2.4934		55	0.2511	1237.1	(97)	0.000193	0.000194	1236.83	0.2266	-0.000001	0.051			255.01		985.6952
2.9953		55	0.2871	1280.8	(97)	0.000200	0.000201	1280.62	0.1284	0.000000	0.016			299.34		985.6952
3.5741		55	0.3246	1328.9	(97)	0.000207	0.000207	1329.00	-0.0776	0.000000	0.006			348.21		985.6952
						Average Res			0.0042	-0.000001	44.5182	Sum chi sqr				
						Std dev Res			0.6222	0.000012						
						Avg - 4std			-2.4845	-0.000051						
						Avg + 4std			2.4929	0.000049						

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4) \cdot ^2)}$

c0 1868.499

c1 1137.233

c2 0.071852

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Apparent molar volume / cm³/mol	Density of water / kg/m³
c3		0.002565														
c4		575.6913														
Min T		0														
Max T		55														
Min w		0.0013														
Max w		0.4204														
Avg dens res		0.0042														
Std dens res		0.622171														
Avg app vol res *10³		-0.00092														
Std app vol res *10³		0.012407														
No of points in corr		116														
No of inconsistent pair		3														
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)																
1.7904		25	0.1940	1163.1	(26)	0.000265	0.000153	1193.13	-30.0810	0.000112	904.868	!	!			997.0449
0.0625		35	0.0083	999.05	(74)	0.000400	0.000102	1001.54	-2.4899	0.000299	6.199	!	!	53.8		994.0319
0.125		35	0.0165	1003.95	(74)	0.000405	0.000105	1008.97	-5.0158	0.000300	25.158	!	!	54.4		994.0319
0.25		35	0.0325	1013.61	(74)	0.000408	0.000112	1023.63	-10.0119	0.000297	100.237	!	!	54.9		994.0319
0.5		35	0.0630	1032.08	(74)	0.000417	0.000123	1052.19	-20.1103	0.000294	404.424	!	!	56.1		994.0319
1		35	0.1185	1066.61	(74)	0.000428	0.000142	1106.68	-40.0682	0.000286	1605.464	!	!	57.6		994.0319
0.0625		40	0.0083	997.20	(74)	0.000404	0.000109	999.65	-2.4534	0.000295	6.019		!	54.3		992.2158
0.125		40	0.0165	1002.07	(74)	0.000408	0.000112	1007.01	-4.9441	0.000296	24.444	!	!	54.9		992.2158
0.25		40	0.0325	1011.66	(74)	0.000412	0.000118	1021.54	-9.8739	0.000294	97.493	!	!	55.4		992.2158
0.5		40	0.0630	1030.00	(74)	0.000421	0.000130	1049.85	-19.8533	0.000291	394.153	!	!	56.6		992.2158
1		40	0.1185	1064.17	(74)	0.000433	0.000148	1103.89	-39.7184	0.000285	1577.548	!	!	58.2		992.2158
		40	0.1600	1151.0	(90)	0.000139	0.000159	1146.67	4.3333	-0.000021	18.778	!				992.2158
		40	0.2000	1195.3	(90)	0.000152	0.000170	1190.19	5.1104	-0.000018	26.116	!				992.2158
0.0625		50	0.0083	992.97	(74)	0.000408	0.000122	995.33	-2.3563	0.000286	5.552		!	54.9		988.0363
0.125		50	0.0165	997.80	(74)	0.000413	0.000125	1002.55	-4.7524	0.000287	22.586	!	!	55.5		988.0363
0.25		50	0.0325	1007.34	(74)	0.000416	0.000131	1016.81	-9.4766	0.000285	89.806	!	!	55.9		988.0363
0.5		50	0.0630	1025.53	(74)	0.000425	0.000142	1044.62	-19.0953	0.000283	364.629	!	!	57.1		988.0363
1		50	0.1185	1059.53	(74)	0.000436	0.000159	1097.76	-38.2280	0.000277	1461.378	!	!	58.6		988.0363

Density of aqueous solutions of **CuSO₄**

- References (84) Pearce, J. N.; Pumphin, G. G. The Apparent and Partial Molal Volume of Ammonium Chloride and of Cupric Sulfate in Aqueous Solutions at 25°C. *J. Am. Chem. Soc.* **1937**, *59*, 1221-1222.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (95) Demichowicz-Pigoniowa, J. Dependence of Density, Viscosity and Electric Conductivity of Aqueous CuSO₄ Solutions on Temperature and Concentration. *Ann. Soc. Chim. Polonorum* **1973**, *47*, 2183-2190.
- (101) Puchalska, D.; Atkinson, G.; Routh, S. Solution Thermodynamics of First-Row Transition Elements. 4. Apparent Molal Volumes of Aqueous ZnSO₄ and CuSO₄ Solutions from 15 to 55°C. *J. Sol. Chem.* **1993**, *22*, 625-639.
- (125) Suryanarayana, C. V.; Alamelu, S. Electrical Conductance of Concentrated Aqueous Solutions of Copper Sulfate. *Bull. Chem. Soc. Japan* **1959**, *32*, 333-339.

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m ³	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
		0	0.0100	1010.40	(90)	-0.000045	-0.000028	1010.22	0.1750	-0.000017	0.031					999.8395
		0	0.0400	1042.90	(90)	-0.000032	-0.000022	1042.45	0.4472	-0.000010	0.200					999.8395
		0	0.0800	1088.70	(90)	-0.000020	-0.000013	1087.98	0.7242	-0.000008	0.525					999.8395
		0	0.1200	1137.90	(90)	-0.000011	-0.000002	1136.42	1.4788	-0.000010	2.187					999.8395
0.01009		15	0.0016	1000.80	(101)	-0.000057	-0.000014	1000.73	0.0694	-0.000043	0.005					999.0996
0.05		15	0.0079	1007.60	(95)	-0.000066	-0.000012	1007.17	0.4268	-0.000053	0.182					999.0996
0.05005		15	0.0079	1007.39	(101)	-0.000038	-0.000012	1007.18	0.2087	-0.000026	0.044					999.0996
0.07024		15	0.0111	1010.66	(101)	-0.000032	-0.000012	1010.44	0.2248	-0.000020	0.051					999.0996
0.09946		15	0.0156	1015.49	(101)	-0.000033	-0.000011	1015.14	0.3522	-0.000022	0.124					999.0996
0.15013		15	0.0234	1023.53	(101)	-0.000020	-0.000010	1023.27	0.2565	-0.000010	0.066					999.0996
0.20012		15	0.0310	1031.53	(101)	-0.000016	-0.000008	1031.28	0.2544	-0.000008	0.065					999.0996
0.25		15	0.0384	1042.00	(95)	-0.000073	-0.000006	1039.23	2.7653	-0.000067	7.647					999.0996
0.30011		15	0.0457	1047.32	(101)	-0.000007	-0.000005	1047.20	0.1162	-0.000002	0.014					999.0996
0.49998		15	0.0739	1078.36	(101)	0.000005	0.000002	1078.70	-0.3402	0.000004	0.116					999.0996
0.5		15	0.0739	1080.40	(95)	-0.000018	0.000002	1078.70	1.6967	-0.000020	2.879					999.0996
0.7002		15	0.1005	1108.96	(101)	0.000015	0.000008	1109.73	-0.7675	0.000006	0.589					999.0996
0.752		15	0.1072	1118.60	(95)	0.000003	0.000010	1117.66	0.9412	-0.000007	0.886					999.0996
1		15	0.1376	1153.84	(101)	0.000026	0.000019	1155.01	-1.1738	0.000006	1.378					999.0996
1.005		15	0.1382	1157.30	(95)	0.000011	0.000019	1155.76	1.5444	-0.000008	2.385					999.0996
1.265		15	0.1680	1196.50	(95)	0.000018	0.000030	1193.64	2.8614	-0.000012	8.187					999.0996
1.33069		15	0.1752	1202.12	(101)	0.000036	0.000033	1202.98	-0.8585	0.000003	0.737					999.0996
0.05		18	0.0079	1007.00	(95)	-0.000054	-0.000010	1006.64	0.3566	-0.000044	0.127					998.5956
0.25		18	0.0384	1040.20	(95)	-0.000042	-0.000004	1038.60	1.6000	-0.000039	2.560					998.5956
0.5		18	0.0739	1080.60	(95)	-0.000027	0.000004	1077.93	2.6655	-0.000031	7.105					998.5956
0.752		18	0.1072	1118.30	(95)	0.000001	0.000013	1116.75	1.5469	-0.000012	2.393					998.5956
1.005		18	0.1382	1156.50	(95)	0.000012	0.000022	1154.71	1.7876	-0.000010	3.196					998.5956
1.265		18	0.1680	1194.70	(95)	0.000023	0.000032	1192.46	2.2436	-0.000009	5.034					998.5956
		20	0.0100	1008.60	(90)	-0.000031	-0.000008	1008.37	0.2349	-0.000023	0.055					998.2041
		20	0.0400	1040.10	(90)	-0.000007	-0.000002	1039.87	0.2268	-0.000005	0.051					998.2041
		20	0.0800	1084.00	(90)	0.000011	0.000007	1084.32	-0.3219	0.000003	0.104					998.2041
		20	0.1200	1130.80	(90)	0.000023	0.000018	1131.55	-0.7537	0.000005	0.568					998.2041
		20	0.1600	1180.00	(90)	0.000037	0.000031	1181.39	-1.3949	0.000006	1.946					998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
		20	0.1800	1206.00	(90)	0.000043	0.000038	1207.16	-1.1573	0.000004	1.339					998.2041
0.02993		25	0.0048	1001.93	(101)	-0.000026	-0.000005	1001.83	0.1000	-0.000021	0.010					997.0449
0.05		25	0.0079	1005.60	(95)	-0.000075	-0.000004	1005.03	0.5658	-0.000071	0.320					997.0449
0.05005		25	0.0079	1005.18	(101)	-0.000021	-0.000004	1005.04	0.1378	-0.000017	0.019					997.0449
0.07024		25	0.0111	1008.42	(101)	-0.000017	-0.000003	1008.26	0.1581	-0.000014	0.025					997.0449
0.09913		25	0.0156	1013.02	(101)	-0.000012	-0.000003	1012.86	0.1576	-0.000010	0.025					997.0449
0.1		25	0.0157	1013.21	(84)	-0.000015	-0.000003	1013.00	0.2051	-0.000013	0.042			16.2		997.0449
0.15013		25	0.0234	1020.94	(101)	0.000000	-0.000001	1020.96	-0.0243	0.000001	0.001					997.0449
0.2		25	0.0309	1029.11	(84)	-0.000007	0.000000	1028.86	0.2450	-0.000007	0.060			32.1		997.0449
0.20012		25	0.0310	1028.78	(101)	0.000003	0.000000	1028.88	-0.1008	0.000003	0.010					997.0449
0.25		25	0.0384	1039.40	(95)	-0.000062	0.000002	1036.75	2.6458	-0.000064	7.000					997.0449
0.30011		25	0.0457	1044.14	(101)	0.000013	0.000003	1044.64	-0.4969	0.000010	0.247					997.0449
0.4		25	0.0600	1060.36	(84)	0.000005	0.000006	1060.27	0.0957	-0.000001	0.009			63.3		997.0449
0.49998		25	0.0739	1074.50	(101)	0.000025	0.000010	1075.79	-1.2864	0.000015	1.655					997.0449
0.5		25	0.0739	1077.40	(95)	-0.000009	0.000010	1075.79	1.6105	-0.000019	2.594					997.0449
0.6		25	0.0874	1090.96	(84)	0.000015	0.000013	1091.18	-0.2217	0.000002	0.049			93.9		997.0449
0.7002		25	0.1005	1104.32	(101)	0.000034	0.000016	1106.46	-2.1449	0.000017	4.600					997.0449
0.752		25	0.1072	1115.40	(95)	0.000010	0.000018	1114.31	1.0939	-0.000008	1.197					997.0449
0.8		25	0.1132	1120.99	(84)	0.000024	0.000020	1121.53	-0.5406	0.000004	0.292			123.9		997.0449
1		25	0.1376	1150.56	(84)	0.000031	0.000027	1151.23	-0.6737	0.000004	0.454			153.5		997.0449
1		25	0.1376	1149.08	(101)	0.000039	0.000027	1151.23	-2.1536	0.000012	4.638					997.0449
1.005		25	0.1382	1152.20	(95)	0.000026	0.000027	1151.97	0.2331	-0.000001	0.054					997.0449
1.1964		25	0.1603	1179.05	(84)	0.000037	0.000035	1179.67	-0.6162	0.000003	0.380			182.0		997.0449
1.265		25	0.1680	1191.70	(95)	0.000028	0.000037	1189.41	2.2857	-0.000010	5.224					997.0449
1.33069		25	0.1752	1196.81	(101)	0.000047	0.000040	1198.65	-1.8372	0.000007	3.375					997.0449
1.4182		25	0.1846	1210.68	(84)	0.000044	0.000044	1210.79	-0.1140	0.000000	0.013			213.6		997.0449
0.0992		30	0.0156	1011.00	(125)	0.000026	0.000001	1011.40	-0.3957	0.000025	0.157					995.6473
0.1965		30	0.0304	1027.00	(125)	-0.000004	0.000004	1026.75	0.2483	-0.000008	0.062					995.6473
0.2921		30	0.0445	1042.00	(125)	0.000001	0.000007	1041.74	0.2556	-0.000005	0.065					995.6473
0.3862		30	0.0581	1057.00	(125)	0.000000	0.000010	1056.40	0.5975	-0.000009	0.357					995.6473
0.4785		30	0.0710	1071.00	(125)	0.000008	0.000012	1070.68	0.3228	-0.000004	0.104					995.6473
0.5693		30	0.0833	1085.00	(125)	0.000011	0.000015	1084.61	0.3869	-0.000004	0.150					995.6473
0.6586		30	0.0951	1098.00	(125)	0.000020	0.000018	1098.21	-0.2083	0.000002	0.043					995.6473
0.7463		30	0.1064	1110.00	(125)	0.000032	0.000021	1111.45	-1.4461	0.000011	2.091					995.6473
0.8326		30	0.1173	1124.00	(125)	0.000027	0.000024	1124.36	-0.3556	0.000002	0.126					995.6473
0.9175		30	0.1277	1136.00	(125)	0.000033	0.000027	1136.94	-0.9353	0.000006	0.875					995.6473
1.001		30	0.1378	1149.00	(125)	0.000031	0.000030	1149.18	-0.1842	0.000001	0.034					995.6473
1.083		30	0.1474	1161.00	(125)	0.000034	0.000033	1161.09	-0.0873	0.000000	0.008					995.6473
1.164		30	0.1567	1172.00	(125)	0.000040	0.000036	1172.72	-0.7161	0.000003	0.513					995.6473
1.244		30	0.1657	1184.00	(125)	0.000040	0.000040	1184.07	-0.0684	0.000000	0.005					995.6473
1.321		30	0.1741	1195.00	(125)	0.000042	0.000043	1194.86	0.1361	-0.000001	0.019					995.6473
1.398		30	0.1824	1205.00	(125)	0.000048	0.000046	1205.52	-0.5242	0.000002	0.275					995.6473
1.51		30	0.1942	1223.00	(125)	0.000043	0.000051	1220.78	2.2248	-0.000008	4.950					995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.01009		35	0.0016	995.69	(101)	-0.000036	0.000002	995.63	0.0602	-0.000038	0.004					994.0319
0.02993		35	0.0048	998.89	(101)	-0.000023	0.000002	998.77	0.1207	-0.000025	0.015					994.0319
0.05		35	0.0079	1002.40	(95)	-0.000055	0.000003	1001.94	0.4584	-0.000058	0.210					994.0319
0.05005		35	0.0079	1002.11	(101)	-0.000017	0.000003	1001.95	0.1605	-0.000020	0.026					994.0319
0.07024		35	0.0111	1005.31	(101)	-0.000012	0.000003	1005.14	0.1729	-0.000015	0.030					994.0319
0.0992		35	0.0156	1009.00	(125)	0.000049	0.000004	1009.70	-0.7026	0.000044	0.494					994.0319
0.09946		35	0.0156	1009.99	(101)	-0.000011	0.000004	1009.74	0.2465	-0.000015	0.061					994.0319
0.15013		35	0.0234	1017.89	(101)	-0.000002	0.000006	1017.71	0.1778	-0.000007	0.032					994.0319
0.1965		35	0.0304	1025.00	(125)	0.000007	0.000007	1024.98	0.0176	-0.000001	0.000					994.0319
0.20012		35	0.0310	1025.67	(101)	0.000003	0.000007	1025.55	0.1209	-0.000004	0.015					994.0319
0.25		35	0.0384	1036.00	(95)	-0.000056	0.000009	1033.34	2.6571	-0.000065	7.060					994.0319
0.2921		35	0.0445	1040.00	(125)	0.000008	0.000010	1039.90	0.0996	-0.000002	0.010					994.0319
0.30011		35	0.0457	1040.89	(101)	0.000015	0.000010	1041.15	-0.2559	0.000005	0.065					994.0319
0.3862		35	0.0581	1054.00	(125)	0.000020	0.000013	1054.49	-0.4855	0.000008	0.236					994.0319
0.4785		35	0.0710	1068.00	(125)	0.000024	0.000016	1068.69	-0.6889	0.000009	0.475					994.0319
0.49998		35	0.0739	1071.29	(101)	0.000024	0.000016	1071.98	-0.6890	0.000008	0.475					994.0319
0.5		35	0.0739	1074.10	(95)	-0.000009	0.000016	1071.98	2.1179	-0.000025	4.486					994.0319
0.5693		35	0.0833	1082.00	(125)	0.000024	0.000018	1082.56	-0.5554	0.000006	0.309					994.0319
0.6586		35	0.0951	1095.00	(125)	0.000031	0.000021	1096.08	-1.0832	0.000009	1.173					994.0319
0.7002		35	0.1005	1101.39	(101)	0.000031	0.000023	1102.35	-0.9559	0.000008	0.914					994.0319
0.7463		35	0.1064	1109.00	(125)	0.000026	0.000024	1109.26	-0.2557	0.000002	0.065					994.0319
0.752		35	0.1072	1111.40	(95)	0.000015	0.000024	1110.11	1.2922	-0.000010	1.670					994.0319
0.8326		35	0.1173	1121.00	(125)	0.000035	0.000027	1122.10	-1.1019	0.000007	1.214					994.0319
0.9175		35	0.1277	1133.00	(125)	0.000040	0.000030	1134.62	-1.6206	0.000010	2.626					994.0319
1		35	0.1376	1145.30	(101)	0.000041	0.000033	1146.67	-1.3655	0.000008	1.865					994.0319
1.001		35	0.1378	1146.00	(125)	0.000038	0.000033	1146.81	-0.8108	0.000004	0.657					994.0319
1.005		35	0.1382	1147.40	(95)	0.000033	0.000033	1147.39	0.0084	0.000000	0.000					994.0319
1.083		35	0.1474	1158.00	(125)	0.000039	0.000036	1158.66	-0.6576	0.000003	0.432					994.0319
1.164		35	0.1567	1170.00	(125)	0.000040	0.000039	1170.23	-0.2322	0.000001	0.054					994.0319
1.244		35	0.1657	1181.00	(125)	0.000045	0.000042	1181.53	-0.5326	0.000002	0.284					994.0319
1.265		35	0.1680	1185.50	(95)	0.000039	0.000043	1184.48	1.0234	-0.000004	1.047					994.0319
1.321		35	0.1741	1192.00	(125)	0.000047	0.000045	1192.28	-0.2799	0.000001	0.078					994.0319
1.33069		35	0.1752	1192.94	(101)	0.000049	0.000046	1193.62	-0.6830	0.000003	0.466					994.0319
1.398		35	0.1824	1203.00	(125)	0.000048	0.000049	1202.89	0.1063	0.000000	0.011					994.0319
		40	0.0100	1002.40	(90)	-0.000016	0.000006	1002.18	0.2247	-0.000022	0.050					992.2158
0.0992		40	0.0156	1007.00	(125)	0.000059	0.000007	1007.81	-0.8111	0.000051	0.658					992.2158
0.1965		40	0.0304	1023.00	(125)	0.000011	0.000010	1023.02	-0.0172	0.000001	0.000					992.2158
		40	0.0400	1033.20	(90)	0.000008	0.000012	1033.05	0.1474	-0.000003	0.022					992.2158
0.2921		40	0.0445	1038.00	(125)	0.000010	0.000013	1037.86	0.1366	-0.000003	0.019					992.2158
0.3862		40	0.0581	1052.00	(125)	0.000021	0.000016	1052.38	-0.3783	0.000006	0.143					992.2158
0.4785		40	0.0710	1066.00	(125)	0.000025	0.000018	1066.51	-0.5138	0.000006	0.264					992.2158
		40	0.0800	1076.40	(90)	0.000023	0.000020	1076.60	-0.2023	0.000002	0.041					992.2158
0.5693		40	0.0833	1080.00	(125)	0.000024	0.000021	1080.31	-0.3144	0.000003	0.099					992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.6586		40	0.0951	1093.00	(125)	0.000031	0.000024	1093.78	-0.7783	0.000007	0.606					992.2158
0.7463		40	0.1064	1106.00	(125)	0.000034	0.000027	1106.89	-0.8894	0.000007	0.791					992.2158
0.8326		40	0.1173	1119.00	(125)	0.000034	0.000030	1119.68	-0.6764	0.000005	0.458					992.2158
		40	0.1200	1122.20	(90)	0.000035	0.000031	1122.88	-0.6811	0.000005	0.464					992.2158
0.9175		40	0.1277	1131.00	(125)	0.000040	0.000033	1132.14	-1.1382	0.000007	1.296					992.2158
1.001		40	0.1378	1143.00	(125)	0.000043	0.000036	1144.27	-1.2741	0.000007	1.623					992.2158
1.083		40	0.1474	1155.00	(125)	0.000044	0.000039	1156.07	-1.0691	0.000005	1.143					992.2158
1.164		40	0.1567	1167.00	(125)	0.000044	0.000042	1167.59	-0.5944	0.000003	0.353					992.2158
1.244		40	0.1657	1179.00	(125)	0.000044	0.000045	1178.85	0.1521	-0.000001	0.023					992.2158
1.321		40	0.1741	1190.00	(125)	0.000046	0.000048	1189.55	0.4482	-0.000002	0.201					992.2158
1.398		40	0.1824	1200.00	(125)	0.000051	0.000051	1200.12	-0.1243	0.000000	0.015					992.2158
1.8		40	0.2232	1251.00	(125)	0.000074	0.000068	1252.93	-1.9289	0.000006	3.721					992.2158
0.01009		45	0.0016	991.87	(101)	-0.000039	0.000008	991.80	0.0740	-0.000047	0.005					990.2132
0.02993		45	0.0048	995.03	(101)	-0.000018	0.000008	994.91	0.1243	-0.000026	0.015					990.2132
0.05005		45	0.0079	998.21	(101)	-0.000011	0.000009	998.06	0.1543	-0.000020	0.024					990.2132
0.07024		45	0.0111	1001.35	(101)	-0.000003	0.000009	1001.21	0.1370	-0.000012	0.019					990.2132
0.0992		45	0.0156	1005.00	(125)	0.000057	0.000010	1005.74	-0.7352	0.000047	0.541					990.2132
0.15013		45	0.0234	1013.79	(101)	0.000006	0.000011	1013.67	0.1211	-0.000005	0.015					990.2132
0.1965		45	0.0304	1021.00	(125)	0.000009	0.000013	1020.87	0.1299	-0.000004	0.017					990.2132
0.20012		45	0.0310	1021.47	(101)	0.000012	0.000013	1021.43	0.0386	-0.000001	0.001					990.2132
0.25		45	0.0384	1031.50	(95)	-0.000044	0.000014	1029.15	2.3485	-0.000058	5.516					990.2132
0.2921		45	0.0445	1035.00	(125)	0.000029	0.000015	1035.65	-0.6470	0.000014	0.419					990.2132
0.30011		45	0.0457	1036.71	(101)	0.000019	0.000016	1036.88	-0.1707	0.000003	0.029					990.2132
0.3862		45	0.0581	1050.00	(125)	0.000020	0.000018	1050.09	-0.0946	0.000001	0.009					990.2132
0.4785		45	0.0710	1064.00	(125)	0.000023	0.000021	1064.17	-0.1651	0.000002	0.027					990.2132
0.49998		45	0.0739	1066.54	(101)	0.000032	0.000021	1067.42	-0.8846	0.000011	0.782					990.2132
0.5		45	0.0739	1070.00	(95)	-0.000009	0.000021	1067.43	2.5724	-0.000030	6.617					990.2132
0.5693		45	0.0833	1077.00	(125)	0.000033	0.000024	1077.90	-0.9029	0.000009	0.815					990.2132
0.6586		45	0.0951	1091.00	(125)	0.000029	0.000026	1091.31	-0.3064	0.000003	0.094					990.2132
0.7002		45	0.1005	1095.03	(101)	0.000048	0.000028	1097.51	-2.4821	0.000021	6.161					990.2132
0.7463		45	0.1064	1104.00	(125)	0.000032	0.000029	1104.36	-0.3595	0.000003	0.129					990.2132
0.752		45	0.1072	1106.70	(95)	0.000018	0.000029	1105.20	1.4961	-0.000011	2.238					990.2132
0.8326		45	0.1173	1116.00	(125)	0.000040	0.000032	1117.09	-1.0910	0.000007	1.190					990.2132
0.9175		45	0.1277	1129.00	(125)	0.000038	0.000035	1129.50	-0.4999	0.000003	0.250					990.2132
1		45	0.1376	1139.54	(101)	0.000048	0.000038	1141.44	-1.9014	0.000011	3.615					990.2132
1.001		45	0.1378	1141.00	(125)	0.000041	0.000038	1141.59	-0.5854	0.000003	0.343					990.2132
1.005		45	0.1382	1143.00	(95)	0.000033	0.000038	1142.16	0.8387	-0.000005	0.703					990.2132
1.083		45	0.1474	1153.00	(125)	0.000042	0.000041	1153.33	-0.3328	0.000002	0.111					990.2132
1.164		45	0.1567	1165.00	(125)	0.000043	0.000044	1164.81	0.1870	-0.000001	0.035					990.2132
1.244		45	0.1657	1176.00	(125)	0.000047	0.000047	1176.02	-0.0240	0.000000	0.001					990.2132
1.265		45	0.1680	1181.20	(95)	0.000038	0.000048	1178.95	2.2549	-0.000010	5.084					990.2132
1.321		45	0.1741	1188.00	(125)	0.000044	0.000050	1186.69	1.3109	-0.000005	1.719					990.2132
1.33069		45	0.1752	1186.77	(101)	0.000055	0.000050	1188.02	-1.2522	0.000005	1.568					990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
1.398		45	0.1824	1198.00	(125)	0.000050	0.000053	1197.22	0.7751	-0.000003	0.601					990.2132
1.95		45	0.2374	1268.00	(125)	0.000078	0.000077	1268.38	-0.3818	0.000001	0.146					990.2132
0.0992		50	0.0156	1003.00	(125)	0.000043	0.000012	1003.49	-0.4870	0.000031	0.237					988.0363
0.1965		50	0.0304	1019.00	(125)	0.000001	0.000015	1018.55	0.4472	-0.000014	0.200					988.0363
0.2921		50	0.0445	1033.00	(125)	0.000023	0.000018	1033.26	-0.2627	0.000006	0.069					988.0363
0.3862		50	0.0581	1047.00	(125)	0.000030	0.000020	1047.65	-0.6456	0.000010	0.417					988.0363
0.4785		50	0.0710	1061.00	(125)	0.000031	0.000023	1061.65	-0.6538	0.000008	0.428					988.0363
0.5693		50	0.0833	1075.00	(125)	0.000029	0.000026	1075.33	-0.3318	0.000003	0.110					988.0363
0.6586		50	0.0951	1088.00	(125)	0.000034	0.000028	1088.68	-0.6778	0.000006	0.459					988.0363
0.7463		50	0.1064	1101.00	(125)	0.000036	0.000031	1101.68	-0.6762	0.000005	0.457					988.0363
0.8326		50	0.1173	1114.00	(125)	0.000036	0.000034	1114.36	-0.3555	0.000002	0.126					988.0363
0.9175		50	0.1277	1127.00	(125)	0.000035	0.000037	1126.71	0.2851	-0.000002	0.081					988.0363
1.001		50	0.1378	1139.00	(125)	0.000038	0.000040	1138.75	0.2463	-0.000001	0.061					988.0363
1.083		50	0.1474	1150.00	(125)	0.000045	0.000043	1150.46	-0.4572	0.000002	0.209					988.0363
1.164		50	0.1567	1162.00	(125)	0.000045	0.000045	1161.90	0.1039	0.000000	0.011					988.0363
1.244		50	0.1657	1173.00	(125)	0.000049	0.000048	1173.07	-0.0686	0.000000	0.005					988.0363
1.321		50	0.1741	1185.00	(125)	0.000046	0.000051	1183.70	1.3012	-0.000005	1.693					988.0363
1.398		50	0.1824	1195.00	(125)	0.000051	0.000054	1194.20	0.7978	-0.000003	0.637					988.0363
2.12		50	0.2528	1285.00	(125)	0.000087	0.000086	1285.30	-0.3035	0.000001	0.092					988.0363
0.01009		55	0.0016	987.34	(101)	-0.000037	0.000012	987.26	0.0763	-0.000049	0.006					985.6952
0.02993		55	0.0048	990.48	(101)	-0.000016	0.000013	990.35	0.1349	-0.000029	0.018					985.6952
0.05		55	0.0079	993.20	(95)	0.000046	0.000013	993.46	-0.2588	0.000033	0.067					985.6952
0.05005		55	0.0079	993.64	(101)	-0.000009	0.000013	993.47	0.1735	-0.000022	0.030					985.6952
0.07024		55	0.0111	996.77	(101)	-0.000002	0.000014	996.60	0.1748	-0.000016	0.031					985.6952
0.0992		55	0.0156	1001.00	(125)	0.000019	0.000014	1001.08	-0.0765	0.000005	0.006					985.6952
0.09946		55	0.0156	1001.39	(101)	-0.000003	0.000014	1001.12	0.2733	-0.000017	0.075					985.6952
0.15013		55	0.0234	1009.11	(101)	0.000009	0.000016	1008.94	0.1714	-0.000007	0.029					985.6952
0.1965		55	0.0304	1016.00	(125)	0.000019	0.000017	1016.08	-0.0751	0.000002	0.006					985.6952
0.20012		55	0.0310	1016.62	(101)	0.000017	0.000017	1016.63	-0.0114	0.000000	0.000					985.6952
0.25		55	0.0384	1025.50	(95)	-0.000012	0.000018	1024.28	1.2175	-0.000030	1.482					985.6952
0.2921		55	0.0445	1030.00	(125)	0.000035	0.000020	1030.72	-0.7203	0.000015	0.519					985.6952
0.30011		55	0.0457	1031.60	(101)	0.000027	0.000020	1031.94	-0.3431	0.000007	0.118					985.6952
0.3862		55	0.0581	1045.00	(125)	0.000023	0.000022	1045.04	-0.0407	0.000001	0.002					985.6952
0.4785		55	0.0710	1059.00	(125)	0.000025	0.000025	1058.99	0.0109	0.000000	0.000					985.6952
0.49998		55	0.0739	1060.36	(101)	0.000048	0.000026	1062.22	-1.8606	0.000022	3.462					985.6952
0.5		55	0.0739	1063.30	(95)	0.000013	0.000026	1062.22	1.0764	-0.000013	1.159					985.6952
0.5693		55	0.0833	1073.00	(125)	0.000024	0.000028	1072.61	0.3902	-0.000004	0.152					985.6952
0.6586		55	0.0951	1086.00	(125)	0.000029	0.000030	1085.90	0.0988	-0.000001	0.010					985.6952
0.7002		55	0.1005	1089.79	(101)	0.000051	0.000032	1092.06	-2.2658	0.000019	5.134					985.6952
0.7463		55	0.1064	1098.00	(125)	0.000040	0.000033	1098.85	-0.8476	0.000007	0.718					985.6952
0.752		55	0.1072	1098.90	(95)	0.000039	0.000033	1099.69	-0.7852	0.000006	0.617					985.6952
0.8326		55	0.1173	1111.00	(125)	0.000039	0.000036	1111.48	-0.4778	0.000003	0.228					985.6952
0.9175		55	0.1277	1124.00	(125)	0.000037	0.000039	1123.79	0.2093	-0.000001	0.044					985.6952

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
1		55	0.1376	1133.19	(101)	0.000055	0.000041	1135.64	-2.4530	0.000014	6.017					985.6952
1.001		55	0.1378	1136.00	(125)	0.000040	0.000041	1135.79	0.2140	-0.000001	0.046					985.6952
1.005		55	0.1382	1137.00	(95)	0.000038	0.000041	1136.36	0.6424	-0.000004	0.413					985.6952
1.083		55	0.1474	1148.00	(125)	0.000041	0.000044	1147.45	0.5511	-0.000003	0.304					985.6952
1.164		55	0.1567	1160.00	(125)	0.000042	0.000047	1158.85	1.1500	-0.000005	1.323					985.6952
1.244		55	0.1657	1170.00	(125)	0.000050	0.000050	1169.99	0.0125	0.000000	0.000					985.6952
1.265		55	0.1680	1174.40	(95)	0.000044	0.000051	1172.89	1.5098	-0.000007	2.280					985.6952
1.321		55	0.1741	1182.00	(125)	0.000047	0.000053	1180.59	1.4135	-0.000006	1.998					985.6952
1.33069		55	0.1752	1181.00	(101)	0.000057	0.000053	1181.91	-0.9116	0.000004	0.831					985.6952
1.398		55	0.1824	1192.00	(125)	0.000052	0.000056	1191.06	0.9390	-0.000004	0.882					985.6952
2.3		55	0.2685	1302.00	(125)	0.000097	0.000096	1302.26	-0.2646	0.000001	0.070					985.6952
0.0992		60	0.0156	998.80	(125)	-0.000002	0.000016	998.51	0.2877	-0.000019	0.083					983.1989
0.1965		60	0.0304	1014.00	(125)	0.000001	0.000019	1013.45	0.5544	-0.000018	0.307					983.1989
0.2921		60	0.0445	1028.00	(125)	0.000022	0.000021	1028.03	-0.0279	0.000001	0.001					983.1989
0.3862		60	0.0581	1042.00	(125)	0.000029	0.000024	1042.29	-0.2879	0.000005	0.083					983.1989
0.4785		60	0.0710	1056.00	(125)	0.000029	0.000027	1056.18	-0.1787	0.000002	0.032					983.1989
0.5693		60	0.0833	1070.00	(125)	0.000027	0.000029	1069.74	0.2556	-0.000003	0.065					983.1989
0.6586		60	0.0951	1083.00	(125)	0.000032	0.000032	1082.98	0.0165	0.000000	0.000					983.1989
0.7463		60	0.1064	1095.00	(125)	0.000041	0.000035	1095.88	-0.8806	0.000007	0.775					983.1989
0.8326		60	0.1173	1109.00	(125)	0.000034	0.000037	1108.46	0.5358	-0.000004	0.287					983.1989
0.9175		60	0.1277	1121.00	(125)	0.000038	0.000040	1120.73	0.2665	-0.000002	0.071					983.1989
1.001		60	0.1378	1133.00	(125)	0.000041	0.000043	1132.69	0.3120	-0.000002	0.097					983.1989
1.083		60	0.1474	1144.00	(125)	0.000047	0.000045	1144.31	-0.3133	0.000002	0.098					983.1989
1.164		60	0.1567	1157.00	(125)	0.000042	0.000048	1155.68	1.3204	-0.000006	1.743					983.1989
1.244		60	0.1657	1168.00	(125)	0.000046	0.000051	1166.79	1.2147	-0.000005	1.475					983.1989
1.321		60	0.1741	1180.00	(125)	0.000043	0.000054	1177.36	2.6439	-0.000011	6.990					983.1989
1.398		60	0.1824	1190.00	(125)	0.000048	0.000057	1187.81	2.1949	-0.000009	4.818					983.1989
2.49		60	0.2844	1319.00	(125)	0.000107	0.000106	1319.07	-0.0661	0.000000	0.004					983.1989
Average Res									0.0324	-0.000004	222.5815	Sum Chi sqr				
Std dev Res									0.9811	0.000017						
Avg - 4std									-3.8919	-0.000072						
Avg + 4std									3.9567	0.000064						

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	-2E-07
c1	1.09E-07
c2	-0.12506
c3	0.003831
c4	4936.746
Min T	0
Max T	60
Min w	0.001608
Max w	0.2844
Avg dens res	0.032402

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
Std dens res		0.981072														
Avg app vol res *10 ³	-0.00382															
Std app vol res *10 ³	0.016932															
No of points in corr		232														
No of inconsistent pair		3														
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)																
0.01009		25	0.0016	997.20	(101)	0.000906	-0.000005	998.66	-1.4589	0.000911	2.128		!			997.0449
1.65		35	0.2085	1249.00	(125)	0.000021	0.000059	1236.62	12.3843	-0.000038	153.370	!				994.0319
0.05		45	0.0079	998.70	(95)	-0.000074	0.000009	998.05	0.6521	-0.000083	0.425		!			990.2132

Density of aqueous solutions of **FeCl2**

- References (48) Kaminsky, M. Concentration and Temperature Dependence of the Viscosity of Aqueous Solutions of Strong Electrolytes. II. NaCl, Li₂SO₄, FeCl₂, and CeCl₃ Solutions. *Z. Physik. Chem. N. F.*, **1956**, 8, 173-191
- (99) Pogue, R. F.; Atkinson, G. Solution Thermodynamics of First-Row Transition Elements. 2. Apparent Molal Volumes of Aqueous MnCl₂, Mn(ClO₄)₂, CoCl₂, Co(ClO₄)₂, FeCl₂, and Fe(ClO₄)₂, from 15 to 55°C. *J. Chem. Eng. Data* **1989**, 34, 227-232

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density / 1000(rho-1)	Density of water / kg/m³
0.0251		15	0.0032	1001.93	(99)	0.000110	0.000124	1001.88	0.0445	-0.000014	0.002			2.83	999.0996
0.05136		15	0.0065	1004.86	(99)	0.000113	0.000125	1004.79	0.0781	-0.000012	0.006			5.77	999.0996
0.07416		15	0.0093	1007.42	(99)	0.000113	0.000126	1007.30	0.1210	-0.000013	0.015			8.33	999.0996
0.1009		15	0.0126	1010.36	(99)	0.000118	0.000127	1010.24	0.1166	-0.000009	0.014			11.27	999.0996
0.2501		15	0.0307	1026.67	(99)	0.000126	0.000131	1026.51	0.1649	-0.000005	0.027			27.6	999.0996
0.5322		15	0.0632	1056.77	(99)	0.000137	0.000139	1056.60	0.1632	-0.000002	0.027			57.72	999.0996
0.8246		15	0.0946	1087.02	(99)	0.000145	0.000146	1086.93	0.0951	-0.000001	0.009			88	999.0996
1.045		15	0.1170	1109.10	(99)	0.000152	0.000151	1109.22	-0.1207	0.000001	0.015			110.1	999.0996
1.5322		15	0.1626	1156.73	(99)	0.000162	0.000161	1156.90	-0.1726	0.000001	0.030			157.77	999.0996
2.0932		15	0.2097	1209.26	(99)	0.000171	0.000171	1209.25	0.0130	0.000000	0.000			210.35	999.0996
	0.00099	15.5	0.0001	999.14	(48)	0.000045	0.000124	999.13	0.0099	-0.000079	0.000		!	0.12	999.0228
	0.00198	15.5	0.0003	999.25	(48)	0.000085	0.000124	999.24	0.0099	-0.000039	0.000			0.23	999.0228
	0.00496	15.5	0.0006	999.59	(48)	0.000094	0.000124	999.57	0.0186	-0.000030	0.000			0.57	999.0228
	0.00991	15.5	0.0013	1000.15	(48)	0.000101	0.000124	1000.12	0.0286	-0.000023	0.001			1.13	999.0228
	0.01984	15.5	0.0025	1001.28	(48)	0.000102	0.000124	1001.22	0.0559	-0.000022	0.003			2.26	999.0228
	0.04959	15.5	0.0063	1004.73	(48)	0.000093	0.000125	1004.52	0.2075	-0.000033	0.043			5.71	999.0228
	0.09919	15.5	0.0124	1010.15	(48)	0.000115	0.000127	1010.00	0.1529	-0.000012	0.023			11.14	999.0228
	0.19838	15.5	0.0246	1021.06	(48)	0.000124	0.000130	1020.90	0.1617	-0.000006	0.026			22.06	999.0228
	0.2975	15.5	0.0365	1031.81	(48)	0.000131	0.000133	1031.72	0.0877	-0.000002	0.008			32.82	999.0228
	0.00099	18	0.0001	998.72	(48)	0.000045	0.000126	998.71	0.0101	-0.000081	0.000		!	0.12	998.5956
	0.00198	18	0.0003	998.83	(48)	0.000085	0.000126	998.82	0.0103	-0.000041	0.000			0.23	998.5956
	0.00496	18	0.0006	999.16	(48)	0.000095	0.000126	999.15	0.0196	-0.000031	0.000			0.57	998.5956
	0.00991	18	0.0013	999.71	(48)	0.000110	0.000126	999.69	0.0205	-0.000016	0.000			1.12	998.5956
	0.01984	18	0.0025	1000.83	(48)	0.000111	0.000126	1000.79	0.0397	-0.000016	0.002			2.24	998.5956
	0.04959	18	0.0063	1004.15	(48)	0.000117	0.000127	1004.08	0.0663	-0.000011	0.004			5.56	998.5956
	0.09919	18	0.0125	1009.63	(48)	0.000122	0.000129	1009.55	0.0808	-0.000006	0.007			11.05	998.5956
	0.19838	18	0.0246	1020.41	(48)	0.000132	0.000132	1020.43	-0.0157	0.000001	0.000			21.85	998.5956
	0.2975	18	0.0366	1031.07	(48)	0.000139	0.000135	1031.24	-0.1671	0.000004	0.028			32.52	998.5956
	0.00099	25	0.0001	997.15	(48)	0.000126	0.000131	997.15	0.0006	-0.000005	0.000			0.11	997.0449
	0.00198	25	0.0003	997.27	(48)	0.000087	0.000131	997.26	0.0112	-0.000045	0.000			0.23	997.0449
	0.00495	25	0.0006	997.60	(48)	0.000110	0.000131	997.59	0.0130	-0.000021	0.000			0.56	997.0449
	0.0099	25	0.0013	998.15	(48)	0.000118	0.000131	998.14	0.0162	-0.000013	0.000			1.11	997.0449
	0.0198	25	0.0025	999.26	(48)	0.000118	0.000132	999.23	0.0332	-0.000013	0.001			2.22	997.0449
0.0261		25	0.0033	999.96	(99)	0.000117	0.000132	999.91	0.0477	-0.000014	0.002			2.92	997.0449
	0.04951	25	0.0063	1002.55	(48)	0.000123	0.000133	1002.49	0.0578	-0.000009	0.003			5.52	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density / 1000(rho-1)	Density of water / kg/m³
0.0519		25	0.0065	1002.81	(99)	0.000121	0.000133	1002.73	0.0760	-0.000012	0.006			5.78	997.0449
0.07846		25	0.0098	1005.74	(99)	0.000122	0.000133	1005.63	0.1086	-0.000011	0.012			8.72	997.0449
0.09903		25	0.0124	1007.99	(99)	0.000124	0.000134	1007.87	0.1224	-0.000010	0.015			10.98	997.0449
	0.09903	25	0.0125	1007.97	(48)	0.000130	0.000134	1007.92	0.0529	-0.000004	0.003			10.96	997.0449
	0.19804	25	0.0246	1018.66	(48)	0.000139	0.000137	1018.72	-0.0625	0.000002	0.004			21.68	997.0449
0.2501		25	0.0307	1024.30	(99)	0.000134	0.000138	1024.18	0.1276	-0.000004	0.016			27.34	997.0449
	0.29696	25	0.0366	1029.19	(48)	0.000146	0.000140	1029.45	-0.2648	0.000007	0.070			32.24	997.0449
0.5435		25	0.0644	1055.20	(99)	0.000145	0.000146	1055.16	0.0470	-0.000001	0.002			58.33	997.0449
0.8401		25	0.0962	1085.62	(99)	0.000153	0.000153	1085.59	0.0332	0.000000	0.001			88.84	997.0449
1.0861		25	0.1210	1110.23	(99)	0.000158	0.000158	1110.19	0.0385	0.000000	0.001			113.52	997.0449
1.4891		25	0.1588	1149.27	(99)	0.000166	0.000166	1149.31	-0.0335	0.000000	0.001			152.68	997.0449
2.0932		25	0.2097	1205.36	(99)	0.000176	0.000176	1205.37	-0.0089	0.000000	0.000			208.93	997.0449
	0.00099	30	0.0001	995.76	(48)	0.000128	0.000135	995.76	0.0009	-0.000007	0.000			0.11	995.6473
	0.00198	30	0.0003	995.87	(48)	0.000128	0.000135	995.86	0.0017	-0.000007	0.000			0.22	995.6473
	0.00494	30	0.0006	996.20	(48)	0.000110	0.000135	996.19	0.0154	-0.000025	0.000			0.56	995.6473
	0.00987	30	0.0013	996.74	(48)	0.000125	0.000135	996.73	0.0122	-0.000010	0.000			1.1	995.6473
	0.01974	30	0.0025	997.85	(48)	0.000121	0.000135	997.81	0.0351	-0.000014	0.001			2.21	995.6473
	0.04944	30	0.0063	1001.12	(48)	0.000127	0.000136	1001.06	0.0585	-0.000009	0.003			5.5	995.6473
	0.09888	30	0.0125	1006.49	(48)	0.000135	0.000137	1006.46	0.0249	-0.000002	0.001			10.89	995.6473
	0.19774	30	0.0246	1017.04	(48)	0.000147	0.000140	1017.22	-0.1718	0.000007	0.030			21.49	995.6473
	0.29649	30	0.0366	1027.47	(48)	0.000154	0.000143	1027.89	-0.4261	0.000011	0.182			31.96	995.6473
	0.00098	35	0.0001	994.14	(48)	0.000120	0.000138	994.14	0.0022	-0.000018	0.000			0.11	994.0319
	0.00197	35	0.0003	994.24	(48)	0.000165	0.000138	994.25	-0.0067	0.000027	0.000			0.21	994.0319
	0.00494	35	0.0006	994.58	(48)	0.000128	0.000138	994.57	0.0065	-0.000010	0.000			0.55	994.0319
	0.00987	35	0.0013	995.13	(48)	0.000127	0.000138	995.11	0.0143	-0.000012	0.000			1.1	994.0319
	0.01975	35	0.0025	996.21	(48)	0.000131	0.000139	996.19	0.0184	-0.000007	0.000			2.19	994.0319
0.02526		35	0.0032	996.83	(99)	0.000123	0.000139	996.77	0.0506	-0.000016	0.003			2.81	994.0319
	0.04936	35	0.0063	999.44	(48)	0.000136	0.000139	999.42	0.0180	-0.000003	0.000			5.44	994.0319
0.05153		35	0.0065	999.71	(99)	0.000126	0.000139	999.62	0.0883	-0.000014	0.008			5.71	994.0319
0.07635		35	0.0096	1002.41	(99)	0.000129	0.000140	1002.30	0.1110	-0.000012	0.012			8.43	994.0319
	0.09871	35	0.0125	1004.77	(48)	0.000143	0.000141	1004.79	-0.0258	0.000002	0.001			10.8	994.0319
0.1015		35	0.0127	1005.15	(99)	0.000130	0.000141	1005.01	0.1346	-0.000010	0.018			11.18	994.0319
	0.19739	35	0.0246	1015.26	(48)	0.000152	0.000143	1015.49	-0.2242	0.000009	0.050			21.36	994.0319
0.2501		35	0.0307	1021.05	(99)	0.000140	0.000145	1020.89	0.1638	-0.000005	0.027			27.18	994.0319
	0.29596	35	0.0366	1025.59	(48)	0.000160	0.000146	1026.12	-0.5232	0.000014	0.274			31.75	994.0319
0.5291		35	0.0628	1050.22	(99)	0.000150	0.000152	1050.08	0.1460	-0.000002	0.021			56.53	994.0319
0.7871		35	0.0907	1076.53	(99)	0.000156	0.000157	1076.39	0.1349	-0.000001	0.018			82.99	994.0319
1.073		35	0.1197	1104.90	(99)	0.000163	0.000163	1104.82	0.0739	-0.000001	0.005			111.53	994.0319
1.6069		35	0.1692	1156.09	(99)	0.000173	0.000173	1155.99	0.0998	0.000000	0.010			163.03	994.0319
2.0932		35	0.2097	1200.73	(99)	0.000180	0.000181	1200.56	0.1702	-0.000001	0.029			207.94	994.0319
	0.00098	40	0.0001	992.32	(48)	0.000122	0.000141	992.32	0.0023	-0.000019	0.000			0.11	992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density / 1000(rho-r-1)	Density of water / kg/m³
	0.00197	40	0.0003	992.42	(48)	0.000167	0.000141	992.43	-0.0063	0.000026	0.000			0.21	992.2158
	0.00492	40	0.0006	992.76	(48)	0.000126	0.000141	992.75	0.0096	-0.000015	0.000			0.55	992.2158
	0.00985	40	0.0013	993.29	(48)	0.000143	0.000141	993.29	-0.0017	0.000001	0.000			1.08	992.2158
	0.0197	40	0.0025	994.37	(48)	0.000139	0.000142	994.36	0.0073	-0.000003	0.000			2.17	992.2158
	0.04926	40	0.0063	997.57	(48)	0.000143	0.000143	997.58	-0.0026	0.000000	0.000			5.4	992.2158
	0.09853	40	0.0125	1002.85	(48)	0.000149	0.000144	1002.92	-0.0698	0.000006	0.005			10.72	992.2158
	0.19701	40	0.0246	1013.24	(48)	0.000159	0.000147	1013.56	-0.3228	0.000013	0.104			21.19	992.2158
	0.29539	40	0.0366	1023.47	(48)	0.000167	0.000149	1024.14	-0.6703	0.000017	0.449	!		31.5	992.2158
0.02555		45	0.0032	993.02	(99)	0.000127	0.000145	992.96	0.0571	-0.000018	0.003			2.83	990.2132
0.05239		45	0.0066	995.93	(99)	0.000132	0.000146	995.83	0.0919	-0.000014	0.008			5.77	990.2132
0.07629		45	0.0096	998.51	(99)	0.000134	0.000146	998.39	0.1213	-0.000013	0.015			8.38	990.2132
0.09856		45	0.0123	1000.91	(99)	0.000135	0.000147	1000.77	0.1422	-0.000012	0.020			10.8	990.2132
0.2501		45	0.0307	1016.97	(99)	0.000145	0.000151	1016.79	0.1749	-0.000006	0.031			27.02	990.2132
0.4931		45	0.0588	1042.13	(99)	0.000155	0.000156	1042.02	0.1128	-0.000002	0.013			52.43	990.2132
0.8438		45	0.0966	1077.48	(99)	0.000163	0.000164	1077.43	0.0534	0.000000	0.003			88.13	990.2132
1.056		45	0.1180	1098.39	(99)	0.000167	0.000168	1098.31	0.0834	-0.000001	0.007			109.25	990.2132
2.0932		45	0.2097	1194.81	(99)	0.000185	0.000185	1195.00	-0.1895	0.000001	0.036			206.62	990.2132
Average Res									0.0141	-0.000009	1.817	Sum chi sqr			
Std dev Res									0.1398	0.000016					
Avg - 4std									-0.5452	-0.000074					
Avg + 4std									0.5734	0.000056					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	98.65403
c1	199.5046
c2	0.336389
c3	0.003844
c4	1650.129
Min T	15
Max T	45
Min w	0.000125
Max w	0.209682
Avg dens res	0.0141
Std dens res	0.139823
Avg app vol res *10 ³	-0.008644
Std app vol res *10 ³	0.01622
No of points in corr	93
No of inconsistent pair	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **FeSO4**

References (7) Bakeev, M. I.; Zharmenov, A. A.; Andamasov, R. S.; Baikenova, N. A.; Abdygalimova, S. Sh. Electrical Conductivity and Viscosity of the Binary Systems MeSO4-H2O (Me=Mn2+, Fe2+, Co2+, Zn2+, Cd2+) at 25-75 Degree and the Structure of Electrolyte Solutions. /zv. Nats. Akad. Nauk Resp. Kaz., Ser. Khim. **1994**, 6, 25-30.

(21) Degremont, "Memento Technique de l'eau.", Paris, 1989

(90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	g FeSO4 .7H2O/L	Density of water / kg/m³
		15	0.0071	1007.0	(21)	-0.000104	-0.000041	1006.55	0.4550	-0.000063	0.207			13.1	999.0996
		15	0.0100	1009.0	(90)	0.000019	-0.000037	1009.57	-0.5683	0.000056	0.323				999.0996
		15	0.0142	1014.0	(21)	-0.000033	-0.000032	1013.98	0.0187	-0.000001	0.000			26.4	999.0996
		15	0.0218	1021.0	(21)	0.000018	-0.000022	1021.91	-0.9055	0.000040	0.820			40.8	999.0996
		15	0.0295	1028.0	(21)	0.000047	-0.000012	1029.86	-1.8573	0.000059	3.449			55.5	999.0996
		15	0.0372	1036.0	(21)	0.000042	-0.000003	1037.79	-1.7933	0.000045	3.216			70.5	999.0996
		15	0.0400	1038.0	(90)	0.000063	0.000001	1040.69	-2.6914	0.000062	7.244				999.0996
		15	0.0448	1044.0	(21)	0.000039	0.000007	1045.57	-1.5686	0.000032	2.461			85.5	999.0996
		15	0.0530	1051.0	(21)	0.000069	0.000017	1054.03	-3.0285	0.000052	9.172			102	999.0996
		15	0.0601	1059.0	(21)	0.000059	0.000026	1061.22	-2.2173	0.000033	4.916			116.5	999.0996
		15	0.0676	1067.0	(21)	0.000059	0.000036	1068.77	-1.7678	0.000023	3.125			132	999.0996
		15	0.0747	1075.0	(21)	0.000055	0.000045	1075.90	-0.8974	0.000010	0.805			147	999.0996
		15	0.0800	1079.0	(90)	0.000074	0.000051	1081.15	-2.1471	0.000023	4.610				999.0996
		15	0.0822	1083.0	(21)	0.000058	0.000054	1083.37	-0.3668	0.000004	0.135			163	999.0996
		15	0.0897	1091.0	(21)	0.000060	0.000064	1090.66	0.3382	-0.000003	0.114			179	999.0996
		15	0.0975	1099.0	(21)	0.000067	0.000074	1098.27	0.7348	-0.000006	0.540			196	999.0996
		15	0.1050	1108.0	(21)	0.000064	0.000083	1105.59	2.4128	-0.000019	5.822			213	999.0996
		15	0.1126	1116.0	(21)	0.000070	0.000093	1112.81	3.1945	-0.000023	10.205			230	999.0996
		15	0.1200	1125.0	(21)	0.000067	0.000102	1119.73	5.2650	-0.000035	27.720			247	999.0996
		15	0.1200	1123.5	(90)	0.000077	0.000102	1119.76	3.7382	-0.000025	13.974				999.0996
		15	0.1277	1134.0	(21)	0.000068	0.000112	1126.91	7.0865	-0.000043	50.218			265	999.0996
		15	0.1358	1143.0	(21)	0.000073	0.000122	1134.31	8.6866	-0.000049	75.456			284	999.0996
		15	0.1442	1152.0	(21)	0.000080	0.000133	1141.91	10.0947	-0.000053	101.904			304	999.0996
		15	0.1525	1161.0	(21)	0.000086	0.000143	1149.25	11.7545	-0.000058	138.167			324	999.0996
		15	0.1600	1169.0	(90)	0.000092	0.000153	1155.77	13.2310	-0.000061	175.061				999.0996
		15	0.1881	1170.0	(21)	0.000224	0.000189	1179.11	-9.1055	0.000035	82.909			344	999.0996
		15	0.1996	1180.0	(21)	0.000232	0.000203	1188.08	-8.0800	0.000029	65.287			365	999.0996
		15	0.2117	1190.0	(21)	0.000242	0.000219	1197.11	-7.1094	0.000024	50.544			387	999.0996
		15	0.2231	1200.0	(21)	0.000250	0.000233	1205.35	-5.3535	0.000017	28.660			408	999.0996
		15	0.2352	1210.0	(21)	0.000259	0.000249	1213.58	-3.5771	0.000010	12.795			430	999.0996
		15	0.2472	1220.0	(21)	0.000268	0.000264	1221.36	-1.3578	0.000004	1.844			452	999.0996
		15	0.2592	1230.0	(21)	0.000276	0.000279	1228.68	1.3242	-0.000003	1.753			474	999.0996
		15	0.2740	1241.0	(21)	0.000289	0.000298	1237.00	4.0034	-0.000010	16.027			501	999.0996

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	g FeSO4 .7H2O/L	Density of water / kg/m³
		18	0.0020	1000.7	(90)	-0.000042	-0.000040	1000.68	0.0028	-0.000001	0.000				998.5956
		18	0.0040	1002.8	(90)	-0.000036	-0.000038	1002.76	-0.0076	0.000002	0.000				998.5956
		18	0.0080	1006.5	(90)	0.000025	-0.000033	1006.91	-0.4646	0.000057	0.216				998.5956
		18	0.0100	1008.5	(90)	0.000018	-0.000030	1008.99	-0.4909	0.000048	0.241				998.5956
		18	0.0400	1037.5	(90)	0.000063	0.000007	1039.92	-2.4161	0.000056	5.837				998.5956
		18	0.0800	1078.5	(90)	0.000074	0.000056	1080.17	-1.6741	0.000018	2.803				998.5956
		18	0.1200	1122.0	(90)	0.000084	0.000106	1118.69	3.3096	-0.000022	10.953				998.5956
		18	0.1600	1167.5	(90)	0.000096	0.000155	1154.73	12.7750	-0.000059	163.200				998.5956
		20	0.0020	1000.2	(90)	0.000002	-0.000036	1000.28	-0.0760	0.000038	0.006				998.2041
		20	0.0040	1002.2	(90)	0.000003	-0.000033	1002.35	-0.1468	0.000037	0.022				998.2041
		20	0.0080	1006.2	(90)	0.000007	-0.000028	1006.48	-0.2847	0.000035	0.081				998.2041
		20	0.0100	1008.2	(90)	0.000009	-0.000026	1008.55	-0.3517	0.000035	0.124				998.2041
		25	0.0054	1002.0	(7)	0.000078	-0.000021	1002.53	-0.5325	0.000099	0.284				997.0449
		25	0.0100	1006.1	(7)	0.000100	-0.000016	1007.28	-1.1771	0.000116	1.386				997.0449
		25	0.0247	1020.2	(7)	0.000080	0.000001	1022.23	-2.0326	0.000079	4.132				997.0449
		25	0.0458	1038.4	(7)	0.000131	0.000026	1043.62	-5.2191	0.000105	27.239				997.0449
		25	0.0935	1080.2	(7)	0.000177	0.000082	1090.69	-10.4880	0.000095	109.997				997.0449
		25	0.1178	1106.9	(7)	0.000158	0.000110	1113.89	-6.9893	0.000048	48.850				997.0449
		25	0.1400	1123.5	(7)	0.000197	0.000136	1134.29	-10.7881	0.000060	116.383				997.0449
		25	0.1695	1153.1	(7)	0.000202	0.000171	1160.18	-7.0825	0.000031	50.162				997.0449
		25	0.1895	1172.7	(7)	0.000210	0.000194	1176.82	-4.1187	0.000016	16.964				997.0449
		25	0.2109	1196.1	(7)	0.000212	0.000220	1193.69	2.4100	-0.000008	5.808				997.0449
		50	0.0054	993.4	(7)	-0.000007	0.000020	993.25	0.1452	-0.000027	0.021				988.0363
		50	0.0247	1012.1	(7)	0.000037	0.000038	1012.05	0.0460	-0.000002	0.002				988.0363
		50	0.0458	1030.8	(7)	0.000096	0.000059	1032.59	-1.7944	0.000037	3.220				988.0363
		50	0.0935	1073.5	(7)	0.000150	0.000104	1078.43	-4.9256	0.000046	24.261				988.0363
		50	0.1178	1098.9	(7)	0.000146	0.000128	1101.43	-2.5304	0.000018	6.403				988.0363
		50	0.1400	1115.2	(7)	0.000188	0.000149	1121.95	-6.7544	0.000039	45.622				988.0363
		50	0.1695	1145.7	(7)	0.000190	0.000178	1148.52	-2.8189	0.000013	7.946				988.0363
		50	0.1895	1161.7	(7)	0.000214	0.000197	1165.97	-4.2698	0.000017	18.231				988.0363
		50	0.2109	1191.2	(7)	0.000194	0.000218	1184.06	7.1354	-0.000024	50.915				988.0363
		75	0.0247	997.7	(7)	0.000073	0.000062	997.98	-0.2762	0.000011	0.076				974.849
		75	0.0458	1017.6	(7)	0.000085	0.000079	1017.90	-0.2977	0.000006	0.089				974.849
		75	0.0935	1060.6	(7)	0.000138	0.000116	1062.93	-2.3342	0.000022	5.449				974.849
		75	0.1178	1090.8	(7)	0.000100	0.000135	1085.92	4.8819	-0.000035	23.833				974.849
		75	0.1400	1106.0	(7)	0.000157	0.000153	1106.69	-0.6887	0.000004	0.474				974.849
		75	0.1695	1133.6	(7)	0.000178	0.000176	1134.02	-0.4209	0.000002	0.177				974.849
		75	0.1895	1150.8	(7)	0.000198	0.000192	1152.31	-1.5076	0.000006	2.273				974.849
		75	0.2109	1181.4	(7)	0.000175	0.000209	1171.61	9.7943	-0.000034	95.927				974.849
								Average Res	-0.3405	0.000015	1749.09	Sum chi sq			

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	g FeSO4 .7H2O/L	Density of water / kg/m³
									Std dev Res	4.9515	0.000040				
									Avg - 4std	-20.1465	-0.000144				
									Avg + 4std	19.4656	0.000175				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	-3.67E-06
c1	0.000125
c2	-0.062861
c3	0.00157
c4	3942.992
Min T	15
Max T	75
Min w	0.002
Max w	0.274007
Avg dens res	-0.340468
Std dens res	4.951515
Avg app vol res *10 ³	0.015094
Std app vol res *10 ³	0.039891
No of points in corr	72
No of inconsistent pair	5

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

15	0.2000	1215.0	(90)	0.000112	0.000204	1188.37	26.6335	-0.000092	709.344	!			999.0996
18	0.2000	1213.5	(90)	0.000115	0.000205	1187.50	25.9996	-0.000090	675.978	!			998.5956
50	0.0100	1001.8	(7)	-0.000378	0.000024	997.77	4.0272	-0.000403	16.218			!	988.0363
75	0.0054	982.2	(7)	-0.000407	0.000047	979.86	2.3400	-0.000454	5.476			!	974.849
75	0.0100	988.5	(7)	-0.000391	0.000051	984.20	4.2955	-0.000442	18.451			!	974.849

Density of aqueous solutions of **FeCl3**References (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		0	0.0100	1008.6	(90)	0.000131	0.000178	1008.13	0.4707	-0.000046	0.222			999.8395
		0	0.0200	1017.4	(90)	0.000137	0.000179	1016.52	0.8775	-0.000042	0.770			999.8395
		0	0.0400	1034.7	(90)	0.000158	0.000183	1033.62	1.0752	-0.000025	1.156			999.8395
		0	0.0800	1070.3	(90)	0.000177	0.000190	1069.13	1.1680	-0.000013	1.364			999.8395
		0	0.1200	1108.8	(90)	0.000181	0.000197	1106.45	2.3474	-0.000016	5.510			999.8395
		0	0.1600	1147.5	(90)	0.000196	0.000204	1145.68	1.8207	-0.000009	3.315			999.8395
		0	0.2000	1187.0	(90)	0.000212	0.000212	1186.90	0.0956	0.000000	0.009			999.8395
		0	0.2500	1240.0	(90)	0.000225	0.000222	1241.38	-1.3837	0.000004	1.915			999.8395
		0	0.3000	1297.0	(90)	0.000236	0.000232	1299.29	-2.2937	0.000005	5.261			999.8395
		0	0.3500	1360.5	(90)	0.000243	0.000242	1360.78	-0.2822	0.000000	0.080			999.8395
10		0.0100	1008.4	1008.4	(90)	0.000137	0.000183	1007.94	0.4635	-0.000046	0.215			999.6996
10		0.0200	1016.8	1016.8	(90)	0.000159	0.000185	1016.28	0.5248	-0.000025	0.275			999.6996
10		0.0400	1034.1	1034.1	(90)	0.000168	0.000188	1033.26	0.8369	-0.000020	0.700			999.6996
10		0.0800	1069.2	1069.2	(90)	0.000188	0.000195	1068.52	0.6806	-0.000007	0.463			999.6996
10		0.1200	1107.1	1107.1	(90)	0.000192	0.000202	1105.56	1.5435	-0.000011	2.382			999.6996
10		0.1600	1144.9	1144.9	(90)	0.000207	0.000209	1144.46	0.4371	-0.000002	0.191			999.6996
10		0.2000	1184.7	1184.7	(90)	0.000219	0.000217	1185.33	-0.6265	0.000002	0.392			999.6996
10		0.2500	1238.0	1238.0	(90)	0.000230	0.000227	1239.29	-1.2882	0.000003	1.659			999.6996
10		0.3000	1295.0	1295.0	(90)	0.000240	0.000237	1296.60	-1.5975	0.000003	2.552			999.6996
10		0.3500	1358.0	1358.0	(90)	0.000246	0.000247	1357.39	0.6100	-0.000001	0.372			999.6996
10		0.4000	1423.5	1423.5	(90)	0.000256	0.000258	1421.77	1.7310	-0.000002	2.996			999.6996
10		0.4500	1492.0	1492.0	(90)	0.000267	0.000269	1489.79	2.2103	-0.000002	4.886			999.6996
10		0.5000	1561.0	1561.0	(90)	0.000281	0.000281	1561.44	-0.4388	0.000000	0.193			999.6996
20		0.0100	1006.8	1006.8	(90)	0.000146	0.000188	1006.38	0.4177	-0.000041	0.175			998.2041
20		0.0200	1015.2	1015.2	(90)	0.000163	0.000189	1014.66	0.5394	-0.000026	0.291			998.2041
20		0.0400	1032.4	1032.4	(90)	0.000172	0.000193	1031.52	0.8771	-0.000021	0.769			998.2041
20		0.0800	1066.9	1066.9	(90)	0.000195	0.000200	1066.51	0.3923	-0.000004	0.154			998.2041
20		0.1200	1104.0	1104.0	(90)	0.000202	0.000207	1103.24	0.7568	-0.000005	0.573			998.2041
20		0.1600	1141.8	1141.8	(90)	0.000214	0.000214	1141.81	-0.0149	0.000000	0.000			998.2041
20		0.2000	1182.0	1182.0	(90)	0.000223	0.000222	1182.31	-0.3069	0.000001	0.094			998.2041
20		0.2500	1234.0	1234.0	(90)	0.000236	0.000232	1235.75	-1.7463	0.000005	3.050			998.2041
20		0.3000	1291.0	1291.0	(90)	0.000244	0.000242	1292.46	-1.4611	0.000003	2.135			998.2041
20		0.3500	1353.0	1353.0	(90)	0.000251	0.000252	1352.58	0.4222	-0.000001	0.178			998.2041
20		0.4000	1417.5	1417.5	(90)	0.000261	0.000263	1416.19	1.3103	-0.000002	1.717			998.2041
20		0.4500	1485.0	1485.0	(90)	0.000272	0.000274	1483.34	1.6584	-0.000002	2.750			998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		20	0.5000	1551.0	(90)	0.000288	0.000285	1554.01	-3.0101	0.000002	9.060			998.2041
		30	0.0100	1004.0	(90)	0.000169	0.000192	1003.76	0.2372	-0.000024	0.056			995.6473
		30	0.0200	1012.2	(90)	0.000183	0.000194	1011.98	0.2228	-0.000011	0.050			995.6473
		30	0.0400	1029.2	(90)	0.000186	0.000197	1028.71	0.4928	-0.000012	0.243			995.6473
		30	0.0800	1063.6	(90)	0.000202	0.000204	1063.41	0.1918	-0.000002	0.037			995.6473
		30	0.1200	1100.6	(90)	0.000206	0.000212	1099.83	0.7670	-0.000005	0.588			995.6473
		30	0.1600	1138.6	(90)	0.000216	0.000219	1138.06	0.5360	-0.000003	0.287			995.6473
		30	0.2000	1178.6	(90)	0.000225	0.000226	1178.18	0.4172	-0.000002	0.174			995.6473
		30	0.2500	1229.0	(90)	0.000242	0.000236	1231.11	-2.1050	0.000006	4.431			995.6473
		30	0.3000	1285.0	(90)	0.000250	0.000246	1287.24	-2.2406	0.000005	5.020			995.6473
		30	0.3500	1347.5	(90)	0.000255	0.000256	1346.71	0.7909	-0.000001	0.625			995.6473
		30	0.4000	1411.5	(90)	0.000265	0.000267	1409.60	1.9028	-0.000002	3.621			995.6473
								Average Res	0.2134	-0.000008	72.9574	Sum chi sq		
								Std dev Res	1.2408	0.000014				
								Avg - 4std	-4.7497	-0.000064				
								Avg + 4std	5.1765	0.000048				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	-1333.774
c1	4369.203
c2	1.529782
c3	0.007099
c4	829.2131
Min T	0
Max T	30
Min w	0.0100
Max w	0.5000
Avg dens res	0.2134
Std dens res	1.2408
Avg app vol res *10 ³	-0.0083
Std app vol res *10 ³	0.0140
No of points in corr	47
No of inconsistent poir	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **Fe2(SO4)3**

- References (14) Chenlo, F. et al., "Viscosidad de disoluciones acuosas de Fe2(SO4)3, Fe2(SO4)3-Na2SO4 y Fe2(SO4)3-NaCl a diferentes concentraciones y temperaturas", *Afinidad*, **1997**, 54, 126-128
- (75) National Research Council USA, "International Critical Tables of Physical and Numerical Data, Physics, Chemistry, and Technology.", McGraw-Hill, New York, **1928**
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.

molarity	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
	15	0.0100	1008.0	(75)	0.000117	0.000142	1007.75	0.2479	-0.000024	0.061				999.0996
	15	0.0200	1018.0	(75)	0.000072	0.000143	1016.53	1.4659	-0.000071	2.149				999.0996
	15	0.0400	1037.0	(75)	0.000086	0.000145	1034.50	2.5045	-0.000058	6.272				999.0996
	15	0.0600	1056.0	(75)	0.000102	0.000147	1053.00	2.9968	-0.000045	8.981				999.0996
	15	0.0800	1076.0	(75)	0.000107	0.000149	1072.08	3.9233	-0.000043	15.392				999.0996
	15	0.1000	1095.0	(75)	0.000124	0.000152	1091.74	3.2639	-0.000027	10.653				999.0996
	15	0.1200	1116.0	(75)	0.000127	0.000154	1112.00	3.9981	-0.000027	15.985				999.0996
	15	0.1400	1137.0	(75)	0.000134	0.000157	1132.89	4.1053	-0.000023	16.854				999.0996
	15	0.1600	1158.0	(75)	0.000143	0.000159	1154.44	3.5645	-0.000017	12.706				999.0996
	15	0.1800	1181.0	(75)	0.000144	0.000162	1176.65	4.3548	-0.000017	18.964				999.0996
	15	0.2000	1204.0	(75)	0.000149	0.000165	1199.54	4.4552	-0.000015	19.848				999.0996
	15	0.2500	1264.0	(75)	0.000162	0.000172	1259.95	4.0547	-0.000010	16.440				999.0996
	15	0.3000	1330.0	(75)	0.000171	0.000180	1325.08	4.9161	-0.000009	24.168				999.0996
	15	0.3500	1400.0	(75)	0.000182	0.000189	1395.20	4.7979	-0.000007	23.020				999.0996
	15	0.4000	1476.0	(75)	0.000192	0.000199	1470.43	5.5707	-0.000006	31.033				999.0996
	15	0.4500	1560.0	(75)	0.000201	0.000210	1550.70	9.3011	-0.000009	86.511				999.0996
	15	0.5000	1647.0	(75)	0.000213	0.000222	1635.62	11.3778	-0.000008	129.455				999.0996
	17.5	0.0100	1007.2	(75)	0.000155	0.000147	1007.28	-0.0829	0.000008	0.007				998.6866
	17.5	0.0200	1015.7	(75)	0.000163	0.000148	1016.01	-0.3058	0.000015	0.094				998.6866
	17.5	0.0400	1032.7	(75)	0.000177	0.000150	1033.84	-1.1407	0.000027	1.301				998.6866
	17.5	0.0600	1049.8	(75)	0.000189	0.000152	1052.21	-2.4094	0.000036	5.805				998.6866
	17.5	0.0800	1067.0	(75)	0.000200	0.000155	1071.13	-4.1304	0.000045	17.060				998.6866
	17.5	0.1000	1084.0	(75)	0.000213	0.000157	1090.62	-6.6223	0.000056	43.855				998.6866
	17.5	0.1200	1102.8	(75)	0.000214	0.000160	1110.70	-7.9042	0.000054	62.476				998.6866
	17.5	0.1400	1121.5	(75)	0.000218	0.000162	1131.40	-9.8951	0.000056	97.913				998.6866
	17.5	0.1600	1140.9	(75)	0.000221	0.000165	1152.71	-11.8143	0.000056	139.577				998.6866
	17.5	0.1800	1160.9	(75)	0.000224	0.000168	1174.68	-13.7806	0.000056	189.905				998.6866
	17.5	0.2000	1181.1	(75)	0.000228	0.000171	1197.31	-16.2129	0.000057	262.857				998.6866
	17.5	0.2500	1241.0	(75)	0.000219	0.000178	1256.92	-15.9240	0.000041	253.572				998.6866
	17.5	0.3000	1307.3	(75)	0.000213	0.000187	1321.06	-13.7630	0.000027	189.421				998.6866
	17.5	0.3500	1376.4	(75)	0.000216	0.000196	1389.91	-13.5147	0.000020	182.648				998.6866
	17.5	0.4000	1448.7	(75)	0.000224	0.000206	1463.54	-14.8365	0.000017	220.121				998.6866
	17.5	0.4500	1527.8	(75)	0.000231	0.000218	1541.77	-13.9718	0.000013	195.212				998.6866

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		17.5	0.5000	1612.7	(75)	0.000239	0.000230	1624.12	-11.4229	0.000009	130.482			998.6866
		17.5	0.5500	1702.8	(75)	0.000249	0.000244	1709.57	-6.7662	0.000004	45.781			998.6866
		17.5	0.6000	1798.3	(75)	0.000259	0.000260	1796.30	2.0031	-0.000001	4.012			998.6866
		18	0.0100	1006.6	(75)	0.000205	0.000148	1007.18	-0.5808	0.000057	0.337			998.5956
		18	0.0100	1007.2	(90)	0.000146	0.000148	1007.18	0.0192	-0.000002	0.000			998.5956
		18	0.0200	1015.6	(75)	0.000163	0.000149	1015.89	-0.2922	0.000014	0.085			998.5956
		18	0.0200	1015.7	(90)	0.000158	0.000149	1015.89	-0.1922	0.000009	0.037			998.5956
		18	0.0400	1034.6	(75)	0.000130	0.000151	1033.70	0.8975	-0.000021	0.806			998.5956
		18	0.0400	1032.7	(90)	0.000175	0.000151	1033.70	-1.0025	0.000023	1.005			998.5956
		18	0.0600	1055.4	(75)	0.000103	0.000153	1052.04	3.3559	-0.000050	11.262			998.5956
		18	0.0800	1075.4	(75)	0.000107	0.000156	1070.94	4.4646	-0.000048	19.932			998.5956
		18	0.0800	1067.0	(90)	0.000199	0.000156	1070.94	-3.9354	0.000043	15.488			998.5956
		18	0.1000	1095.4	(75)	0.000116	0.000158	1090.39	5.0052	-0.000042	25.052			998.5956
		18	0.1200	1116.4	(75)	0.000121	0.000161	1110.44	5.9590	-0.000040	35.510			998.5956
		18	0.1200	1102.8	(90)	0.000213	0.000161	1110.44	-7.6410	0.000052	58.384			998.5956
		18	0.1400	1138.2	(75)	0.000124	0.000164	1131.09	7.1073	-0.000039	50.513			998.5956
		18	0.1600	1160.2	(75)	0.000130	0.000166	1152.37	7.8311	-0.000037	61.327			998.5956
		18	0.1600	1140.9	(90)	0.000221	0.000166	1152.37	-11.4689	0.000055	131.535			998.5956
		18	0.1800	1182.2	(75)	0.000137	0.000169	1174.29	7.9119	-0.000032	62.599			998.5956
		18	0.2000	1206.1	(75)	0.000140	0.000172	1196.87	9.2315	-0.000032	85.220			998.5956
		18	0.2000	1181.1	(90)	0.000228	0.000172	1196.87	-15.7685	0.000056	248.647			998.5956
		18	0.2500	1268.9	(75)	0.000148	0.000180	1256.33	12.5731	-0.000032	158.083			998.5956
		18	0.3000	1334.7	(75)	0.000161	0.000188	1320.27	14.4270	-0.000027	208.138			998.5956
		18	0.3000	1307.3	(90)	0.000213	0.000188	1320.27	-12.9730	0.000025	168.299			998.5956
		18	0.3500	1408.5	(75)	0.000169	0.000197	1388.88	19.6193	-0.000029	384.917			998.5956
		18	0.4000	1487.3	(75)	0.000179	0.000208	1462.19	25.1062	-0.000029	630.322			998.5956
		18	0.4000	1448.7	(90)	0.000224	0.000208	1462.19	-13.4938	0.000016	182.082			998.5956
		18	0.5000	1612.7	(90)	0.000239	0.000232	1621.90	-9.1982	0.000007	84.608			998.5956
		18	0.6000	1798.3	(90)	0.000259	0.000262	1792.69	5.6130	-0.000003	31.506			998.5956
	0.125	25	0.0480	1041.3	(14)	0.000115	0.000166	1038.67	2.6297	-0.000051	6.915			997.0449
	0.25	25	0.0925	1080.5	(14)	0.000166	0.000171	1079.88	0.6194	-0.000006	0.384			997.0449
	0.5	25	0.1712	1167.7	(14)	0.000147	0.000183	1159.39	8.3084	-0.000036	69.030			997.0449
	0.75	25	0.2404	1247.5	(14)	0.000165	0.000194	1236.88	10.6158	-0.000029	112.696			997.0449
	1	25	0.3008	1329.3	(14)	0.000170	0.000205	1310.73	18.5677	-0.000035	344.761			997.0449
									Average Res	0.0854	-0.000001	5670.073	Sum chi sqr	
									Std dev Res	9.2684	0.000035			
									Avg - 4std	-36.9881	-0.000141			
									Avg + 4std	37.1589	0.000139			

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4) \cdot ^2)}$

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
c0		0.474439												
c1		-0.646238												
c2		-713.1004												
c3		-25.56846												
c4		4023.184												
Min T		15												
Max T		25												
Min w		0.0100												
Max w		0.6000												
Avg dens res		0.085379												
Std dens res		9.268376												
Avg app vol res *10^3		-0.001226												
Std app vol res *10^3		0.035048												
No of points in corr		67												
No of inconsistent points		0												

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **HCl**

- References (3) Akerlof, G.; Teare, J. A. Note on the Density of Aqueous Solutions of Hydrochloric Acid. *J. Am. Chem. Soc.* **1938**, *60*, 1226-1228.
- (30) Goldsack, D. E.; Franchetto, A. A. The Viscosity of Concentrated Electrolyte Solutions. III. A Mixture Law. *Electrochimica Acta* **1977**, *22*, 1287-1294.
- (39) Hershey, J. P.; Sotolongo, S.; Millero, F. J. Densities and Compressibilities of Aqueous HCl and NaOH from 0 to 45°C. The Effect of Pressure on the Ionization of Water. *J. Sol. Chem.* **1984**, *13*, 825-848.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (98) Pogue, Randall; Atkinson, Gordon, Apparent Molal Volumes and Heat Capacities of Aqueous HCl and HClO₄ at 15-55 °C, *J Chem Eng Data*, **1988**, *33*, 495-499
- (128) Torók, T. I.; Berecz, E. Volumetric Properties and Electrolytic Conductances of Aqueous Ternary Mixtures of Hydrogen Chloride and some Transition Metal Chlorides at 25°C. *J. Sol. Chem.* **1989**, *18*, 1117-1131.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	1000*(RD-1)	Density of water / kg/m³
		-5	0.0100	1004.80	(90)	0.000449	0.000479	1004.50	0.3022	-0.000030	0.091					999.2563
		-5	0.0200	1010.40	(90)	0.000449	0.000480	1009.76	0.6370	-0.000031	0.406					999.2563
		-5	0.0400	1021.30	(90)	0.000461	0.000483	1020.36	0.9374	-0.000022	0.879					999.2563
		-5	0.0600	1032.10	(90)	0.000470	0.000486	1031.05	1.0488	-0.000016	1.100					999.2563
		-5	0.0800	1042.80	(90)	0.000478	0.000490	1041.82	0.9752	-0.000011	0.951					999.2563
		-5	0.1000	1053.60	(90)	0.000485	0.000493	1052.68	0.9211	-0.000008	0.848					999.2563
		-5	0.1200	1064.50	(90)	0.000490	0.000496	1063.61	0.8916	-0.000007	0.795					999.2563
		-5	0.1400	1075.40	(90)	0.000495	0.000500	1074.61	0.7921	-0.000005	0.627					999.2563
		-5	0.1600	1086.40	(90)	0.000499	0.000503	1085.67	0.7287	-0.000004	0.531					999.2563
		-5	0.1800	1097.50	(90)	0.000503	0.000506	1096.79	0.7077	-0.000003	0.501					999.2563
		-5	0.2000	1108.70	(90)	0.000507	0.000510	1107.96	0.7362	-0.000003	0.542					999.2563
		-5	0.2200	1120.00	(90)	0.000510	0.000513	1119.18	0.8220	-0.000003	0.676					999.2563
		-5	0.2400	1131.40	(90)	0.000514	0.000517	1130.43	0.9731	-0.000003	0.947					999.2563
		-5	0.2600	1142.60	(90)	0.000518	0.000521	1141.70	0.8986	-0.000003	0.807					999.2563
		-5	0.2800	1153.70	(90)	0.000522	0.000524	1152.99	0.7079	-0.000002	0.501					999.2563
		-5	0.3000	1164.80	(90)	0.000527	0.000528	1164.29	0.5114	-0.000001	0.262					999.2563
		0	0.0200	1010.57	(3)	0.000469	0.000489	1010.17	0.3977	-0.000019	0.158			10.73		999.8395
		0	0.0400	1021.18	(3)	0.000478	0.000492	1020.59	0.5924	-0.000014	0.351			21.34		999.8395
		0	0.0600	1031.78	(3)	0.000484	0.000495	1031.08	0.6981	-0.000011	0.487			31.94		999.8395
		0	0.0800	1042.39	(3)	0.000490	0.000498	1041.65	0.7394	-0.000009	0.547			42.55		999.8395
		0	0.1000	1053.01	(3)	0.000495	0.000502	1052.29	0.7212	-0.000007	0.520			53.17		999.8395
		0	0.1200	1063.67	(3)	0.000500	0.000505	1062.99	0.6789	-0.000005	0.461			63.83		999.8395
		0	0.1400	1074.36	(3)	0.000505	0.000508	1073.75	0.6085	-0.000004	0.370			74.52		999.8395
		0	0.1600	1085.09	(3)	0.000509	0.000512	1084.56	0.5263	-0.000003	0.277			85.25		999.8395
		0	0.1800	1095.83	(3)	0.000513	0.000515	1095.42	0.4092	-0.000002	0.167			95.99		999.8395
		0	0.2000	1106.60	(3)	0.000518	0.000519	1106.31	0.2848	-0.000001	0.081			106.76		999.8395
		0	0.2200	1117.38	(3)	0.000522	0.000522	1117.24	0.1410	-0.000001	0.020			117.54		999.8395
		0	0.2400	1128.17	(3)	0.000526	0.000526	1128.18	-0.0134	0.000000	0.000			128.33		999.8395
		0	0.2600	1138.95	(3)	0.000530	0.000530	1139.14	-0.1892	0.000001	0.036			139.11		999.8395
		0	0.2800	1149.72	(3)	0.000535	0.000533	1150.10	-0.3764	0.000001	0.142			149.88		999.8395
		0	0.3000	1160.46	(3)	0.000539	0.000537	1161.04	-0.5844	0.000001	0.341			160.62		999.8395
		0	0.3200	1171.15	(3)	0.000543	0.000541	1171.97	-0.8218	0.000002	0.675			171.31		999.8395
		0	0.3400	1181.77	(3)	0.000547	0.000545	1182.87	-1.0965	0.000002	1.202			181.93		999.8395
		0	0.3600	1192.82	(3)	0.000551	0.000549	1193.72	-0.8959	0.000002	0.803			192.98		999.8395

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	1000*(RD-1)	Density of water / kg/m³
		0	0.3800	1202.74	(3)	0.000556	0.000553	1204.51	-1.7662	0.000003	3.120			202.90		999.8395
0.09273		5	0.0034	1001.75	(39)	0.000469	0.000494	1001.67	0.0823	-0.000024	0.007			1.791		999.9638
0.19421		5	0.0070	1003.68	(39)	0.000473	0.000494	1003.53	0.1501	-0.000021	0.023			3.718		999.9638
0.29113		5	0.0105	1005.50	(39)	0.000476	0.000495	1005.30	0.2027	-0.000019	0.041			5.536		999.9638
0.3884		5	0.0140	1007.31	(39)	0.000478	0.000495	1007.06	0.2500	-0.000018	0.063			7.345		999.9638
0.42968		5	0.0154	1008.07	(39)	0.000479	0.000496	1007.80	0.2694	-0.000017	0.073			8.109		999.9638
0.51396		5	0.0184	1009.62	(39)	0.000480	0.000496	1009.32	0.3058	-0.000016	0.093			9.66		999.9638
0.5994		5	0.0214	1011.19	(39)	0.000481	0.000497	1010.85	0.3399	-0.000016	0.116			11.222		999.9638
0.68327		5	0.0243	1012.71	(39)	0.000482	0.000497	1012.34	0.3736	-0.000015	0.140			12.748		999.9638
0.76939		5	0.0273	1014.27	(39)	0.000483	0.000498	1013.86	0.4058	-0.000014	0.165			14.305		999.9638
0.85291		5	0.0302	1015.77	(39)	0.000484	0.000498	1015.33	0.4384	-0.000014	0.192			15.809		999.9638
		10	0.0200	1009.90	(3)	0.000495	0.000503	1009.73	0.1697	-0.000008	0.029			10.20		999.6996
		10	0.0400	1020.00	(3)	0.000503	0.000507	1019.83	0.1723	-0.000004	0.030			20.30		999.6996
		10	0.0600	1030.09	(3)	0.000508	0.000510	1029.99	0.1027	-0.000002	0.011			30.39		999.6996
		10	0.0800	1040.18	(3)	0.000514	0.000513	1040.20	-0.0242	0.000000	0.001			40.48		999.6996
		10	0.1000	1050.30	(3)	0.000518	0.000517	1050.47	-0.1727	0.000002	0.030			50.60		999.6996
		10	0.1200	1060.45	(3)	0.000523	0.000520	1060.79	-0.3367	0.000002	0.113			60.75		999.6996
		10	0.1400	1070.62	(3)	0.000527	0.000524	1071.14	-0.5198	0.000003	0.270			70.92		999.6996
		10	0.1600	1080.83	(3)	0.000531	0.000527	1081.52	-0.6949	0.000004	0.483			81.13		999.6996
		10	0.1800	1091.06	(3)	0.000535	0.000531	1091.93	-0.8745	0.000004	0.765			91.36		999.6996
		10	0.2000	1101.31	(3)	0.000539	0.000535	1102.36	-1.0504	0.000004	1.103			101.61		999.6996
		10	0.2200	1111.58	(3)	0.000543	0.000538	1112.79	-1.2140	0.000004	1.474			111.88		999.6996
		10	0.2400	1121.86	(3)	0.000546	0.000542	1123.23	-1.3659	0.000005	1.866			122.16		999.6996
		10	0.2600	1132.14	(3)	0.000550	0.000546	1133.65	-1.5064	0.000005	2.269			132.44		999.6996
		10	0.2800	1142.41	(3)	0.000554	0.000550	1144.04	-1.6349	0.000004	2.673			142.71		999.6996
		10	0.3000	1152.65	(3)	0.000558	0.000553	1154.41	-1.7601	0.000004	3.098			152.95		999.6996
		10	0.3200	1162.86	(3)	0.000562	0.000557	1164.73	-1.8703	0.000004	3.498			163.16		999.6996
		10	0.3400	1173.02	(3)	0.000566	0.000561	1174.99	-1.9729	0.000004	3.892			173.32		999.6996
		10	0.3600	1183.62	(3)	0.000569	0.000565	1185.18	-1.5648	0.000003	2.448			183.92		999.6996
		10	0.3800	1193.10	(3)	0.000574	0.000570	1195.29	-2.1918	0.000004	4.804			193.40		999.6996
0.01005		15	0.0004	999.29	(98)	0.000476	0.000507	999.28	0.0110	-0.000030	0.000				0.192	999.0996
0.02032		15	0.0007	999.49	(98)	0.000477	0.000507	999.47	0.0222	-0.000030	0.000				0.388	999.0996
0.03001		15	0.0011	999.67	(98)	0.000479	0.000507	999.64	0.0300	-0.000027	0.001				0.57	999.0996
0.0505		15	0.0018	1000.05	(98)	0.000486	0.000507	1000.01	0.0388	-0.000021	0.002				0.947	999.0996
0.07539		15	0.0027	1000.51	(98)	0.000488	0.000507	1000.45	0.0523	-0.000019	0.003				1.407	999.0996
0.09273		15	0.0034	1000.82	(39)	0.000492	0.000507	1000.76	0.0521	-0.000015	0.003			1.716		999.0996
0.1001		15	0.0036	1000.96	(98)	0.000489	0.000507	1000.90	0.0666	-0.000018	0.004				1.864	999.0996
0.124		15	0.0045	1001.39	(98)	0.000491	0.000507	1001.32	0.0721	-0.000016	0.005				2.297	999.0996
0.1488		15	0.0054	1001.85	(98)	0.000492	0.000507	1001.77	0.0851	-0.000016	0.007				2.753	999.0996
0.19421		15	0.0070	1002.66	(39)	0.000495	0.000508	1002.57	0.0870	-0.000012	0.008			3.561		999.0996
0.2303		15	0.0083	1003.32	(98)	0.000495	0.000508	1003.21	0.1091	-0.000013	0.012				4.228	999.0996
0.29113		15	0.0105	1004.40	(39)	0.000498	0.000508	1004.29	0.1105	-0.000010	0.012			5.303		999.0996
0.38838		15	0.0140	1006.13	(39)	0.000500	0.000509	1006.01	0.1284	-0.000009	0.016			7.035		999.0996
0.42968		15	0.0154	1006.87	(39)	0.000500	0.000509	1006.73	0.1345	-0.000009	0.018			7.766		999.0996
0.51396		15	0.0184	1008.35	(39)	0.000502	0.000510	1008.20	0.1449	-0.000008	0.021			9.25		999.0996
0.59944		15	0.0214	1009.85	(39)	0.000503	0.000510	1009.69	0.1550	-0.000007	0.024			10.747		999.0996
0.68327		15	0.0243	1011.30	(39)	0.000504	0.000510	1011.14	0.1623	-0.000007	0.026			12.205		999.0996

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	1000*(RD-1)	Density of water / kg/m³
0.76938		15	0.0273	1012.80	(39)	0.000505	0.000511	1012.62	0.1707	-0.000006	0.029			13.696		999.0996
0.8529		15	0.0302	1014.23	(39)	0.000506	0.000511	1014.06	0.1782	-0.000006	0.032			15.134		999.0996
		20	0.0100	1003.20	(90)	0.000503	0.000514	1003.09	0.1088	-0.000011	0.012					998.2041
		20	0.0200	1008.00	(3)	0.000515	0.000515	1007.99	0.0114	-0.000001	0.000			9.80		998.2041
		20	0.0200	1008.20	(90)	0.000505	0.000515	1007.99	0.2073	-0.000010	0.043					998.2041
		20	0.0400	1017.91	(3)	0.000517	0.000519	1017.84	0.0776	-0.000002	0.006			19.71		998.2041
		20	0.0400	1018.10	(90)	0.000512	0.000519	1017.84	0.2635	-0.000006	0.069					998.2041
		20	0.0600	1027.71	(3)	0.000522	0.000522	1027.73	-0.0162	0.000000	0.000			29.51		998.2041
		20	0.0600	1027.90	(90)	0.000519	0.000522	1027.73	0.1697	-0.000003	0.029					998.2041
		20	0.0800	1037.51	(3)	0.000527	0.000526	1037.67	-0.1544	0.000002	0.024			39.31		998.2041
		20	0.0800	1037.60	(90)	0.000526	0.000526	1037.67	-0.0686	0.000001	0.005					998.2041
		20	0.1000	1047.34	(3)	0.000532	0.000529	1047.65	-0.3012	0.000003	0.091			49.14		998.2041
		20	0.1000	1047.40	(90)	0.000531	0.000529	1047.65	-0.2453	0.000002	0.060					998.2041
		20	0.1200	1057.21	(3)	0.000536	0.000533	1057.65	-0.4399	0.000003	0.194			59.01		998.2041
		20	0.1200	1057.40	(90)	0.000534	0.000533	1057.65	-0.2541	0.000002	0.065					998.2041
		20	0.1400	1067.10	(3)	0.000540	0.000536	1067.69	-0.5837	0.000004	0.341			68.90		998.2041
		20	0.1400	1067.50	(90)	0.000537	0.000536	1067.69	-0.1879	0.000001	0.035					998.2041
		20	0.1600	1077.03	(3)	0.000544	0.000540	1077.74	-0.7051	0.000004	0.497			78.83		998.2041
		20	0.1600	1077.60	(90)	0.000540	0.000540	1077.74	-0.1393	0.000001	0.019					998.2041
		20	0.1800	1086.98	(3)	0.000547	0.000543	1087.80	-0.8162	0.000004	0.666			88.78		998.2041
		20	0.1800	1087.80	(90)	0.000543	0.000543	1087.80	-0.0003	0.000000	0.000					998.2041
		20	0.2000	1096.95	(3)	0.000551	0.000547	1097.86	-0.9083	0.000004	0.825			98.75		998.2041
		20	0.2000	1098.00	(90)	0.000547	0.000547	1097.86	0.1375	-0.000001	0.019					998.2041
		20	0.2200	1106.95	(3)	0.000554	0.000551	1107.92	-0.9625	0.000004	0.926			108.75		998.2041
		20	0.2200	1108.30	(90)	0.000549	0.000551	1107.92	0.3834	-0.000001	0.147					998.2041
		20	0.2400	1116.97	(3)	0.000558	0.000555	1117.95	-0.9791	0.000003	0.959			118.77		998.2041
		20	0.2400	1118.70	(90)	0.000552	0.000555	1117.95	0.7468	-0.000002	0.558					998.2041
		20	0.2600	1126.98	(3)	0.000562	0.000559	1127.96	-0.9778	0.000003	0.956			128.78		998.2041
		20	0.2600	1129.00	(90)	0.000555	0.000559	1127.96	1.0381	-0.000003	1.078					998.2041
		20	0.2800	1137.00	(3)	0.000565	0.000562	1137.93	-0.9278	0.000003	0.861			138.80		998.2041
		20	0.2800	1139.20	(90)	0.000559	0.000562	1137.93	1.2681	-0.000003	1.608					998.2041
		20	0.3000	1146.99	(3)	0.000569	0.000566	1147.85	-0.8576	0.000002	0.735			148.79		998.2041
		20	0.3000	1149.30	(90)	0.000563	0.000566	1147.85	1.4483	-0.000004	2.098					998.2041
		20	0.3200	1156.97	(3)	0.000572	0.000570	1157.71	-0.7350	0.000002	0.540			158.77		998.2041
		20	0.3200	1159.30	(90)	0.000567	0.000570	1157.71	1.5909	-0.000004	2.531					998.2041
		20	0.3400	1166.89	(3)	0.000576	0.000575	1167.49	-0.5972	0.000001	0.357			168.69		998.2041
		20	0.3400	1169.10	(90)	0.000571	0.000575	1167.49	1.6086	-0.000003	2.588					998.2041
		20	0.3600	1177.26	(3)	0.000579	0.000579	1177.19	0.0791	0.000000	0.006			179.06		998.2041
		20	0.3600	1178.90	(90)	0.000575	0.000579	1177.19	1.7150	-0.000003	2.941					998.2041
		20	0.3800	1186.54	(3)	0.000583	0.000583	1186.78	-0.2318	0.000000	0.054			188.34		998.2041
		20	0.3800	1188.50	(90)	0.000580	0.000583	1186.78	1.7240	-0.000003	2.972					998.2041
		20	0.4000	1198.00	(90)	0.000584	0.000587	1196.25	1.7506	-0.000003	3.065					998.2041
0.01005		25	0.0004	997.23	(98)	0.000494	0.000517	997.22	0.0085	-0.000023	0.000				0.186	997.0449
0.02032		25	0.0007	997.42	(98)	0.000498	0.000517	997.40	0.0142	-0.000019	0.000				0.373	997.0449
0.03001		25	0.0011	997.59	(98)	0.000498	0.000517	997.57	0.0213	-0.000020	0.000				0.551	997.0449
0.0505		25	0.0018	997.96	(98)	0.000501	0.000517	997.93	0.0301	-0.000016	0.001				0.921	997.0449
0.07539		25	0.0027	998.41	(98)	0.000502	0.000517	998.37	0.0431	-0.000016	0.002				1.372	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	1000*(RD-1)	Density of water / kg/m³
0.1001		25	0.0036	998.85	(98)	0.000504	0.000518	998.80	0.0509	-0.000014	0.003				1.814	997.0449
0.124		25	0.0045	999.28	(98)	0.000505	0.000518	999.22	0.0586	-0.000013	0.003				2.241	997.0449
0.1488		25	0.0054	999.72	(98)	0.000505	0.000518	999.65	0.0681	-0.000013	0.005				2.685	997.0449
0.2303		25	0.0083	1001.16	(98)	0.000508	0.000518	1001.07	0.0852	-0.000010	0.007				4.125	997.0449
0.582		25	0.0208	1007.23	(128)	0.000515	0.000520	1007.11	0.1134	-0.000005	0.013					997.0449
0.608		25	0.0217	1007.70	(30)	0.000514	0.000521	1007.55	0.1461	-0.000007	0.021					997.0449
0.61316		25	0.0219	1007.75	(39)	0.000516	0.000521	1007.64	0.1135	-0.000005	0.013			10.71		997.0449
0.69727		25	0.0248	1009.17	(39)	0.000517	0.000521	1009.06	0.1052	-0.000004	0.011			12.124		997.0449
0.79917		25	0.0283	1010.87	(39)	0.000519	0.000522	1010.78	0.0911	-0.000003	0.008			13.823		997.0449
0.90026		25	0.0318	1012.53	(39)	0.000520	0.000522	1012.47	0.0694	-0.000002	0.005			15.49		997.0449
0.96879		25	0.0341	1013.71	(128)	0.000520	0.000523	1013.60	0.1047	-0.000003	0.011					997.0449
1.229		25	0.0429	1018.30	(30)	0.000515	0.000524	1017.88	0.4156	-0.000009	0.173					997.0449
1.27612		25	0.0445	1018.65	(39)	0.000525	0.000524	1018.65	-0.0062	0.000000	0.000			21.601		997.0449
1.867		25	0.0637	1028.30	(30)	0.000525	0.000528	1028.09	0.2097	-0.000003	0.044					997.0449
1.96232		25	0.0668	1029.55	(128)	0.000529	0.000528	1029.58	-0.0348	0.000000	0.001					997.0449
2.52		25	0.0841	1038.10	(30)	0.000532	0.000531	1038.13	-0.0265	0.000000	0.001					997.0449
3.0147		25	0.0990	1045.23	(128)	0.000536	0.000534	1045.46	-0.2385	0.000002	0.057					997.0449
3.191		25	0.1042	1047.70	(30)	0.000538	0.000535	1048.03	-0.3260	0.000003	0.106					997.0449
3.8527		25	0.1232	1057.02	(128)	0.000541	0.000538	1057.40	-0.3729	0.000003	0.139					997.0449
3.878		25	0.1239	1057.80	(30)	0.000538	0.000538	1057.75	0.0533	0.000000	0.003					997.0449
4.6314		25	0.1445	1067.47	(128)	0.000545	0.000542	1067.95	-0.4727	0.000003	0.223					997.0449
4.9124		25	0.1519	1071.16	(128)	0.000546	0.000543	1071.63	-0.4756	0.000003	0.226					997.0449
5.316		25	0.1624	1076.10	(30)	0.000549	0.000545	1076.82	-0.7175	0.000004	0.515					997.0449
6.0064		25	0.1797	1084.93	(128)	0.000551	0.000549	1085.40	-0.4729	0.000002	0.224					997.0449
6.6253		25	0.1946	1092.40	(128)	0.000553	0.000551	1092.79	-0.3925	0.000002	0.154					997.0449
6.836		25	0.1995	1094.60	(30)	0.000555	0.000552	1095.25	-0.6464	0.000003	0.418					997.0449
7.616		25	0.2173	1103.88	(128)	0.000556	0.000556	1104.07	-0.1937	0.000001	0.038					997.0449
8.447		25	0.2355	1113.10	(30)	0.000559	0.000559	1113.03	0.0705	0.000000	0.005					997.0449
9.2949		25	0.2531	1122.13	(128)	0.000561	0.000563	1121.73	0.4044	-0.000001	0.164					997.0449
10.2353		25	0.2718	1131.65	(128)	0.000564	0.000566	1130.88	0.7652	-0.000002	0.586					997.0449
11.2696		25	0.2912	1141.59	(128)	0.000567	0.000570	1140.39	1.2019	-0.000003	1.445					997.0449
12.163		25	0.3072	1149.76	(128)	0.000569	0.000573	1148.16	1.5980	-0.000004	2.554					997.0449
13.177		25	0.3245	1158.39	(128)	0.000573	0.000577	1156.51	1.8786	-0.000004	3.529					997.0449
13.857		25	0.3357	1163.86	(128)	0.000575	0.000579	1161.84	2.0111	-0.000004	4.045					997.0449
14.336		25	0.3433	1167.51	(128)	0.000576	0.000581	1165.48	2.0297	-0.000004	4.120					997.0449
14.856		25	0.3514	1171.37	(128)	0.000578	0.000582	1169.32	2.0435	-0.000004	4.176					997.0449
15.288		25	0.3579	1174.37	(128)	0.000580	0.000584	1172.43	1.9419	-0.000004	3.771					997.0449
15.38		25	0.3593	1175.15	(128)	0.000580	0.000584	1173.08	2.0696	-0.000004	4.283					997.0449
16.37		25	0.3738	1181.99	(128)	0.000583	0.000587	1179.90	2.0923	-0.000004	4.378					997.0449
		30	0.0200	1005.34	(3)	0.000520	0.000525	1005.25	0.0868	-0.000004	0.008			9.69		995.6473
		30	0.0400	1014.93	(3)	0.000527	0.000528	1014.90	0.0267	-0.000001	0.001			19.28		995.6473
		30	0.0600	1024.52	(3)	0.000533	0.000531	1024.59	-0.0748	0.000001	0.006			28.87		995.6473
		30	0.0800	1034.11	(3)	0.000537	0.000535	1034.32	-0.2120	0.000002	0.045			38.46		995.6473
		30	0.1000	1043.72	(3)	0.000542	0.000539	1044.08	-0.3586	0.000003	0.129			48.07		995.6473
		30	0.1200	1053.37	(3)	0.000546	0.000542	1053.86	-0.4878	0.000004	0.238			57.72		995.6473
		30	0.1400	1063.04	(3)	0.000550	0.000546	1063.65	-0.6125	0.000004	0.375			67.39		995.6473
		30	0.1600	1072.75	(3)	0.000553	0.000549	1073.45	-0.7048	0.000004	0.497			77.10		995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	1000*(RD-1)	Density of water / kg/m³
		30	0.1800	1082.47	(3)	0.000557	0.000553	1083.25	-0.7867	0.000004	0.619			86.82		995.6473
		30	0.2000	1092.22	(3)	0.000560	0.000557	1093.05	-0.8293	0.000003	0.688			96.57		995.6473
		30	0.2200	1102.00	(3)	0.000564	0.000561	1102.82	-0.8233	0.000003	0.678			106.35		995.6473
		30	0.2400	1111.79	(3)	0.000567	0.000565	1112.57	-0.7789	0.000003	0.607			116.14		995.6473
		30	0.2600	1121.57	(3)	0.000571	0.000569	1122.27	-0.7056	0.000002	0.498			125.92		995.6473
		30	0.2800	1131.35	(3)	0.000574	0.000572	1131.93	-0.5824	0.000002	0.339			135.70		995.6473
		30	0.3000	1141.12	(3)	0.000578	0.000577	1141.52	-0.4075	0.000001	0.166			145.47		995.6473
		30	0.3200	1150.87	(3)	0.000581	0.000581	1151.05	-0.1787	0.000000	0.032			155.22		995.6473
		30	0.3400	1160.56	(3)	0.000585	0.000585	1160.48	0.0768	0.000000	0.006			164.91		995.6473
		30	0.3600	1170.73	(3)	0.000587	0.000589	1169.81	0.9127	-0.000002	0.833			175.08		995.6473
		30	0.3800	1179.77	(3)	0.000592	0.000593	1179.03	0.7331	-0.000001	0.537			184.12		995.6473
0.01005		35	0.0004	994.21	(98)	0.000504	0.000525	994.21	0.0078	-0.000022	0.000				0.183	994.0319
0.02032		35	0.0007	994.40	(98)	0.000501	0.000525	994.38	0.0178	-0.000024	0.000				0.372	994.0319
0.03001		35	0.0011	994.57	(98)	0.000509	0.000525	994.55	0.0172	-0.000016	0.000				0.54	994.0319
0.0505		35	0.0018	994.94	(98)	0.000508	0.000525	994.91	0.0318	-0.000017	0.001				0.911	994.0319
0.07539		35	0.0027	995.36	(98)	0.000515	0.000525	995.34	0.0286	-0.000011	0.001				1.34	994.0319
0.1001		35	0.0036	995.82	(98)	0.000510	0.000526	995.76	0.0550	-0.000015	0.003				1.795	994.0319
0.124		35	0.0045	996.24	(98)	0.000510	0.000526	996.17	0.0701	-0.000016	0.005				2.224	994.0319
0.1488		35	0.0054	996.68	(98)	0.000511	0.000526	996.60	0.0784	-0.000015	0.006				2.661	994.0319
0.2303		35	0.0083	998.10	(98)	0.000514	0.000526	997.99	0.1024	-0.000012	0.010				4.089	994.0319
0.5183		35	0.0185	1002.99	(39)	0.000522	0.000528	1002.87	0.1196	-0.000006	0.014			8.956		994.0319
0.61481		35	0.0219	1004.60	(39)	0.000523	0.000529	1004.48	0.1231	-0.000006	0.015			10.573		994.0319
0.7177		35	0.0255	1006.32	(39)	0.000524	0.000529	1006.19	0.1247	-0.000005	0.016			12.284		994.0319
0.8274		35	0.0293	1008.12	(39)	0.000526	0.000530	1008.00	0.1235	-0.000004	0.015			14.093		994.0319
1.0322		35	0.0363	1011.46	(39)	0.000528	0.000531	1011.35	0.1163	-0.000003	0.014			17.432		994.0319
		40	0.0200	1001.78	(3)	0.000527	0.000531	1001.69	0.0905	-0.000005	0.008			9.56		992.2158
		40	0.0400	1011.25	(3)	0.000534	0.000535	1011.20	0.0493	-0.000001	0.002			19.03		992.2158
		40	0.0600	1020.69	(3)	0.000539	0.000538	1020.74	-0.0581	0.000001	0.003			28.47		992.2158
		40	0.0800	1030.14	(3)	0.000544	0.000542	1030.32	-0.1857	0.000002	0.034			37.92		992.2158
		40	0.1000	1039.61	(3)	0.000548	0.000545	1039.92	-0.3170	0.000003	0.100			47.39		992.2158
		40	0.1200	1049.10	(3)	0.000552	0.000549	1049.54	-0.4452	0.000003	0.198			56.88		992.2158
		40	0.1400	1058.61	(3)	0.000556	0.000553	1059.17	-0.5630	0.000004	0.317			66.39		992.2158
		40	0.1600	1068.15	(3)	0.000560	0.000557	1068.80	-0.6525	0.000004	0.426			75.93		992.2158
		40	0.1800	1077.71	(3)	0.000564	0.000560	1078.42	-0.7154	0.000003	0.512			85.49		992.2158
		40	0.2000	1087.28	(3)	0.000567	0.000564	1088.03	-0.7527	0.000003	0.567			95.06		992.2158
		40	0.2200	1098.67	(3)	0.000564	0.000568	1097.61	1.0549	-0.000004	1.113			106.45		992.2158
		40	0.2400	1106.46	(3)	0.000574	0.000572	1107.16	-0.7025	0.000002	0.494			114.24		992.2158
		40	0.2600	1116.05	(3)	0.000578	0.000576	1116.66	-0.6146	0.000002	0.378			123.83		992.2158
		40	0.2800	1125.63	(3)	0.000581	0.000580	1126.11	-0.4800	0.000001	0.230			133.41		992.2158
		40	0.3000	1135.19	(3)	0.000585	0.000584	1135.48	-0.2971	0.000001	0.088			142.97		992.2158
		40	0.3200	1144.72	(3)	0.000588	0.000588	1144.78	-0.0636	0.000000	0.004			152.50		992.2158
		40	0.3400	1154.19	(3)	0.000592	0.000592	1153.98	0.2034	0.000000	0.041			161.97		992.2158
		40	0.3600	1164.12	(3)	0.000594	0.000597	1163.08	1.0376	-0.000002	1.077			171.90		992.2158
		40	0.3800	1172.93	(3)	0.000599	0.000601	1172.05	0.8731	-0.000002	0.762			180.71		992.2158
0.01005		45	0.0004	990.40	(98)	0.000497	0.000531	990.39	0.0120	-0.000034	0.000				0.186	990.2132
0.02032		45	0.0007	990.58	(98)	0.000507	0.000531	990.56	0.0174	-0.000024	0.000				0.369	990.2132
0.03001		45	0.0011	990.75	(98)	0.000508	0.000531	990.73	0.0240	-0.000022	0.001				0.543	990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	1000*(RD-1)	Density of water / kg/m³
0.0505		45	0.0018	991.11	(98)	0.000511	0.000531	991.08	0.0352	-0.000020	0.001				0.908	990.2132
0.07539		45	0.0027	991.55	(98)	0.000513	0.000531	991.50	0.0491	-0.000018	0.002				1.351	990.2132
0.1001		45	0.0036	991.98	(98)	0.000515	0.000531	991.92	0.0599	-0.000017	0.004				1.787	990.2132
0.124		45	0.0045	992.39	(98)	0.000518	0.000531	992.33	0.0613	-0.000014	0.004				2.199	990.2132
0.1488		45	0.0054	992.82	(98)	0.000518	0.000532	992.75	0.0737	-0.000014	0.005				2.637	990.2132
0.2303		45	0.0083	994.23	(98)	0.000520	0.000532	994.13	0.0953	-0.000012	0.009				4.052	990.2132
0.61284		45	0.0219	1000.61	(39)	0.000530	0.000534	1000.51	0.1020	-0.000005	0.010			10.399		990.2132
0.72355		45	0.0257	1002.40	(39)	0.000532	0.000535	1002.33	0.0735	-0.000003	0.005			12.188		990.2132
0.83905		45	0.0297	1004.25	(39)	0.000534	0.000536	1004.21	0.0381	-0.000001	0.001			14.035		990.2132
0.93388		45	0.0329	1005.75	(39)	0.000536	0.000536	1005.75	0.0039	0.000000	0.000			15.536		990.2132
0.99252		45	0.0349	1006.67	(39)	0.000537	0.000537	1006.69	-0.0198	0.000001	0.000			16.457		990.2132
		50	0.0200	997.56	(3)	0.000529	0.000536	997.42	0.1374	-0.000007	0.019			9.52		988.0363
		50	0.0400	1006.97	(3)	0.000536	0.000540	1006.84	0.1255	-0.000003	0.016			18.93		988.0363
		50	0.0600	1016.35	(3)	0.000542	0.000543	1016.30	0.0500	-0.000001	0.002			28.31		988.0363
		50	0.0800	1025.73	(3)	0.000547	0.000547	1025.78	-0.0533	0.000001	0.003			37.69		988.0363
		50	0.1000	1035.11	(3)	0.000552	0.000550	1035.28	-0.1778	0.000002	0.032			47.07		988.0363
		50	0.1200	1044.51	(3)	0.000556	0.000554	1044.80	-0.2965	0.000002	0.088			56.47		988.0363
		50	0.1400	1053.92	(3)	0.000560	0.000558	1054.33	-0.4122	0.000003	0.170			65.88		988.0363
		50	0.1600	1063.35	(3)	0.000564	0.000561	1063.85	-0.5070	0.000003	0.257			75.31		988.0363
		50	0.1800	1072.78	(3)	0.000568	0.000565	1073.37	-0.5924	0.000003	0.351			84.74		988.0363
		50	0.2000	1082.23	(3)	0.000572	0.000569	1082.87	-0.6396	0.000003	0.409			94.19		988.0363
		50	0.2200	1091.67	(3)	0.000575	0.000573	1092.34	-0.6691	0.000003	0.448			103.63		988.0363
		50	0.2400	1101.11	(3)	0.000579	0.000577	1101.77	-0.6609	0.000002	0.437			113.07		988.0363
		50	0.2600	1110.54	(3)	0.000583	0.000581	1111.15	-0.6146	0.000002	0.378			122.50		988.0363
		50	0.2800	1119.93	(3)	0.000586	0.000585	1120.48	-0.5490	0.000002	0.301			131.89		988.0363
		50	0.3000	1130.58	(3)	0.000587	0.000589	1129.73	0.8477	-0.000002	0.719			142.54		988.0363
		50	0.3200	1139.92	(3)	0.000591	0.000593	1138.90	1.0177	-0.000002	1.036			151.88		988.0363
		50	0.3400	1147.88	(3)	0.000598	0.000597	1147.97	-0.0961	0.000000	0.009			159.84		988.0363
		50	0.3600	1157.56	(3)	0.000600	0.000602	1156.94	0.6199	-0.000001	0.384			169.52		988.0363
		50	0.3800	1167.54	(3)	0.000603	0.000606	1165.78	1.7597	-0.000003	3.097			179.50		988.0363
0.01005		55	0.0004	985.88	(98)	0.000494	0.000534	985.87	0.0144	-0.000040	0.000				0.188	985.6952
0.02032		55	0.0007	986.07	(98)	0.000497	0.000534	986.04	0.0271	-0.000038	0.001				0.378	985.6952
0.03001		55	0.0011	986.24	(98)	0.000499	0.000534	986.21	0.0379	-0.000036	0.001				0.556	985.6952
0.0505		55	0.0018	986.60	(98)	0.000507	0.000534	986.55	0.0499	-0.000028	0.002				0.921	985.6952
0.07539		55	0.0027	987.04	(98)	0.000510	0.000535	986.97	0.0657	-0.000025	0.004				1.365	985.6952
0.1001		55	0.0036	987.44	(98)	0.000522	0.000535	987.39	0.0459	-0.000013	0.002				1.769	985.6952
0.124		55	0.0045	987.89	(98)	0.000514	0.000535	987.80	0.0935	-0.000021	0.009				2.227	985.6952
0.1488		55	0.0054	988.32	(98)	0.000515	0.000535	988.22	0.1050	-0.000020	0.011				2.663	985.6952
0.2303		55	0.0083	989.72	(98)	0.000519	0.000536	989.59	0.1317	-0.000016	0.017				4.08	985.6952
		60	0.0200	992.77	(3)	0.000527	0.000539	992.54	0.2325	-0.000012	0.054			9.57		983.1989
		60	0.0400	1002.20	(3)	0.000535	0.000542	1001.91	0.2857	-0.000007	0.082			19.00		983.1989
		60	0.0600	1011.59	(3)	0.000541	0.000546	1011.32	0.2652	-0.000004	0.070			28.39		983.1989
		60	0.0800	1020.97	(3)	0.000547	0.000549	1020.76	0.2069	-0.000002	0.043			37.77		983.1989
		60	0.1000	1030.33	(3)	0.000552	0.000553	1030.22	0.1072	-0.000001	0.011			47.13		983.1989
		60	0.1200	1039.70	(3)	0.000556	0.000557	1039.70	0.0031	0.000000	0.000			56.50		983.1989
		60	0.1400	1049.07	(3)	0.000561	0.000560	1049.18	-0.1081	0.000001	0.012			65.87		983.1989
		60	0.1600	1058.44	(3)	0.000565	0.000564	1058.66	-0.2187	0.000001	0.048			75.24		983.1989

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	1000*(RD-1)	Density of water / kg/m³
		60	0.1800	1067.80	(3)	0.000569	0.000568	1068.13	-0.3303	0.000002	0.109			84.60		983.1989
		60	0.2000	1077.16	(3)	0.000573	0.000572	1077.58	-0.4240	0.000002	0.180			93.96		983.1989
		60	0.2200	1086.50	(3)	0.000578	0.000576	1087.01	-0.5106	0.000002	0.261			103.30		983.1989
		60	0.2400	1095.82	(3)	0.000582	0.000580	1096.40	-0.5800	0.000002	0.336			112.62		983.1989
		60	0.2600	1105.10	(3)	0.000586	0.000584	1105.74	-0.6418	0.000002	0.412			121.90		983.1989
		60	0.2800	1114.35	(3)	0.000590	0.000588	1115.02	-0.6749	0.000002	0.456			131.15		983.1989
		60	0.3000	1124.80	(3)	0.000590	0.000592	1124.24	0.5622	-0.000001	0.316			141.60		983.1989
		60	0.3200	1132.66	(3)	0.000598	0.000596	1133.37	-0.7081	0.000002	0.501			149.46		983.1989
		60	0.3400	1141.62	(3)	0.000602	0.000600	1142.40	-0.7831	0.000002	0.613			158.42		983.1989
		60	0.3600	1151.12	(3)	0.000605	0.000605	1151.33	-0.2093	0.000000	0.044			167.92		983.1989
		70	0.0200	987.46	(3)	0.000521	0.000539	987.10	0.3606	-0.000018	0.130			9.69		977.7696
		70	0.0400	997.00	(3)	0.000530	0.000543	996.47	0.5298	-0.000013	0.281			19.23		977.7696
		70	0.0600	1006.47	(3)	0.000537	0.000546	1005.88	0.5930	-0.000010	0.352			28.70		977.7696
		70	0.0800	1015.91	(3)	0.000543	0.000550	1015.31	0.5960	-0.000007	0.355			38.14		977.7696
		70	0.1000	1025.32	(3)	0.000548	0.000554	1024.77	0.5453	-0.000005	0.297			47.55		977.7696
		70	0.1200	1034.72	(3)	0.000554	0.000557	1034.25	0.4674	-0.000004	0.218			56.95		977.7696
		70	0.1400	1044.10	(3)	0.000559	0.000561	1043.74	0.3596	-0.000002	0.129			66.33		977.7696
		70	0.1600	1053.46	(3)	0.000563	0.000565	1053.23	0.2296	-0.000001	0.053			75.69		977.7696
		70	0.1800	1062.80	(3)	0.000568	0.000569	1062.71	0.0857	0.000000	0.007			85.03		977.7696
		70	0.2000	1072.11	(3)	0.000573	0.000572	1072.18	-0.0736	0.000000	0.005			94.34		977.7696
		70	0.2200	1081.39	(3)	0.000577	0.000576	1081.63	-0.2390	0.000001	0.057			103.62		977.7696
		70	0.2400	1090.62	(3)	0.000582	0.000580	1091.04	-0.4206	0.000001	0.177			112.85		977.7696
		70	0.2600	1099.80	(3)	0.000586	0.000584	1100.41	-0.6081	0.000002	0.370			122.03		977.7696
		70	0.2800	1108.90	(3)	0.000591	0.000588	1109.72	-0.8207	0.000002	0.674			131.13		977.7696
		70	0.3000	1117.93	(3)	0.000595	0.000593	1118.97	-1.0368	0.000003	1.075			140.16		977.7696
		70	0.3200	1126.86	(3)	0.000600	0.000597	1128.13	-1.2742	0.000003	1.624			149.09		977.7696
		70	0.3400	1135.66	(3)	0.000605	0.000601	1137.21	-1.5504	0.000004	2.404			157.89		977.7696
		70	0.3600	1144.83	(3)	0.000608	0.000605	1146.18	-1.3520	0.000003	1.828			167.06		977.7696
		80	0.0200	981.71	(3)	0.000510	0.000539	981.15	0.5565	-0.000029	0.310			9.91		971.7978
		80	0.0400	991.41	(3)	0.000520	0.000542	990.55	0.8575	-0.000022	0.735			19.61		971.7978
		80	0.0600	1001.03	(3)	0.000528	0.000546	999.99	1.0383	-0.000017	1.078			29.23		971.7978
		80	0.0800	1010.59	(3)	0.000535	0.000549	1009.46	1.1246	-0.000014	1.265			38.79		971.7978
		80	0.1000	1019.83	(3)	0.000544	0.000553	1018.97	0.8624	-0.000008	0.744			48.03		971.7978
		80	0.1200	1029.59	(3)	0.000548	0.000556	1028.49	1.0983	-0.000009	1.206			57.79		971.7978
		80	0.1400	1039.04	(3)	0.000553	0.000560	1038.03	1.0094	-0.000007	1.019			67.24		971.7978
		80	0.1600	1048.45	(3)	0.000559	0.000564	1047.57	0.8730	-0.000005	0.762			76.65		971.7978
		80	0.1800	1057.81	(3)	0.000564	0.000568	1057.12	0.6872	-0.000003	0.472			86.01		971.7978
		80	0.2000	1067.12	(3)	0.000569	0.000571	1066.66	0.4605	-0.000002	0.212			95.32		971.7978
		80	0.2200	1076.37	(3)	0.000575	0.000575	1076.18	0.1919	-0.000001	0.037			104.57		971.7978
		80	0.2400	1085.54	(3)	0.000580	0.000579	1085.67	-0.1289	0.000000	0.017			113.74		971.7978
		80	0.2600	1094.63	(3)	0.000585	0.000583	1095.12	-0.4918	0.000002	0.242			122.83		971.7978
		80	0.2800	1103.63	(3)	0.000590	0.000587	1104.52	-0.8962	0.000003	0.803			131.83		971.7978
		80	0.3000	1112.50	(3)	0.000595	0.000592	1113.87	-1.3706	0.000004	1.879			140.70		971.7978
		80	0.3200	1121.24	(3)	0.000600	0.000596	1123.14	-1.9031	0.000005	3.622			149.44		971.7978
		80	0.3400	1129.82	(3)	0.000606	0.000600	1132.33	-2.5113	0.000006	6.307			158.02		971.7978
		80	0.3600	1138.74	(3)	0.000610	0.000604	1141.42	-2.6819	0.000006	7.193			166.94		971.7978
		100	0.0100	963.60	(90)	0.000476	0.000531	963.10	0.5036	-0.000054	0.254		!			958.3637

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	1000*(RD-1)	Density of water / kg/m³
		100	0.0200	968.80	(90)	0.000481	0.000532	967.84	0.9558	-0.000051	0.914		!			958.3637
		100	0.0400	979.10	(90)	0.000491	0.000536	977.38	1.7168	-0.000045	2.947					958.3637
		100	0.0600	989.20	(90)	0.000501	0.000539	986.98	2.2241	-0.000038	4.947					958.3637
		100	0.0800	999.20	(90)	0.000510	0.000543	996.62	2.5828	-0.000032	6.671					958.3637
		100	0.1000	1009.00	(90)	0.000520	0.000546	1006.30	2.6983	-0.000027	7.281					958.3637
		100	0.1200	1018.80	(90)	0.000528	0.000550	1016.02	2.7767	-0.000022	7.710					958.3637
		100	0.1400	1028.60	(90)	0.000535	0.000554	1025.78	2.8242	-0.000019	7.976					958.3637
		100	0.1600	1038.30	(90)	0.000541	0.000557	1035.55	2.7479	-0.000016	7.551					958.3637
		100	0.1800	1047.90	(90)	0.000548	0.000561	1045.34	2.5551	-0.000013	6.528					958.3637
		100	0.2000	1057.40	(90)	0.000555	0.000565	1055.15	2.2537	-0.000010	5.079					958.3637
		100	0.2200	1066.80	(90)	0.000561	0.000569	1064.95	1.8521	-0.000007	3.430					958.3637
		100	0.2400	1076.10	(90)	0.000568	0.000573	1074.74	1.3593	-0.000005	1.848					958.3637
		100	0.2600	1085.30	(90)	0.000574	0.000577	1084.52	0.7850	-0.000003	0.616					958.3637
		100	0.2800	1094.20	(90)	0.000581	0.000581	1094.26	-0.0608	0.000000	0.004					958.3637
		100	0.3000	1103.00	(90)	0.000587	0.000585	1103.97	-0.9672	0.000003	0.935					958.3637
							Average Res		0.0889	-0.000006	240.850	Sum chi sq				
							Std dev Res		0.8497	0.000010						
							Avg - 4std		-3.3097	-0.000047						
							Avg + 4std		3.4876	0.000035						

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0 -80.0605

c1 255.4204

c2 118.4171

c3 1.01639

c4 2619.464

Min T -5

Max T 100

Min w 0.000366

Max w 0.4

Avg dens res 0.0889

Std dens res 0.849655

Avg app vol res *10³ -0.00566

Std app vol res *10³ 0.010245

No of points in corr 331

No of inconsistent pair 0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of an aqueous solution of **HCN**

References (53) Kortüm, G., Reber, H., Density, viscosity, and dielectric constant of pure hydrocyanic acid and of hydrocyanic acid – water mixtures at 0°, *Z. Elektrochem.*, **1961**, 65, 809

(90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		0	0.1536	978.2	(53)	0.001145	0.001153	976.87	1.2881	-0.000009	1.659			999.8395
		0	0.2372	957.5	(53)	0.001186	0.001192	956.44	1.1013	-0.000005	1.213			999.8395
		0	0.3190	932.9	(53)	0.001225	0.001225	933.06	-0.1300	0.000000	0.017			999.8395
		0	0.4140	902.7	(53)	0.001260	0.001258	903.27	-0.5927	0.000002	0.351			999.8395
		0	0.4964	875.1	(53)	0.001287	0.001285	876.16	-1.0997	0.000003	1.209			999.8395
		0	0.5853	846.7	(53)	0.001309	0.001310	846.41	0.2619	-0.000001	0.069			999.8395
		0	0.7270	799.4	(53)	0.001345	0.001345	799.31	0.0596	0.000000	0.004			999.8395
		0	0.9757	720.4	(53)	0.001398	0.001396	721.45	-1.0929	0.000002	1.194			999.8395
		0	1.0000	715.5	(53)	0.001398	0.001400	714.30	1.1605	-0.000002	1.347			999.8395
	15	0.0100	998.0	998.0	(90)	0.001111	0.001189	997.22	0.7764	-0.000078	0.603			999.0996
	15	0.0200	996.0	996.0	(90)	0.001157	0.001194	995.26	0.7388	-0.000037	0.546			999.0996
	15	0.0400	993.0	993.0	(90)	0.001155	0.001203	991.09	1.9087	-0.000048	3.643			999.0996
	15	0.0800	984.0	984.0	(90)	0.001193	0.001221	981.86	2.1359	-0.000028	4.562			999.0996
	15	0.1200	971.0	971.0	(90)	0.001242	0.001237	971.62	-0.6180	0.000005	0.382			999.0996
	15	0.1600	956.0	956.0	(90)	0.001283	0.001252	960.53	-4.5316	0.000031	20.535			999.0996
	15	0.8200	752.0	752.0	(90)	0.001402	0.001412	747.18	4.8243	-0.000010	23.274			999.0996
	15	0.9000	724.0	724.0	(90)	0.001423	0.001425	723.41	0.5894	-0.000001	0.347			999.0996
	15	1.0000	691.0	691.0	(90)	0.001447	0.001439	695.05	-4.0475	0.000008	16.382			999.0996
Average Res									0.1518	-0.000009	77.337	Sum chi sqr		
Std dev Res									2.1272	0.000025				
Avg - 4std									-8.3569	-0.000108				
Avg + 4std									8.6605	0.000089				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4) \cdot ^2)}$

c0	255.8148
c1	283.1092
c2	0.668883
c3	0.006206
c4	891.0008
Min T	0
Max T	15
Min w	0.0100
Max w	1
Avg dens res	0.151819
Std dens res	2.12717
Avg app vol res *10 ³	-0.00933
Std app vol res *10 ³	0.024626
No of points in corr	18
No of inconsistent pair	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **HNO3**

References (35) Haase, R.; Saurmann, P.-F.; Dücker, K.-H. Conductivities of Concentrated Electrolyte Solutions. II. Nitric Acid. *Z. Physik. Chem. N. F.* **1965**, 46, 129-139.

(82) Patterson, B. A.; Woolley, E. M.; Thermodynamics for Ionization of Water at Temperatures from 278.15 K to 393.15 K and at the Pressure 0.35 MPa: Apparent Molar Volumes and Apparent Molar Heat Capacities of Aqueous Solutions of Potassium and Sodium Nitrates and Nitric Acid, *J. Chem. Thermodynamics*, **2002**, 34, 535 - 556

(90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
		-10	0.1810	1116.9	(35)	0.000413	0.000435	1112.0	4.8715	-0.000022	23.732				998.117
		-10	0.2212	1143.7	(35)	0.000425	0.000441	1139.3	4.4355	-0.000015	19.674				998.117
		-10	0.2588	1170.8	(35)	0.000431	0.000446	1165.3	5.5007	-0.000016	30.258				998.117
		-10	0.2957	1195.4	(35)	0.000443	0.000452	1191.3	4.0806	-0.000010	16.652				998.117
		-10	0.3308	1222.6	(35)	0.000446	0.000458	1216.4	6.1625	-0.000013	37.976				998.117
		-10	0.3625	1246.4	(35)	0.000451	0.000464	1239.4	7.0338	-0.000013	49.475				998.117
		-10	0.4000	1271.9	(35)	0.000463	0.000471	1266.7	5.2093	-0.000008	27.137				998.117
		-10	0.4267	1292.2	(35)	0.000468	0.000476	1286.2	5.9931	-0.000008	35.917				998.117
		-10	0.4508	1308.6	(35)	0.000475	0.000481	1303.8	4.7888	-0.000006	22.932				998.117
		-10	0.4842	1332.4	(35)	0.000483	0.000488	1328.1	4.3053	-0.000005	18.535				998.117
		-10	0.4985	1341.8	(35)	0.000487	0.000491	1338.4	3.3819	-0.000004	11.437				998.117
		-10	0.5497	1374.8	(35)	0.000503	0.000503	1374.8	0.0384	0.000000	0.001				998.117
		-10	0.6003	1403.2	(35)	0.000520	0.000515	1409.2	-5.9812	0.000005	35.775				998.117
		-10	0.7011	1459.1	(35)	0.000550	0.000543	1469.8	-10.6697	0.000007	113.842	!			998.117
		-10	0.7533	1500.4	(35)	0.000557	0.000560	1494.6	5.7644	-0.000003	33.228				998.117
		-10	0.8011	1508.8	(35)	0.000579	0.000577	1511.9	-3.0523	0.000002	9.316				998.117
		0	0.0100	1005.8	(90)	0.000407	0.000424	1005.6	0.1683	-0.000017	0.028				999.8395
		0	0.0200	1011.7	(90)	0.000414	0.000425	1011.5	0.2327	-0.000011	0.054				999.8395
		0	0.0300	1017.6	(90)	0.000418	0.000426	1017.3	0.2537	-0.000008	0.064				999.8395
		0	0.0306	1018.3	(35)	0.000408	0.000427	1017.7	0.5878	-0.000019	0.346				999.8395
		0	0.0391	1023.2	(35)	0.000417	0.000428	1022.8	0.4425	-0.000011	0.196				999.8395
		0	0.0400	1023.6	(90)	0.000420	0.000428	1023.3	0.3315	-0.000008	0.110				999.8395
		0	0.0500	1029.6	(90)	0.000422	0.000429	1029.2	0.3662	-0.000007	0.134				999.8395
		0	0.0700	1041.8	(35)	0.000425	0.000431	1041.3	0.5129	-0.000007	0.263				999.8395
		0	0.0900	1054.3	(35)	0.000426	0.000434	1053.5	0.7834	-0.000008	0.614				999.8395
		0	0.1000	1060.6	(90)	0.000427	0.000435	1059.7	0.8993	-0.000008	0.809				999.8395
		0	0.1100	1066.9	(35)	0.000429	0.000436	1065.9	0.9796	-0.000008	0.960				999.8395
		0	0.1397	1086.2	(35)	0.000431	0.000440	1084.6	1.5652	-0.000010	2.450				999.8395
		0	0.1500	1092.7	(90)	0.000434	0.000442	1091.2	1.4921	-0.000008	2.226				999.8395
		0	0.1600	1099.2	(35)	0.000435	0.000443	1097.6	1.5704	-0.000008	2.466				999.8395
		0	0.1810	1112.9	(35)	0.000439	0.000446	1111.2	1.6594	-0.000007	2.753				999.8395
		0	0.2000	1125.5	(35)	0.000442	0.000449	1123.7	1.8026	-0.000007	3.249				999.8395
		0	0.2000	1125.5	(90)	0.000442	0.000449	1123.7	1.8026	-0.000007	3.249				999.8395
		0	0.2212	1139.7	(35)	0.000445	0.000452	1137.7	1.9513	-0.000007	3.807				999.8395
		0	0.2400	1152.5	(35)	0.000448	0.000455	1150.3	2.1634	-0.000007	4.680				999.8395
		0	0.2500	1159.4	(90)	0.000450	0.000457	1157.1	2.3215	-0.000007	5.389				999.8395

INO3.xls

															Density
molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
		0	0.2800	1180.3	(35)	0.000454	0.000461	1177.5	2.8177	-0.000007	7.939				999.8395
		0	0.2957	1191.4	(35)	0.000456	0.000464	1188.3	3.1424	-0.000008	9.875				999.8395
		0	0.3000	1194.5	(90)	0.000457	0.000465	1191.2	3.2806	-0.000008	10.762				999.8395
		0	0.3100	1201.6	(35)	0.000458	0.000466	1198.1	3.4764	-0.000008	12.085				999.8395
		0	0.3308	1216.6	(35)	0.000461	0.000470	1212.6	4.0489	-0.000008	16.393				999.8395
		0	0.3500	1230.6	(90)	0.000464	0.000473	1225.9	4.6635	-0.000009	21.749				999.8395
		0	0.3625	1239.4	(35)	0.000467	0.000475	1234.7	4.7216	-0.000009	22.294				999.8395
		0	0.4000	1264.9	(35)	0.000476	0.000482	1261.0	3.9174	-0.000006	15.346				999.8395
		0	0.4000	1264.9	(90)	0.000476	0.000482	1261.0	3.9174	-0.000006	15.346				999.8395
		0	0.4267	1283.2	(35)	0.000483	0.000488	1279.7	3.4767	-0.000005	12.087				999.8395
		0	0.4500	1299.0	(90)	0.000488	0.000492	1296.0	2.9668	-0.000004	8.802				999.8395
		0	0.4508	1299.6	(35)	0.000488	0.000492	1296.6	3.0081	-0.000004	9.049				999.8395
		0	0.4842	1322.4	(35)	0.000496	0.000499	1319.8	2.6009	-0.000003	6.765				999.8395
		0	0.4985	1331.8	(35)	0.000500	0.000503	1329.6	2.1583	-0.000002	4.658				999.8395
		0	0.5000	1332.7	(90)	0.000501	0.000503	1330.7	2.0300	-0.000002	4.121				999.8395
		0	0.5200	1345.4	(35)	0.000506	0.000507	1344.3	1.1054	-0.000001	1.222				999.8395
		0	0.5497	1363.8	(35)	0.000515	0.000514	1364.2	-0.3667	0.000000	0.134				999.8395
		0	0.5500	1364.0	(90)	0.000515	0.000514	1364.4	-0.3648	0.000000	0.133				999.8395
		0	0.5700	1375.9	(35)	0.000521	0.000519	1377.4	-1.5367	0.000001	2.362				999.8395
		0	0.6000	1393.1	(90)	0.000530	0.000527	1396.5	-3.3618	0.000003	11.302				999.8395
		0	0.6003	1393.2	(35)	0.000530	0.000527	1396.6	-3.4480	0.000003	11.889				999.8395
		0	0.7011	1444.0	(35)	0.000561	0.000555	1453.0	-9.0429	0.000006	81.773				999.8395
		0	0.8011	1484.8	(35)	0.000592	0.000589	1490.8	-6.0052	0.000003	36.062				999.8395
0.01657		5	0.0010	1000.55	(82)	0.000439	0.000429	1000.6	-0.0106	0.000010	0.000			27.65	999.9638
0.03313		5	0.0021	1001.14	(82)	0.000436	0.000429	1001.2	-0.0153	0.000007	0.000			27.48	999.9638
0.06637		5	0.0042	1002.38	(82)	0.000422	0.000429	1002.3	0.0301	-0.000007	0.001			26.58	999.9638
0.13233		5	0.0083	1004.66	(82)	0.000434	0.000430	1004.7	-0.0405	0.000005	0.002			27.37	999.9638
		5	0.0100	1005.7	(90)	0.000428	0.000430	1005.7	0.0206	-0.000002	0.000				999.9638
0.27635		5	0.0171	1009.81	(82)	0.000430	0.000431	1009.8	0.0035	0.000000	0.000			27.117	999.9638
		5	0.0200	1011.5	(90)	0.000430	0.000431	1011.5	0.0129	-0.000001	0.000				999.9638
		5	0.0300	1017.3	(90)	0.000432	0.000432	1017.3	0.0033	0.000000	0.000				999.9638
0.5498		5	0.0335	1019.28	(82)	0.000434	0.000432	1019.3	-0.0498	0.000001	0.002			27.343	999.9638
		5	0.0400	1023.2	(90)	0.000433	0.000433	1023.2	-0.0082	0.000000	0.000				999.9638
		5	0.0500	1029.0	(90)	0.000435	0.000435	1029.1	-0.0213	0.000000	0.000				999.9638
		5	0.1000	1059.4	(90)	0.000439	0.000441	1059.2	0.2058	-0.000002	0.042				999.9638
		5	0.1500	1090.9	(90)	0.000444	0.000448	1090.3	0.5737	-0.000003	0.329				999.9638
		5	0.2000	1123.4	(90)	0.000451	0.000455	1122.4	1.0042	-0.000004	1.008				999.9638
		5	0.2500	1156.9	(90)	0.000457	0.000462	1155.3	1.5922	-0.000005	2.535				999.9638
		5	0.3000	1191.7	(90)	0.000464	0.000470	1188.9	2.7733	-0.000007	7.691				999.9638
		5	0.3500	1227.5	(90)	0.000470	0.000479	1223.1	4.4347	-0.000008	19.667				999.9638
		5	0.4000	1261.3	(90)	0.000482	0.000488	1257.5	3.8264	-0.000006	14.641				999.9638
		5	0.4500	1294.7	(90)	0.000494	0.000498	1291.8	2.8748	-0.000004	8.264				999.9638
		5	0.5000	1327.7	(90)	0.000506	0.000509	1325.7	1.9980	-0.000002	3.992				999.9638
		5	0.5500	1358.3	(90)	0.000520	0.000520	1358.6	-0.2781	0.000000	0.077				999.9638

														Density
/ °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³	
5	0.6000	1386.8	(90)	0.000535	0.000533	1389.8	-3.0035	0.000003	9.021				999.9638	
5	0.6500	1412.8	(90)	0.000550	0.000546	1418.6	-5.7889	0.000004	33.511				999.9638	
10	0.0100	1005.3	(90)	0.000439	0.000435	1005.4	-0.0382	0.000004	0.001				999.6996	
10	0.0200	1011.0	(90)	0.000442	0.000436	1011.1	-0.1075	0.000005	0.012				999.6996	
10	0.0300	1016.7	(90)	0.000443	0.000438	1016.9	-0.1774	0.000006	0.031				999.6996	
10	0.0306	1017.0	(35)	0.000445	0.000438	1017.2	-0.2158	0.000007	0.047				999.6996	
10	0.0391	1022.0	(35)	0.000443	0.000439	1022.2	-0.1573	0.000004	0.025				999.6996	
10	0.0400	1022.4	(90)	0.000445	0.000439	1022.7	-0.2577	0.000006	0.066				999.6996	
10	0.0489	1027.5	(35)	0.000447	0.000440	1027.9	-0.3539	0.000007	0.125				999.6996	
10	0.0500	1028.2	(90)	0.000447	0.000440	1028.5	-0.3383	0.000006	0.114				999.6996	
10	0.0700	1039.9	(35)	0.000448	0.000443	1040.3	-0.3936	0.000005	0.155				999.6996	
10	0.0900	1051.8	(35)	0.000450	0.000445	1052.3	-0.4529	0.000005	0.205				999.6996	
10	0.1000	1057.8	(90)	0.000451	0.000446	1058.3	-0.4971	0.000004	0.247				999.6996	
10	0.1100	1063.8	(35)	0.000452	0.000448	1064.4	-0.5738	0.000005	0.329				999.6996	
10	0.1397	1082.4	(35)	0.000453	0.000452	1082.6	-0.2441	0.000001	0.060				999.6996	
10	0.1500	1088.7	(90)	0.000455	0.000453	1089.1	-0.3563	0.000002	0.127				999.6996	
10	0.1600	1095.0	(35)	0.000456	0.000455	1095.3	-0.3182	0.000002	0.101				999.6996	
10	0.1810	1108.4	(35)	0.000458	0.000457	1108.6	-0.1819	0.000001	0.033				999.6996	
10	0.2000	1120.6	(35)	0.000461	0.000460	1120.7	-0.1105	0.000000	0.012				999.6996	
10	0.2000	1120.6	(90)	0.000461	0.000460	1120.7	-0.1105	0.000000	0.012				999.6996	
10	0.2212	1134.4	(35)	0.000463	0.000463	1134.4	0.0205	0.000000	0.000				999.6996	
10	0.2400	1146.9	(35)	0.000465	0.000466	1146.6	0.2864	-0.000001	0.082				999.6996	
10	0.2500	1153.6	(90)	0.000467	0.000468	1153.2	0.4385	-0.000001	0.192				999.6996	
10	0.2800	1173.8	(35)	0.000470	0.000473	1173.0	0.8413	-0.000002	0.708				999.6996	
10	0.2957	1184.7	(35)	0.000472	0.000475	1183.4	1.2986	-0.000003	1.686				999.6996	
10	0.3000	1187.6	(90)	0.000473	0.000476	1186.3	1.3298	-0.000003	1.768				999.6996	
10	0.3100	1194.5	(35)	0.000474	0.000478	1193.0	1.5448	-0.000003	2.386				999.6996	
10	0.3308	1209.0	(35)	0.000477	0.000481	1206.9	2.0874	-0.000004	4.357				999.6996	
10	0.3500	1222.7	(90)	0.000479	0.000485	1219.8	2.8532	-0.000005	8.141				999.6996	
10	0.3625	1231.0	(35)	0.000482	0.000487	1228.3	2.7139	-0.000005	7.365				999.6996	
10	0.4000	1256.0	(35)	0.000490	0.000494	1253.6	2.3608	-0.000004	5.573				999.6996	
10	0.4000	1256.0	(90)	0.000490	0.000494	1253.6	2.3608	-0.000004	5.573				999.6996	
10	0.4267	1273.6	(35)	0.000496	0.000499	1271.7	1.9371	-0.000003	3.752				999.6996	
10	0.4500	1289.0	(90)	0.000501	0.000504	1287.3	1.6799	-0.000002	2.822				999.6996	
10	0.4508	1289.6	(35)	0.000501	0.000504	1287.9	1.7441	-0.000002	3.042				999.6996	
10	0.4842	1311.6	(35)	0.000509	0.000511	1310.1	1.5173	-0.000002	2.302				999.6996	
10	0.4985	1320.6	(35)	0.000513	0.000514	1319.5	1.1099	-0.000001	1.232				999.6996	
10	0.5000	1321.5	(90)	0.000513	0.000514	1320.5	1.0278	-0.000001	1.056				999.6996	
10	0.5200	1333.8	(35)	0.000518	0.000519	1333.5	0.3281	0.000000	0.108				999.6996	
10	0.5497	1351.6	(35)	0.000527	0.000526	1352.4	-0.7848	0.000001	0.616				999.6996	
10	0.5500	1351.8	(90)	0.000527	0.000526	1352.6	-0.7731	0.000001	0.598				999.6996	
10	0.5700	1363.4	(35)	0.000532	0.000531	1365.0	-1.5794	0.000001	2.494				999.6996	
10	0.6000	1380.1	(90)	0.000541	0.000538	1383.0	-2.8792	0.000003	8.290				999.6996	
10	0.6003	1380.2	(35)	0.000541	0.000538	1383.2	-2.9550	0.000003	8.732				999.6996	

INO3.xls															Density
molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.01657	0.03313	10	0.6500	1405.5	(90)	0.000556	0.000552	1410.9	-5.4120	0.000004	29.290				999.6996
		10	0.7011	1428.9	(35)	0.000572	0.000567	1435.9	-7.0413	0.000005	49.580				999.6996
		10	0.7533	1456.7	(35)	0.000584	0.000584	1456.7	0.0483	0.000000	0.002				999.6996
		10	0.8011	1468.6	(35)	0.000602	0.000601	1470.1	-1.5377	0.000001	2.364				999.6996
		15	0.0010	999.65	(82)	0.000468	0.000440	999.7	-0.0293	0.000028	0.001			29.49	999.0996
		15	0.0021	1000.23	(82)	0.000458	0.000440	1000.3	-0.0379	0.000018	0.001			28.87	999.0996
		15	0.0042	1001.42	(82)	0.000445	0.000440	1001.4	-0.0192	0.000005	0.000			28.03	999.0996
		15	0.0083	1003.62	(82)	0.000456	0.000441	1003.7	-0.1242	0.000015	0.015			28.71	999.0996
		15	0.0100	1004.6	(90)	0.000449	0.000441	1004.7	-0.0808	0.000008	0.007				999.0996
		15	0.0171	1008.50	(82)	0.000456	0.000442	1008.7	-0.2414	0.000014	0.058			28.71	999.0996
0.27635	0.5498	15	0.0200	1010.2	(90)	0.000452	0.000442	1010.4	-0.2015	0.000010	0.041				999.0996
		15	0.0300	1015.8	(90)	0.000454	0.000443	1016.1	-0.3215	0.000010	0.103				999.0996
		15	0.0335	1017.60	(82)	0.000457	0.000444	1018.1	-0.4763	0.000014	0.227			28.825	999.0996
		15	0.0400	1021.4	(90)	0.000455	0.000445	1021.8	-0.4507	0.000011	0.203				999.0996
		15	0.0500	1027.0	(90)	0.000457	0.000446	1027.6	-0.5788	0.000011	0.335				999.0996
		15	0.1000	1056.1	(90)	0.000461	0.000452	1057.1	-0.9644	0.000009	0.930				999.0996
		15	0.1500	1086.5	(90)	0.000464	0.000459	1087.5	-0.9537	0.000005	0.910				999.0996
		15	0.2000	1117.8	(90)	0.000469	0.000466	1118.7	-0.8982	0.000004	0.807				999.0996
		15	0.2500	1150.3	(90)	0.000475	0.000473	1150.7	-0.3969	0.000001	0.158				999.0996
		15	0.3000	1183.8	(90)	0.000480	0.000482	1183.3	0.4922	-0.000001	0.242				999.0996
		15	0.3500	1218.3	(90)	0.000486	0.000490	1216.3	1.9609	-0.000004	3.845				999.0996
		15	0.4000	1251.1	(90)	0.000497	0.000499	1249.5	1.5626	-0.000002	2.442				999.0996
		15	0.4500	1283.6	(90)	0.000508	0.000509	1282.6	1.0248	-0.000001	1.050				999.0996
		15	0.5000	1315.7	(90)	0.000519	0.000520	1315.0	0.6630	-0.000001	0.440				999.0996
		15	0.5500	1345.5	(90)	0.000532	0.000531	1346.4	-0.9044	0.000001	0.818				999.0996
		15	0.6000	1373.4	(90)	0.000546	0.000544	1376.0	-2.6410	0.000002	6.975				999.0996
		15	0.6500	1398.4	(90)	0.000561	0.000557	1403.2	-4.7797	0.000004	22.846				999.0996
		20	0.0100	1003.6	(90)	0.000459	0.000447	1003.8	-0.1279	0.000013	0.016				998.2041
		20	0.0200	1009.1	(90)	0.000461	0.000448	1009.4	-0.2799	0.000014	0.078				998.2041
		20	0.0300	1014.6	(90)	0.000463	0.000449	1015.0	-0.4401	0.000014	0.194				998.2041
		20	0.0306	1014.9	(35)	0.000464	0.000449	1015.4	-0.4610	0.000015	0.213				998.2041
		20	0.0391	1019.5	(35)	0.000467	0.000450	1020.2	-0.6984	0.000017	0.488				998.2041
		20	0.0400	1020.1	(90)	0.000465	0.000450	1020.7	-0.6082	0.000015	0.370				998.2041
		20	0.0489	1025.0	(35)	0.000466	0.000451	1025.8	-0.7734	0.000015	0.598				998.2041
		20	0.0500	1025.6	(90)	0.000466	0.000451	1026.4	-0.7740	0.000015	0.599				998.2041
		20	0.0600	1031.2	(90)	0.000467	0.000453	1032.2	-0.9372	0.000015	0.878				998.2041
		20	0.0700	1036.9	(35)	0.000468	0.000454	1037.9	-1.0417	0.000014	1.085				998.2041
		20	0.0700	1036.9	(90)	0.000468	0.000454	1037.9	-1.0476	0.000014	1.097				998.2041
		20	0.0800	1042.7	(90)	0.000467	0.000455	1043.8	-1.0748	0.000012	1.155				998.2041
		20	0.0900	1048.5	(35)	0.000468	0.000456	1049.6	-1.1326	0.000011	1.283				998.2041
20	0.0900	1048.5	(90)	0.000468	0.000456	1049.6	-1.1384	0.000011	1.296				998.2041		
20	0.1000	1054.3	(90)	0.000469	0.000458	1055.5	-1.2382	0.000011	1.533				998.2041		
20	0.1100	1060.2	(35)	0.000469	0.000459	1061.5	-1.2736	0.000010	1.622				998.2041		
20	0.1100	1060.2	(90)	0.000469	0.000459	1061.5	-1.2736	0.000010	1.622				998.2041		

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
		20	0.1200	1066.1	(90)	0.000470	0.000460	1067.4	-1.3442	0.000010	1.807				998.2041
		20	0.1300	1072.1	(90)	0.000471	0.000462	1073.4	-1.3494	0.000009	1.821				998.2041
		20	0.1397	1078.1	(35)	0.000470	0.000463	1079.3	-1.2070	0.000007	1.457				998.2041
		20	0.1400	1078.1	(90)	0.000472	0.000463	1079.5	-1.3887	0.000009	1.929				998.2041
		20	0.1500	1084.2	(90)	0.000472	0.000464	1085.6	-1.3615	0.000008	1.854				998.2041
		20	0.1600	1090.3	(35)	0.000473	0.000466	1091.7	-1.3671	0.000007	1.869				998.2041
		20	0.1600	1090.3	(90)	0.000473	0.000466	1091.7	-1.3671	0.000007	1.869				998.2041
		20	0.1700	1096.4	(90)	0.000474	0.000467	1097.8	-1.4048	0.000007	1.974				998.2041
		20	0.1800	1102.6	(90)	0.000475	0.000469	1104.0	-1.3739	0.000006	1.888				998.2041
		20	0.1810	1103.2	(35)	0.000475	0.000469	1104.6	-1.3925	0.000006	1.939				998.2041
		20	0.1900	1108.8	(90)	0.000476	0.000470	1110.2	-1.3735	0.000006	1.887				998.2041
		20	0.2000	1115.0	(35)	0.000477	0.000471	1116.4	-1.4027	0.000006	1.968				998.2041
		20	0.2000	1115.0	(90)	0.000477	0.000471	1116.4	-1.4027	0.000006	1.968				998.2041
		20	0.2200	1127.6	(90)	0.000479	0.000474	1128.9	-1.3463	0.000005	1.813				998.2041
		20	0.2212	1128.3	(35)	0.000480	0.000475	1129.7	-1.4024	0.000005	1.967				998.2041
		20	0.2400	1140.4	(35)	0.000481	0.000477	1141.6	-1.1963	0.000004	1.431				998.2041
		20	0.2500	1146.9	(90)	0.000482	0.000479	1148.0	-1.0583	0.000003	1.120				998.2041
		20	0.2588	1152.6	(35)	0.000483	0.000480	1153.6	-0.9759	0.000003	0.952				998.2041
		20	0.2700	1160.0	(90)	0.000484	0.000482	1160.7	-0.7499	0.000002	0.562				998.2041
		20	0.2800	1166.6	(35)	0.000485	0.000484	1167.2	-0.5766	0.000002	0.333				998.2041
		20	0.2957	1177.2	(35)	0.000487	0.000486	1177.3	-0.1036	0.000000	0.011				998.2041
		20	0.3000	1180.0	(90)	0.000487	0.000487	1180.1	-0.0844	0.000000	0.007				998.2041
		20	0.3100	1186.7	(35)	0.000488	0.000489	1186.6	0.1380	0.000000	0.019				998.2041
		20	0.3200	1193.4	(90)	0.000490	0.000491	1193.1	0.3469	-0.000001	0.120				998.2041
		20	0.3308	1200.7	(35)	0.000491	0.000492	1200.1	0.6237	-0.000001	0.389				998.2041
		20	0.3500	1214.0	(90)	0.000493	0.000496	1212.6	1.4127	-0.000003	1.996				998.2041
		20	0.3625	1222.1	(35)	0.000495	0.000498	1220.7	1.3563	-0.000003	1.840				998.2041
		20	0.3700	1227.0	(90)	0.000497	0.000499	1225.6	1.3605	-0.000002	1.851				998.2041
		20	0.4000	1246.3	(35)	0.000503	0.000505	1245.2	1.0868	-0.000002	1.181				998.2041
		20	0.4000	1246.3	(90)	0.000503	0.000505	1245.2	1.0868	-0.000002	1.181				998.2041
		20	0.4200	1259.1	(90)	0.000508	0.000509	1258.2	0.8725	-0.000001	0.761				998.2041
		20	0.4267	1263.3	(35)	0.000509	0.000510	1262.6	0.7240	-0.000001	0.524				998.2041
		20	0.4500	1278.3	(90)	0.000514	0.000515	1277.6	0.6648	-0.000001	0.442				998.2041
		20	0.4508	1278.8	(35)	0.000514	0.000515	1278.2	0.6498	-0.000001	0.422				998.2041
		20	0.4700	1291.1	(90)	0.000518	0.000519	1290.5	0.6424	-0.000001	0.413				998.2041
		20	0.4842	1300.3	(35)	0.000521	0.000522	1299.5	0.8145	-0.000001	0.663				998.2041
		20	0.4985	1309.1	(35)	0.000525	0.000525	1308.5	0.6003	-0.000001	0.360				998.2041
		20	0.5000	1310.0	(90)	0.000525	0.000526	1309.4	0.5598	-0.000001	0.313				998.2041
		20	0.5200	1321.9	(35)	0.000530	0.000530	1321.9	0.0219	0.000000	0.000				998.2041
		20	0.5200	1321.9	(90)	0.000530	0.000530	1321.9	0.0219	0.000000	0.000				998.2041
		20	0.5497	1339.1	(35)	0.000538	0.000537	1339.9	-0.8351	0.000001	0.697				998.2041
		20	0.5500	1339.3	(90)	0.000538	0.000537	1340.1	-0.8146	0.000001	0.664				998.2041
		20	0.5700	1350.5	(35)	0.000543	0.000542	1351.9	-1.4311	0.000001	2.048				998.2041
		20	0.5700	1350.5	(90)	0.000543	0.000542	1351.9	-1.4311	0.000001	2.048				998.2041

															Density
molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.01657 0.06637 0.13233 0.27635 0.5498		20	0.6000	1366.7	(90)	0.000552	0.000550	1369.0	-2.3298	0.000002	5.428				998.2041
		20	0.6003	1366.8	(35)	0.000552	0.000550	1369.2	-2.3966	0.000002	5.743				998.2041
		20	0.6200	1376.9	(90)	0.000557	0.000555	1379.9	-3.0386	0.000003	9.233				998.2041
		20	0.6500	1391.3	(90)	0.000566	0.000563	1395.4	-4.1303	0.000003	17.059				998.2041
		20	0.7011	1413.8	(35)	0.000582	0.000578	1418.9	-5.0842	0.000004	25.849				998.2041
		20	0.7533	1434.9	(35)	0.000597	0.000595	1438.0	-3.1228	0.000002	9.752				998.2041
		20	0.8011	1452.4	(35)	0.000611	0.000612	1450.2	2.2449	-0.000001	5.040				998.2041
		25	0.0010	997.59	(82)	0.000476	0.000451	997.6	-0.0257	0.000025	0.001			29.98	997.0449
		25	0.0042	999.24	(82)	0.000474	0.000451	999.3	-0.0927	0.000022	0.009			29.85	997.0449
		25	0.0083	1001.42	(82)	0.000473	0.000452	1001.6	-0.1783	0.000021	0.032			29.83	997.0449
		25	0.0171	1006.12	(82)	0.000474	0.000453	1006.5	-0.3700	0.000021	0.137			29.886	997.0449
		25	0.0306	1013.4	(35)	0.000474	0.000455	1014.0	-0.6225	0.000020	0.388				997.0449
		25	0.0335	1014.92	(82)	0.000475	0.000455	1015.6	-0.7054	0.000020	0.498			29.952	997.0449
		25	0.0391	1018.1	(35)	0.000473	0.000456	1018.8	-0.7080	0.000017	0.501				997.0449
		25	0.0489	1023.6	(35)	0.000471	0.000457	1024.3	-0.7226	0.000014	0.522				997.0449
		25	0.0700	1035.3	(35)	0.000473	0.000459	1036.4	-1.0564	0.000014	1.116				997.0449
		25	0.0900	1046.6	(35)	0.000475	0.000462	1047.9	-1.3145	0.000013	1.728				997.0449
		25	0.1100	1058.0	(35)	0.000478	0.000465	1059.6	-1.6176	0.000013	2.616				997.0449
		25	0.1397	1075.8	(35)	0.000477	0.000469	1077.2	-1.4364	0.000009	2.063				997.0449
		25	0.1600	1087.9	(35)	0.000479	0.000471	1089.4	-1.5429	0.000008	2.380				997.0449
	25	0.1810	1100.7	(35)	0.000481	0.000474	1102.2	-1.5032	0.000007	2.260				997.0449	
	25	0.2212	1125.4	(35)	0.000486	0.000480	1127.0	-1.5792	0.000006	2.494				997.0449	
	25	0.2400	1137.4	(35)	0.000487	0.000483	1138.7	-1.3087	0.000004	1.713				997.0449	
	25	0.2588	1149.5	(35)	0.000489	0.000486	1150.5	-1.0185	0.000003	1.037				997.0449	
	25	0.2800	1163.1	(35)	0.000492	0.000489	1163.9	-0.8211	0.000002	0.674				997.0449	
	25	0.2957	1173.5	(35)	0.000493	0.000492	1173.9	-0.3968	0.000001	0.157				997.0449	
	25	0.3100	1182.9	(35)	0.000495	0.000494	1183.0	-0.1141	0.000000	0.013				997.0449	
	25	0.3308	1196.8	(35)	0.000497	0.000498	1196.3	0.4827	-0.000001	0.233				997.0449	
	25	0.3625	1217.9	(35)	0.000501	0.000504	1216.6	1.2502	-0.000002	1.563				997.0449	
	25	0.4000	1241.7	(35)	0.000509	0.000511	1240.7	0.9972	-0.000002	0.994				997.0449	
	25	0.4267	1258.5	(35)	0.000515	0.000516	1257.8	0.7441	-0.000001	0.554				997.0449	
	25	0.4508	1273.7	(35)	0.000520	0.000521	1273.0	0.6587	-0.000001	0.434				997.0449	
	25	0.4842	1294.9	(35)	0.000527	0.000528	1294.0	0.9368	-0.000001	0.878				997.0449	
	25	0.4985	1303.4	(35)	0.000530	0.000531	1302.8	0.6041	-0.000001	0.365				997.0449	
	25	0.5200	1316.0	(35)	0.000535	0.000536	1315.9	0.1031	0.000000	0.011				997.0449	
	25	0.5497	1332.9	(35)	0.000543	0.000543	1333.6	-0.6626	0.000001	0.439				997.0449	
	25	0.5700	1344.1	(35)	0.000549	0.000547	1345.3	-1.1866	0.000001	1.408				997.0449	
	25	0.6003	1360.1	(35)	0.000557	0.000555	1362.1	-2.0410	0.000002	4.166				997.0449	
	25	0.7011	1406.5	(35)	0.000587	0.000584	1410.5	-3.9560	0.000003	15.650				997.0449	
	25	0.7533	1427.0	(35)	0.000602	0.000601	1428.9	-1.9178	0.000001	3.678				997.0449	
	25	0.8011	1444.2	(35)	0.000615	0.000618	1440.5	3.7179	-0.000002	13.823				997.0449	
	30	0.0100	1000.9	(90)	0.000477	0.000458	1001.1	-0.1965	0.000020	0.039				995.6473	
	30	0.0200	1006.1	(90)	0.000483	0.000459	1006.6	-0.4817	0.000024	0.232				995.6473	
	30	0.0300	1011.4	(90)	0.000483	0.000460	1012.1	-0.7029	0.000023	0.494				995.6473	

INO3.xls															Density
molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
		30	0.0306	1011.7	(35)	0.000484	0.000460	1012.4	-0.7464	0.000024	0.557				995.6473
		30	0.0391	1016.3	(35)	0.000483	0.000461	1017.2	-0.8804	0.000022	0.775				995.6473
		30	0.0400	1016.8	(90)	0.000482	0.000461	1017.7	-0.8596	0.000021	0.739				995.6473
		30	0.0489	1021.7	(35)	0.000481	0.000462	1022.6	-0.9349	0.000018	0.874				995.6473
		30	0.0500	1022.2	(90)	0.000483	0.000462	1023.3	-1.0518	0.000020	1.106				995.6473
		30	0.0700	1033.3	(35)	0.000481	0.000465	1034.5	-1.2353	0.000017	1.526				995.6473
		30	0.0900	1044.6	(35)	0.000481	0.000467	1046.0	-1.3620	0.000014	1.855				995.6473
		30	0.1000	1050.3	(90)	0.000482	0.000469	1051.7	-1.4318	0.000013	2.050				995.6473
		30	0.1100	1055.9	(35)	0.000483	0.000470	1057.5	-1.6289	0.000013	2.653				995.6473
		30	0.1397	1072.3	(35)	0.000490	0.000474	1074.9	-2.6363	0.000016	6.950				995.6473
		30	0.1500	1079.4	(90)	0.000485	0.000475	1081.0	-1.6375	0.000009	2.681				995.6473
		30	0.1600	1085.4	(35)	0.000485	0.000477	1087.0	-1.5917	0.000008	2.533				995.6473
		30	0.1810	1098.0	(35)	0.000487	0.000480	1099.6	-1.5901	0.000007	2.528				995.6473
		30	0.2000	1109.4	(35)	0.000489	0.000483	1111.1	-1.6938	0.000007	2.869				995.6473
		30	0.2000	1109.4	(90)	0.000489	0.000483	1111.1	-1.6938	0.000007	2.869				995.6473
		30	0.2212	1122.5	(35)	0.000491	0.000486	1124.0	-1.5395	0.000006	2.370				995.6473
		30	0.2400	1134.3	(35)	0.000493	0.000489	1135.6	-1.3085	0.000004	1.712				995.6473
		30	0.2500	1140.6	(90)	0.000494	0.000490	1141.8	-1.1936	0.000004	1.425				995.6473
		30	0.2588	1146.2	(35)	0.000495	0.000492	1147.3	-1.0530	0.000003	1.109				995.6473
		30	0.2800	1159.7	(35)	0.000497	0.000495	1160.5	-0.7632	0.000002	0.582				995.6473
		30	0.3000	1172.7	(90)	0.000499	0.000498	1173.0	-0.2901	0.000001	0.084				995.6473
		30	0.3100	1179.2	(35)	0.000500	0.000500	1179.3	-0.0729	0.000000	0.005				995.6473
		30	0.3308	1192.7	(35)	0.000503	0.000503	1192.4	0.3278	-0.000001	0.107				995.6473
		30	0.3500	1205.5	(90)	0.000505	0.000507	1204.5	1.0114	-0.000002	1.023				995.6473
		30	0.3625	1213.4	(35)	0.000507	0.000509	1212.4	1.0179	-0.000002	1.036				995.6473
		30	0.4000	1237.0	(35)	0.000514	0.000516	1236.0	0.9646	-0.000002	0.930				995.6473
		30	0.4000	1237.0	(90)	0.000514	0.000516	1236.0	0.9646	-0.000002	0.930				995.6473
		30	0.4267	1253.6	(35)	0.000520	0.000521	1252.8	0.8075	-0.000001	0.652				995.6473
		30	0.4500	1268.0	(90)	0.000525	0.000526	1267.3	0.6930	-0.000001	0.480				995.6473
		30	0.4508	1268.5	(35)	0.000525	0.000526	1267.8	0.6970	-0.000001	0.486				995.6473
		30	0.4842	1288.4	(35)	0.000533	0.000533	1288.3	0.0673	0.000000	0.005				995.6473
		30	0.4985	1297.8	(35)	0.000535	0.000536	1297.0	0.8062	-0.000001	0.650				995.6473
		30	0.5000	1298.7	(90)	0.000536	0.000537	1297.9	0.8030	-0.000001	0.645				995.6473
		30	0.5200	1310.2	(35)	0.000541	0.000541	1309.8	0.3668	0.000000	0.135				995.6473
		30	0.5497	1326.8	(35)	0.000548	0.000548	1327.1	-0.3313	0.000000	0.110				995.6473
		30	0.5500	1327.0	(90)	0.000548	0.000548	1327.3	-0.3030	0.000000	0.092				995.6473
		30	0.5700	1337.7	(35)	0.000554	0.000553	1338.6	-0.9009	0.000001	0.812				995.6473
		30	0.6000	1353.3	(90)	0.000562	0.000561	1354.9	-1.6138	0.000001	2.604				995.6473
		30	0.6003	1353.4	(35)	0.000562	0.000561	1355.1	-1.6726	0.000002	2.798				995.6473
		30	0.6500	1377.0	(90)	0.000576	0.000574	1380.0	-2.9978	0.000002	8.987				995.6473
		30	0.7533	1419.1	(35)	0.000607	0.000606	1420.0	-0.8812	0.000001	0.776				995.6473
		30	0.8011	1449.8	(35)	0.000612	0.000623	1431.0	18.7543	-0.000011	351.726	!			995.6473
0.01657		35	0.0010	994.54	(82)	0.000511	0.000462	994.6	-0.0507	0.000049	0.003		!	32.22	994.0319
0.03313		35	0.0021	995.07	(82)	0.000504	0.000462	995.2	-0.0867	0.000042	0.008		!	31.78	994.0319

INO3.xls															Density
molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.06637		35	0.0042	996.21	(82)	0.000477	0.000463	996.3	-0.0600	0.000015	0.004			30.06	994.0319
0.13233		35	0.0083	998.25	(82)	0.000492	0.000463	998.5	-0.2360	0.000029	0.056			30.98	994.0319
0.27635		35	0.0171	1002.81	(82)	0.000491	0.000464	1003.3	-0.4724	0.000027	0.223			30.97	994.0319
0.5498		35	0.0335	1011.36	(82)	0.000491	0.000466	1012.2	-0.8653	0.000025	0.749			30.955	994.0319
		40	0.0100	997.3	(90)	0.000494	0.000469	997.6	-0.2517	0.000025	0.063				992.2158
		40	0.0200	1002.5	(90)	0.000491	0.000470	1002.9	-0.4217	0.000021	0.178				992.2158
		40	0.0300	1007.7	(90)	0.000492	0.000471	1008.3	-0.6256	0.000021	0.391				992.2158
		40	0.0306	1007.9	(35)	0.000496	0.000471	1008.7	-0.7618	0.000024	0.580				992.2158
		40	0.0391	1012.4	(35)	0.000494	0.000472	1013.3	-0.8941	0.000022	0.799				992.2158
		40	0.0400	1012.9	(90)	0.000493	0.000472	1013.8	-0.8631	0.000021	0.745				992.2158
		40	0.0489	1017.7	(35)	0.000492	0.000473	1018.6	-0.9304	0.000018	0.866				992.2158
		40	0.0500	1018.2	(90)	0.000493	0.000474	1019.2	-1.0338	0.000020	1.069				992.2158
		40	0.0700	1029.0	(35)	0.000493	0.000476	1030.3	-1.2684	0.000017	1.609				992.2158
		40	0.0900	1039.9	(35)	0.000494	0.000479	1041.4	-1.5375	0.000016	2.364				992.2158
		40	0.1000	1045.5	(90)	0.000494	0.000480	1047.1	-1.5750	0.000014	2.481				992.2158
		40	0.1100	1051.0	(35)	0.000495	0.000481	1052.7	-1.7377	0.000014	3.020				992.2158
		40	0.1397	1068.1	(35)	0.000495	0.000485	1069.7	-1.6329	0.000010	2.666				992.2158
		40	0.1500	1073.9	(90)	0.000497	0.000486	1075.7	-1.7865	0.000010	3.191				992.2158
		40	0.1600	1079.7	(35)	0.000497	0.000488	1081.5	-1.7949	0.000010	3.222				992.2158
		40	0.1810	1091.9	(35)	0.000499	0.000491	1093.8	-1.8796	0.000009	3.533				992.2158
		40	0.2000	1103.1	(35)	0.000501	0.000494	1105.0	-1.8905	0.000008	3.574				992.2158
		40	0.2000	1103.1	(90)	0.000501	0.000494	1105.0	-1.8905	0.000008	3.574				992.2158
		40	0.2212	1115.7	(35)	0.000504	0.000497	1117.6	-1.8992	0.000007	3.607				992.2158
		40	0.2400	1127.1	(35)	0.000505	0.000500	1128.9	-1.7604	0.000006	3.099				992.2158
		40	0.2500	1133.2	(90)	0.000506	0.000501	1134.9	-1.6781	0.000005	2.816				992.2158
		40	0.2588	1138.7	(35)	0.000507	0.000502	1140.2	-1.4883	0.000004	2.215				992.2158
		40	0.2800	1151.9	(35)	0.000509	0.000506	1153.0	-1.1313	0.000003	1.280				992.2158
		40	0.3000	1164.5	(90)	0.000511	0.000509	1165.2	-0.7018	0.000002	0.493				992.2158
		40	0.3100	1170.8	(35)	0.000512	0.000511	1171.3	-0.5027	0.000001	0.253				992.2158
		40	0.3308	1184.1	(35)	0.000514	0.000514	1184.0	0.0839	0.000000	0.007				992.2158
		40	0.3500	1196.6	(90)	0.000516	0.000518	1195.8	0.8328	-0.000002	0.693				992.2158
		40	0.3625	1204.3	(35)	0.000518	0.000520	1203.4	0.8816	-0.000002	0.777				992.2158
		40	0.4000	1227.0	(35)	0.000526	0.000527	1226.3	0.6763	-0.000001	0.457				992.2158
		40	0.4000	1227.0	(90)	0.000526	0.000527	1226.3	0.6763	-0.000001	0.457				992.2158
		40	0.4267	1243.0	(35)	0.000531	0.000532	1242.5	0.4699	-0.000001	0.221				992.2158
		40	0.4500	1257.0	(90)	0.000536	0.000537	1256.6	0.4472	-0.000001	0.200				992.2158
		40	0.4508	1257.5	(35)	0.000536	0.000537	1257.0	0.4682	-0.000001	0.219				992.2158
		40	0.4842	1277.7	(35)	0.000543	0.000544	1276.8	0.8601	-0.000001	0.740				992.2158
		40	0.4985	1285.9	(35)	0.000546	0.000547	1285.2	0.7129	-0.000001	0.508				992.2158
		40	0.5000	1286.7	(90)	0.000547	0.000547	1286.1	0.6427	-0.000001	0.413				992.2158
		40	0.5200	1297.8	(35)	0.000551	0.000552	1297.5	0.2500	0.000000	0.063				992.2158
		40	0.5497	1313.9	(35)	0.000559	0.000559	1314.2	-0.2830	0.000000	0.080				992.2158
		40	0.5500	1314.1	(90)	0.000559	0.000559	1314.3	-0.2480	0.000000	0.062				992.2158
		40	0.5700	1324.6	(35)	0.000564	0.000564	1325.2	-0.5955	0.000001	0.355				992.2158

INO3.xls															Density
molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.01657 0.03313 0.06637 0.13233 0.27635 0.5498		40	0.6000	1339.8	(90)	0.000572	0.000571	1340.8	-1.0325	0.000001	1.066				992.2158
		40	0.6003	1339.9	(35)	0.000572	0.000571	1341.0	-1.0846	0.000001	1.176				992.2158
		40	0.7011	1383.5	(35)	0.000601	0.000600	1385.8	-2.3449	0.000002	5.499				992.2158
		40	0.7533	1403.4	(35)	0.000616	0.000616	1402.7	0.7200	0.000000	0.518				992.2158
		40	0.8011	1425.8	(35)	0.000625	0.000633	1412.9	12.8600	-0.000008	165.379	!			992.2158
		45	0.0010	990.73	(82)	0.000503	0.000473	990.8	-0.0306	0.000030	0.001			31.7	990.2132
		45	0.0021	991.26	(82)	0.000497	0.000473	991.3	-0.0485	0.000024	0.002			31.32	990.2132
		45	0.0042	992.36	(82)	0.000485	0.000474	992.4	-0.0455	0.000011	0.002			30.54	990.2132
		45	0.0083	994.39	(82)	0.000497	0.000474	994.6	-0.1842	0.000023	0.034			31.29	990.2132
		45	0.0171	998.88	(82)	0.000498	0.000475	999.3	-0.3888	0.000023	0.151			31.37	990.2132
		45	0.0335	1007.26	(82)	0.000499	0.000477	1008.0	-0.7624	0.000022	0.581			31.471	990.2132
		50	0.0100	993.1	(90)	0.000496	0.000480	993.3	-0.1611	0.000016	0.026				988.0363
		50	0.0200	998.2	(90)	0.000497	0.000481	998.5	-0.3183	0.000016	0.101				988.0363
		50	0.0300	1003.3	(90)	0.000499	0.000482	1003.8	-0.5075	0.000017	0.258				988.0363
		50	0.0306	1003.6	(35)	0.000500	0.000482	1004.1	-0.5365	0.000017	0.288				988.0363
		50	0.0391	1007.9	(35)	0.000502	0.000483	1008.7	-0.7696	0.000019	0.592				988.0363
		50	0.0400	1008.4	(90)	0.000501	0.000483	1009.1	-0.7285	0.000018	0.531				988.0363
		50	0.0489	1013.0	(35)	0.000502	0.000484	1013.9	-0.8907	0.000018	0.793				988.0363
		50	0.0500	1013.6	(90)	0.000502	0.000484	1014.5	-0.8810	0.000017	0.776				988.0363
		50	0.0699	1024.1	(35)	0.000502	0.000487	1025.2	-1.1247	0.000015	1.265				988.0363
		50	0.0899	1034.9	(35)	0.000502	0.000489	1036.1	-1.2438	0.000013	1.547				988.0363
		50	0.1000	1040.3	(90)	0.000504	0.000491	1041.7	-1.4029	0.000013	1.968				988.0363
		50	0.1100	1045.7	(35)	0.000505	0.000492	1047.2	-1.5362	0.000013	2.360				988.0363
		50	0.1397	1062.4	(35)	0.000505	0.000496	1063.8	-1.4354	0.000009	2.060				988.0363
		50	0.1500	1068.0	(90)	0.000507	0.000497	1069.6	-1.6477	0.000010	2.715				988.0363
		50	0.1600	1073.7	(35)	0.000507	0.000499	1075.3	-1.6169	0.000009	2.614				988.0363
		50	0.1810	1085.7	(35)	0.000509	0.000502	1087.3	-1.6029	0.000008	2.569				988.0363
		50	0.2000	1096.6	(35)	0.000511	0.000504	1098.2	-1.6362	0.000007	2.677				988.0363
		50	0.2000	1096.6	(90)	0.000511	0.000504	1098.2	-1.6362	0.000007	2.677				988.0363
		50	0.2212	1109.0	(35)	0.000513	0.000507	1110.5	-1.5266	0.000006	2.330				988.0363
		50	0.2400	1120.1	(35)	0.000515	0.000510	1121.5	-1.3981	0.000005	1.955				988.0363
		50	0.2500	1126.0	(90)	0.000516	0.000512	1127.4	-1.3590	0.000004	1.847				988.0363
		50	0.2800	1144.2	(35)	0.000519	0.000517	1145.0	-0.8300	0.000002	0.689				988.0363
		50	0.3000	1156.4	(90)	0.000521	0.000520	1156.9	-0.4696	0.000001	0.220				988.0363
		50	0.3100	1162.5	(35)	0.000522	0.000521	1162.8	-0.3022	0.000001	0.091				988.0363
		50	0.3308	1175.4	(35)	0.000524	0.000525	1175.2	0.2400	-0.000001	0.058				988.0363
		50	0.3500	1187.6	(90)	0.000526	0.000528	1186.6	1.0239	-0.000002	1.048				988.0363
		50	0.3625	1195.0	(35)	0.000529	0.000530	1194.0	0.9942	-0.000002	0.988				988.0363
		50	0.4000	1217.0	(35)	0.000536	0.000537	1216.2	0.7677	-0.000001	0.589				988.0363
		50	0.4000	1217.0	(90)	0.000536	0.000537	1216.2	0.7677	-0.000001	0.589				988.0363
		50	0.4267	1232.6	(35)	0.000541	0.000542	1231.9	0.6565	-0.000001	0.431				988.0363
		50	0.4500	1246.1	(90)	0.000546	0.000547	1245.5	0.5726	-0.000001	0.328				988.0363
		50	0.4508	1246.6	(35)	0.000546	0.000547	1246.0	0.6088	-0.000001	0.371				988.0363
		50	0.4842	1266.1	(35)	0.000553	0.000554	1265.2	0.9385	-0.000001	0.881				988.0363

INO3.xls															Density
molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.01657 0.03313 0.06637 0.13233 0.27635 0.5498		50	0.4985	1274.0	(35)	0.000556	0.000557	1273.2	0.7665	-0.000001	0.588				988.0363
		50	0.5000	1274.8	(90)	0.000557	0.000558	1274.1	0.7253	-0.000001	0.526				988.0363
		50	0.5200	1285.6	(35)	0.000562	0.000562	1285.2	0.4187	0.000000	0.175				988.0363
		50	0.5497	1301.2	(35)	0.000569	0.000569	1301.2	-0.0411	0.000000	0.002				988.0363
		50	0.5500	1301.3	(90)	0.000569	0.000569	1301.4	-0.1004	0.000000	0.010				988.0363
		50	0.5700	1311.4	(35)	0.000574	0.000574	1311.9	-0.4638	0.000000	0.215				988.0363
		50	0.6000	1326.1	(90)	0.000582	0.000581	1326.9	-0.8316	0.000001	0.692				988.0363
		50	0.6003	1326.2	(35)	0.000582	0.000581	1327.1	-0.8781	0.000001	0.771				988.0363
		50	0.7011	1368.4	(35)	0.000611	0.000609	1370.2	-1.7647	0.000001	3.114				988.0363
		50	0.7533	1387.7	(35)	0.000625	0.000626	1386.2	1.4659	-0.000001	2.149				988.0363
		50	0.8011	1412.5	(35)	0.000632	0.000643	1395.9	16.5618	-0.000010	274.294	!			988.0363
		55	0.0010	986.21	(82)	0.000506	0.000484	986.2	-0.0225	0.000022	0.001			31.9	985.6952
		55	0.0021	986.73	(82)	0.000505	0.000484	986.8	-0.0424	0.000021	0.002			31.83	985.6952
		55	0.0042	987.81	(82)	0.000492	0.000484	987.8	-0.0304	0.000007	0.001			31	985.6952
		55	0.0083	989.82	(82)	0.000503	0.000485	990.0	-0.1469	0.000018	0.022			31.7	985.6952
		55	0.0171	994.23	(82)	0.000506	0.000486	994.6	-0.3370	0.000020	0.114			31.877	985.6952
		55	0.0335	1002.48	(82)	0.000507	0.000488	1003.1	-0.6551	0.000019	0.429			31.969	985.6952
		60	0.0100	988.2	(90)	0.000502	0.000491	988.3	-0.1155	0.000012	0.013				983.1989
		60	0.0200	993.2	(90)	0.000505	0.000492	993.5	-0.2628	0.000013	0.069				983.1989
		60	0.0300	998.2	(90)	0.000508	0.000493	998.6	-0.4407	0.000015	0.194				983.1989
	60	0.0400	1003.3	(90)	0.000508	0.000494	1003.8	-0.5488	0.000014	0.301				983.1989	
	60	0.0500	1008.4	(90)	0.000509	0.000495	1009.1	-0.6869	0.000014	0.472				983.1989	
	60	0.1000	1034.7	(90)	0.000511	0.000501	1035.7	-1.0131	0.000009	1.026				983.1989	
	60	0.1500	1061.9	(90)	0.000515	0.000508	1063.0	-1.1222	0.000007	1.259				983.1989	
	60	0.2000	1089.9	(90)	0.000519	0.000515	1090.9	-1.0353	0.000004	1.072				983.1989	
	60	0.2500	1118.5	(90)	0.000525	0.000522	1119.3	-0.8441	0.000003	0.713				983.1989	
	60	0.3000	1148.2	(90)	0.000530	0.000530	1148.1	0.0956	0.000000	0.009				983.1989	
	60	0.3500	1178.4	(90)	0.000536	0.000539	1177.0	1.3715	-0.000003	1.881				983.1989	
	60	0.4000	1206.9	(90)	0.000546	0.000548	1205.9	1.0233	-0.000002	1.047				983.1989	
	60	0.4500	1235.0	(90)	0.000556	0.000557	1234.3	0.6529	-0.000001	0.426				983.1989	
	60	0.5000	1262.8	(90)	0.000567	0.000568	1262.1	0.7343	-0.000001	0.539				983.1989	
	60	0.5500	1288.3	(90)	0.000579	0.000579	1288.6	-0.2749	0.000000	0.076				983.1989	
	60	0.6000	1312.4	(90)	0.000592	0.000591	1313.3	-0.9233	0.000001	0.853				983.1989	
0.01657		65	0.0010	981.07	(82)	0.000505	0.000495	981.1	-0.0106	0.000011	0.000			31.85	980.5548
0.03313		65	0.0021	981.60	(82)	0.000499	0.000495	981.6	-0.0073	0.000004	0.000			31.42	980.5548
0.06637		65	0.0042	982.60	(82)	0.000510	0.000495	982.7	-0.0577	0.000014	0.003			32.11	980.5548
0.13233		65	0.0083	984.65	(82)	0.000507	0.000496	984.7	-0.0911	0.000011	0.008			31.95	980.5548
0.27635		65	0.0171	989.01	(82)	0.000510	0.000497	989.2	-0.2264	0.000014	0.051			32.15	980.5548
0.5498		65	0.0335	997.17	(82)	0.000512	0.000499	997.6	-0.4618	0.000014	0.213			32.291	980.5548
0.01657		75	0.0010	975.37	(82)	0.000500	0.000505	975.4	0.0055	-0.000006	0.000			31.5	974.849
0.03313		75	0.0021	975.90	(82)	0.000496	0.000506	975.9	0.0181	-0.000009	0.000			31.28	974.849
0.06637		75	0.0042	976.87	(82)	0.000517	0.000506	976.9	-0.0448	0.000011	0.002			32.58	974.849
0.13233		75	0.0083	978.92	(82)	0.000510	0.000506	978.9	-0.0278	0.000004	0.001			32.12	974.849
0.27635		75	0.0171	983.26	(82)	0.000513	0.000507	983.4	-0.0971	0.000006	0.009			32.331	974.849

INO3.xls															Density
molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.5498		75	0.0335	991.35	(82)	0.000516	0.000509	991.6	-0.2264	0.000007	0.051			32.512	974.849
		80	0.0100	976.7	(90)	0.000513	0.000512	976.7	-0.0090	0.000001	0.000				971.7978
		80	0.0200	981.6	(90)	0.000515	0.000513	981.6	-0.0486	0.000003	0.002				971.7978
		80	0.0300	986.5	(90)	0.000518	0.000514	986.6	-0.1164	0.000004	0.014				971.7978
		80	0.0400	991.5	(90)	0.000518	0.000515	991.6	-0.1121	0.000003	0.013				971.7978
		80	0.0500	996.5	(90)	0.000519	0.000516	996.6	-0.1354	0.000003	0.018				971.7978
		80	0.1000	1022.1	(90)	0.000523	0.000522	1022.2	-0.0529	0.000001	0.003				971.7978
		80	0.1500	1048.5	(90)	0.000527	0.000528	1048.3	0.2029	-0.000001	0.041				971.7978
		80	0.2000	1075.4	(90)	0.000533	0.000535	1075.0	0.4072	-0.000002	0.166				971.7978
		80	0.2500	1102.7	(90)	0.000540	0.000542	1102.1	0.5621	-0.000002	0.316				971.7978
		80	0.3000	1130.7	(90)	0.000547	0.000550	1129.6	1.1028	-0.000003	1.216				971.7978
		80	0.3500	1159.1	(90)	0.000554	0.000558	1157.2	1.9037	-0.000004	3.624				971.7978
		80	0.4000	1185.8	(90)	0.000565	0.000567	1184.7	1.0873	-0.000002	1.182				971.7978
		80	0.4500	1211.9	(90)	0.000576	0.000576	1211.9	0.0321	0.000000	0.001				971.7978
		80	0.5000	1237.7	(90)	0.000587	0.000586	1238.3	-0.6172	0.000001	0.381				971.7978
		80	0.5500	1261.5	(90)	0.000599	0.000597	1263.6	-2.1400	0.000002	4.579				971.7978
		80	0.6000	1283.9	(90)	0.000612	0.000609	1287.3	-3.4297	0.000003	11.763				971.7978
0.01657		85	0.0010	969.15	(82)	0.000494	0.000516	969.1	0.0217	-0.000022	0.000			31.1	968.6203
0.03313		85	0.0021	969.67	(82)	0.000494	0.000516	969.6	0.0421	-0.000022	0.002			31.15	968.6203
0.06637		85	0.0042	970.65	(82)	0.000514	0.000516	970.6	0.0062	-0.000002	0.000			32.42	968.6203
0.13233		85	0.0083	972.68	(82)	0.000511	0.000517	972.6	0.0419	-0.000005	0.002			32.21	968.6203
0.27635		85	0.0171	977.02	(82)	0.000514	0.000517	977.0	0.0567	-0.000003	0.003			32.39	968.6203
0.5498		85	0.0335	985.05	(82)	0.000518	0.000519	985.0	0.0349	-0.000001	0.001			32.656	968.6203
0.03313		95	0.0021	962.96	(82)	0.000490	0.000526	962.9	0.0701	-0.000036	0.005		!	30.85	961.9004
0.06637		95	0.0042	963.96	(82)	0.000505	0.000526	963.9	0.0805	-0.000021	0.006			31.84	961.9004
0.13233		95	0.0083	965.97	(82)	0.000510	0.000527	965.8	0.1260	-0.000016	0.016			32.15	961.9004
0.27635		95	0.0171	970.30	(82)	0.000514	0.000527	970.1	0.2202	-0.000014	0.048			32.377	961.9004
0.5498		95	0.0335	978.32	(82)	0.000518	0.000529	978.0	0.3473	-0.000011	0.121			32.667	961.9004
		100	0.0100	963.2	(90)	0.000520	0.000532	963.1	0.1121	-0.000012	0.013				958.3637
		100	0.0200	968.1	(90)	0.000519	0.000533	967.8	0.2608	-0.000014	0.068				958.3637
		100	0.0300	973.0	(90)	0.000520	0.000534	972.6	0.3828	-0.000013	0.147				958.3637
		100	0.0400	977.9	(90)	0.000522	0.000535	977.4	0.4781	-0.000013	0.229				958.3637
		100	0.0500	982.9	(90)	0.000522	0.000536	982.3	0.6471	-0.000013	0.419				958.3637
		100	0.1000	1008.3	(90)	0.000527	0.000542	1006.8	1.5090	-0.000015	2.277				958.3637
		100	0.1500	1034.1	(90)	0.000534	0.000548	1031.9	2.1690	-0.000014	4.705				958.3637
		100	0.2000	1059.8	(90)	0.000544	0.000554	1057.6	2.1942	-0.000010	4.814				958.3637
		100	0.2500	1085.7	(90)	0.000554	0.000561	1083.7	1.9753	-0.000007	3.902				958.3637
		100	0.3000	1112.2	(90)	0.000562	0.000568	1110.2	2.0329	-0.000005	4.132				958.3637
		100	0.3500	1139.0	(90)	0.000571	0.000576	1136.8	2.2227	-0.000005	4.940				958.3637
		100	0.4000	1163.8	(90)	0.000583	0.000584	1163.4	0.4436	-0.000001	0.197				958.3637
		100	0.4500	1187.9	(90)	0.000595	0.000593	1189.7	-1.7549	0.000003	3.080				958.3637
		100	0.5000	1211.8	(90)	0.000607	0.000602	1215.4	-3.5635	0.000005	12.699				958.3637
		100	0.5500	1233.9	(90)	0.000620	0.000612	1240.1	-6.2036	0.000007	38.485				958.3637
		100	0.6000	1254.7	(90)	0.000633	0.000624	1263.4	-8.7176	0.000009	75.996				958.3637

HNO3.xls															Density
molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
									Average Res	-0.0404	0.000003	2503.311	Sum chi sqr		
									Std dev Res	2.2953	0.000010				
									Avg - 4std	-9.2217	-0.000035				
									Avg + 4std	9.1408	0.000042				
Curve fit for the model App vol=(w+c2+c3*t °C)/(c0*w + c1)/e^(0.000001*(t °C+c4)^2)															
c0		12.9926													
c1		-23.57871													
c2		-3.606972													
c3		0.007942													
c4		-2427.104													
Min T		-10													
Max T		100													
Min w		0.001													
Max w		0.801													
Avg dens res		-0.0404													
Std dens res		2.2953													
Avg app vol res *10^3		0.003308													
Std app vol res *10^3		0.009635													
No of points in corr		476													
No of inconsistent pair		2													
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)															
0.03313		25	0.0021	998.06	(82)	0.000511	0.000451	998.2	-0.1242	0.000060	0.015		!	32.2	997.0449
		30	0.7011	1416.6	(35)	0.000579	0.000589	1402.1	14.4725	-0.000010	209.454	!			995.6473
0.01657		95	0.0010	962.45	(82)	0.000471	0.000526	962.4	0.0526	-0.000054	0.003		!	29.7	961.9004

Density of aqueous solution of **H3PO4**

References (17) Christensen, J. H.; Reed, R. B. Density of Aqueous Solutions of Phosphoric Acid. Measurements at 25°C. *Ind. Eng. Chem.* **1955**, *47*, 1277-1279.

(25) Egan, E. P.; Luff, B. B. Density of Aqueous Solutions of Phosphoric Acid. Measurements at 15° to 80°C. *Ind. Eng. Chem.* **1955**, *47*, 1280-1280.

(90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.

molality	molarity	t °C	mass frac	Density exp kg/m³	Ref	App vol exp m³/kg	App vol Calc m³/kg	Density calc kg/m³	Density Residual kg/m³	App Vol Residual m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
		15.85	0.0446	1023.20	(25)	0.000469	0.000470	1023.17	0.0255	-0.000001	0.001				998.9673
		15.85	0.0935	1051.40	(25)	0.000467	0.000472	1050.87	0.5288	-0.000005	0.280				998.9673
		15.85	0.1921	1111.40	(25)	0.000474	0.000477	1110.67	0.7270	-0.000003	0.529				998.9673
		15.85	0.2933	1179.10	(25)	0.000480	0.000482	1178.09	1.0069	-0.000002	1.014				998.9673
		15.85	0.3915	1251.10	(25)	0.000486	0.000487	1250.05	1.0512	-0.000002	1.105				998.9673
		15.85	0.4936	1332.50	(25)	0.000493	0.000493	1332.46	0.0356	0.000000	0.001				998.9673
		15.85	0.5954	1423.90	(25)	0.000499	0.000500	1423.18	0.7211	-0.000001	0.520				998.9673
		15.85	0.7010	1528.00	(25)	0.000507	0.000507	1527.17	0.8321	-0.000001	0.692				998.9673
		15.85	0.7997	1634.50	(25)	0.000514	0.000514	1634.16	0.3353	0.000000	0.112				998.9673
		15.85	0.8481	1690.30	(25)	0.000518	0.000518	1690.24	0.0588	0.000000	0.003				998.9673
		20	0.0200	1009.20	(90)	0.000456	0.000471	1008.91	0.2947	-0.000014	0.087				998.2041
		20	0.0600	1030.90	(90)	0.000472	0.000472	1030.90	0.0021	0.000000	0.000				998.2041
		20	0.1400	1076.40	(90)	0.000482	0.000476	1077.37	-0.9738	0.000006	0.948				998.2041
		20	0.2000	1113.40	(90)	0.000484	0.000479	1114.56	-1.1639	0.000005	1.355				998.2041
		20	0.2600	1152.90	(90)	0.000485	0.000482	1153.91	-1.0097	0.000003	1.020				998.2041
		20	0.3500	1216.00	(90)	0.000489	0.000487	1217.30	-1.2990	0.000003	1.687				998.2041
		20	0.5000	1335.00	(90)	0.000496	0.000495	1335.94	-0.9437	0.000001	0.891				998.2041
		25	0.0010	997.64	(17)	0.000400	0.000472	997.57	0.0715	-0.000072	0.005		!	0.60	997.0449
		25	0.0020	998.14	(17)	0.000450	0.000472	998.10	0.0425	-0.000021	0.002			1.10	997.0449
		25	0.0030	998.74	(17)	0.000434	0.000472	998.63	0.1130	-0.000038	0.013			1.70	997.0449
		25	0.0040	999.34	(17)	0.000426	0.000472	999.16	0.1830	-0.000046	0.034		!	2.30	997.0449
		25	0.0050	999.84	(17)	0.000441	0.000472	999.69	0.1526	-0.000031	0.023			2.80	997.0449
		25	0.0060	1000.44	(17)	0.000435	0.000472	1000.22	0.2217	-0.000037	0.049			3.40	997.0449
		25	0.0070	1000.94	(17)	0.000445	0.000472	1000.75	0.1903	-0.000027	0.036			3.90	997.0449
		25	0.0080	1001.54	(17)	0.000440	0.000472	1001.29	0.2584	-0.000032	0.067			4.50	997.0449
		25	0.0090	1002.04	(17)	0.000447	0.000472	1001.82	0.2261	-0.000025	0.051			5.00	997.0449
		25	0.0100	1002.64	(17)	0.000443	0.000472	1002.35	0.2933	-0.000029	0.086			5.60	997.0449
		25	0.0110	1003.14	(17)	0.000449	0.000472	1002.88	0.2600	-0.000023	0.068			6.10	997.0449
		25	0.0120	1003.74	(17)	0.000445	0.000472	1003.42	0.3262	-0.000027	0.106			6.70	997.0449
		25	0.0130	1004.24	(17)	0.000450	0.000472	1003.95	0.2919	-0.000022	0.085			7.20	997.0449
		25	0.0140	1004.74	(17)	0.000454	0.000472	1004.49	0.2572	-0.000018	0.066			7.70	997.0449
		25	0.0150	1005.34	(17)	0.000451	0.000472	1005.02	0.3219	-0.000021	0.104			8.30	997.0449
		25	0.0160	1005.84	(17)	0.000455	0.000472	1005.56	0.2862	-0.000018	0.082			8.80	997.0449
		25	0.0170	1006.44	(17)	0.000452	0.000472	1006.09	0.3500	-0.000020	0.123			9.40	997.0449
		25	0.0180	1006.94	(17)	0.000455	0.000472	1006.63	0.3133	-0.000017	0.098			9.90	997.0449
		25	0.0190	1007.54	(17)	0.000453	0.000472	1007.17	0.3762	-0.000020	0.142			10.50	997.0449
		25	0.0200	1008.04	(17)	0.000456	0.000472	1007.71	0.3385	-0.000017	0.115			11.00	997.0449
		25	0.0210	1008.54	(17)	0.000458	0.000472	1008.24	0.3004	-0.000014	0.090			11.50	997.0449
		25	0.0220	1009.14	(17)	0.000456	0.000472	1008.78	0.3618	-0.000016	0.131			12.10	997.0449

molality	molarity	t °C	mass frac	Density exp kg/m ³	Ref	App vol exp m ³ /kg	App vol Calc m ³ /kg	Density calc kg/m ³	Density Residual kg/m ³	App Vol Residual m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m ³	Density of water / kg/m ³
		25	0.0230	1009.64	(17)	0.000459	0.000473	1009.32	0.3227	-0.000014	0.104			12.60	997.0449
		25	0.0240	1010.14	(17)	0.000461	0.000473	1009.86	0.2831	-0.000012	0.080			13.10	997.0449
		25	0.0250	1010.74	(17)	0.000459	0.000473	1010.40	0.3430	-0.000013	0.118			13.70	997.0449
		25	0.0260	1011.24	(17)	0.000461	0.000473	1010.94	0.3024	-0.000011	0.091			14.20	997.0449
		25	0.0270	1011.84	(17)	0.000460	0.000473	1011.48	0.3614	-0.000013	0.131			14.80	997.0449
		25	0.0280	1012.34	(17)	0.000462	0.000473	1012.03	0.3198	-0.000011	0.102			15.30	997.0449
		25	0.0290	1012.94	(17)	0.000460	0.000473	1012.57	0.3778	-0.000013	0.143			15.90	997.0449
		25	0.0300	1013.44	(17)	0.000462	0.000473	1013.11	0.3352	-0.000011	0.112			16.40	997.0449
		25	0.0310	1014.04	(17)	0.000461	0.000473	1013.65	0.3922	-0.000012	0.154			17.00	997.0449
		25	0.0320	1014.54	(17)	0.000462	0.000473	1014.20	0.3487	-0.000011	0.122			17.50	997.0449
		25	0.0330	1015.14	(17)	0.000461	0.000473	1014.74	0.4047	-0.000012	0.164			18.10	997.0449
		25	0.0340	1015.64	(17)	0.000463	0.000473	1015.28	0.3602	-0.000010	0.130			18.60	997.0449
		25	0.0350	1016.24	(17)	0.000462	0.000473	1015.83	0.4152	-0.000011	0.172			19.20	997.0449
		25	0.0360	1016.74	(17)	0.000463	0.000473	1016.38	0.3697	-0.000010	0.137			19.70	997.0449
		25	0.0370	1017.34	(17)	0.000462	0.000473	1016.92	0.4238	-0.000011	0.180			20.30	997.0449
		25	0.0380	1017.84	(17)	0.000464	0.000473	1017.47	0.3773	-0.000010	0.142			20.80	997.0449
		25	0.0390	1018.34	(17)	0.000465	0.000473	1018.01	0.3303	-0.000008	0.109			21.30	997.0449
		25	0.0400	1018.94	(17)	0.000464	0.000473	1018.56	0.3829	-0.000009	0.147			21.90	997.0449
		25	0.0410	1019.54	(17)	0.000463	0.000473	1019.11	0.4349	-0.000010	0.189			22.50	997.0449
		25	0.0420	1020.04	(17)	0.000465	0.000473	1019.66	0.3864	-0.000009	0.149			23.00	997.0449
		25	0.0430	1020.64	(17)	0.000464	0.000473	1020.21	0.4375	-0.000010	0.191			23.60	997.0449
		25	0.0440	1021.14	(17)	0.000465	0.000473	1020.76	0.3880	-0.000008	0.151			24.10	997.0449
		25	0.0450	1021.74	(17)	0.000464	0.000473	1021.31	0.4381	-0.000009	0.192			24.70	997.0449
		25	0.0460	1022.24	(17)	0.000465	0.000474	1021.86	0.3876	-0.000008	0.150			25.20	997.0449
		25	0.0470	1022.84	(17)	0.000465	0.000474	1022.41	0.4367	-0.000009	0.191			25.80	997.0449
		25	0.0480	1023.34	(17)	0.000466	0.000474	1022.96	0.3852	-0.000008	0.148			26.30	997.0449
		25	0.0490	1023.94	(17)	0.000465	0.000474	1023.51	0.4333	-0.000008	0.188			26.90	997.0449
		25	0.0500	1024.44	(17)	0.000466	0.000474	1024.06	0.3808	-0.000007	0.145			27.40	997.0449
		25	0.0510	1025.04	(17)	0.000466	0.000474	1024.62	0.4278	-0.000008	0.183			28.00	997.0449
		25	0.0520	1025.54	(17)	0.000467	0.000474	1025.17	0.3744	-0.000007	0.140			28.50	997.0449
		25	0.0530	1026.14	(17)	0.000466	0.000474	1025.72	0.4204	-0.000008	0.177			29.10	997.0449
		25	0.0540	1026.64	(17)	0.000467	0.000474	1026.28	0.3659	-0.000006	0.134			29.60	997.0449
		25	0.0550	1027.24	(17)	0.000467	0.000474	1026.83	0.4110	-0.000007	0.169			30.20	997.0449
		25	0.0560	1027.84	(17)	0.000466	0.000474	1027.39	0.4555	-0.000008	0.207			30.80	997.0449
		25	0.0570	1028.34	(17)	0.000467	0.000474	1027.95	0.3995	-0.000007	0.160			31.30	997.0449
		25	0.0580	1028.94	(17)	0.000467	0.000474	1028.50	0.4430	-0.000007	0.196			31.90	997.0449
		25	0.0590	1029.44	(17)	0.000468	0.000474	1029.06	0.3860	-0.000006	0.149			32.40	997.0449
		25	0.0600	1030.04	(17)	0.000467	0.000474	1029.62	0.4285	-0.000007	0.184			33.00	997.0449
		25	0.0700	1035.64	(17)	0.000469	0.000475	1035.22	0.4254	-0.000006	0.181			38.60	997.0449
		25	0.0800	1041.24	(17)	0.000471	0.000475	1040.87	0.3709	-0.000004	0.138			44.20	997.0449
		25	0.0900	1046.94	(17)	0.000472	0.000476	1046.58	0.3645	-0.000004	0.133			49.90	997.0449
		25	0.1000	1052.74	(17)	0.000472	0.000476	1052.34	0.4055	-0.000004	0.164			55.70	997.0449
		25	0.1100	1058.44	(17)	0.000474	0.000476	1058.15	0.2933	-0.000002	0.086			61.40	997.0449
		25	0.1200	1064.34	(17)	0.000474	0.000477	1064.02	0.3273	-0.000002	0.107			67.30	997.0449
		25	0.1300	1070.24	(17)	0.000475	0.000477	1069.94	0.3070	-0.000002	0.094			73.20	997.0449

molality	molarity	t °C	mass frac	Density exp kg/m ³	Ref	App vol exp m ³ /kg	App vol Calc m ³ /kg	Density calc kg/m ³	Density Residual kg/m ³	App Vol Residual m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m ³	Density of water / kg/m ³
		25	0.1400	1076.24	(17)	0.000476	0.000478	1075.91	0.3316	-0.000002	0.110			79.20	997.0449
		25	0.1500	1082.24	(17)	0.000477	0.000478	1081.94	0.3007	-0.000002	0.090			85.20	997.0449
		25	0.1600	1088.34	(17)	0.000477	0.000479	1088.03	0.3134	-0.000002	0.098			91.30	997.0449
		25	0.1700	1094.44	(17)	0.000478	0.000479	1094.18	0.2693	-0.000001	0.073			97.40	997.0449
		25	0.1800	1100.54	(17)	0.000479	0.000480	1100.38	0.1676	-0.000001	0.028			103.50	997.0449
		25	0.1900	1106.84	(17)	0.000479	0.000480	1106.64	0.2077	-0.000001	0.043			109.80	997.0449
		25	0.2000	1113.14	(17)	0.000480	0.000481	1112.96	0.1890	-0.000001	0.036			116.10	997.0449
		25	0.2100	1119.54	(17)	0.000480	0.000481	1119.33	0.2107	-0.000001	0.044			122.50	997.0449
		25	0.2200	1125.94	(17)	0.000481	0.000482	1125.77	0.1723	-0.000001	0.030			128.90	997.0449
		25	0.2300	1132.44	(17)	0.000482	0.000482	1132.27	0.1730	-0.000001	0.030			135.40	997.0449
		25	0.2400	1138.94	(17)	0.000482	0.000483	1138.83	0.1121	0.000000	0.013			141.90	997.0449
		25	0.2500	1145.54	(17)	0.000483	0.000483	1145.46	0.0890	0.000000	0.008			148.50	997.0449
		25	0.2600	1152.24	(17)	0.000483	0.000484	1152.14	0.1029	0.000000	0.011			155.20	997.0449
		25	0.2700	1158.94	(17)	0.000484	0.000484	1158.89	0.0532	0.000000	0.003			161.90	997.0449
		25	0.2800	1165.74	(17)	0.000485	0.000485	1165.71	0.0391	0.000000	0.002			168.70	997.0449
		25	0.2900	1172.64	(17)	0.000485	0.000485	1172.58	0.0600	0.000000	0.004			175.60	997.0449
		25	0.3000	1179.54	(17)	0.000486	0.000486	1179.53	0.0151	0.000000	0.000			182.50	997.0449
		25	0.3100	1186.54	(17)	0.000486	0.000486	1186.54	0.0037	0.000000	0.000			189.50	997.0449
		25	0.3200	1193.64	(17)	0.000487	0.000487	1193.62	0.0250	0.000000	0.001			196.60	997.0449
		25	0.3300	1200.74	(17)	0.000487	0.000487	1200.77	-0.0217	0.000000	0.000			203.70	997.0449
		25	0.3400	1207.94	(17)	0.000488	0.000488	1207.98	-0.0370	0.000000	0.001			210.90	997.0449
		25	0.3500	1215.14	(17)	0.000489	0.000488	1215.27	-0.1219	0.000000	0.015			218.10	997.0449
		25	0.3600	1222.54	(17)	0.000489	0.000489	1222.62	-0.0770	0.000000	0.006			225.50	997.0449
		25	0.3700	1229.94	(17)	0.000490	0.000489	1230.05	-0.1030	0.000000	0.011			232.90	997.0449
		25	0.3800	1237.44	(17)	0.000490	0.000490	1237.55	-0.1008	0.000000	0.010			240.40	997.0449
		25	0.3900	1244.94	(17)	0.000491	0.000491	1245.12	-0.1711	0.000000	0.029			247.90	997.0449
		25	0.4000	1252.64	(17)	0.000491	0.000491	1252.76	-0.1147	0.000000	0.013			255.60	997.0449
		25	0.4100	1260.34	(17)	0.000492	0.000492	1260.48	-0.1323	0.000000	0.018			263.30	997.0449
		25	0.4200	1268.14	(17)	0.000492	0.000492	1268.27	-0.1248	0.000000	0.016			271.10	997.0449
		25	0.4300	1275.94	(17)	0.000493	0.000493	1276.14	-0.1928	0.000000	0.037			278.90	997.0449
		25	0.4400	1283.94	(17)	0.000494	0.000493	1284.08	-0.1373	0.000000	0.019			286.90	997.0449
		25	0.4500	1291.94	(17)	0.000494	0.000494	1292.10	-0.1589	0.000000	0.025			294.90	997.0449
		25	0.4600	1300.14	(17)	0.000495	0.000495	1300.20	-0.0584	0.000000	0.003			303.10	997.0449
		25	0.4700	1308.34	(17)	0.000495	0.000495	1308.38	-0.0368	0.000000	0.001			311.30	997.0449
		25	0.4800	1316.54	(17)	0.000496	0.000496	1316.64	-0.0946	0.000000	0.009			319.50	997.0449
		25	0.4900	1324.94	(17)	0.000496	0.000496	1324.98	-0.0328	0.000000	0.001			327.90	997.0449
		25	0.5000	1333.34	(17)	0.000497	0.000497	1333.40	-0.0522	0.000000	0.003			336.30	997.0449
		25	0.5100	1341.84	(17)	0.000498	0.000498	1341.90	-0.0534	0.000000	0.003			344.80	997.0449
		25	0.5200	1350.44	(17)	0.000498	0.000498	1350.48	-0.0373	0.000000	0.001			353.40	997.0449
		25	0.5300	1359.14	(17)	0.000499	0.000499	1359.15	-0.0048	0.000000	0.000			362.10	997.0449
		25	0.5400	1367.84	(17)	0.000499	0.000499	1367.90	-0.0565	0.000000	0.003			370.80	997.0449
		25	0.5500	1376.74	(17)	0.000500	0.000500	1376.74	0.0068	0.000000	0.000			379.70	997.0449
		25	0.5600	1385.64	(17)	0.000501	0.000501	1385.66	-0.0158	0.000000	0.000			388.60	997.0449
		25	0.5700	1394.64	(17)	0.000501	0.000501	1394.67	-0.0251	0.000000	0.001			397.60	997.0449
		25	0.5800	1403.74	(17)	0.000502	0.000502	1403.77	-0.0217	0.000000	0.000			406.70	997.0449

molality	molarity	t °C	mass frac	Density exp kg/m ³	Ref	App vol exp m ³ /kg	App vol Calc m ³ /kg	Density calc kg/m ³	Density Residual kg/m ³	App Vol Residual m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m ³	Density of water / kg/m ³
		25	0.5900	1412.94	(17)	0.000503	0.000503	1412.95	-0.0065	0.000000	0.000			415.90	997.0449
		25	0.6000	1422.24	(17)	0.000503	0.000503	1422.23	0.0198	0.000000	0.000			425.20	997.0449
		25	0.6100	1431.54	(17)	0.000504	0.000504	1431.59	-0.0435	0.000000	0.002			434.50	997.0449
		25	0.6200	1441.04	(17)	0.000505	0.000505	1441.04	0.0027	0.000000	0.000			444.00	997.0449
		25	0.6300	1450.54	(17)	0.000505	0.000505	1450.59	-0.0423	0.000000	0.002			453.50	997.0449
		25	0.6400	1460.24	(17)	0.000506	0.000506	1460.22	0.0209	0.000000	0.000			463.20	997.0449
		25	0.6500	1469.94	(17)	0.000507	0.000507	1469.95	-0.0085	0.000000	0.000			472.90	997.0449
		25	0.6600	1479.84	(17)	0.000507	0.000507	1479.78	0.0688	0.000000	0.005			482.80	997.0449
		25	0.6700	1489.74	(17)	0.000508	0.000508	1489.69	0.0521	0.000000	0.003			492.70	997.0449
		25	0.6800	1499.84	(17)	0.000509	0.000509	1499.70	0.1408	0.000000	0.020			502.80	997.0449
		25	0.6900	1509.94	(17)	0.000509	0.000509	1509.81	0.1342	0.000000	0.018			512.90	997.0449
		25	0.7000	1520.14	(17)	0.000510	0.000510	1520.01	0.1317	0.000000	0.017			523.10	997.0449
		25	0.7100	1530.44	(17)	0.000511	0.000511	1530.31	0.1325	0.000000	0.018			533.40	997.0449
		25	0.7200	1540.84	(17)	0.000511	0.000511	1540.71	0.1363	0.000000	0.019			543.80	997.0449
		25	0.7300	1551.34	(17)	0.000512	0.000512	1551.20	0.1423	0.000000	0.020			554.30	997.0449
		25	0.7400	1561.94	(17)	0.000513	0.000513	1561.79	0.1501	0.000000	0.023			564.90	997.0449
		25	0.7500	1572.64	(17)	0.000514	0.000514	1572.49	0.1590	0.000000	0.025			575.60	997.0449
		25	0.7600	1583.34	(17)	0.000514	0.000514	1583.28	0.0687	0.000000	0.005			586.30	997.0449
		25	0.7700	1594.24	(17)	0.000515	0.000515	1594.17	0.0786	0.000000	0.006			597.20	997.0449
		25	0.7800	1605.14	(17)	0.000516	0.000516	1605.16	-0.0116	0.000000	0.000			608.10	997.0449
		25	0.7900	1616.24	(17)	0.000517	0.000517	1616.25	-0.0025	0.000000	0.000			619.20	997.0449
		25	0.8000	1627.44	(17)	0.000517	0.000517	1627.44	0.0058	0.000000	0.000			630.40	997.0449
		25	0.8100	1638.64	(17)	0.000518	0.000518	1638.73	-0.0872	0.000000	0.008			641.60	997.0449
		25	0.8200	1649.94	(17)	0.000519	0.000519	1650.13	-0.1817	0.000000	0.033			652.90	997.0449
		25	0.8300	1661.34	(17)	0.000520	0.000520	1661.62	-0.2780	0.000000	0.077			664.30	997.0449
		25	0.8400	1672.84	(17)	0.000521	0.000520	1673.22	-0.3762	0.000000	0.142			675.80	997.0449
		25	0.8500	1684.44	(17)	0.000521	0.000521	1684.92	-0.4765	0.000000	0.227			687.40	997.0449
		25.18	0.0446	1021.30	(25)	0.000468	0.000474	1021.04	0.2627	-0.000006	0.069				996.9986
		25.18	0.0935	1048.90	(25)	0.000472	0.000476	1048.54	0.3632	-0.000004	0.132				996.9986
		25.18	0.1921	1107.20	(25)	0.000483	0.000480	1107.90	-0.6976	0.000003	0.487				996.9986
		25.18	0.2933	1174.20	(25)	0.000487	0.000485	1174.80	-0.5982	0.000001	0.358				996.9986
		25.18	0.3915	1246.10	(25)	0.000491	0.000491	1246.18	-0.0760	0.000000	0.006				996.9986
		25.18	0.4936	1327.20	(25)	0.000497	0.000497	1327.91	-0.7051	0.000001	0.497				996.9986
		25.18	0.5954	1417.60	(25)	0.000503	0.000503	1417.84	-0.2400	0.000000	0.058				996.9986
		25.18	0.7010	1521.30	(25)	0.000510	0.000510	1520.91	0.3852	0.000000	0.148				996.9986
		25.18	0.7997	1627.10	(25)	0.000517	0.000517	1626.96	0.1382	0.000000	0.019				996.9986
		25.18	0.8481	1682.30	(25)	0.000521	0.000521	1682.54	-0.2422	0.000000	0.059				996.9986
		40.82	0.0446	1015.90	(25)	0.000474	0.000479	1015.67	0.2344	-0.000005	0.055				991.8998
		40.82	0.0935	1042.80	(25)	0.000482	0.000481	1042.85	-0.0500	0.000000	0.003				991.8998
		40.82	0.1921	1100.90	(25)	0.000489	0.000486	1101.52	-0.6219	0.000003	0.387				991.8998
		40.82	0.2933	1166.70	(25)	0.000493	0.000491	1167.64	-0.9361	0.000002	0.876				991.8998
		40.82	0.3915	1237.10	(25)	0.000498	0.000496	1238.17	-1.0704	0.000002	1.146				991.8998
		40.82	0.4936	1318.30	(25)	0.000502	0.000502	1318.94	-0.6377	0.000001	0.407				991.8998
		40.82	0.5954	1407.60	(25)	0.000508	0.000508	1407.83	-0.2337	0.000000	0.055				991.8998
		40.82	0.7010	1509.60	(25)	0.000515	0.000515	1509.77	-0.1651	0.000000	0.027				991.8998

molality	molarity	t °C	mass frac	Density exp kg/m ³	Ref	App vol exp m ³ /kg	App vol Calc m ³ /kg	Density calc kg/m ³	Density Residual kg/m ³	App Vol Residual m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m ³	Density of water / kg/m ³
		40.82	0.7997	1614.90	(25)	0.000522	0.000522	1614.72	0.1822	0.000000	0.033				991.8998
		40.82	0.8481	1669.50	(25)	0.000526	0.000526	1669.77	-0.2696	0.000000	0.073				991.8998
		60.81	0.0446	1006.40	(25)	0.000482	0.000486	1006.22	0.1810	-0.000004	0.033				982.7804
		60.81	0.0935	1032.90	(25)	0.000489	0.000488	1033.03	-0.1322	0.000001	0.017				982.7804
		60.81	0.1921	1091.00	(25)	0.000492	0.000492	1090.92	0.0831	0.000000	0.007				982.7804
		60.81	0.2933	1156.10	(25)	0.000497	0.000497	1156.17	-0.0747	0.000000	0.006				982.7804
		60.81	0.3915	1225.60	(25)	0.000503	0.000502	1225.84	-0.2421	0.000000	0.059				982.7804
		60.81	0.4936	1305.40	(25)	0.000508	0.000508	1305.69	-0.2923	0.000000	0.085				982.7804
		60.81	0.5954	1393.80	(25)	0.000514	0.000514	1393.70	0.1046	0.000000	0.011				982.7804
		60.81	0.7010	1495.00	(25)	0.000520	0.000520	1494.79	0.2113	0.000000	0.045				982.7804
		60.81	0.7997	1598.90	(25)	0.000527	0.000527	1599.13	-0.2338	0.000000	0.055				982.7804
		60.81	0.8481	1655.20	(25)	0.000530	0.000531	1653.99	1.2107	-0.000001	1.466				982.7804
		81.40	0.0446	994.50	(25)	0.000482	0.000493	994.05	0.4499	-0.000010	0.202				970.9207
		81.40	0.0935	1021.00	(25)	0.000490	0.000495	1020.52	0.4804	-0.000005	0.231				970.9207
		81.40	0.1921	1077.60	(25)	0.000499	0.000499	1077.70	-0.1027	0.000000	0.011				970.9207
		81.40	0.2933	1141.50	(25)	0.000505	0.000503	1142.24	-0.7445	0.000002	0.554				970.9207
		81.40	0.3915	1211.60	(25)	0.000507	0.000508	1211.25	0.3509	-0.000001	0.123				970.9207
		81.40	0.4936	1291.10	(25)	0.000512	0.000513	1290.49	0.6115	-0.000001	0.374				970.9207
		81.40	0.5954	1378.80	(25)	0.000518	0.000519	1378.03	0.7689	-0.000001	0.591				970.9207
		81.40	0.7010	1479.40	(25)	0.000525	0.000525	1478.92	0.4847	0.000000	0.235				970.9207
		81.40	0.7997	1583.20	(25)	0.000532	0.000532	1583.46	-0.2617	0.000000	0.068				970.9207
		81.40	0.8481	1637.80	(25)	0.000535	0.000535	1638.62	-0.8164	0.000000	0.666				970.9207
Average Res									0.1060	-0.000005	29.702	Sum chi sqr			
Std dev Res									0.375527	0.000010					
Avg - 4std									-1.3961	-0.000044					
Avg + 4std									1.6081	0.000034					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 t^2) / (c_0 w + c_1) / e^{(0.000001 * (t^2 + c_4))}$

c0 1358.336
 c1 -4327.678
 c2 -4.594996
 c3 0.004383
 c4 -912.4458
 Min T 15.85
 Max T 81.4
 Min w 0.001
 Max w 0.85
 Avg dens res 0.106011
 Std dens res 0.375527
 Avg app vol res *10³ -0.005177
 Std app vol res *10³ 0.009713
 No of points in corr 196
 No of inconsistent pair 0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **H2SO4**

- References (35) Haase, R.; Saurmann, P.-F.; Dücker, K.-H. Conductivity of Concentrated Electrolyte Solutions. V. Sulfuric Acid. *Z. Physik. Chem. N. F.* **1966**, *48*, 206-212.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (103) Przepiera, A.; Zielenkiewicz, A.; Apparent Molar Volumes of Aqueous Solution in the MnSO₄ + H₂SO₄ System; *Bull. Pol. Acad. Sci. Chem.*, **2000**, *48*, 267-272

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m ³
		0	0.0100	1007.40	(90)	0.000250	0.000313	1006.76	0.6405	-0.000063	0.410			999.8395
		0	0.0200	1014.70	(90)	0.000268	0.000315	1013.72	0.9755	-0.000047	0.952			999.8395
		0	0.0300	1021.90	(90)	0.000280	0.000318	1020.74	1.1648	-0.000037	1.357			999.8395
		0	0.0393	1028.60	(35)	0.000288	0.000320	1027.29	1.3105	-0.000032	1.718			999.8395
		0	0.0400	1029.10	(90)	0.000289	0.000320	1027.79	1.3080	-0.000031	1.711			999.8395
		0	0.0500	1036.40	(90)	0.000295	0.000323	1034.90	1.5045	-0.000028	2.264			999.8395
		0	0.0700	1051.10	(35)	0.000303	0.000327	1049.24	1.8557	-0.000024	3.444			999.8395
		0	0.1000	1073.50	(90)	0.000314	0.000334	1071.13	2.3695	-0.000021	5.615			999.8395
		0	0.1456	1108.20	(35)	0.000328	0.000345	1105.26	2.9381	-0.000016	8.632			999.8395
		0	0.1500	1111.60	(90)	0.000330	0.000346	1108.61	2.9878	-0.000016	8.927			999.8395
		0	0.1980	1149.50	(35)	0.000342	0.000357	1145.83	3.6651	-0.000014	13.433			999.8395
		0	0.2000	1151.00	(90)	0.000343	0.000357	1147.41	3.5868	-0.000014	12.865			999.8395
		0	0.2500	1191.40	(90)	0.000357	0.000368	1187.61	3.7880	-0.000011	14.349			999.8395
		0	0.2531	1193.80	(35)	0.000358	0.000368	1190.15	3.6477	-0.000010	13.306			999.8395
		0	0.2947	1228.20	(35)	0.000369	0.000377	1224.80	3.3979	-0.000008	11.545			999.8395
		0	0.3000	1232.60	(90)	0.000371	0.000378	1229.29	3.3067	-0.000007	10.934			999.8395
		0	0.3428	1268.50	(35)	0.000382	0.000386	1266.22	2.2810	-0.000004	5.203			999.8395
		0	0.3500	1274.60	(90)	0.000384	0.000388	1272.55	2.0516	-0.000004	4.209			999.8395
		0	0.3910	1310.00	(35)	0.000395	0.000396	1309.26	0.7387	-0.000001	0.546			999.8395
		0	0.4000	1317.90	(90)	0.000397	0.000397	1317.48	0.4235	-0.000001	0.179			999.8395
		0	0.4394	1353.30	(35)	0.000406	0.000405	1354.13	-0.8284	0.000001	0.686			999.8395
		0	0.4500	1363.00	(90)	0.000408	0.000407	1364.18	-1.1849	0.000001	1.404			999.8395
		0	0.4871	1398.50	(35)	0.000415	0.000413	1400.06	-1.5618	0.000002	2.439			999.8395
		0	0.5000	1411.00	(90)	0.000417	0.000415	1412.79	-1.7905	0.000002	3.206			999.8395
		0	0.5348	1446.20	(35)	0.000423	0.000422	1447.81	-1.6065	0.000001	2.581			999.8395
		0	0.5500	1461.90	(90)	0.000425	0.000424	1463.42	-1.5201	0.000001	2.311			999.8395
		0	0.5835	1497.40	(35)	0.000431	0.000430	1498.54	-1.1428	0.000001	1.306			999.8395
		0	0.6000	1515.40	(90)	0.000433	0.000432	1516.21	-0.8123	0.000001	0.660			999.8395
		0	0.6310	1549.90	(35)	0.000438	0.000437	1550.10	-0.1953	0.000000	0.038			999.8395
		0	0.6500	1571.40	(90)	0.000440	0.000441	1571.32	0.0816	0.000000	0.007			999.8395
		0	0.6754	1600.80	(35)	0.000444	0.000445	1600.25	0.5491	0.000000	0.302			999.8395
		0	0.7000	1629.30	(90)	0.000448	0.000448	1628.90	0.3962	0.000000	0.157			999.8395
		0	0.7228	1656.30	(35)	0.000452	0.000452	1656.03	0.2654	0.000000	0.070			999.8395
		0	0.7706	1713.50	(35)	0.000460	0.000459	1714.79	-1.2919	0.000001	1.669			999.8395
		5.96	0.0001	1000.01	(90)	-0.000452	0.000320	999.98	0.0386	-0.000771	0.001		!	999.9414

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		5.96	0.0001	1000.06	(90)	-0.000162	0.000320	1000.01	0.0481	-0.000481	0.002		!	999.9414
		5.96	0.0002	1000.14	(90)	-0.000010	0.000320	1000.08	0.0659	-0.000329	0.004		!	999.9414
		5.96	0.0003	1000.23	(90)	0.000046	0.000320	1000.15	0.0820	-0.000273	0.007			999.9414
		5.96	0.0004	1000.31	(90)	0.000078	0.000320	1000.21	0.0968	-0.000242	0.009			999.9414
		5.96	0.0005	1000.39	(90)	0.000099	0.000320	1000.28	0.1103	-0.000220	0.012			999.9414
		5.96	0.0006	1000.47	(90)	0.000115	0.000320	1000.35	0.1228	-0.000205	0.015			999.9414
		5.96	0.0007	1000.55	(90)	0.000128	0.000320	1000.42	0.1345	-0.000192	0.018			999.9414
		5.96	0.0008	1000.63	(90)	0.000138	0.000320	1000.49	0.1454	-0.000182	0.021			999.9414
		5.96	0.0009	1000.71	(90)	0.000147	0.000320	1000.55	0.1558	-0.000173	0.024			999.9414
		5.96	0.0010	1000.79	(90)	0.000154	0.000320	1000.62	0.1659	-0.000166	0.028			999.9414
		5.96	0.0015	1001.17	(90)	0.000180	0.000320	1000.96	0.2106	-0.000140	0.044			999.9414
		5.96	0.0020	1001.55	(90)	0.000196	0.000320	1001.30	0.2482	-0.000124	0.062			999.9414
		5.96	0.0025	1001.93	(90)	0.000208	0.000320	1001.64	0.2814	-0.000112	0.079			999.9414
		5.96	0.0030	1002.30	(90)	0.000217	0.000320	1001.98	0.3113	-0.000103	0.097			999.9414
		5.96	0.0035	1002.66	(90)	0.000224	0.000320	1002.33	0.3381	-0.000096	0.114			999.9414
		5.96	0.0040	1003.03	(90)	0.000230	0.000320	1002.67	0.3624	-0.000090	0.131			999.9414
		5.96	0.0045	1003.39	(90)	0.000236	0.000321	1003.01	0.3843	-0.000085	0.148			999.9414
		5.96	0.0050	1003.75	(90)	0.000240	0.000321	1003.35	0.4041	-0.000080	0.163			999.9414
	10	0.0100	1006.80	(90)	0.000295	0.000328	1006.47	0.3348	-0.000033	0.112				999.6996
	10	0.0200	1013.80	(90)	0.000305	0.000330	1013.28	0.5247	-0.000026	0.275				999.6996
	10	0.0300	1020.60	(90)	0.000317	0.000333	1020.13	0.4696	-0.000015	0.220				999.6996
	10	0.0393	1026.90	(35)	0.000326	0.000335	1026.54	0.3603	-0.000009	0.130				999.6996
	10	0.0400	1027.50	(90)	0.000324	0.000335	1027.03	0.4688	-0.000011	0.220				999.6996
	10	0.0500	1034.40	(90)	0.000329	0.000337	1033.98	0.4220	-0.000008	0.178				999.6996
	10	0.0700	1048.50	(35)	0.000335	0.000342	1048.01	0.4879	-0.000006	0.238				999.6996
	10	0.1000	1070.00	(35)	0.000343	0.000348	1069.42	0.5772	-0.000005	0.333				999.6996
	10	0.1000	1070.00	(90)	0.000343	0.000348	1069.42	0.5772	-0.000005	0.333				999.6996
	10	0.1456	1103.60	(35)	0.000353	0.000358	1102.83	0.7747	-0.000004	0.600				999.6996
	10	0.1500	1106.90	(90)	0.000354	0.000359	1106.10	0.7952	-0.000004	0.632				999.6996
	10	0.1980	1143.80	(35)	0.000364	0.000369	1142.55	1.2459	-0.000005	1.552				999.6996
	10	0.2000	1145.30	(90)	0.000364	0.000369	1144.10	1.1998	-0.000005	1.440				999.6996
	10	0.2500	1184.80	(90)	0.000375	0.000379	1183.49	1.3088	-0.000004	1.713				999.6996
	10	0.2531	1187.20	(35)	0.000376	0.000380	1185.98	1.2186	-0.000003	1.485				999.6996
	10	0.2947	1221.10	(35)	0.000385	0.000387	1219.96	1.1388	-0.000003	1.297				999.6996
	10	0.3000	1225.50	(90)	0.000386	0.000388	1224.37	1.1328	-0.000003	1.283				999.6996
	10	0.3428	1261.20	(35)	0.000395	0.000396	1260.61	0.5905	-0.000001	0.349				999.6996
	10	0.3500	1267.20	(90)	0.000397	0.000398	1266.82	0.3752	-0.000001	0.141				999.6996
	10	0.3910	1302.50	(35)	0.000406	0.000405	1302.89	-0.3936	0.000001	0.155				999.6996
	10	0.4000	1310.30	(90)	0.000408	0.000407	1310.97	-0.6690	0.000001	0.448				999.6996
	10	0.4394	1345.60	(35)	0.000415	0.000413	1347.02	-1.4173	0.000002	2.009				999.6996
	10	0.4500	1355.30	(90)	0.000417	0.000415	1356.91	-1.6142	0.000002	2.606				999.6996
	10	0.4871	1390.40	(35)	0.000423	0.000421	1392.24	-1.8427	0.000002	3.396				999.6996

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		10	0.5000	1402.90	(90)	0.000425	0.000423	1404.79	-1.8851	0.000002	3.554			999.6996
		10	0.5348	1437.80	(35)	0.000430	0.000429	1439.31	-1.5115	0.000001	2.285			999.6996
		10	0.5500	1453.50	(90)	0.000432	0.000431	1454.72	-1.2178	0.000001	1.483			999.6996
		10	0.5835	1488.90	(35)	0.000437	0.000437	1489.40	-0.4999	0.000000	0.250			999.6996
		10	0.6000	1506.70	(90)	0.000439	0.000439	1506.86	-0.1615	0.000000	0.026			999.6996
		10	0.6310	1540.90	(35)	0.000444	0.000444	1540.37	0.5281	0.000000	0.279			999.6996
		10	0.6500	1562.30	(90)	0.000446	0.000447	1561.38	0.9204	-0.000001	0.847			999.6996
		10	0.6754	1591.20	(35)	0.000450	0.000450	1590.04	1.1588	-0.000001	1.343			999.6996
		10	0.7000	1619.80	(90)	0.000453	0.000454	1618.45	1.3480	-0.000001	1.817			999.6996
		10	0.7228	1646.70	(35)	0.000457	0.000457	1645.38	1.3220	-0.000001	1.748			999.6996
		10	0.7706	1703.30	(35)	0.000464	0.000464	1703.78	-0.4757	0.000000	0.226			999.6996
		13	0.0005	999.81	(90)	0.000134	0.000330	999.71	0.0979	-0.000196	0.010			999.3771
		13	0.0010	1000.19	(90)	0.000192	0.000330	1000.05	0.1378	-0.000138	0.019			999.3771
		13	0.0020	1000.91	(90)	0.000233	0.000330	1000.72	0.1942	-0.000097	0.038			999.3771
		13	0.0030	1001.62	(90)	0.000253	0.000331	1001.39	0.2342	-0.000078	0.055			999.3771
		13	0.0040	1002.33	(90)	0.000265	0.000331	1002.06	0.2658	-0.000066	0.071			999.3771
		13	0.0050	1003.02	(90)	0.000273	0.000331	1002.73	0.2909	-0.000058	0.085			999.3771
		13	0.0060	1003.72	(90)	0.000280	0.000331	1003.40	0.3116	-0.000052	0.097			999.3771
		13	0.0080	1005.09	(90)	0.000290	0.000332	1004.75	0.3397	-0.000042	0.115			999.3771
		13	0.0100	1006.45	(90)	0.000297	0.000332	1006.10	0.3539	-0.000035	0.125			999.3771
		13	0.0120	1007.81	(90)	0.000303	0.000333	1007.45	0.3594	-0.000030	0.129			999.3771
		13	0.0140	1009.16	(90)	0.000308	0.000333	1008.80	0.3602	-0.000025	0.130			999.3771
		13	0.0160	1010.51	(90)	0.000312	0.000334	1010.15	0.3581	-0.000022	0.128			999.3771
		13	0.0180	1011.86	(90)	0.000315	0.000334	1011.51	0.3532	-0.000019	0.125			999.3771
		13	0.0200	1013.21	(90)	0.000318	0.000334	1012.86	0.3456	-0.000017	0.119			999.3771
		13	0.0220	1014.56	(90)	0.000320	0.000335	1014.22	0.3351	-0.000015	0.112			999.3771
		13	0.0240	1015.90	(90)	0.000322	0.000335	1015.58	0.3218	-0.000013	0.104			999.3771
		18	0.0005	999.03	(90)	0.000135	0.000337	998.93	0.1010	-0.000202	0.010			998.5956
		18	0.0010	999.40	(90)	0.000195	0.000337	999.26	0.1415	-0.000142	0.020			998.5956
		18	0.0020	1000.12	(90)	0.000239	0.000337	999.92	0.1972	-0.000099	0.039			998.5956
		18	0.0030	1000.82	(90)	0.000260	0.000338	1000.59	0.2345	-0.000078	0.055			998.5956
		18	0.0040	1001.51	(90)	0.000272	0.000338	1001.25	0.2623	-0.000065	0.069			998.5956
		18	0.0050	1002.20	(90)	0.000282	0.000338	1001.91	0.2827	-0.000056	0.080			998.5956
		18	0.0060	1002.88	(90)	0.000289	0.000338	1002.58	0.2976	-0.000049	0.089			998.5956
		18	0.0080	1004.23	(90)	0.000299	0.000339	1003.91	0.3161	-0.000039	0.100			998.5956
		18	0.0100	1005.57	(90)	0.000307	0.000339	1005.24	0.3259	-0.000032	0.106			998.5956
		18	0.0120	1006.91	(90)	0.000312	0.000340	1006.58	0.3299	-0.000027	0.109			998.5956
		18	0.0140	1008.25	(90)	0.000317	0.000340	1007.92	0.3311	-0.000023	0.110			998.5956
		18	0.0160	1009.58	(90)	0.000320	0.000340	1009.25	0.3285	-0.000020	0.108			998.5956
		18	0.0180	1010.92	(90)	0.000323	0.000341	1010.59	0.3231	-0.000018	0.104			998.5956
		18	0.0200	1012.25	(90)	0.000326	0.000341	1011.94	0.3150	-0.000015	0.099			998.5956
		18	0.0220	1013.59	(90)	0.000328	0.000342	1013.28	0.3050	-0.000013	0.093			998.5956

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		18	0.0240	1014.92	(90)	0.000330	0.000342	1014.63	0.2923	-0.000012	0.085			998.5956
		20	0.0100	1005.10	(90)	0.000314	0.000342	1004.82	0.2756	-0.000027	0.076			998.2041
		20	0.0200	1011.80	(90)	0.000329	0.000344	1011.49	0.3109	-0.000015	0.097			998.2041
		20	0.0300	1018.40	(90)	0.000340	0.000346	1018.20	0.2014	-0.000006	0.041			998.2041
		20	0.0393	1024.60	(35)	0.000345	0.000348	1024.47	0.1275	-0.000003	0.016			998.2041
		20	0.0400	1025.00	(90)	0.000347	0.000348	1024.95	0.0464	-0.000001	0.002			998.2041
		20	0.0500	1031.70	(90)	0.000351	0.000350	1031.75	-0.0546	0.000001	0.003			998.2041
		20	0.0700	1045.30	(35)	0.000357	0.000354	1045.50	-0.1968	0.000003	0.039			998.2041
		20	0.1000	1066.10	(35)	0.000364	0.000361	1066.47	-0.3696	0.000003	0.137			998.2041
		20	0.1000	1066.10	(90)	0.000364	0.000361	1066.47	-0.3696	0.000003	0.137			998.2041
		20	0.1456	1098.80	(35)	0.000372	0.000370	1099.21	-0.4079	0.000002	0.166			998.2041
		20	0.1500	1102.00	(90)	0.000373	0.000370	1102.42	-0.4235	0.000002	0.179			998.2041
		20	0.1980	1138.00	(35)	0.000380	0.000380	1138.18	-0.1795	0.000001	0.032			998.2041
		20	0.2000	1139.40	(90)	0.000381	0.000380	1139.70	-0.2968	0.000001	0.088			998.2041
		20	0.2500	1178.30	(90)	0.000389	0.000389	1178.38	-0.0767	0.000000	0.006			998.2041
		20	0.2531	1180.70	(35)	0.000390	0.000390	1180.82	-0.1233	0.000000	0.015			998.2041
		20	0.2947	1214.20	(35)	0.000397	0.000397	1214.22	-0.0244	0.000000	0.001			998.2041
		20	0.3000	1218.50	(90)	0.000398	0.000398	1218.56	-0.0578	0.000000	0.003			998.2041
		20	0.3428	1253.90	(35)	0.000406	0.000405	1254.22	-0.3229	0.000001	0.104			998.2041
		20	0.3500	1259.90	(90)	0.000407	0.000406	1260.34	-0.4430	0.000001	0.196			998.2041
		20	0.3910	1295.00	(35)	0.000415	0.000413	1295.88	-0.8823	0.000001	0.779			998.2041
		20	0.4000	1302.80	(90)	0.000416	0.000415	1303.84	-1.0446	0.000002	1.091			998.2041
		20	0.4394	1337.90	(35)	0.000423	0.000421	1339.41	-1.5130	0.000002	2.289			998.2041
		20	0.4500	1347.60	(90)	0.000425	0.000423	1349.19	-1.5853	0.000002	2.513			998.2041
		20	0.4871	1382.60	(35)	0.000430	0.000428	1384.10	-1.4953	0.000002	2.236			998.2041
		20	0.5000	1395.10	(90)	0.000432	0.000430	1396.50	-1.3990	0.000001	1.957			998.2041
		20	0.5348	1429.70	(35)	0.000436	0.000436	1430.67	-0.9713	0.000001	0.943			998.2041
		20	0.5500	1445.30	(90)	0.000438	0.000438	1445.93	-0.6329	0.000001	0.401			998.2041
		20	0.5835	1480.50	(35)	0.000442	0.000443	1480.32	0.1804	0.000000	0.033			998.2041
		20	0.6000	1498.30	(90)	0.000445	0.000445	1497.65	0.6513	0.000000	0.424			998.2041
		20	0.6754	1582.10	(35)	0.000454	0.000455	1580.35	1.7496	-0.000001	3.061			998.2041
		20	0.7228	1637.20	(35)	0.000461	0.000462	1635.51	1.6868	-0.000001	2.845			998.2041
		20	0.7706	1693.50	(35)	0.000468	0.000468	1693.86	-0.3557	0.000000	0.127			998.2041
		25	0.0393	1022.90	(35)	0.000358	0.000354	1023.04	-0.1433	0.000003	0.021			997.0449
		25	0.0700	1043.40	(35)	0.000366	0.000360	1043.86	-0.4574	0.000006	0.209			997.0449
		25	0.1000	1064.00	(35)	0.000372	0.000366	1064.63	-0.6260	0.000006	0.392			997.0449
		25	0.1456	1096.20	(35)	0.000380	0.000375	1097.06	-0.8572	0.000005	0.735			997.0449
		25	0.1980	1135.10	(35)	0.000387	0.000385	1135.68	-0.5829	0.000002	0.340			997.0449
3.0991		25	0.2331	1163.88	(103)	0.000386	0.000391	1162.42	1.4614	-0.000005	2.136			997.0449
		25	0.2531	1177.40	(35)	0.000396	0.000394	1177.97	-0.5740	0.000002	0.329			997.0449
		25	0.2947	1210.70	(35)	0.000402	0.000401	1211.12	-0.4188	0.000001	0.175			997.0449
		25	0.3428	1250.30	(35)	0.000410	0.000409	1250.83	-0.5345	0.000001	0.286			997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
5.5776		25	0.3536	1258.33	(103)	0.000414	0.000411	1259.97	-1.6386	0.000003	2.685			997.0449
		25	0.3910	1291.30	(35)	0.000418	0.000417	1292.23	-0.9283	0.000001	0.862			997.0449
7.0913		25	0.4102	1309.03	(103)	0.000420	0.000420	1309.19	-0.1591	0.000000	0.025			997.0449
		25	0.4394	1334.00	(35)	0.000426	0.000424	1335.51	-1.5143	0.000002	2.293			997.0449
		25	0.4871	1378.70	(35)	0.000433	0.000432	1379.98	-1.2814	0.000001	1.642			997.0449
		25	0.5348	1425.80	(35)	0.000439	0.000438	1426.37	-0.5732	0.000001	0.329			997.0449
		25	0.5835	1476.20	(35)	0.000445	0.000445	1475.87	0.3287	0.000000	0.108			997.0449
		25	0.6310	1527.80	(35)	0.000451	0.000452	1526.38	1.4154	-0.000001	2.003			997.0449
		25	0.6754	1577.60	(35)	0.000456	0.000458	1575.75	1.8514	-0.000001	3.428			997.0449
		25	0.7228	1632.50	(35)	0.000463	0.000464	1630.91	1.5855	-0.000001	2.514			997.0449
		25	0.7706	1688.50	(35)	0.000470	0.000470	1689.33	-0.8298	0.000000	0.689			997.0449
		30	0.0100	1002.20	(90)	0.000348	0.000354	1002.13	0.0673	-0.000007	0.005			995.6473
		30	0.0200	1008.70	(90)	0.000355	0.000356	1008.66	0.0374	-0.000002	0.001			995.6473
		30	0.0300	1015.20	(90)	0.000360	0.000358	1015.24	-0.0376	0.000001	0.001			995.6473
		30	0.0393	1021.10	(35)	0.000367	0.000360	1021.39	-0.2867	0.000007	0.082			995.6473
		30	0.0400	1021.60	(90)	0.000366	0.000360	1021.86	-0.2583	0.000006	0.067			995.6473
		30	0.0500	1028.10	(90)	0.000370	0.000362	1028.53	-0.4252	0.000008	0.181			995.6473
		30	0.0700	1041.40	(35)	0.000374	0.000366	1042.00	-0.6001	0.000008	0.360			995.6473
		30	0.1000	1061.70	(35)	0.000380	0.000372	1062.57	-0.8746	0.000008	0.765			995.6473
		30	0.1000	1061.70	(90)	0.000380	0.000372	1062.57	-0.8746	0.000008	0.765			995.6473
		30	0.1456	1093.60	(35)	0.000387	0.000380	1094.72	-1.1153	0.000006	1.244			995.6473
		30	0.1500	1096.80	(90)	0.000387	0.000381	1097.87	-1.0740	0.000006	1.153			995.6473
		30	0.1980	1132.10	(35)	0.000393	0.000389	1133.02	-0.9165	0.000004	0.840			995.6473
		30	0.2000	1133.50	(90)	0.000394	0.000390	1134.51	-1.0086	0.000004	1.017			995.6473
		30	0.2500	1171.80	(90)	0.000400	0.000398	1172.57	-0.7710	0.000002	0.595			995.6473
		30	0.2531	1174.20	(35)	0.000401	0.000399	1174.98	-0.7802	0.000002	0.609			995.6473
		30	0.2947	1207.30	(35)	0.000407	0.000406	1207.89	-0.5898	0.000001	0.348			995.6473
		30	0.3000	1211.50	(90)	0.000408	0.000406	1212.16	-0.6621	0.000002	0.438			995.6473
		30	0.3428	1246.60	(35)	0.000415	0.000413	1247.35	-0.7493	0.000001	0.562			995.6473
		30	0.3500	1252.60	(90)	0.000416	0.000414	1253.39	-0.7919	0.000001	0.627			995.6473
		30	0.3910	1287.50	(35)	0.000422	0.000421	1288.51	-1.0071	0.000002	1.014			995.6473
		30	0.4000	1295.30	(90)	0.000423	0.000422	1296.38	-1.0806	0.000002	1.168			995.6473
		30	0.4394	1330.30	(35)	0.000429	0.000428	1331.58	-1.2808	0.000002	1.640			995.6473
		30	0.4500	1339.90	(90)	0.000431	0.000429	1341.26	-1.3602	0.000002	1.850			995.6473
		30	0.4871	1374.80	(35)	0.000436	0.000435	1375.87	-1.0679	0.000001	1.140			995.6473
		30	0.5000	1387.20	(90)	0.000437	0.000436	1388.18	-0.9755	0.000001	0.952			995.6473
		30	0.5348	1421.80	(35)	0.000441	0.000441	1422.11	-0.3139	0.000000	0.099			995.6473
		30	0.5500	1437.20	(90)	0.000443	0.000443	1437.29	-0.0858	0.000000	0.007			995.6473
		30	0.5835	1472.10	(35)	0.000447	0.000448	1471.50	0.5953	0.000000	0.354			995.6473
		30	0.6000	1489.80	(90)	0.000449	0.000450	1488.77	1.0327	-0.000001	1.066			995.6473
		30	0.6310	1523.60	(35)	0.000453	0.000454	1521.96	1.6389	-0.000001	2.686			995.6473
		30	0.6500	1544.60	(90)	0.000455	0.000456	1542.81	1.7854	-0.000001	3.188			995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
3.0991 5.5776 7.0913		30	0.6754	1573.20	(35)	0.000458	0.000460	1571.32	1.8783	-0.000001	3.528			995.6473
		30	0.7000	1601.40	(90)	0.000462	0.000463	1599.64	1.7561	-0.000001	3.084			995.6473
		30	0.7228	1627.90	(35)	0.000465	0.000465	1626.55	1.3541	-0.000001	1.834			995.6473
		30	0.7706	1683.60	(35)	0.000472	0.000471	1685.10	-1.4952	0.000001	2.236			995.6473
		35	0.2331	1157.43	(103)	0.000397	0.000400	1156.53	0.9014	-0.000003	0.813			994.0319
		35	0.3536	1250.99	(103)	0.000422	0.000418	1252.82	-1.8250	0.000003	3.330			994.0319
		35	0.4102	1301.53	(103)	0.000427	0.000427	1301.53	-0.0021	0.000000	0.000			994.0319
		40	0.0100	998.60	(90)	0.000364	0.000366	998.58	0.0228	-0.000002	0.001			992.2158
		40	0.0200	1005.00	(90)	0.000367	0.000368	1004.98	0.0163	-0.000001	0.000			992.2158
		40	0.0300	1011.30	(90)	0.000374	0.000369	1011.44	-0.1356	0.000004	0.018			992.2158
		40	0.0393	1017.10	(35)	0.000380	0.000371	1017.47	-0.3708	0.000009	0.138			992.2158
		40	0.0400	1017.60	(90)	0.000379	0.000371	1017.93	-0.3337	0.000008	0.111			992.2158
		40	0.0500	1024.00	(90)	0.000382	0.000373	1024.48	-0.4786	0.000009	0.229			992.2158
		40	0.0700	1037.10	(35)	0.000385	0.000377	1037.71	-0.6113	0.000008	0.374			992.2158
		40	0.1000	1057.00	(35)	0.000390	0.000382	1057.93	-0.9272	0.000008	0.860			992.2158
		40	0.1000	1057.00	(90)	0.000390	0.000382	1057.93	-0.9272	0.000008	0.860			992.2158
		40	0.1456	1088.30	(35)	0.000397	0.000390	1089.54	-1.2363	0.000007	1.529			992.2158
		40	0.1500	1091.40	(90)	0.000397	0.000390	1092.64	-1.2446	0.000007	1.549			992.2158
		40	0.1980	1126.10	(35)	0.000403	0.000398	1127.25	-1.1509	0.000005	1.325			992.2158
		40	0.2000	1127.50	(90)	0.000403	0.000398	1128.72	-1.2213	0.000005	1.492			992.2158
		40	0.2500	1165.30	(90)	0.000409	0.000406	1166.26	-0.9556	0.000003	0.913			992.2158
		40	0.2531	1167.60	(35)	0.000410	0.000407	1168.63	-1.0331	0.000003	1.067			992.2158
		40	0.2947	1200.40	(35)	0.000415	0.000413	1201.13	-0.7330	0.000002	0.537			992.2158
		40	0.3000	1204.60	(90)	0.000416	0.000414	1205.36	-0.7552	0.000002	0.570			992.2158
		40	0.3428	1239.40	(35)	0.000421	0.000420	1240.16	-0.7566	0.000001	0.572			992.2158
		40	0.3500	1245.40	(90)	0.000422	0.000421	1246.14	-0.7378	0.000001	0.544			992.2158
		40	0.3910	1280.20	(35)	0.000428	0.000427	1280.93	-0.7256	0.000001	0.527			992.2158
		40	0.4000	1288.00	(90)	0.000429	0.000428	1288.73	-0.7326	0.000001	0.537			992.2158
		40	0.4394	1322.90	(35)	0.000434	0.000433	1323.67	-0.7664	0.000001	0.587			992.2158
		40	0.4500	1332.50	(90)	0.000436	0.000435	1333.28	-0.7816	0.000001	0.611			992.2158
		40	0.4871	1367.20	(35)	0.000440	0.000440	1367.69	-0.4919	0.000001	0.242			992.2158
		40	0.5000	1379.50	(90)	0.000442	0.000441	1379.94	-0.4415	0.000000	0.195			992.2158
		40	0.5348	1413.90	(35)	0.000446	0.000446	1413.75	0.1463	0.000000	0.021			992.2158
		40	0.5500	1429.30	(90)	0.000447	0.000448	1428.89	0.4147	0.000000	0.172			992.2158
		40	0.5835	1464.00	(35)	0.000451	0.000452	1463.05	0.9499	-0.000001	0.902			992.2158
		40	0.6000	1481.60	(90)	0.000453	0.000454	1480.30	1.2951	-0.000001	1.677			992.2158
		40	0.6310	1515.10	(35)	0.000457	0.000458	1513.52	1.5790	-0.000001	2.493			992.2158
		40	0.6500	1536.10	(90)	0.000459	0.000460	1534.41	1.6864	-0.000001	2.844			992.2158
		40	0.6754	1561.50	(35)	0.000464	0.000463	1563.01	-1.5059	0.000001	2.268			992.2158
		40	0.7000	1592.50	(90)	0.000465	0.000466	1591.45	1.0509	-0.000001	1.104			992.2158
		40	0.7228	1618.80	(35)	0.000468	0.000468	1618.50	0.2999	0.000000	0.090			992.2158
		40	0.7706	1674.10	(35)	0.000475	0.000474	1677.49	-3.3886	0.000002	11.482			992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
3.0991		45	0.2331	1153.08	(103)	0.000398	0.000407	1150.16	2.9173	-0.000009	8.510			990.2132
5.5776		45	0.3536	1245.31	(103)	0.000425	0.000425	1245.42	-0.1139	0.000000	0.013			990.2132
7.0913		45	0.4102	1294.82	(103)	0.000431	0.000432	1293.77	1.0527	-0.000002	1.108			990.2132
		50	0.0100	994.40	(90)	0.000364	0.000376	994.28	0.1152	-0.000012	0.013			988.0363
		50	0.0200	1000.60	(90)	0.000377	0.000378	1000.58	0.0211	-0.000001	0.000			988.0363
		50	0.0300	1006.70	(90)	0.000387	0.000379	1006.92	-0.2193	0.000007	0.048			988.0363
		50	0.0393	1012.60	(35)	0.000387	0.000381	1012.85	-0.2516	0.000006	0.063			988.0363
		50	0.0400	1012.90	(90)	0.000391	0.000381	1013.31	-0.4066	0.000010	0.165			988.0363
		50	0.0500	1019.20	(90)	0.000393	0.000383	1019.74	-0.5415	0.000010	0.293			988.0363
		50	0.0700	1032.10	(35)	0.000395	0.000386	1032.76	-0.6565	0.000009	0.431			988.0363
		50	0.1000	1051.70	(35)	0.000399	0.000391	1052.65	-0.9528	0.000009	0.908			988.0363
		50	0.1000	1051.70	(90)	0.000399	0.000391	1052.65	-0.9528	0.000009	0.908			988.0363
		50	0.1456	1082.70	(35)	0.000404	0.000398	1083.79	-1.0939	0.000006	1.197			988.0363
		50	0.1500	1085.70	(90)	0.000405	0.000399	1086.86	-1.1583	0.000007	1.342			988.0363
		50	0.1980	1119.30	(35)	0.000413	0.000406	1121.00	-1.7020	0.000007	2.897			988.0363
		50	0.2000	1121.50	(90)	0.000410	0.000406	1122.45	-0.9538	0.000004	0.910			988.0363
		50	0.2500	1158.80	(90)	0.000416	0.000413	1159.54	-0.7440	0.000002	0.554			988.0363
		50	0.2531	1161.10	(35)	0.000416	0.000414	1161.90	-0.7954	0.000002	0.633			988.0363
		50	0.2947	1193.50	(35)	0.000421	0.000420	1194.06	-0.5618	0.000001	0.316			988.0363
		50	0.3000	1197.70	(90)	0.000422	0.000420	1198.24	-0.5439	0.000001	0.296			988.0363
		50	0.3428	1232.20	(35)	0.000427	0.000426	1232.74	-0.5446	0.000001	0.297			988.0363
		50	0.3500	1238.30	(90)	0.000428	0.000427	1238.68	-0.3794	0.000001	0.144			988.0363
		50	0.3910	1272.90	(35)	0.000433	0.000432	1273.23	-0.3285	0.000001	0.108			988.0363
		50	0.4000	1280.60	(90)	0.000434	0.000433	1280.99	-0.3892	0.000001	0.152			988.0363
		50	0.4394	1315.50	(35)	0.000439	0.000438	1315.75	-0.2495	0.000000	0.062			988.0363
		50	0.4500	1325.10	(90)	0.000440	0.000440	1325.33	-0.2266	0.000000	0.051			988.0363
		50	0.5000	1371.90	(90)	0.000446	0.000446	1371.86	0.0392	0.000000	0.002			988.0363
		50	0.5348	1406.10	(35)	0.000449	0.000450	1405.64	0.4559	0.000000	0.208			988.0363
		50	0.5500	1421.40	(90)	0.000451	0.000452	1420.78	0.6201	-0.000001	0.384			988.0363
		50	0.5835	1456.00	(35)	0.000455	0.000455	1454.99	1.0068	-0.000001	1.014			988.0363
		50	0.6000	1473.50	(90)	0.000456	0.000457	1472.29	1.2067	-0.000001	1.456			988.0363
		50	0.6310	1506.90	(35)	0.000460	0.000461	1505.64	1.2643	-0.000001	1.598			988.0363
		50	0.6500	1527.70	(90)	0.000462	0.000463	1526.63	1.0655	-0.000001	1.135			988.0363
		50	0.6754	1555.90	(35)	0.000465	0.000465	1555.41	0.4944	0.000000	0.244			988.0363
		50	0.7000	1583.80	(90)	0.000468	0.000468	1584.07	-0.2654	0.000000	0.070			988.0363
		50	0.7228	1610.00	(35)	0.000471	0.000470	1611.36	-1.3582	0.000001	1.845			988.0363
		60	0.0100	989.50	(90)	0.000369	0.000385	989.35	0.1548	-0.000016	0.024			983.1989
		60	0.0200	995.60	(90)	0.000384	0.000387	995.54	0.0619	-0.000003	0.004			983.1989
		60	0.0300	1001.70	(90)	0.000391	0.000388	1001.78	-0.0781	0.000003	0.006			983.1989
		60	0.0400	1007.80	(90)	0.000396	0.000390	1008.07	-0.2660	0.000007	0.071			983.1989
		60	0.0500	1014.00	(90)	0.000399	0.000391	1014.40	-0.4024	0.000008	0.162			983.1989
		60	0.1000	1046.00	(90)	0.000406	0.000399	1046.84	-0.8377	0.000008	0.702			983.1989

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		60	0.1500	1079.80	(90)	0.000410	0.000406	1080.60	-0.7978	0.000005	0.636			983.1989
		60	0.2000	1115.30	(90)	0.000415	0.000413	1115.78	-0.4844	0.000002	0.235			983.1989
		60	0.2500	1152.30	(90)	0.000420	0.000419	1152.51	-0.2091	0.000001	0.044			983.1989
		60	0.3000	1190.90	(90)	0.000426	0.000426	1190.89	0.0059	0.000000	0.000			983.1989
		60	0.3500	1231.10	(90)	0.000432	0.000432	1231.07	0.0254	0.000000	0.001			983.1989
		60	0.4000	1273.20	(90)	0.000438	0.000438	1273.20	0.0007	0.000000	0.000			983.1989
		60	0.4500	1317.70	(90)	0.000443	0.000444	1317.43	0.2667	0.000000	0.071			983.1989
		60	0.5000	1364.40	(90)	0.000449	0.000449	1363.96	0.4401	0.000000	0.194			983.1989
		60	0.5500	1413.70	(90)	0.000454	0.000455	1412.98	0.7167	-0.000001	0.514			983.1989
		60	0.6000	1465.60	(90)	0.000459	0.000460	1464.73	0.8681	-0.000001	0.754			983.1989
		60	0.6500	1519.50	(90)	0.000465	0.000465	1519.46	0.0384	0.000000	0.001			983.1989
		60	0.7000	1575.30	(90)	0.000471	0.000470	1577.46	-2.1606	0.000001	4.668			983.1989
		80	0.0100	977.90	(90)	0.000387	0.000400	977.77	0.1295	-0.000014	0.017			971.7978
		80	0.0200	983.90	(90)	0.000396	0.000402	983.79	0.1080	-0.000006	0.012			971.7978
		80	0.0300	990.00	(90)	0.000398	0.000403	989.86	0.1370	-0.000005	0.019			971.7978
		80	0.0400	996.10	(90)	0.000401	0.000404	995.98	0.1158	-0.000003	0.013			971.7978
		80	0.0500	1002.20	(90)	0.000405	0.000406	1002.16	0.0436	-0.000001	0.002			971.7978
		80	0.1000	1033.80	(90)	0.000412	0.000412	1033.81	-0.0103	0.000000	0.000			971.7978
		80	0.1500	1067.10	(90)	0.000416	0.000418	1066.86	0.2366	-0.000001	0.056			971.7978
		80	0.2000	1102.10	(90)	0.000421	0.000423	1101.43	0.6702	-0.000003	0.449			971.7978
		80	0.2500	1138.80	(90)	0.000425	0.000429	1137.64	1.1646	-0.000004	1.356			971.7978
		80	0.3000	1177.10	(90)	0.000431	0.000434	1175.62	1.4807	-0.000004	2.193			971.7978
		80	0.3500	1216.90	(90)	0.000437	0.000439	1215.54	1.3644	-0.000003	1.862			971.7978
		80	0.4000	1258.90	(90)	0.000442	0.000444	1257.56	1.3442	-0.000002	1.807			971.7978
		80	0.4500	1302.90	(90)	0.000448	0.000449	1301.87	1.0288	-0.000001	1.058			971.7978
		80	0.5000	1349.40	(90)	0.000453	0.000454	1348.70	0.7038	-0.000001	0.495			971.7978
		80	0.5500	1398.40	(90)	0.000458	0.000458	1398.27	0.1288	0.000000	0.017			971.7978
		80	0.6000	1449.70	(90)	0.000464	0.000463	1450.87	-1.1678	0.000001	1.364			971.7978
		80	0.6500	1503.10	(90)	0.000469	0.000467	1506.79	-3.6931	0.000003	13.639			971.7978
		100	0.0100	964.50	(90)	0.000380	0.000412	964.20	0.3000	-0.000032	0.090			958.3637
		100	0.0200	970.50	(90)	0.000391	0.000413	970.09	0.4122	-0.000022	0.170			958.3637
		100	0.0300	976.60	(90)	0.000394	0.000414	976.03	0.5721	-0.000020	0.327			958.3637
		100	0.0400	982.70	(90)	0.000397	0.000415	982.02	0.6790	-0.000018	0.461			958.3637
		100	0.0500	988.80	(90)	0.000401	0.000416	988.07	0.7319	-0.000015	0.536			958.3637
		100	0.1000	1020.40	(90)	0.000409	0.000421	1019.14	1.2565	-0.000012	1.579			958.3637
		100	0.1500	1053.70	(90)	0.000414	0.000426	1051.71	1.9947	-0.000012	3.979			958.3637
		100	0.2000	1088.50	(90)	0.000420	0.000431	1085.88	2.6189	-0.000011	6.858			958.3637
		100	0.2500	1125.00	(90)	0.000425	0.000435	1121.81	3.1874	-0.000010	10.159			958.3637
		100	0.3000	1163.00	(90)	0.000431	0.000440	1159.66	3.3428	-0.000008	11.174			958.3637
		100	0.3500	1202.70	(90)	0.000438	0.000444	1199.59	3.1093	-0.000006	9.668			958.3637
		100	0.4000	1244.60	(90)	0.000444	0.000448	1241.81	2.7902	-0.000005	7.785			958.3637
		100	0.4500	1288.60	(90)	0.000449	0.000452	1286.54	2.0640	-0.000003	4.260			958.3637

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		100	0.5000	1334.80	(90)	0.000455	0.000456	1334.02	0.7811	-0.000001	0.610			958.3637
		100	0.5500	1383.40	(90)	0.000461	0.000459	1384.54	-1.1416	0.000001	1.303			958.3637
		100	0.6000	1434.40	(90)	0.000466	0.000463	1438.43	-4.0261	0.000003	16.209			958.3637
								Average Res	0.0891	-0.000019	433.47	Sum chi sqr		
								Std dev Res	1.1409	0.000066				
								Avg - 4std	-4.4744	-0.000285				
								Avg + 4std	4.6526	0.000246				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 * t \text{ } ^\circ\text{C}) / (c_0 * w + c_1) / e^{(0.000001 * (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	89.891385
c1	224.47991
c2	0.8228534
c3	0.0068422
c4	1571.49
Min T	0
Max T	100
Min w	0.0001
Max w	0.7706
Avg dens res	0.0891376
Std dens res	1.1408776
Avg app vol res *10 ³	-0.019123
Std app vol res *10 ³	0.0663563
No of points in corr	332
No of inconsistent poin	6

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

20	0.6500	1557.80	(90)	0.000448	0.000452	1551.82	5.9754	-0.000004	35.706	!		998.2041
20	0.7000	1615.10	(90)	0.000455	0.000459	1608.66	6.4428	-0.000004	41.510	!		998.2041
50	0.7706	1664.70	(35)	0.000478	0.000475	1671.00	-6.2962	0.000003	39.643	!		988.0363
80	0.7000	1558.20	(90)	0.000476	0.000471	1566.40	-8.1964	0.000005	67.181	!		971.7978
100	0.6500	1487.30	(90)	0.000473	0.000467	1496.04	-8.7402	0.000006	76.392	!		958.3637
100	0.7000	1541.70	(80)	0.000479	0.000470	1557.81	-16.1068	0.000010	259.429	!		958.3637

Density of aqueous solutions of **KCl**

- References
- (20) Dedick, Eugene A.; Hershey, J. Peter; Sotolongo, Sara; Stade, David J.; Millero, Frank J. The PVT Properties of Concentrated Aqueous Electrolytes IX. The Volume Properties of KCl and K₂SO₄ and their Mixtures with NaCl and Na₂SO₄ as a Function of Temperature, *J. Solution Chem.* **1990**, *19*, 353-374
- (28) Gates, J. A.; Wood, R. H. Densities of Aqueous Solutions of NaCl, MgCl₂, KCl, NaBr, LiCl, and CaCl₂ from 0.05 to 5.0 mol kg⁻¹ and 0.1013 to 40 MPa at 298.15K. *J. Chem. Eng. Data* **1985**, *30*, 44-49.
- (31) Gonçalves, F. Kestin, J. The Viscosity of NaCl and KCl solutions in the range 25-50 °C, *Ber. Bunsenges. Phys. Chem.* **1977**, *81*, 1156-1161
- (32) Gucker, F. T.; Stubble, D.; Hill, D. J. The Isentropic Compressibilities of Aqueous Solutions of Some Alkali Halides at 298.15K. *J. Chem. Thermodynamics* **1975**, *7*, 865-869.
- (44) Isono, T. Measurements of Density, Viscosity, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions. *Rikagaku Kenkyusho Hokoku* **1980**, *56*, 103-114.
- (49) Kaminsky, M. Concentration and Temperature Dependence of the Viscosity of Aqueous Solutions of Strong Electrolytes. III. KCl, K₂SO₄, MgCl₂, BeSO₄, and MgSO₄ Solutions. *Z. Phys. Chem. N. F.* **1957**, *12*, 206-231.
- (52) Korosi, A.; Fabuss, B. M. Viscosities of Binary Aqueous Solutions of NaCl, KCl, Na₂SO₄, and MgSO₄ at Concentrations and Temperatures of Interest in Desalination Processes. *J. Chem. Eng. Data* **1968**, *13*, 548-552.
- (62) Lengyel, S.; Tamás, J.; Giber, J.; Holderith, J. Study of Viscosity of Aqueous Alkali Halide Solutions. *Acta Chim. Acad. Sci. Hung.* **1964**, *40*, 125-143.
- (65) MacInnes, D. A.; Dayhoff, M. O. The Partial Molal Volumes of Potassium Chloride, Potassium and Sodium Iodides and Iodine in Aqueous Solution at 25°C. *J. Am. Chem. Soc.* **1952**, *74*, 1017-1020.
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, *61*, 1492-1498.
- (79) Olofsson, Inger V.; Apparent molar heat capacities and volumes of aqueous NaCl, KCl, and KNO₃ at 298.15 K. Comparison of Picker flow calorimeter with other calorimeters, *J. Chem. Thermodynamics*, **1979**, *11*, 1005-1014
- (80) Out, D. J. P.; Los, J. M. Viscosity of Aqueous Solutions of Univalent Electrolytes from 5 to 95°C. *J. Sol. Chem.* **1980**, *9*, 19-35.
- (81) Patterson, B. A.; Call, T. G.; Jardine, J. J.; Origlia-Luster, M. L.; Woolley, E. M.; Thermodynamics for Ionization of Water at Temperatures from 278.15 K to 393.15 K and at the Pressure 0.35 MPa: Apparent Molar Volumes of Aqueous KCl, KOH, and NaOH and Apparent Molar Heat Capacities of Aqueous HCl, KCl, KOH, and NaOH, *J. Chem. Thermodynamics*, **2001**, *33*, 1237-1262
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (114) Saluja, P. P. S.; Lemire, R. J.; LeBlanc, J. C.; High-Temperature Thermodynamics of Aqueous Alkali-Metal Salts; *J. Chem. Thermodynamics*, **1992**, *24*, 181-203
- (135) Zhang, H.-L.; Han, S.-J. Viscosity and Density of Water + Sodium Chloride + Potassium Chloride Solutions at 298.15K. *J. Chem. Eng. Data* **1996**, *41*, 516-520

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
		0	0.0100	1006.61	(90)	0.000327	0.000351	1006.4	0.2382	-0.000024	0.057						999.8395
		0	0.0200	1013.35	(90)	0.000333	0.000353	1013.0	0.3980	-0.000019	0.158						999.8395
		0	0.0400	1026.90	(90)	0.000341	0.000357	1026.3	0.6438	-0.000015	0.414						999.8395
		0	0.0800	1054.31	(90)	0.000354	0.000364	1053.4	0.8683	-0.000010	0.754						999.8395
		0	0.1200	1082.22	(90)	0.000366	0.000372	1081.4	0.8235	-0.000006	0.678						999.8395
		0	0.1600	1110.68	(90)	0.000376	0.000379	1110.1	0.5627	-0.000003	0.317						999.8395
		0	0.2000	1139.73	(90)	0.000386	0.000387	1139.6	0.1345	-0.000001	0.018						999.8395
0.01501		5	0.0011	1000.77	(81)	0.000283	0.000356	1000.7	0.0814	-0.000073	0.007					21.1	999.9638
0.03002		5	0.0022	1001.48	(81)	0.000320	0.000356	1001.4	0.0798	-0.000036	0.006					23.88	999.9638
0.04		5	0.0030	1001.93	(80)	0.000340	0.000356	1001.9	0.0478	-0.000016	0.002						999.9638
0.06004		5	0.0045	1002.94	(81)	0.000335	0.000356	1002.8	0.0959	-0.000021	0.009					24.97	999.9638
0.09		5	0.0067	1004.38	(80)	0.000340	0.000357	1004.3	0.1102	-0.000016	0.012						999.9638

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.10001		5	0.0074	1004.85	(81)	0.000344	0.000357	1004.7	0.0997	-0.000013	0.010					25.61	999.9638
0.12006		5	0.0089	1005.86	(81)	0.000339	0.000357	1005.7	0.1595	-0.000018	0.025					25.3	999.9638
0.16		5	0.0118	1007.77	(80)	0.000343	0.000358	1007.6	0.1764	-0.000015	0.031						999.9638
0.19998		5	0.0147	1009.69	(81)	0.000344	0.000358	1009.5	0.2117	-0.000014	0.045					25.65	999.9638
0.25		5	0.0183	1012.10	(80)	0.000345	0.000359	1011.8	0.2652	-0.000014	0.070						999.9638
0.25017		5	0.0183	1012.10	(81)	0.000345	0.000359	1011.8	0.2598	-0.000014	0.068					25.72	999.9638
0.35002		5	0.0254	1016.76	(81)	0.000351	0.000360	1016.5	0.2524	-0.000010	0.064					26.134	999.9638
0.4		5	0.0290	1019.19	(80)	0.000349	0.000361	1018.8	0.3665	-0.000012	0.134						999.9638
0.45253		5	0.0326	1021.65	(20)	0.000350	0.000361	1021.2	0.4063	-0.000012	0.165				21.69		999.9638
0.49966		5	0.0359	1023.71	(81)	0.000354	0.000362	1023.4	0.2981	-0.000008	0.089					26.402	999.9638
0.49992		5	0.0359	1023.76	(81)	0.000353	0.000362	1023.4	0.3363	-0.000009	0.113					26.327	999.9638
0.7		5	0.0496	1033.00	(80)	0.000355	0.000365	1032.5	0.4930	-0.000009	0.243						999.9638
0.93692		5	0.0653	1043.53	(20)	0.000361	0.000367	1043.0	0.4877	-0.000007	0.238				43.567		999.9638
1		5	0.0694	1046.34	(80)	0.000361	0.000368	1045.8	0.5310	-0.000007	0.282						999.9638
1.39606		5	0.0943	1063.27	(20)	0.000368	0.000373	1062.8	0.4594	-0.000004	0.211					63.302	999.9638
1.91739		5	0.1251	1084.56	(20)	0.000376	0.000379	1084.2	0.3149	-0.000002	0.099					84.595	999.9638
2.39492		5	0.1515	1103.19	(20)	0.000382	0.000383	1103.0	0.1976	-0.000001	0.039				103.227		999.9638
2.96122		5	0.1808	1124.28	(20)	0.000389	0.000389	1124.2	0.0866	0.000000	0.007					124.313	999.9638
3.44657		5	0.2044	1141.52	(20)	0.000393	0.000393	1141.5	0.0122	0.000000	0.000					141.559	999.9638
4.05968		5	0.2323	1162.37	(20)	0.000399	0.000399	1162.3	0.0268	0.000000	0.001					162.403	999.9638
0.5041		10	0.0362	1023.50	(62)	0.000358	0.000368	1023.1	0.3660	-0.000010	0.134						999.6996
0.991		10	0.0688	1045.10	(62)	0.000369	0.000374	1044.7	0.3711	-0.000005	0.138						999.6996
2.0476		10	0.1324	1088.40	(62)	0.000385	0.000385	1088.3	0.0734	0.000000	0.005						999.6996
2.4968		10	0.1569	1105.60	(62)	0.000390	0.000390	1105.6	-0.0035	0.000000	0.000						999.6996
3.0013		10	0.1828	1124.10	(62)	0.000395	0.000395	1124.2	-0.0772	0.000000	0.006						999.6996
3.5327		10	0.2085	1142.90	(62)	0.000399	0.000399	1142.8	0.0572	0.000000	0.003						999.6996
3.9618		10	0.2280	1157.50	(62)	0.000402	0.000403	1157.3	0.2218	-0.000001	0.049						999.6996
	0.001	12.5	0.0001	999.49	(49)	0.000330	0.000364	999.5	0.0025	-0.000034	0.000				0.5		999.4388
	0.0025	12.5	0.0002	999.57	(49)	0.000303	0.000364	999.6	0.0113	-0.000061	0.000				1.3		999.4388
	0.005	12.5	0.0004	999.69	(49)	0.000330	0.000364	999.7	0.0127	-0.000034	0.000				2.5		999.4388
	0.01	12.5	0.0007	999.93	(49)	0.000343	0.000364	999.9	0.0155	-0.000021	0.000				4.9		999.4388
	0.02001	12.5	0.0015	1000.43	(49)	0.000337	0.000364	1000.4	0.0407	-0.000027	0.002				9.9		999.4388
	0.04003	12.5	0.0030	1001.42	(49)	0.000337	0.000364	1001.3	0.0818	-0.000027	0.007				19.8		999.4388
	0.05005	12.5	0.0037	1001.91	(49)	0.000339	0.000365	1001.8	0.0972	-0.000026	0.009				24.7		999.4388
	0.10009	12.5	0.0074	1004.35	(49)	0.000343	0.000365	1004.2	0.1700	-0.000023	0.029				49.1		999.4388
	0.20019	12.5	0.0148	1009.16	(49)	0.000349	0.000367	1008.9	0.2700	-0.000018	0.073				97.3		999.4388
	0.50052	12.5	0.0365	1023.39	(49)	0.000358	0.000370	1022.9	0.4559	-0.000012	0.208				239.6		999.4388
	0.001	15	0.0001	999.15	(49)	0.000330	0.000366	999.1	0.0027	-0.000036	0.000				0.5		999.0996
	0.0025	15	0.0002	999.22	(49)	0.000357	0.000367	999.2	0.0018	-0.000009	0.000				1.2		999.0996
	0.005	15	0.0004	999.35	(49)	0.000330	0.000367	999.3	0.0135	-0.000036	0.000				2.5		999.0996
	0.01	15	0.0007	999.59	(49)	0.000344	0.000367	999.6	0.0171	-0.000023	0.000				4.9		999.0996
0.01501		15	0.0011	999.87	(81)	0.000315	0.000367	999.8	0.0575	-0.000051	0.003					23.5	999.0996
	0.02001	15	0.0015	1000.08	(49)	0.000344	0.000367	1000.0	0.0339	-0.000023	0.001				9.8		999.0996
0.03002		15	0.0022	1000.57	(81)	0.000341	0.000367	1000.5	0.0576	-0.000026	0.003					25.43	999.0996
0.04		15	0.0030	1001.03	(80)	0.000352	0.000367	1001.0	0.0454	-0.000015	0.002						999.0996
	0.04003	15	0.0030	1001.06	(49)	0.000344	0.000367	1001.0	0.0682	-0.000023	0.005				19.6		999.0996
0.05		15	0.0037	1001.51	(44)	0.000352	0.000367	1001.5	0.0553	-0.000015	0.003						999.0996
	0.05005	15	0.0037	1001.55	(49)	0.000344	0.000367	1001.5	0.0852	-0.000023	0.007				24.5		999.0996

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.06004		15	0.0045	1001.99	(81)	0.000353	0.000367	1001.9	0.0625	-0.000014	0.004					26.34	999.0996
0.09		15	0.0067	1003.41	(80)	0.000356	0.000368	1003.3	0.0794	-0.000012	0.006						999.0996
0.1		15	0.0074	1003.83	(44)	0.000364	0.000368	1003.8	0.0315	-0.000004	0.001						999.0996
0.10001		15	0.0074	1003.87	(81)	0.000359	0.000368	1003.8	0.0670	-0.000009	0.004					26.75	999.0996
	0.10009	15	0.0074	1003.97	(49)	0.000348	0.000368	1003.8	0.1461	-0.000020	0.021			48.7			999.0996
0.12006		15	0.0089	1004.85	(81)	0.000356	0.000368	1004.7	0.1104	-0.000012	0.012					26.52	999.0996
0.16		15	0.0118	1006.72	(80)	0.000358	0.000369	1006.6	0.1237	-0.000010	0.015						999.0996
0.19998		15	0.0147	1008.58	(81)	0.000360	0.000369	1008.5	0.1313	-0.000009	0.017					26.86	999.0996
	0.20019	15	0.0148	1008.75	(49)	0.000354	0.000369	1008.5	0.2319	-0.000015	0.054			96.6			999.0996
0.25		15	0.0183	1010.94	(80)	0.000360	0.000370	1010.8	0.1769	-0.000009	0.031						999.0996
0.25017		15	0.0183	1010.92	(81)	0.000362	0.000370	1010.8	0.1472	-0.000008	0.022					26.976	999.0996
0.35002		15	0.0254	1015.44	(81)	0.000368	0.000371	1015.4	0.0897	-0.000003	0.008					27.401	999.0996
0.4		15	0.0290	1017.86	(80)	0.000364	0.000372	1017.6	0.2314	-0.000008	0.054						999.0996
0.44404		15	0.0320	1019.82	(20)	0.000366	0.000372	1019.6	0.1958	-0.000006	0.038				20.722		999.0996
0.49966		15	0.0359	1022.29	(81)	0.000369	0.000373	1022.1	0.1544	-0.000004	0.024					27.487	999.0996
0.49992		15	0.0359	1022.30	(81)	0.000369	0.000373	1022.1	0.1566	-0.000004	0.025					27.483	999.0996
0.5		15	0.0359	1022.27	(44)	0.000370	0.000373	1022.2	0.1186	-0.000003	0.014						999.0996
	0.50052	15	0.0365	1022.86	(49)	0.000364	0.000373	1022.5	0.3530	-0.000009	0.125			237.8			999.0996
0.7		15	0.0496	1031.32	(80)	0.000370	0.000375	1031.1	0.2510	-0.000005	0.063						999.0996
0.90026		15	0.0629	1040.11	(20)	0.000373	0.000378	1039.8	0.2784	-0.000004	0.078				41.009		999.0996
1		15	0.0694	1044.16	(44)	0.000378	0.000379	1044.1	0.0278	-0.000000	0.001						999.0996
1		15	0.0694	1044.35	(80)	0.000376	0.000379	1044.1	0.2178	-0.000003	0.047						999.0996
1.37083		15	0.0927	1059.90	(20)	0.000382	0.000383	1059.8	0.1192	-0.000001	0.014				60.796		999.0996
1.86235		15	0.1219	1079.69	(20)	0.000388	0.000388	1079.7	-0.0033	0.000000	0.000				80.588		999.0996
2		15	0.1298	1084.78	(44)	0.000392	0.000390	1085.1	-0.3263	0.000002	0.106						999.0996
2.35904		15	0.1496	1098.77	(20)	0.000394	0.000393	1098.9	-0.1391	0.000001	0.019				99.672		999.0996
2.87007		15	0.1763	1117.58	(20)	0.000399	0.000398	1117.8	-0.2050	0.000001	0.042				118.484		999.0996
3		15	0.1828	1121.97	(44)	0.000401	0.000399	1122.4	-0.4793	0.000002	0.230						999.0996
3.40223		15	0.2023	1136.30	(20)	0.000404	0.000403	1136.5	-0.2359	0.000001	0.056				137.199		999.0996
3.9512		15	0.2275	1154.74	(20)	0.000408	0.000407	1155.0	-0.2141	0.000001	0.046				155.64		999.0996
4		15	0.2297	1156.12	(44)	0.000409	0.000408	1156.5	-0.4278	0.000001	0.183						999.0996
4.40156		15	0.2471	1169.31	(20)	0.000411	0.000411	1169.4	-0.0940	0.000000	0.009				170.213		999.0996
	0.0025	20	0.0002	998.32	(49)	0.000358	0.000371	998.3	0.0025	-0.000013	0.000			1.2			998.2041
	0.005	20	0.0004	998.44	(49)	0.000358	0.000371	998.4	0.0049	-0.000013	0.000			2.4			998.2041
	0.01	20	0.0007	998.69	(49)	0.000345	0.000371	998.7	0.0199	-0.000027	0.000			4.9			998.2041
	0.02	20	0.0015	999.17	(49)	0.000351	0.000371	999.1	0.0299	-0.000020	0.001			9.7			998.2041
	0.04	20	0.0030	1000.14	(49)	0.000351	0.000372	1000.1	0.0607	-0.000020	0.004			19.4			998.2041
	0.05	20	0.0037	1000.57	(44)	0.000364	0.000372	1000.5	0.0289	-0.000008	0.001						998.2041
	0.05	20	0.0037	1000.62	(49)	0.000353	0.000372	1000.5	0.0714	-0.000019	0.005			24.2			998.2041
0.0988		20	0.0073	1002.90	(62)	0.000360	0.000372	1002.8	0.0888	-0.000012	0.008						998.2041
0.1		20	0.0074	1002.92	(44)	0.000365	0.000372	1002.9	0.0531	-0.000007	0.003						998.2041
	0.1	20	0.0074	1003.02	(49)	0.000355	0.000372	1002.9	0.1279	-0.000017	0.016			48.2			998.2041
		20	0.0100	1004.62	(90)	0.000362	0.000373	1004.5	0.1093	-0.000011	0.012						998.2041
	0.2	20	0.0148	1007.75	(49)	0.000361	0.000374	1007.6	0.1954	-0.000013	0.038			95.6			998.2041
		20	0.0200	1011.03	(90)	0.000366	0.000375	1010.9	0.1677	-0.000008	0.028						998.2041
0.32974		20	0.0240	1013.49	(31)	0.000372	0.000375	1013.4	0.0784	-0.000003	0.006						998.2041
0.5		20	0.0359	1021.16	(44)	0.000375	0.000377	1021.1	0.0817	-0.000002	0.007						998.2041
0.5041		20	0.0362	1021.50	(62)	0.000371	0.000377	1021.3	0.2386	-0.000006	0.057						998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
	0.5	20	0.0365	1021.72	(49)	0.000370	0.000377	1021.4	0.2907	-0.000008	0.085			235.6			998.2041
0.51841		20	0.0372	1021.96	(31)	0.000376	0.000378	1021.9	0.0601	-0.000002	0.004						998.2041
		20	0.0400	1023.91	(90)	0.000373	0.000378	1023.7	0.2095	-0.000005	0.044						998.2041
0.991		20	0.0688	1042.70	(62)	0.000380	0.000383	1042.5	0.1949	-0.000003	0.038						998.2041
1		20	0.0694	1042.86	(44)	0.000384	0.000383	1042.9	-0.0286	0.000000	0.001						998.2041
1.02409		20	0.0709	1043.89	(31)	0.000384	0.000383	1043.9	-0.0236	0.000000	0.001						998.2041
		20	0.0800	1050.03	(90)	0.000384	0.000385	1049.9	0.1115	-0.000001	0.012						998.2041
1.5097		20	0.1012	1064.10	(62)	0.000389	0.000389	1064.1	0.0139	0.000000	0.000						998.2041
1.54691		20	0.1034	1065.44	(31)	0.000390	0.000389	1065.6	-0.1542	0.000001	0.024						998.2041
		20	0.1200	1076.79	(90)	0.000393	0.000392	1076.9	-0.0694	0.000000	0.005						998.2041
2		20	0.1298	1083.27	(44)	0.000396	0.000394	1083.5	-0.2734	0.000002	0.075						998.2041
2.0476		20	0.1324	1085.30	(62)	0.000395	0.000394	1085.4	-0.0855	0.000001	0.007						998.2041
2.10665		20	0.1357	1087.37	(31)	0.000397	0.000395	1087.7	-0.2895	0.000002	0.084						998.2041
2.4968		20	0.1569	1102.20	(62)	0.000399	0.000399	1102.4	-0.1761	0.000001	0.031						998.2041
		20	0.1600	1104.34	(90)	0.000400	0.000399	1104.5	-0.1806	0.000001	0.033						998.2041
2.72517		20	0.1689	1110.37	(31)	0.000403	0.000401	1110.7	-0.3785	0.000002	0.143						998.2041
3		20	0.1828	1120.18	(44)	0.000405	0.000403	1120.6	-0.4152	0.000002	0.172						998.2041
3.0013		20	0.1828	1120.50	(62)	0.000404	0.000403	1120.6	-0.1412	0.000001	0.020						998.2041
		20	0.2000	1132.80	(90)	0.000407	0.000406	1132.9	-0.0954	0.000000	0.009						998.2041
3.42161		20	0.2032	1134.90	(31)	0.000408	0.000407	1135.2	-0.3316	0.000001	0.110						998.2041
3.5327		20	0.2085	1139.00	(62)	0.000408	0.000408	1139.0	0.0036	0.000000	0.000						998.2041
3.93033		20	0.2266	1151.93	(31)	0.000412	0.000411	1152.2	-0.2391	0.000001	0.057						998.2041
3.9618		20	0.2280	1153.30	(62)	0.000411	0.000411	1153.2	0.1081	0.000000	0.012						998.2041
4		20	0.2297	1154.10	(44)	0.000413	0.000412	1154.4	-0.3295	0.000001	0.109						998.2041
		20	0.2400	1162.26	(90)	0.000413	0.000413	1162.0	0.2875	-0.000001	0.083						998.2041
4.55469		20	0.2535	1171.94	(31)	0.000416	0.000416	1171.9	0.0023	0.000000	0.000						998.2041
0.01013		24.04	0.0008	997.99	(114)	0.000064	0.000375	997.8	0.2337	-0.000311	0.055		!				997.2867
0.03034		24.04	0.0023	998.95	(114)	0.000265	0.000375	998.7	0.2480	-0.000110	0.061						997.2867
0.10983		24.04	0.0081	1002.67	(114)	0.000340	0.000376	1002.4	0.2897	-0.000035	0.084						997.2867
0.19497		24.04	0.0143	1006.62	(114)	0.000354	0.000377	1006.3	0.3339	-0.000023	0.112						997.2867
0.29443		24.04	0.0215	1011.14	(114)	0.000363	0.000378	1010.8	0.3279	-0.000015	0.107						997.2867
0.41553		24.04	0.0300	1016.60	(114)	0.000369	0.000380	1016.3	0.3398	-0.000011	0.115						997.2867
0.57041		24.04	0.0408	1023.51	(114)	0.000373	0.000381	1023.1	0.3577	-0.000008	0.128						997.2867
	0.0025	25	0.0002	997.16	(49)	0.000359	0.000375	997.2	0.0030	-0.000016	0.000			1.2			997.0449
	0.00499	25	0.0004	997.28	(49)	0.000358	0.000375	997.3	0.0065	-0.000017	0.000			2.4			997.0449
		25	0.0006	997.49	(65)	0.000313	0.000375	997.4	0.0398	-0.000062	0.002						997.0449
	0.00999	25	0.0007	997.52	(49)	0.000358	0.000375	997.5	0.0125	-0.000017	0.000			4.8			997.0449
		25	0.0010	997.70	(65)	0.000332	0.000375	997.7	0.0422	-0.000043	0.002						997.0449
0.01501		25	0.0011	997.79	(81)	0.000331	0.000375	997.7	0.0491	-0.000044	0.002					24.7	997.0449
		25	0.0011	997.80	(65)	0.000335	0.000375	997.8	0.0463	-0.000041	0.002						997.0449
	0.01998	25	0.0015	998.00	(49)	0.000358	0.000375	998.0	0.0252	-0.000017	0.001			9.6			997.0449
0.0214		25	0.0016	998.10	(135)	0.000337	0.000375	998.0	0.0605	-0.000038	0.004						997.0449
0.03002		25	0.0022	998.48	(81)	0.000355	0.000376	998.4	0.0449	-0.000020	0.002					26.5	997.0449
0.04		25	0.0030	998.96	(80)	0.000356	0.000376	998.9	0.0577	-0.000019	0.003						997.0449
	0.03995	25	0.0030	998.96	(49)	0.000358	0.000376	998.9	0.0517	-0.000017	0.003			19.2			997.0449
	0.042077	25	0.0031	999.02	(32)	0.000370	0.000376	999.0	0.0174	-0.000006	0.000						997.0449
0.04642		25	0.0034	999.21	(79)	0.000371	0.000376	999.2	0.0151	-0.000004	0.000					27.69	997.0449
0.05		25	0.0037	999.38	(44)	0.000372	0.000376	999.4	0.0144	-0.000004	0.000						997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
	0.04994	25	0.0037	999.43	(49)	0.000361	0.000376	999.4	0.0550	-0.000015	0.003			23.9			997.0449
0.05103		25	0.0038	999.43	(20)	0.000371	0.000376	999.4	0.0186	-0.000005	0.000				2.387		997.0449
0.05581		25	0.0041	999.69	(20)	0.000363	0.000376	999.6	0.0544	-0.000013	0.003				2.644		997.0449
0.0585		25	0.0043	999.62	(28)	0.000408	0.000376	999.8	-0.1381	0.000032	0.019				2.576		997.0449
0.059		25	0.0044	999.90	(135)	0.000349	0.000376	999.8	0.1179	-0.000027	0.014						997.0449
0.06004		25	0.0045	999.87	(81)	0.000368	0.000376	999.8	0.0353	-0.000008	0.001					27.44	997.0449
0.08221		25	0.0061	1000.89	(79)	0.000371	0.000376	1000.9	0.0304	-0.000005	0.001					27.68	997.0449
0.087		25	0.0064	1001.12	(28)	0.000370	0.000376	1001.1	0.0401	-0.000006	0.002				4.071		997.0449
0.08769		25	0.0065	1001.13	(20)	0.000373	0.000376	1001.1	0.0233	-0.000004	0.001				4.086		997.0449
0.09		25	0.0067	1001.30	(80)	0.000363	0.000376	1001.2	0.0858	-0.000013	0.007						997.0449
0.0955		25	0.0071	1001.50	(135)	0.000372	0.000376	1001.5	0.0322	-0.000005	0.001						997.0449
0.09635		25	0.0071	1001.56	(20)	0.000369	0.000376	1001.5	0.0519	-0.000007	0.003				4.514		997.0449
0.09974		25	0.0074	1001.75	(73)	0.000365	0.000376	1001.7	0.0868	-0.000012	0.008						997.0449
0.0999		25	0.0074	1001.70	(52)	0.000373	0.000376	1001.7	0.0294	-0.000004	0.001						997.0449
0.1		25	0.0074	1001.73	(44)	0.000369	0.000376	1001.7	0.0548	-0.000007	0.003						997.0449
0.10001		25	0.0074	1001.73	(81)	0.000369	0.000376	1001.7	0.0546	-0.000007	0.003					27.52	997.0449
	0.09988	25	0.0074	1001.79	(49)	0.000364	0.000376	1001.7	0.0950	-0.000013	0.009			47.6			997.0449
0.11238		25	0.0083	1002.28	(79)	0.000373	0.000377	1002.2	0.0324	-0.000004	0.001					27.79	997.0449
0.12006		25	0.0089	1002.68	(81)	0.000367	0.000377	1002.6	0.0845	-0.000009	0.007					27.38	997.0449
0.134		25	0.0099	1003.30	(135)	0.000371	0.000377	1003.2	0.0606	-0.000006	0.004						997.0449
		25	0.0100	1003.42	(90)	0.000366	0.000377	1003.3	0.1124	-0.000011	0.013						997.0449
0.14839		25	0.0109	1003.94	(79)	0.000373	0.000377	1003.9	0.0403	-0.000004	0.002					27.84	997.0449
		25	0.0117	1004.46	(65)	0.000368	0.000377	1004.4	0.1092	-0.000009	0.012						997.0449
0.1597		25	0.0118	1004.60	(135)	0.000362	0.000377	1004.4	0.1816	-0.000015	0.033						997.0449
0.16		25	0.0118	1004.55	(80)	0.000367	0.000377	1004.4	0.1178	-0.000010	0.014						997.0449
	0.160378	25	0.0119	1004.61	(32)	0.000368	0.000377	1004.5	0.1061	-0.000009	0.011						997.0449
0.17219		25	0.0127	1005.04	(79)	0.000374	0.000377	1005.0	0.0471	-0.000004	0.002					27.86	997.0449
0.1991		25	0.0146	1006.34	(73)	0.000370	0.000378	1006.2	0.1197	-0.000008	0.014						997.0449
0.19998		25	0.0147	1006.34	(81)	0.000372	0.000378	1006.3	0.0798	-0.000005	0.006					27.76	997.0449
	0.19975	25	0.0148	1006.48	(49)	0.000368	0.000378	1006.3	0.1496	-0.000010	0.022			94.6			997.0449
0.20274		25	0.0149	1006.43	(79)	0.000375	0.000378	1006.4	0.0450	-0.000003	0.002					27.94	997.0449
0.25		25	0.0183	1008.69	(80)	0.000370	0.000378	1008.5	0.1520	-0.000008	0.023						997.0449
0.25017		25	0.0183	1008.64	(81)	0.000373	0.000378	1008.5	0.0913	-0.000005	0.008					27.84	997.0449
0.2555		25	0.0187	1008.88	(28)	0.000373	0.000378	1008.8	0.0971	-0.000005	0.009				11.84		997.0449
	0.265137	25	0.0196	1009.47	(32)	0.000372	0.000379	1009.4	0.1238	-0.000006	0.015						997.0449
		25	0.0200	1009.77	(90)	0.000371	0.000379	1009.6	0.1551	-0.000008	0.024						997.0449
0.29381		25	0.0214	1010.57	(79)	0.000377	0.000379	1010.5	0.0426	-0.000002	0.002					28.1	997.0449
0.30304		25	0.0221	1011.08	(73)	0.000373	0.000379	1010.9	0.1387	-0.000006	0.019						997.0449
0.3197		25	0.0233	1011.80	(135)	0.000375	0.000379	1011.7	0.1064	-0.000004	0.011						997.0449
0.32974		25	0.0240	1012.21	(31)	0.000377	0.000379	1012.1	0.0635	-0.000003	0.004						997.0449
		25	0.0251	1013.00	(65)	0.000375	0.000379	1012.9	0.1200	-0.000005	0.014						997.0449
0.35002		25	0.0254	1013.06	(81)	0.000379	0.000380	1013.1	0.0044	0.000000	0.000					28.283	997.0449
	0.359371	25	0.0264	1013.76	(32)	0.000377	0.000380	1013.7	0.0613	-0.000002	0.004						997.0449
0.3686		25	0.0267	1013.95	(79)	0.000378	0.000380	1013.9	0.0525	-0.000002	0.003					28.17	997.0449
0.4		25	0.0290	1015.49	(80)	0.000374	0.000380	1015.3	0.1868	-0.000006	0.035						997.0449
0.40037		25	0.0290	1015.46	(73)	0.000375	0.000380	1015.3	0.1402	-0.000005	0.020						997.0449
0.43865		25	0.0317	1017.11	(20)	0.000378	0.000381	1017.0	0.0782	-0.000002	0.006				20.064		997.0449
0.4432		25	0.0320	1017.32	(28)	0.000378	0.000381	1017.2	0.0842	-0.000003	0.007				20.273		997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.45498		25	0.0328	1017.72	(20)	0.000382	0.000381	1017.8	-0.0358	0.000001	0.001				20.678		997.0449
0.48243		25	0.0347	1019.00	(79)	0.000381	0.000381	1019.0	0.0161	0.000000	0.000					28.38	997.0449
0.4944		25	0.0355	1019.70	(135)	0.000376	0.000381	1019.5	0.1886	-0.000005	0.036						997.0449
0.49966		25	0.0359	1019.85	(81)	0.000379	0.000381	1019.7	0.1034	-0.000003	0.011					28.222	997.0449
0.49992		25	0.0359	1019.80	(81)	0.000380	0.000381	1019.8	0.0484	-0.000001	0.002					28.332	997.0449
0.5		25	0.0359	1019.77	(44)	0.000381	0.000381	1019.8	0.0102	0.000000	0.000						997.0449
0.50389		25	0.0362	1020.07	(73)	0.000378	0.000381	1019.9	0.1377	-0.000004	0.019						997.0449
0.5041		25	0.0362	1020.10	(62)	0.000377	0.000381	1019.9	0.1583	-0.000004	0.025						997.0449
	0.49933	25	0.0365	1020.30	(49)	0.000377	0.000381	1020.1	0.1845	-0.000005	0.034			233.2			997.0449
0.51841		25	0.0372	1020.61	(31)	0.000381	0.000382	1020.6	0.0343	-0.000001	0.001						997.0449
	0.509858	25	0.0372	1020.70	(32)	0.000379	0.000382	1020.6	0.1012	-0.000003	0.010						997.0449
0.5331		25	0.0382	1021.30	(135)	0.000380	0.000382	1021.2	0.0743	-0.000002	0.006						997.0449
		25	0.0400	1022.55	(90)	0.000378	0.000382	1022.4	0.1863	-0.000004	0.035						997.0449
0.5687		25	0.0407	1022.82	(79)	0.000381	0.000382	1022.8	0.0279	-0.000001	0.001					28.44	997.0449
		25	0.0428	1024.30	(65)	0.000380	0.000382	1024.2	0.1307	-0.000003	0.017						997.0449
0.6066		25	0.0433	1024.45	(79)	0.000383	0.000383	1024.5	-0.0111	0.000000	0.000					28.54	997.0449
0.61488		25	0.0438	1024.96	(73)	0.000380	0.000383	1024.8	0.1325	-0.000003	0.018						997.0449
	0.636132	25	0.0462	1026.48	(32)	0.000380	0.000383	1026.4	0.1255	-0.000003	0.016						997.0449
0.7		25	0.0496	1028.72	(80)	0.000380	0.000384	1028.5	0.1732	-0.000003	0.030						997.0449
0.7069		25	0.0501	1028.90	(52)	0.000383	0.000384	1028.8	0.0530	-0.000001	0.003						997.0449
0.72503		25	0.0513	1029.76	(73)	0.000382	0.000384	1029.6	0.1252	-0.000002	0.016						997.0449
0.7618		25	0.0537	1031.20	(79)	0.000385	0.000384	1031.2	-0.0268	0.000000	0.001					28.69	997.0449
0.8096		25	0.0569	1033.24	(79)	0.000386	0.000385	1033.3	-0.0525	0.000001	0.003					28.76	997.0449
0.82477		25	0.0579	1034.07	(73)	0.000383	0.000385	1033.9	0.1253	-0.000002	0.016						997.0449
0.89356		25	0.0625	1036.70	(20)	0.000389	0.000386	1036.9	-0.1886	0.000003	0.036				39.66		997.0449
0.90321		25	0.0631	1037.18	(20)	0.000388	0.000386	1037.3	-0.1278	0.000002	0.016				40.133		997.0449
0.92801		25	0.0647	1038.47	(73)	0.000385	0.000386	1038.4	0.1069	-0.000002	0.011						997.0449
0.9414		25	0.0656	1038.85	(79)	0.000387	0.000386	1038.9	-0.0797	0.000001	0.006					28.89	997.0449
0.9477		25	0.0660	1039.30	(135)	0.000385	0.000386	1039.2	0.0991	-0.000001	0.010						997.0449
0.991		25	0.0688	1041.20	(62)	0.000385	0.000387	1041.0	0.1622	-0.000002	0.026						997.0449
1		25	0.0694	1041.35	(44)	0.000388	0.000387	1041.4	-0.0687	0.000001	0.005						997.0449
1		25	0.0694	1041.52	(80)	0.000386	0.000387	1041.4	0.1013	-0.000001	0.010						997.0449
1.00491		25	0.0697	1041.73	(73)	0.000386	0.000387	1041.6	0.1037	-0.000001	0.011						997.0449
1.0096		25	0.0700	1041.74	(79)	0.000388	0.000387	1041.8	-0.0892	0.000001	0.008					28.95	997.0449
1.018		25	0.0705	1042.19	(28)	0.000387	0.000387	1042.2	0.0125	0.000000	0.000				45.147		997.0449
	0.987727	25	0.0706	1042.40	(32)	0.000385	0.000387	1042.2	0.1508	-0.000002	0.023						997.0449
	0.98953	25	0.0708	1042.41	(32)	0.000386	0.000387	1042.3	0.0756	-0.000001	0.006						997.0449
1.02409		25	0.0709	1042.37	(31)	0.000388	0.000387	1042.4	-0.0665	0.000001	0.004						997.0449
1.1593		25	0.0796	1047.98	(79)	0.000390	0.000389	1048.1	-0.1233	0.000001	0.015					29.09	997.0449
		25	0.0800	1048.47	(90)	0.000388	0.000389	1048.4	0.0701	-0.000001	0.005						997.0449
1.2157		25	0.0831	1050.32	(79)	0.000391	0.000389	1050.5	-0.1350	0.000001	0.018					29.14	997.0449
1.2173		25	0.0832	1050.70	(135)	0.000387	0.000389	1050.5	0.1831	-0.000002	0.034						997.0449
1.2968		25	0.0882	1053.90	(135)	0.000389	0.000390	1053.8	0.1007	-0.000001	0.010						997.0449
1.3584		25	0.0920	1056.40	(135)	0.000390	0.000391	1056.3	0.0742	-0.000001	0.006						997.0449
1.37765		25	0.0931	1056.74	(20)	0.000395	0.000391	1057.1	-0.3674	0.000004	0.135				59.7		997.0449
1.38366		25	0.0935	1056.97	(20)	0.000395	0.000391	1057.4	-0.3877	0.000004	0.150				59.925		997.0449
1.4139		25	0.0954	1058.40	(52)	0.000393	0.000391	1058.6	-0.1896	0.000002	0.036						997.0449
1.4195		25	0.0957	1058.58	(79)	0.000394	0.000392	1058.8	-0.2418	0.000002	0.058					29.36	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
	1.433396	25	0.1006	1062.05	(32)	0.000393	0.000392	1062.1	-0.0568	0.000001	0.003						997.0449
	1.452132	25	0.1019	1062.93	(32)	0.000393	0.000393	1062.9	-0.0008	0.000000	0.000						997.0449
1.54691		25	0.1034	1063.76	(31)	0.000395	0.000393	1064.0	-0.2074	0.000002	0.043						997.0449
1.6048		25	0.1069	1066.04	(79)	0.000396	0.000393	1066.3	-0.2516	0.000002	0.063				29.49		997.0449
1.7032		25	0.1127	1070.10	(135)	0.000395	0.000394	1070.2	-0.1016	0.000001	0.010						997.0449
1.7218		25	0.1138	1070.90	(135)	0.000395	0.000395	1070.9	-0.0375	0.000000	0.001						997.0449
1.7758		25	0.1169	1073.20	(135)	0.000394	0.000395	1073.1	0.1332	-0.000001	0.018						997.0449
		25	0.1200	1075.06	(90)	0.000396	0.000396	1075.2	-0.0954	0.000001	0.009						997.0449
1.84381		25	0.1209	1075.25	(20)	0.000399	0.000396	1075.7	-0.4833	0.000003	0.234				78.205		997.0449
1.847		25	0.1210	1075.50	(79)	0.000398	0.000396	1075.9	-0.3597	0.000003	0.129					29.71	997.0449
2		25	0.1298	1081.43	(44)	0.000400	0.000397	1081.8	-0.3636	0.000002	0.132						997.0449
2.0087		25	0.1303	1081.78	(79)	0.000400	0.000398	1082.1	-0.3523	0.000002	0.124					29.81	997.0449
	1.892966	25	0.1304	1082.25	(32)	0.000397	0.000398	1082.2	0.0197	0.000000	0.000						997.0449
2.0476		25	0.1324	1083.50	(62)	0.000399	0.000398	1083.6	-0.1232	0.000001	0.015						997.0449
	1.956091	25	0.1344	1084.90	(32)	0.000399	0.000398	1085.0	-0.0795	0.000001	0.006						997.0449
2.10665		25	0.1357	1085.56	(31)	0.000400	0.000398	1085.9	-0.3216	0.000002	0.103						997.0449
2.2846		25	0.1455	1092.60	(135)	0.000400	0.000400	1092.6	-0.0136	0.000000	0.000						997.0449
2.35		25	0.1491	1094.87	(28)	0.000402	0.000401	1095.1	-0.1922	0.000001	0.037				97.823		997.0449
2.36692		25	0.1500	1095.03	(20)	0.000405	0.000401	1095.7	-0.6648	0.000004	0.442				97.981		997.0449
2.3745		25	0.1504	1095.32	(20)	0.000405	0.000401	1096.0	-0.6480	0.000004	0.420				98.28		997.0449
2.424		25	0.1531	1097.80	(135)	0.000402	0.000402	1097.8	-0.0107	0.000000	0.000						997.0449
2.4968		25	0.1569	1100.30	(62)	0.000403	0.000402	1100.5	-0.1984	0.000001	0.039						997.0449
		25	0.1600	1102.45	(90)	0.000404	0.000403	1102.6	-0.1784	0.000001	0.032						997.0449
2.72517		25	0.1689	1108.45	(31)	0.000406	0.000404	1108.8	-0.3644	0.000002	0.133						997.0449
	2.547544	25	0.1711	1110.39	(32)	0.000404	0.000405	1110.3	0.0418	0.000000	0.002						997.0449
2.7977		25	0.1726	1111.40	(135)	0.000405	0.000405	1111.4	-0.0194	0.000000	0.000						997.0449
2.88083		25	0.1768	1113.67	(20)	0.000409	0.000406	1114.4	-0.7112	0.000003	0.506				116.628		997.0449
2.89358		25	0.1774	1114.11	(20)	0.000409	0.000406	1114.8	-0.7269	0.000003	0.528				117.065		997.0449
3		25	0.1828	1118.28	(44)	0.000408	0.000407	1118.6	-0.3152	0.000001	0.099						997.0449
3.0013		25	0.1828	1118.50	(62)	0.000407	0.000407	1118.6	-0.1409	0.000001	0.020						997.0449
3.012		25	0.1834	1118.74	(28)	0.000408	0.000407	1119.0	-0.2728	0.000001	0.074				121.699		997.0449
	2.754042	25	0.1835	1119.18	(32)	0.000406	0.000407	1119.1	0.0994	0.000000	0.010						997.0449
		25	0.2000	1130.72	(90)	0.000410	0.000410	1130.8	-0.0937	0.000000	0.009						997.0449
3.3554		25	0.2001	1130.90	(135)	0.000410	0.000410	1130.9	0.0124	0.000000	0.000						997.0449
3.41002		25	0.2027	1132.01	(20)	0.000413	0.000410	1132.7	-0.7322	0.000003	0.536				134.965		997.0449
3.4123		25	0.2028	1132.18	(20)	0.000413	0.000410	1132.8	-0.6364	0.000002	0.405				135.138		997.0449
3.42161		25	0.2032	1132.86	(31)	0.000411	0.000410	1133.1	-0.2744	0.000001	0.075						997.0449
3.4934		25	0.2066	1135.60	(135)	0.000411	0.000411	1135.6	0.0444	0.000000	0.002						997.0449
3.5327		25	0.2085	1136.80	(62)	0.000412	0.000411	1136.9	-0.0744	0.000000	0.006						997.0449
3.5347		25	0.2086	1136.90	(52)	0.000411	0.000411	1136.9	-0.0414	0.000000	0.002						997.0449
3.5485		25	0.2092	1137.50	(135)	0.000411	0.000411	1137.4	0.0967	0.000000	0.009						997.0449
	3.225612	25	0.2111	1138.96	(32)	0.000411	0.000412	1138.8	0.1632	-0.000001	0.027						997.0449
3.93033		25	0.2266	1149.82	(31)	0.000415	0.000414	1150.0	-0.1410	0.000000	0.020						997.0449
3.93177		25	0.2267	1149.60	(20)	0.000416	0.000414	1150.0	-0.4046	0.000001	0.164				152.558		997.0449
3.9487		25	0.2274	1150.80	(135)	0.000414	0.000415	1150.6	0.2455	-0.000001	0.060						997.0449
3.95785		25	0.2278	1150.44	(20)	0.000416	0.000415	1150.8	-0.4058	0.000001	0.165				153.399		997.0449
3.9618		25	0.2280	1151.10	(62)	0.000414	0.000415	1151.0	0.1229	0.000000	0.015						997.0449
4		25	0.2297	1152.03	(44)	0.000416	0.000415	1152.2	-0.1767	0.000001	0.031						997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
	3.577974	25	0.2312	1153.75	(32)	0.000414	0.000415	1153.3	0.4548	-0.000001	0.207						997.0449
		25	0.2400	1159.95	(90)	0.000416	0.000417	1159.7	0.2491	-0.000001	0.062						997.0449
4.40004		25	0.2470	1164.34	(20)	0.000420	0.000418	1164.8	-0.4923	0.000001	0.242				167.3		997.0449
4.40058		25	0.2470	1164.61	(20)	0.000419	0.000418	1164.9	-0.2431	0.000001	0.059				167.566		997.0449
4.55469		25	0.2535	1169.75	(31)	0.000419	0.000419	1169.6	0.1477	0.000000	0.022						997.0449
	4.006439	25	0.2550	1171.34	(32)	0.000418	0.000420	1170.7	0.6184	-0.000002	0.382						997.0449
4.603		25	0.2555	1171.70	(135)	0.000418	0.000420	1171.1	0.6223	-0.000002	0.387						997.0449
4.6934		25	0.2592	1174.40	(62)	0.000419	0.000420	1173.8	0.5782	-0.000002	0.334						997.0449
4.8181		25	0.2643	1178.20	(135)	0.000419	0.000421	1177.6	0.6280	-0.000002	0.394						997.0449
	0.001	30	0.0001	995.70	(49)	0.000334	0.000379	995.7	0.0033	-0.000045	0.000			0.5			995.6473
	0.00249	30	0.0002	995.77	(49)	0.000358	0.000379	995.8	0.0039	-0.000021	0.000			1.2			995.6473
	0.00499	30	0.0004	995.89	(49)	0.000359	0.000379	995.9	0.0073	-0.000020	0.000			2.4			995.6473
	0.00997	30	0.0007	996.13	(49)	0.000359	0.000379	996.1	0.0150	-0.000020	0.000			4.8			995.6473
	0.01995	30	0.0015	996.60	(49)	0.000359	0.000379	996.6	0.0298	-0.000020	0.001			9.6			995.6473
	0.0399	30	0.0030	997.54	(49)	0.000366	0.000379	997.5	0.0405	-0.000014	0.002			19			995.6473
0.05		30	0.0037	997.96	(44)	0.000378	0.000379	998.0	0.0066	-0.000002	0.000						995.6473
	0.04987	30	0.0037	998.01	(49)	0.000367	0.000379	998.0	0.0463	-0.000012	0.002			23.7			995.6473
0.1		30	0.0074	1000.28	(44)	0.000376	0.000380	1000.2	0.0314	-0.000004	0.001						995.6473
	0.09973	30	0.0074	1000.35	(49)	0.000370	0.000380	1000.3	0.0779	-0.000010	0.006			47.2			995.6473
	0.19946	30	0.0148	1005.00	(49)	0.000373	0.000381	1004.9	0.1246	-0.000008	0.016			93.9			995.6473
0.32974		30	0.0240	1010.71	(31)	0.000381	0.000383	1010.7	0.0555	-0.000002	0.003						995.6473
0.5		30	0.0359	1018.19	(44)	0.000386	0.000385	1018.2	-0.0306	0.000001	0.001						995.6473
0.5041		30	0.0362	1018.60	(62)	0.000380	0.000385	1018.4	0.1987	-0.000005	0.039						995.6473
	0.49856	30	0.0365	1018.72	(49)	0.000381	0.000385	1018.6	0.1462	-0.000004	0.021			231.7			995.6473
0.51841		30	0.0372	1019.05	(31)	0.000385	0.000385	1019.0	0.0186	0.000000	0.000						995.6473
0.991		30	0.0688	1039.50	(62)	0.000389	0.000390	1039.4	0.1322	-0.000002	0.017						995.6473
1		30	0.0694	1039.66	(44)	0.000392	0.000390	1039.7	-0.0863	0.000001	0.007						995.6473
1.02409		30	0.0709	1040.67	(31)	0.000392	0.000391	1040.8	-0.0880	0.000001	0.008						995.6473
1.5097		30	0.1012	1060.60	(62)	0.000396	0.000396	1060.7	-0.0701	0.000001	0.005						995.6473
1.54691		30	0.1034	1061.94	(31)	0.000398	0.000396	1062.2	-0.2189	0.000002	0.048						995.6473
2		30	0.1298	1079.59	(44)	0.000403	0.000401	1079.9	-0.2894	0.000002	0.084						995.6473
2.0476		30	0.1324	1081.60	(62)	0.000402	0.000401	1081.7	-0.0982	0.000001	0.010						995.6473
2.10665		30	0.1357	1083.61	(31)	0.000404	0.000402	1083.9	-0.3334	0.000002	0.111						995.6473
2.4968		30	0.1569	1098.30	(62)	0.000406	0.000405	1098.5	-0.1755	0.000001	0.031						995.6473
2.72517		30	0.1689	1106.41	(31)	0.000409	0.000407	1106.7	-0.3339	0.000002	0.111						995.6473
3		30	0.1828	1116.19	(44)	0.000411	0.000410	1116.5	-0.2795	0.000001	0.078						995.6473
3.0013		30	0.1828	1116.40	(62)	0.000410	0.000410	1116.5	-0.1149	0.000001	0.013						995.6473
3.42161		30	0.2032	1130.72	(31)	0.000414	0.000413	1130.9	-0.2081	0.000001	0.043						995.6473
3.5327		30	0.2085	1134.60	(62)	0.000414	0.000414	1134.6	-0.0476	0.000000	0.002						995.6473
3.93033		30	0.2266	1147.62	(31)	0.000417	0.000417	1147.7	-0.0437	0.000000	0.002						995.6473
3.9618		30	0.2280	1148.80	(62)	0.000417	0.000418	1148.7	0.1256	0.000000	0.016						995.6473
4		30	0.2297	1149.79	(44)	0.000418	0.000418	1149.9	-0.1074	0.000000	0.012						995.6473
4.55469		30	0.2535	1166.28	(31)	0.000425	0.000422	1167.2	-0.9223	0.000003	0.851	!					995.6473
4.6934		30	0.2592	1171.90	(62)	0.000422	0.000423	1171.4	0.4997	-0.000001	0.250						995.6473
	0.00099	35	0.0001	994.08	(49)	0.000329	0.000382	994.1	0.0039	-0.000053	0.000			0.5			994.0319
	0.00249	35	0.0002	994.15	(49)	0.000360	0.000382	994.1	0.0041	-0.000022	0.000			1.2			994.0319
	0.00498	35	0.0004	994.27	(49)	0.000360	0.000382	994.3	0.0083	-0.000022	0.000			2.4			994.0319
	0.00996	35	0.0007	994.50	(49)	0.000373	0.000382	994.5	0.0066	-0.000009	0.000			4.7			994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.01501	0.01992	35	0.0011	994.79	(81)	0.000322	0.000382	994.7	0.0666	-0.000060	0.004					24	994.0319
		35	0.0015	994.97	(49)	0.000373	0.000382	995.0	0.0134	-0.000009	0.000			9.4			994.0319
0.03002	0.03983	35	0.0022	995.44	(81)	0.000367	0.000382	995.4	0.0342	-0.000015	0.001					27.35	994.0319
0.04		35	0.0030	995.93	(80)	0.000361	0.000382	995.9	0.0626	-0.000021	0.004						994.0319
	0.04979	35	0.0030	995.90	(49)	0.000373	0.000382	995.9	0.0281	-0.000009	0.001			18.8			994.0319
0.05		35	0.0037	996.35	(44)	0.000376	0.000383	996.3	0.0248	-0.000007	0.001						994.0319
	0.05635	35	0.0037	996.37	(49)	0.000373	0.000383	996.3	0.0354	-0.000010	0.001			23.5			994.0319
0.05635		35	0.0042	996.66	(20)	0.000372	0.000383	996.6	0.0422	-0.000010	0.002				2.626		994.0319
0.06004	0.06997	35	0.0045	996.83	(81)	0.000371	0.000383	996.8	0.0498	-0.000011	0.002					27.69	994.0319
0.07802		35	0.0058	997.66	(20)	0.000374	0.000383	997.6	0.0513	-0.000009	0.003				3.625		994.0319
0.09	0.09957	35	0.0067	998.24	(80)	0.000370	0.000383	998.2	0.0881	-0.000013	0.008						994.0319
0.1		35	0.0074	998.65	(44)	0.000377	0.000383	998.6	0.0425	-0.000006	0.002						994.0319
0.10001	0.10997	35	0.0074	998.64	(81)	0.000378	0.000383	998.6	0.0370	-0.000005	0.001					28.19	994.0319
		35	0.0074	998.68	(49)	0.000376	0.000383	998.6	0.0560	-0.000008	0.003			46.8			994.0319
0.12006	0.12997	35	0.0089	999.60	(81)	0.000375	0.000383	999.5	0.0774	-0.000009	0.006					27.93	994.0319
0.16		35	0.0118	1001.45	(80)	0.000374	0.000384	1001.3	0.1180	-0.000010	0.014						994.0319
0.19998	0.19913	35	0.0147	1003.19	(81)	0.000381	0.000384	1003.1	0.0540	-0.000004	0.003					28.38	994.0319
		35	0.0148	1003.29	(49)	0.000379	0.000384	1003.2	0.0807	-0.000005	0.007			93.1			994.0319
0.24738	0.24738	35	0.0181	1005.17	(20)	0.000390	0.000385	1005.3	-0.1013	0.000006	0.010				11.139		994.0319
0.25		35	0.0183	1005.53	(80)	0.000377	0.000385	1005.4	0.1403	-0.000008	0.020						994.0319
0.25017	0.25017	35	0.0183	1005.47	(81)	0.000381	0.000385	1005.4	0.0686	-0.000004	0.005					28.42	994.0319
0.35002		35	0.0254	1009.84	(81)	0.000387	0.000386	1009.9	-0.0230	0.000001	0.001					28.849	994.0319
0.4	0.43401	35	0.0290	1012.24	(80)	0.000381	0.000387	1012.1	0.1641	-0.000006	0.027						994.0319
0.43401		35	0.0313	1013.65	(20)	0.000385	0.000387	1013.6	0.0722	-0.000002	0.005				19.619		994.0319
0.49966	0.49966	35	0.0359	1016.54	(81)	0.000386	0.000388	1016.5	0.0757	-0.000002	0.006					28.759	994.0319
0.49992		35	0.0359	1016.48	(81)	0.000388	0.000388	1016.5	0.0021	0.000000	0.000					28.907	994.0319
0.5	0.4977	35	0.0359	1016.45	(44)	0.000389	0.000388	1016.5	-0.0307	0.000001	0.001						994.0319
		35	0.0365	1016.89	(49)	0.000386	0.000388	1016.8	0.0648	-0.000002	0.004			230			994.0319
0.7	0.91994	35	0.0496	1025.31	(80)	0.000387	0.000390	1025.2	0.1439	-0.000003	0.021						994.0319
0.91994		35	0.0642	1034.52	(20)	0.000393	0.000392	1034.5	-0.0092	0.000000	0.000				40.489		994.0319
1	1.38222	35	0.0694	1037.84	(44)	0.000394	0.000393	1037.9	-0.0508	0.000001	0.003						994.0319
1		35	0.0694	1037.97	(80)	0.000392	0.000393	1037.9	0.0792	-0.000001	0.006						994.0319
1.38222	1.8487	35	0.0934	1053.51	(20)	0.000398	0.000397	1053.6	-0.0782	0.000001	0.006				59.482		994.0319
1.8487		35	0.1211	1071.82	(20)	0.000403	0.000402	1072.0	-0.1964	0.000001	0.039				77.784		994.0319
2	2.3552	35	0.1298	1077.56	(44)	0.000405	0.000403	1077.8	-0.2579	0.000002	0.067						994.0319
2.3552		35	0.1494	1090.99	(20)	0.000407	0.000407	1091.1	-0.1416	0.000001	0.020				96.961		994.0319
2.87947	3.41915	35	0.1767	1109.94	(20)	0.000412	0.000411	1110.0	-0.0777	0.000000	0.006				115.908		994.0319
3		35	0.1828	1114.20	(44)	0.000412	0.000412	1114.2	-0.0335	0.000000	0.001						994.0319
3.41915	3.94338	35	0.2031	1128.62	(20)	0.000415	0.000416	1128.5	0.0722	0.000000	0.005				134.585		994.0319
3.94338		35	0.2272	1145.99	(20)	0.000419	0.000420	1145.7	0.2846	-0.000001	0.081				151.961		994.0319
4	4.40076	35	0.2297	1147.53	(44)	0.000420	0.000420	1147.5	0.0150	0.000000	0.000						994.0319
4.40076		35	0.2470	1160.60	(20)	0.000422	0.000423	1160.0	0.5509	-0.000002	0.303				166.569		994.0319
0.0988	0.0999	40	0.0073	996.80	(62)	0.000374	0.000386	996.7	0.0854	-0.000012	0.007						992.2158
0.0999		40	0.0074	996.80	(52)	0.000381	0.000386	996.8	0.0355	-0.000005	0.001						992.2158
	0.32974	40	0.0100	998.47	(90)	0.000377	0.000386	998.4	0.0957	-0.000010	0.009						992.2158
		40	0.0200	1004.71	(90)	0.000381	0.000388	1004.6	0.1326	-0.000007	0.018						992.2158
0.32974	0.5041	40	0.0240	1007.13	(31)	0.000386	0.000388	1007.1	0.0626	-0.000003	0.004						992.2158
0.5041		40	0.0362	1014.90	(62)	0.000386	0.000390	1014.7	0.1649	-0.000004	0.027						992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.51841		40	0.0372	1015.36	(31)	0.000390	0.000391	1015.4	0.0012	0.000000	0.000						992.2158
		40	0.0400	1017.27	(90)	0.000387	0.000391	1017.1	0.1521	-0.000004	0.023						992.2158
0.7069		40	0.0501	1023.50	(52)	0.000393	0.000393	1023.5	0.0036	0.000000	0.000						992.2158
0.991		40	0.0688	1035.60	(62)	0.000394	0.000396	1035.5	0.1075	-0.000001	0.012						992.2158
1.02409		40	0.0709	1036.77	(31)	0.000397	0.000396	1036.9	-0.0991	0.000001	0.010						992.2158
		40	0.0800	1042.78	(90)	0.000397	0.000397	1042.7	0.0413	0.000000	0.002						992.2158
1.4139		40	0.0954	1052.90	(52)	0.000399	0.000400	1052.8	0.1300	-0.000001	0.017						992.2158
1.5097		40	0.1012	1056.50	(62)	0.000402	0.000401	1056.6	-0.0904	0.000001	0.008						992.2158
1.54691		40	0.1034	1057.84	(31)	0.000403	0.000401	1058.1	-0.2252	0.000002	0.051						992.2158
		40	0.1200	1068.97	(90)	0.000405	0.000404	1069.1	-0.1137	0.000001	0.013						992.2158
2.0476		40	0.1324	1077.30	(62)	0.000407	0.000406	1077.4	-0.1254	0.000001	0.016						992.2158
2.10665		40	0.1357	1079.37	(31)	0.000408	0.000407	1079.7	-0.2806	0.000002	0.079						992.2158
2.4968		40	0.1569	1093.90	(62)	0.000411	0.000410	1094.1	-0.1555	0.000001	0.024						992.2158
		40	0.1600	1096.00	(90)	0.000411	0.000411	1096.2	-0.1551	0.000001	0.024						992.2158
2.72517		40	0.1689	1102.01	(31)	0.000413	0.000412	1102.3	-0.2437	0.000001	0.059						992.2158
3.0013		40	0.1828	1111.90	(62)	0.000415	0.000414	1111.9	-0.0439	0.000000	0.002						992.2158
		40	0.2000	1123.99	(90)	0.000417	0.000417	1124.0	0.0377	0.000000	0.001						992.2158
3.42161		40	0.2032	1126.14	(31)	0.000418	0.000418	1126.2	-0.1022	0.000000	0.010						992.2158
3.5327		40	0.2085	1130.10	(62)	0.000418	0.000419	1129.9	0.1670	-0.000001	0.028						992.2158
3.5347		40	0.2086	1130.10	(52)	0.000418	0.000419	1130.0	0.1009	0.000000	0.010						992.2158
3.93033		40	0.2266	1142.93	(31)	0.000421	0.000422	1142.9	0.0786	0.000000	0.006						992.2158
3.9618		40	0.2280	1144.20	(62)	0.000421	0.000422	1143.9	0.3453	-0.000001	0.119						992.2158
		40	0.2400	1152.99	(90)	0.000422	0.000424	1152.5	0.5197	-0.000002	0.270						992.2158
4.55469		40	0.2535	1162.72	(31)	0.000425	0.000426	1162.3	0.4676	-0.000001	0.219						992.2158
4.6934		40	0.2592	1167.30	(62)	0.000425	0.000427	1166.4	0.8777	-0.000002	0.770						992.2158
	0.00099	42.5	0.0001	991.29	(49)	0.000331	0.000386	991.3	0.0040	-0.000054	0.000			0.5			991.237
	0.00249	42.5	0.0002	991.36	(49)	0.000362	0.000386	991.4	0.0043	-0.000023	0.000			1.2			991.237
	0.00498	42.5	0.0004	991.47	(49)	0.000362	0.000386	991.5	0.0086	-0.000023	0.000			2.4			991.237
	0.00996	42.5	0.0007	991.70	(49)	0.000376	0.000386	991.7	0.0073	-0.000010	0.000			4.7			991.237
	0.01992	42.5	0.0015	992.17	(49)	0.000376	0.000386	992.2	0.0148	-0.000010	0.000			9.4			991.237
	0.03983	42.5	0.0030	993.10	(49)	0.000376	0.000386	993.1	0.0308	-0.000010	0.001			18.8			991.237
	0.04979	42.5	0.0037	993.56	(49)	0.000378	0.000386	993.5	0.0289	-0.000008	0.001			23.4			991.237
	0.09957	42.5	0.0075	995.87	(49)	0.000380	0.000387	995.8	0.0527	-0.000007	0.003			46.7			991.237
	0.19913	42.5	0.0148	1000.44	(49)	0.000384	0.000388	1000.4	0.0637	-0.000004	0.004			92.8			991.237
	0.4977	42.5	0.0366	1013.99	(49)	0.000390	0.000392	1013.9	0.0442	-0.000001	0.002			229.5			991.237
0.01501		45	0.0011	990.96	(81)	0.000330	0.000387	990.9	0.0625	-0.000057	0.004					24.6	990.2132
0.03002		45	0.0022	991.64	(81)	0.000358	0.000387	991.6	0.0648	-0.000030	0.004					26.66	990.2132
0.04		45	0.0030	992.07	(80)	0.000374	0.000387	992.0	0.0381	-0.000013	0.001						990.2132
0.05		45	0.0037	992.50	(44)	0.000383	0.000387	992.5	0.0145	-0.000004	0.000						990.2132
0.06004		45	0.0045	993.00	(81)	0.000374	0.000387	992.9	0.0599	-0.000014	0.004					27.87	990.2132
0.09		45	0.0067	994.36	(80)	0.000378	0.000388	994.3	0.0644	-0.000010	0.004						990.2132
0.1		45	0.0074	994.81	(44)	0.000379	0.000388	994.7	0.0629	-0.000009	0.004						990.2132
0.10001		45	0.0074	994.79	(81)	0.000382	0.000388	994.7	0.0403	-0.000006	0.002					28.51	990.2132
0.11084		45	0.0082	995.30	(20)	0.000381	0.000388	995.2	0.0603	-0.000007	0.004				5.083		990.2132
0.12006		45	0.0089	995.73	(81)	0.000379	0.000388	995.7	0.0835	-0.000009	0.007					28.23	990.2132
0.14024		45	0.0103	996.63	(20)	0.000381	0.000388	996.6	0.0708	-0.000007	0.005				6.417		990.2132
0.16		45	0.0118	997.55	(80)	0.000380	0.000389	997.4	0.1031	-0.000009	0.011						990.2132
0.19998		45	0.0147	999.32	(81)	0.000383	0.000389	999.2	0.0818	-0.000006	0.007					28.59	990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.21499		45	0.0158	1000.00	(20)	0.000384	0.000389	999.9	0.0883	-0.000006	0.008				9.783		990.2132
0.25		45	0.0183	1001.60	(80)	0.000382	0.000390	1001.5	0.1319	-0.000007	0.017						990.2132
0.25017		45	0.0183	1001.57	(81)	0.000385	0.000390	1001.5	0.0932	-0.000005	0.009					28.67	990.2132
0.35002		45	0.0254	1005.91	(81)	0.000390	0.000391	1005.9	0.0179	-0.000001	0.000					29.08	990.2132
0.4		45	0.0290	1008.25	(80)	0.000386	0.000391	1008.1	0.1553	-0.000005	0.024						990.2132
0.43192		45	0.0312	1009.61	(20)	0.000388	0.000392	1009.5	0.1184	-0.000004	0.014				19.398		990.2132
0.49966		45	0.0359	1012.53	(81)	0.000390	0.000392	1012.4	0.0885	-0.000002	0.008					29.076	990.2132
0.49992		45	0.0359	1012.45	(81)	0.000393	0.000392	1012.5	-0.0038	0.000000	0.000					29.263	990.2132
0.5		45	0.0359	1012.47	(44)	0.000392	0.000392	1012.5	0.0092	0.000000	0.000						990.2132
0.7		45	0.0496	1021.23	(80)	0.000391	0.000395	1021.1	0.1588	-0.000003	0.025						990.2132
1		45	0.0694	1033.71	(44)	0.000397	0.000398	1033.7	0.0212	0.000000	0.000						990.2132
1		45	0.0694	1033.79	(80)	0.000396	0.000398	1033.7	0.1012	-0.000001	0.010						990.2132
1.66876		45	0.1106	1060.55	(20)	0.000405	0.000404	1060.6	-0.0366	0.000000	0.001				70.334		990.2132
2		45	0.1298	1073.14	(44)	0.000408	0.000407	1073.3	-0.1651	0.000001	0.027						990.2132
2.10683		45	0.1358	1077.30	(20)	0.000408	0.000408	1077.3	-0.0225	0.000000	0.001				87.091		990.2132
2.70941		45	0.1681	1099.34	(20)	0.000413	0.000414	1099.3	0.0405	0.000000	0.002				109.124		990.2132
3		45	0.1828	1109.52	(44)	0.000416	0.000416	1109.5	0.0457	0.000000	0.002						990.2132
3.02028		45	0.1838	1110.28	(20)	0.000416	0.000416	1110.2	0.1045	0.000000	0.011				120.066		990.2132
3.48132		45	0.2061	1126.04	(20)	0.000419	0.000420	1125.8	0.2724	-0.000001	0.074				135.824		990.2132
3.98031		45	0.2288	1142.46	(20)	0.000422	0.000424	1141.9	0.5225	-0.000002	0.273				152.251		990.2132
4		45	0.2297	1142.70	(44)	0.000423	0.000424	1142.6	0.1343	0.000000	0.018						990.2132
4.50107		45	0.2513	1158.91	(20)	0.000425	0.000427	1158.1	0.8142	-0.000002	0.663				168.695		990.2132
0.01013		48.75	0.0008	989.27	(114)	0.000093	0.000388	989.1	0.2178	-0.000295	0.047		!				988.5963
0.03034		48.75	0.0023	990.22	(114)	0.000275	0.000388	990.0	0.2505	-0.000113	0.063						988.5963
0.10983		48.75	0.0081	993.84	(114)	0.000355	0.000389	993.6	0.2794	-0.000035	0.078						988.5963
0.19497		48.75	0.0143	997.67	(114)	0.000369	0.000390	997.4	0.2979	-0.000021	0.089						988.5963
0.29443		48.75	0.0215	1002.09	(114)	0.000378	0.000391	1001.8	0.2976	-0.000014	0.089						988.5963
0.41553		48.75	0.0300	1007.43	(114)	0.000382	0.000393	1007.1	0.3179	-0.000010	0.101						988.5963
0.57041		48.75	0.0408	1014.15	(114)	0.000387	0.000394	1013.8	0.3262	-0.000008	0.106						988.5963
0.32974		50	0.0240	1002.85	(31)	0.000389	0.000392	1002.8	0.0773	-0.000003	0.006						988.0363
0.51841		50	0.0372	1011.01	(31)	0.000394	0.000394	1011.0	0.0077	0.000000	0.000						988.0363
1.02409		50	0.0709	1032.27	(31)	0.000401	0.000400	1032.4	-0.0904	0.000001	0.008						988.0363
1.54691		50	0.1034	1053.23	(31)	0.000406	0.000405	1053.4	-0.1890	0.000002	0.036						988.0363
2.10665		50	0.1357	1074.64	(31)	0.000411	0.000410	1074.9	-0.2383	0.000002	0.057						988.0363
2.72517		50	0.1689	1097.18	(31)	0.000416	0.000415	1097.4	-0.1854	0.000001	0.034						988.0363
3.42161		50	0.2032	1121.21	(31)	0.000421	0.000420	1121.3	-0.0401	0.000000	0.002						988.0363
3.93033		50	0.2266	1137.95	(31)	0.000424	0.000424	1137.8	0.1501	-0.000001	0.023						988.0363
4.55469		50	0.2535	1157.66	(31)	0.000427	0.000429	1157.1	0.5148	-0.000002	0.265						988.0363
0.00509		55	0.0004	985.93	(20)	0.000377	0.000390	985.9	0.0048	-0.000013	0.000				0.235		985.6952
0.01501		55	0.0011	986.40	(81)	0.000362	0.000390	986.4	0.0303	-0.000028	0.001					27	985.6952
0.01549		55	0.0012	986.41	(20)	0.000381	0.000390	986.4	0.0096	-0.000009	0.000				0.71		985.6952
0.03002		55	0.0022	987.09	(81)	0.000373	0.000390	987.1	0.0377	-0.000017	0.001					27.8	985.6952
0.04		55	0.0030	987.53	(80)	0.000381	0.000390	987.5	0.0283	-0.000010	0.001						985.6952
0.04933		55	0.0037	987.98	(20)	0.000375	0.000390	987.9	0.0541	-0.000015	0.003				2.281		985.6952
0.05		55	0.0037	987.98	(44)	0.000383	0.000390	988.0	0.0277	-0.000008	0.001						985.6952
0.06004		55	0.0045	988.46	(81)	0.000379	0.000391	988.4	0.0524	-0.000012	0.003					28.22	985.6952
0.09		55	0.0067	989.81	(80)	0.000382	0.000391	989.8	0.0596	-0.000009	0.004						985.6952
0.09271		55	0.0069	989.92	(20)	0.000383	0.000391	989.9	0.0503	-0.000007	0.003				4.227		985.6952

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.1		55	0.0074	990.24	(44)	0.000385	0.000391	990.2	0.0412	-0.000006	0.002						985.6952
0.10001		55	0.0074	990.26	(81)	0.000383	0.000391	990.2	0.0566	-0.000008	0.003					28.57	985.6952
0.1105		55	0.0082	990.71	(20)	0.000387	0.000391	990.7	0.0370	-0.000005	0.001				5.011		985.6952
0.12006		55	0.0089	991.17	(81)	0.000383	0.000391	991.1	0.0734	-0.000008	0.005					28.54	985.6952
0.16		55	0.0118	992.98	(80)	0.000383	0.000392	992.9	0.0991	-0.000009	0.010						985.6952
0.19819		55	0.0146	994.63	(20)	0.000389	0.000392	994.6	0.0460	-0.000003	0.002				8.931		985.6952
0.19998		55	0.0147	994.74	(81)	0.000387	0.000392	994.7	0.0786	-0.000005	0.006					28.83	985.6952
0.25		55	0.0183	997.01	(80)	0.000385	0.000393	996.9	0.1339	-0.000007	0.018						985.6952
0.25017		55	0.0183	996.97	(81)	0.000388	0.000393	996.9	0.0840	-0.000005	0.007					28.93	985.6952
0.35002		55	0.0254	1001.27	(81)	0.000394	0.000394	1001.3	-0.0093	0.000000	0.000					29.382	985.6952
0.39995		55	0.0290	1003.46	(20)	0.000394	0.000394	1003.5	0.0046	0.000000	0.000				17.768		985.6952
0.4		55	0.0290	1003.63	(80)	0.000388	0.000394	1003.5	0.1691	-0.000006	0.029						985.6952
0.46489		55	0.0335	1006.28	(20)	0.000395	0.000395	1006.3	0.0011	0.000000	0.000				20.587		985.6952
0.49966		55	0.0359	1007.86	(81)	0.000393	0.000395	1007.8	0.0697	-0.000002	0.005					29.331	985.6952
0.49992		55	0.0359	1007.84	(81)	0.000394	0.000395	1007.8	0.0415	-0.000001	0.002					29.389	985.6952
0.5		55	0.0359	1007.87	(44)	0.000393	0.000395	1007.8	0.0699	-0.000002	0.005						985.6952
0.50026		55	0.0360	1007.80	(20)	0.000396	0.000395	1007.8	-0.0121	0.000000	0.000				22.104		985.6952
0.7		55	0.0496	1016.55	(80)	0.000394	0.000397	1016.4	0.1908	-0.000004	0.036						985.6952
0.9156		55	0.0639	1025.27	(20)	0.000402	0.000400	1025.4	-0.1456	0.000002	0.021				39.57		985.6952
1		55	0.0694	1028.95	(44)	0.000400	0.000400	1028.9	0.0442	-0.000001	0.002						985.6952
1		55	0.0694	1029.06	(80)	0.000398	0.000400	1028.9	0.1542	-0.000002	0.024						985.6952
1.38252		55	0.0934	1044.09	(20)	0.000407	0.000404	1044.4	-0.3203	0.000003	0.103				58.396		985.6952
1.85559		55	0.1215	1062.46	(20)	0.000411	0.000408	1062.9	-0.4023	0.000003	0.162				76.76		985.6952
2		55	0.1298	1068.35	(44)	0.000410	0.000410	1068.3	0.0166	0.000000	0.000						985.6952
2.34437		55	0.1488	1080.61	(20)	0.000416	0.000413	1081.1	-0.4961	0.000003	0.246				94.918		985.6952
2.87755		55	0.1766	1099.60	(20)	0.000420	0.000417	1100.1	-0.5310	0.000002	0.282				113.909		985.6952
3		55	0.1828	1104.43	(44)	0.000418	0.000418	1104.4	0.0501	0.000000	0.003						985.6952
3.40706		55	0.2026	1117.75	(20)	0.000423	0.000421	1118.2	-0.4206	0.000002	0.177				132.053		985.6952
3.93418		55	0.2268	1134.94	(20)	0.000426	0.000425	1135.3	-0.3796	0.000001	0.144				149.243		985.6952
4		55	0.2297	1137.56	(44)	0.000425	0.000425	1137.4	0.1548	-0.000001	0.024						985.6952
4.40095		55	0.2471	1149.65	(20)	0.000429	0.000428	1149.9	-0.2232	0.000001	0.050				163.953		985.6952
0.0999		60	0.0074	987.80	(52)	0.000376	0.000392	987.7	0.1132	-0.000016	0.013						983.1989
		60	0.0100	989.40	(90)	0.000380	0.000392	989.3	0.1246	-0.000013	0.016						983.1989
		60	0.0200	995.60	(90)	0.000384	0.000394	995.4	0.2019	-0.000010	0.041						983.1989
		60	0.0400	1008.00	(90)	0.000391	0.000397	1007.8	0.2172	-0.000005	0.047						983.1989
0.7069		60	0.0501	1013.90	(52)	0.000402	0.000398	1014.1	-0.1856	0.000004	0.034						983.1989
		60	0.0800	1033.30	(90)	0.000401	0.000403	1033.1	0.1851	-0.000002	0.034						983.1989
1.4139		60	0.0954	1043.10	(52)	0.000405	0.000405	1043.0	0.0554	-0.000001	0.003						983.1989
		60	0.1200	1059.20	(90)	0.000409	0.000409	1059.2	-0.0075	0.000000	0.000						983.1989
		60	0.1600	1086.10	(90)	0.000415	0.000415	1086.1	0.0295	0.000000	0.001						983.1989
		60	0.2000	1113.80	(90)	0.000421	0.000421	1113.7	0.0882	0.000000	0.008						983.1989
3.5347		60	0.2086	1120.00	(52)	0.000421	0.000422	1119.7	0.2670	-0.000001	0.071						983.1989
		60	0.2400	1142.50	(90)	0.000426	0.000427	1142.1	0.3637	-0.000001	0.132						983.1989
		60	0.2800	1172.30	(90)	0.000431	0.000434	1171.3	0.9545	-0.000002	0.911						983.1989
0.01501		65	0.0011	981.26	(81)	0.000362	0.000392	981.2	0.0318	-0.000030	0.001					27	980.5548
0.03002		65	0.0022	981.95	(81)	0.000370	0.000392	981.9	0.0477	-0.000022	0.002					27.56	980.5548
0.04		65	0.0030	982.39	(80)	0.000379	0.000392	982.4	0.0368	-0.000013	0.001						980.5548
0.06004		65	0.0045	983.31	(81)	0.000379	0.000392	983.3	0.0564	-0.000013	0.003					28.26	980.5548

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.09		65	0.0067	984.66	(80)	0.000382	0.000392	984.6	0.0681	-0.000011	0.005						980.5548
0.09998		65	0.0074	985.12	(20)	0.000382	0.000393	985.0	0.0793	-0.000011	0.006				4.562		980.5548
0.10001		65	0.0074	985.10	(81)	0.000384	0.000393	985.0	0.0614	-0.000009	0.004					28.63	980.5548
0.12006		65	0.0089	986.02	(81)	0.000383	0.000393	985.9	0.0849	-0.000010	0.007					28.55	980.5548
0.16		65	0.0118	987.82	(80)	0.000384	0.000393	987.7	0.1110	-0.000010	0.012						980.5548
0.19998		65	0.0147	989.59	(81)	0.000386	0.000394	989.5	0.1055	-0.000007	0.011					28.8	980.5548
0.25		65	0.0183	991.84	(80)	0.000386	0.000394	991.7	0.1526	-0.000008	0.023						980.5548
0.25017		65	0.0183	991.80	(81)	0.000389	0.000394	991.7	0.1005	-0.000006	0.010					28.97	980.5548
0.35002		65	0.0254	996.11	(81)	0.000394	0.000395	996.1	0.0371	-0.000001	0.001					29.354	980.5548
0.4		65	0.0290	998.45	(80)	0.000389	0.000396	998.2	0.2041	-0.000007	0.042						980.5548
0.41494		65	0.0300	999.03	(20)	0.000391	0.000396	998.9	0.1396	-0.000005	0.019				18.479		980.5548
0.49966		65	0.0359	1002.66	(81)	0.000394	0.000397	1002.6	0.1079	-0.000003	0.012					29.355	980.5548
0.49992		65	0.0359	1002.65	(81)	0.000395	0.000397	1002.6	0.0799	-0.000002	0.006					29.413	980.5548
0.7		65	0.0496	1011.34	(80)	0.000394	0.000399	1011.1	0.2425	-0.000005	0.059						980.5548
0.79154		65	0.0557	1015.08	(20)	0.000397	0.000400	1014.9	0.1289	-0.000002	0.017				34.524		980.5548
1		65	0.0694	1023.82	(80)	0.000399	0.000402	1023.6	0.2151	-0.000003	0.046						980.5548
1.21081		65	0.0828	1031.80	(20)	0.000408	0.000404	1032.2	-0.3981	0.000005	0.158				51.241		980.5548
2.0536		65	0.1328	1064.97	(20)	0.000411	0.000411	1065.0	0.0042	0.000000	0.000				84.413		980.5548
2.49408		65	0.1568	1081.15	(20)	0.000415	0.000415	1081.1	-0.0002	0.000000	0.000				100.591		980.5548
3.42506		65	0.2034	1113.49	(20)	0.000421	0.000422	1113.4	0.1114	0.000000	0.012				132.94		980.5548
3.88956		65	0.2248	1128.84	(20)	0.000424	0.000425	1128.5	0.3070	-0.000001	0.094				148.288		980.5548
4.40092		65	0.2471	1144.97	(20)	0.000427	0.000428	1144.5	0.4238	-0.000001	0.180				164.417		980.5548
0.01013		73.77	0.0008	976.27	(114)	0.000061	0.000392	976.0	0.2383	-0.000331	0.057		!				975.5797
0.03034		73.77	0.0023	977.19	(114)	0.000276	0.000392	976.9	0.2508	-0.000116	0.063						975.5797
0.10983		73.77	0.0081	980.78	(114)	0.000356	0.000393	980.5	0.2872	-0.000037	0.082						975.5797
0.19497		73.77	0.0143	984.58	(114)	0.000371	0.000394	984.3	0.3173	-0.000023	0.101						975.5797
0.29443		73.77	0.0215	988.98	(114)	0.000379	0.000395	988.6	0.3411	-0.000016	0.116						975.5797
0.41553		73.77	0.0300	994.27	(114)	0.000384	0.000396	993.9	0.3639	-0.000012	0.132						975.5797
0.57041		73.77	0.0408	1000.93	(114)	0.000389	0.000397	1000.6	0.3639	-0.000009	0.132						975.5797
0.01501		75	0.0011	975.56	(81)	0.000358	0.000392	975.5	0.0359	-0.000034	0.001					26.7	974.849
0.03002		75	0.0022	976.26	(81)	0.000364	0.000392	976.2	0.0601	-0.000028	0.004					27.12	974.849
0.04		75	0.0030	976.70	(80)	0.000372	0.000392	976.6	0.0572	-0.000020	0.003						974.849
0.06004		75	0.0045	977.62	(81)	0.000373	0.000392	977.5	0.0823	-0.000019	0.007					27.81	974.849
0.09		75	0.0067	978.98	(80)	0.000376	0.000393	978.9	0.1039	-0.000016	0.011						974.849
0.10001		75	0.0074	979.40	(81)	0.000382	0.000393	979.3	0.0734	-0.000010	0.005					28.51	974.849
0.1001		75	0.0074	979.50	(52)	0.000368	0.000393	979.3	0.1740	-0.000024	0.030						974.849
0.12006		75	0.0089	980.32	(81)	0.000380	0.000393	980.2	0.1093	-0.000013	0.012					28.34	974.849
0.16		75	0.0118	982.14	(80)	0.000380	0.000393	982.0	0.1541	-0.000014	0.024						974.849
0.19998		75	0.0147	983.87	(81)	0.000385	0.000394	983.8	0.1195	-0.000008	0.014					28.73	974.849
0.25		75	0.0183	986.16	(80)	0.000383	0.000394	986.0	0.2043	-0.000011	0.042						974.849
0.25017		75	0.0183	986.10	(81)	0.000386	0.000394	986.0	0.1396	-0.000008	0.019					28.81	974.849
0.35002		75	0.0254	990.40	(81)	0.000392	0.000395	990.3	0.0693	-0.000003	0.005					29.262	974.849
0.4		75	0.0290	992.77	(80)	0.000386	0.000396	992.5	0.2684	-0.000009	0.072						974.849
0.40826		75	0.0295	993.01	(20)	0.000391	0.000396	992.9	0.1535	-0.000005	0.024				18.164		974.849
0.49966		75	0.0359	996.97	(81)	0.000392	0.000397	996.8	0.1628	-0.000005	0.027					29.239	974.849
0.49992		75	0.0359	996.97	(81)	0.000392	0.000397	996.8	0.1563	-0.000004	0.024					29.253	974.849
0.7		75	0.0496	1005.65	(80)	0.000392	0.000399	1005.3	0.3161	-0.000006	0.100						974.849
0.7083		75	0.0502	1006.20	(52)	0.000389	0.000399	1005.7	0.5159	-0.000010	0.266						974.849

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.81966		75	0.0576	1010.46	(20)	0.000398	0.000400	1010.4	0.1012	-0.000002	0.010				35.61		974.849
1		75	0.0694	1018.13	(80)	0.000397	0.000401	1017.8	0.3003	-0.000004	0.090						974.849
1.23664		75	0.0844	1027.49	(20)	0.000403	0.000404	1027.5	0.0329	0.000000	0.001				52.64		974.849
1.4166		75	0.0955	1034.80	(52)	0.000404	0.000405	1034.6	0.1557	-0.000002	0.024						974.849
1.71254		75	0.1132	1046.14	(20)	0.000408	0.000408	1046.2	-0.0828	0.000001	0.007				71.291		974.849
2.10774		75	0.1358	1061.04	(20)	0.000412	0.000411	1061.2	-0.1854	0.000001	0.034				86.195		974.849
2.54781		75	0.1596	1077.12	(20)	0.000416	0.000414	1077.4	-0.2348	0.000001	0.055				102.268		974.849
3.01639		75	0.1836	1093.70	(20)	0.000419	0.000418	1093.9	-0.1652	0.000001	0.027				118.855		974.849
3.50044		75	0.2070	1110.02	(20)	0.000422	0.000421	1110.3	-0.2444	0.000001	0.060				135.17		974.849
3.5415		75	0.2089	1111.80	(52)	0.000421	0.000422	1111.6	0.1761	-0.000001	0.031						974.849
3.99611		75	0.2295	1126.19	(20)	0.000425	0.000425	1126.4	-0.1894	0.000001	0.036				151.345		974.849
4.50034		75	0.2512	1142.00	(20)	0.000428	0.000428	1142.1	-0.1256	0.000000	0.016				167.15		974.849
		80	0.0100	978.00	(90)	0.000376	0.000393	977.8	0.1555	-0.000016	0.024						971.7978
		80	0.0200	984.20	(90)	0.000381	0.000394	983.9	0.2598	-0.000013	0.067						971.7978
		80	0.0400	996.60	(90)	0.000389	0.000397	996.3	0.3195	-0.000008	0.102						971.7978
		80	0.0800	1021.90	(90)	0.000398	0.000402	1021.6	0.3351	-0.000004	0.112						971.7978
		80	0.1200	1047.80	(90)	0.000407	0.000408	1047.7	0.1280	-0.000001	0.016						971.7978
		80	0.1600	1074.60	(90)	0.000414	0.000414	1074.6	-0.0217	0.000000	0.000						971.7978
		80	0.2000	1102.40	(90)	0.000419	0.000419	1102.4	-0.0326	0.000000	0.001						971.7978
		80	0.2400	1131.10	(90)	0.000425	0.000425	1131.1	-0.0219	0.000000	0.000						971.7978
		80	0.2800	1160.90	(90)	0.000430	0.000431	1160.7	0.1954	-0.000001	0.038						971.7978
0.01501		85	0.0011	969.31	(81)	0.000373	0.000391	969.3	0.0188	-0.000018	0.000					27.8	968.6203
0.03002		85	0.0022	970.00	(81)	0.000373	0.000391	970.0	0.0383	-0.000018	0.001					27.79	968.6203
0.03254		85	0.0024	970.12	(20)	0.000375	0.000391	970.1	0.0374	-0.000016	0.001				1.496		968.6203
0.04		85	0.0030	970.51	(80)	0.000356	0.000391	970.4	0.0973	-0.000035	0.009						968.6203
0.06004		85	0.0045	971.40	(81)	0.000370	0.000391	971.3	0.0897	-0.000021	0.008					27.58	968.6203
0.06598		85	0.0049	971.63	(20)	0.000379	0.000391	971.6	0.0568	-0.000012	0.003				3.01		968.6203
0.09		85	0.0067	972.78	(80)	0.000370	0.000392	972.6	0.1356	-0.000022	0.018						968.6203
0.10001		85	0.0074	973.18	(81)	0.000379	0.000392	973.1	0.0884	-0.000013	0.008					28.26	968.6203
0.10045		85	0.0074	973.20	(20)	0.000379	0.000392	973.1	0.0908	-0.000013	0.008				4.58		968.6203
0.12006		85	0.0089	974.09	(81)	0.000379	0.000392	974.0	0.1124	-0.000013	0.013					28.22	968.6203
0.16		85	0.0118	975.95	(80)	0.000375	0.000392	975.8	0.1977	-0.000018	0.039						968.6203
0.19998		85	0.0147	977.66	(81)	0.000383	0.000393	977.5	0.1382	-0.000010	0.019					28.54	968.6203
0.20567		85	0.0151	977.94	(20)	0.000381	0.000393	977.8	0.1694	-0.000012	0.029				9.319		968.6203
0.25		85	0.0183	979.98	(80)	0.000378	0.000393	979.7	0.2595	-0.000015	0.067						968.6203
0.25017		85	0.0183	979.89	(81)	0.000384	0.000393	979.7	0.1604	-0.000009	0.026					28.63	968.6203
0.35002		85	0.0254	984.20	(81)	0.000390	0.000394	984.1	0.1064	-0.000004	0.011					29.06	968.6203
0.4		85	0.0290	986.60	(80)	0.000383	0.000395	986.3	0.3347	-0.000012	0.112						968.6203
0.49966		85	0.0359	990.77	(81)	0.000390	0.000396	990.6	0.2083	-0.000006	0.043					29.047	968.6203
0.49992		85	0.0359	990.78	(81)	0.000390	0.000396	990.6	0.2052	-0.000006	0.042					29.054	968.6203
0.7		85	0.0496	999.50	(80)	0.000389	0.000397	999.1	0.3982	-0.000008	0.159						968.6203
1		85	0.0694	1012.00	(80)	0.000395	0.000400	1011.6	0.3902	-0.000005	0.152						968.6203
1.2306		85	0.0840	1021.12	(20)	0.000401	0.000402	1021.0	0.1149	-0.000001	0.013				52.502		968.6203
1.66106		85	0.1102	1038.09	(20)	0.000405	0.000406	1038.1	0.0304	0.000000	0.001				69.473		968.6203
3.03015		85	0.1843	1088.14	(20)	0.000417	0.000416	1088.4	-0.2485	0.000001	0.062				119.516		968.6203
3.50912		85	0.2074	1104.33	(20)	0.000421	0.000419	1104.7	-0.3646	0.000001	0.133				135.706		968.6203
4.00293		85	0.2298	1120.47	(20)	0.000424	0.000422	1120.9	-0.3860	0.000001	0.149				151.848		968.6203
4.50084		85	0.2513	1136.10	(20)	0.000427	0.000425	1136.5	-0.4226	0.000001	0.179				167.477		968.6203

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.01501		95	0.0011	962.61	(81)	0.000358	0.000389	962.6	0.0316	-0.000031	0.001					26.7	961.9004
0.03002		95	0.0022	963.30	(81)	0.000365	0.000389	963.2	0.0497	-0.000024	0.002					27.2	961.9004
0.04		95	0.0030	963.79	(80)	0.000354	0.000389	963.7	0.0961	-0.000035	0.009						961.9004
0.06004		95	0.0045	964.69	(81)	0.000364	0.000389	964.6	0.1028	-0.000025	0.011					27.16	961.9004
0.09		95	0.0067	966.07	(80)	0.000366	0.000389	965.9	0.1428	-0.000023	0.020						961.9004
0.10001		95	0.0074	966.50	(81)	0.000371	0.000389	966.4	0.1286	-0.000019	0.017					27.65	961.9004
0.10244		95	0.0076	966.60	(20)	0.000373	0.000389	966.5	0.1161	-0.000016	0.013				4.697		961.9004
0.12006		95	0.0089	967.40	(81)	0.000374	0.000390	967.3	0.1315	-0.000016	0.017					27.87	961.9004
0.16		95	0.0118	969.25	(80)	0.000371	0.000390	969.0	0.2121	-0.000019	0.045						961.9004
0.18795		95	0.0138	970.46	(20)	0.000376	0.000390	970.3	0.1887	-0.000014	0.036					8.563	961.9004
0.19998		95	0.0147	970.99	(81)	0.000377	0.000390	970.8	0.1815	-0.000013	0.033					28.13	961.9004
0.25		95	0.0183	973.30	(80)	0.000374	0.000391	973.0	0.2898	-0.000017	0.084						961.9004
0.25017		95	0.0183	973.23	(81)	0.000378	0.000391	973.0	0.2164	-0.000012	0.047					28.212	961.9004
0.35002		95	0.0254	977.55	(81)	0.000385	0.000392	977.4	0.1634	-0.000007	0.027					28.71	961.9004
0.4		95	0.0290	979.94	(80)	0.000379	0.000392	979.6	0.3763	-0.000014	0.142						961.9004
0.40699		95	0.0294	980.14	(20)	0.000383	0.000392	979.9	0.2743	-0.000010	0.075				18.241		961.9004
0.49966		95	0.0359	984.16	(81)	0.000385	0.000393	983.9	0.2849	-0.000008	0.081					28.702	961.9004
0.49992		95	0.0359	984.15	(81)	0.000385	0.000393	983.9	0.2702	-0.000008	0.073					28.734	961.9004
0.7		95	0.0496	992.90	(80)	0.000385	0.000395	992.4	0.4759	-0.000010	0.227						961.9004
1		95	0.0694	1005.44	(80)	0.000391	0.000398	1005.0	0.4759	-0.000007	0.227						961.9004
1.2073		95	0.0826	1013.74	(20)	0.000396	0.000399	1013.4	0.2892	-0.000003	0.084					51.836	961.9004
1.67093		95	0.1108	1032.09	(20)	0.000401	0.000403	1031.9	0.1925	-0.000002	0.037					70.192	961.9004
2.09748		95	0.1352	1048.39	(20)	0.000405	0.000406	1048.3	0.1226	-0.000001	0.015					86.488	961.9004
2.55755		95	0.1601	1065.21	(20)	0.000410	0.000410	1065.3	-0.0777	0.000000	0.006					103.314	961.9004
3.03769		95	0.1847	1082.16	(20)	0.000414	0.000413	1082.4	-0.2437	0.000001	0.059					120.257	961.9004
3.49712		95	0.2068	1097.85	(20)	0.000417	0.000416	1098.2	-0.3229	0.000001	0.104					135.948	961.9004
3.9927		95	0.2294	1114.10	(20)	0.000420	0.000419	1114.6	-0.4562	0.000002	0.208					152.199	961.9004
4.50012		95	0.2512	1130.09	(20)	0.000424	0.000422	1130.7	-0.5966	0.000002	0.356					168.194	961.9004
0.00975		98.82	0.0007	959.91	(114)	0.000002	0.000388	959.6	0.2583	-0.000386	0.067		!				959.2088
0.05091		98.82	0.0038	961.83	(114)	0.000292	0.000388	961.5	0.3354	-0.000096	0.112						959.2088
0.1045		98.82	0.0077	964.25	(114)	0.000337	0.000388	963.9	0.3688	-0.000051	0.136						959.2088
0.132		98.82	0.0097	965.50	(114)	0.000345	0.000389	965.1	0.3923	-0.000043	0.154						959.2088
0.2066		98.82	0.0152	968.88	(114)	0.000357	0.000389	968.4	0.4664	-0.000033	0.218						959.2088
0.4891		98.82	0.0352	981.30	(114)	0.000375	0.000392	980.7	0.5619	-0.000017	0.316						959.2088
0.9429		98.82	0.0657	1000.77	(114)	0.000383	0.000396	999.9	0.8215	-0.000012	0.675						959.2088
2.013		98.82	0.1305	1042.96	(114)	0.000401	0.000404	1042.5	0.4633	-0.000003	0.215						959.2088
0.1004		100	0.0074	963.20	(52)	0.000338	0.000388	962.9	0.3427	-0.000050	0.117						958.3637
		100	0.0100	964.60	(90)	0.000369	0.000388	964.4	0.1813	-0.000019	0.033						958.3637
		100	0.0200	970.80	(90)	0.000375	0.000390	970.5	0.2731	-0.000014	0.075						958.3637
0.7104		100	0.0503	990.00	(52)	0.000381	0.000393	989.4	0.6364	-0.000013	0.405						958.3637
1.4207		100	0.0958	1019.00	(52)	0.000395	0.000399	1018.6	0.4124	-0.000004	0.170						958.3637
		100	0.1200	1035.00	(90)	0.000400	0.000402	1034.6	0.3646	-0.000003	0.133						958.3637
		100	0.1600	1061.90	(90)	0.000408	0.000408	1061.9	0.0114	0.000000	0.000						958.3637
		100	0.2000	1089.70	(90)	0.000415	0.000413	1090.1	-0.4090	0.000002	0.167						958.3637
3.5517		100	0.2094	1096.80	(52)	0.000414	0.000414	1096.9	-0.0552	0.000000	0.003						958.3637
		100	0.2400	1118.50	(90)	0.000421	0.000418	1119.3	-0.8285	0.000003	0.686						958.3637
		110	0.0379	973.30	(90)	0.000414	0.000388	974.2	-0.9453	0.000026	0.894	!					950.9471
		110	0.0745	997.80	(90)	0.000389	0.000393	997.5	0.2797	-0.000004	0.078						950.9471

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10^4	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³	
0.1009 1.4287 3.5718		110	0.1362	1038.80	(90)	0.000399	0.000400	1038.6	0.2368	-0.000002	0.056						950.9471	
		125	0.0075	944.40	(52)	0.000247	0.000377	943.5	0.8669	-0.000130	0.752		!				938.9841	
		125	0.0963	1001.20	(52)	0.000377	0.000388	1000.2	0.9709	-0.000010	0.943						938.9841	
		125	0.2103	1080.60	(52)	0.000401	0.000401	1080.7	-0.0641	0.000000	0.004						938.9841	
								Average Res	0.0615	-0.000010	38.586	Sum Chi sqr						
							Std dev Res		0.2289	0.000028								
							Avg - 4std		-0.8539	-0.000124								
							Avg + 4std		0.9769	0.000104								
Curve fit for the model App vol=(w+c2+c3*t °C)/(c0*w + c1)/e^(0.000001*(t °C+c4)^2)																		
		c0	-0.467824															
		c1	4.308005															
		c2	2.378009															
		c3	0.022044															
		c4	2714.019															
		Min T	0															
		Max T	125															
		Min w	7.42E-05															
		Max w	0.28															
		Avg dens res	0.061545															
		Std dens res	0.228851															
		Avg app vol res *10^3	-0.009706															
		Std app vol res *10^3	0.028477															
		No of points in corr	688															
		No of inconsistent pair	5															
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)																		
		40	0.2800	1183.04	(90)	0.000427	0.000431	1181.7	1.3399	-0.000003	1.795	!					992.2158	
		100	0.0400	963.40	(90)	0.000907	0.000392	982.9	-19.5044	0.000515	265.161	!	!				958.3637	
		100	0.0800	1088.80	(90)	-0.000519	0.000397	1008.3	80.4821	-0.000916	839.706	!	!				958.3637	
		100	0.2800	1148.30	(90)	0.000427	0.000424	1149.6	-1.2781	0.000003	1.633	!					958.3637	
0.7144		125	0.0506	971.70	(52)	0.000356	0.000382	970.4	1.2565	-0.000026	1.579	!					938.9841	

Density of aqueous solutions of **K2CO3**

- References (29) Ginzburg, D. M.; Pikulina, N. S.; Litvin, V. P. Density of Potassium Carbonate Solutions. *J. Appl. Chem. USSR* **1964**, 37, 2353-2357.
- (41) Hitchcock, L. B.; McIlhenny, J. S. Viscosity and Density of Pure Alkaline Solutions and their Mixtures. *Ind. Engng. Chem.* **1935**, 27, 461-466.
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, 61, 1492-1498.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.

molality	molarity	t °C	mass frac	Density exp kg/m ³	Ref	App vol exp m ³ /kg	App vol Calc m ³ /kg	Density calc kg/m ³	Density Residual kg/m ³	App Vol Residual m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Normality	Density of water / kg/m ³
		0	0.0100	1009.4	(90)	0.000053	0.000144	1008.47	0.9315	-0.000092	0.868		!		999.8395
		0	0.0200	1018.9	(90)	0.000065	0.000147	1017.20	1.6967	-0.000082	2.879				999.8395
		0	0.0400	1038.1	(90)	0.000079	0.000151	1034.99	3.1062	-0.000072	9.648				999.8395
		0	0.0800	1076.8	(90)	0.000107	0.000160	1071.88	4.9215	-0.000053	24.221				999.8395
		0	0.1200	1116.0	(90)	0.000133	0.000169	1110.53	5.4697	-0.000037	29.918				999.8395
		0	0.1600	1156.2	(90)	0.000155	0.000179	1150.97	5.2345	-0.000025	27.400				999.8395
		0	0.2000	1197.7	(90)	0.000174	0.000190	1193.17	4.5276	-0.000016	20.499				999.8395
		0	0.2400	1240.5	(90)	0.000192	0.000201	1237.10	3.3984	-0.000009	11.549				999.8395
		0	0.2800	1284.6	(90)	0.000208	0.000213	1282.65	1.9455	-0.000004	3.785				999.8395
		0	0.3000	1307.1	(90)	0.000216	0.000219	1305.99	1.1081	-0.000002	1.228				999.8395
		0	0.3500	1364.6	(90)	0.000236	0.000235	1365.74	-1.1444	0.000002	1.310				999.8395
		0	0.4000	1424.4	(90)	0.000255	0.000252	1427.00	-2.6018	0.000003	6.769				999.8395
		0	0.4500	1486.7	(90)	0.000272	0.000270	1488.88	-2.1764	0.000002	4.737				999.8395
		0	0.5000	1551.7	(90)	0.000289	0.000290	1550.12	1.5839	-0.000001	2.509				999.8395
		10	0.0100	1008.9	(90)	0.000088	0.000152	1008.25	0.6548	-0.000064	0.429				999.6996
		10	0.0200	1018.2	(90)	0.000092	0.000155	1016.89	1.3057	-0.000063	1.705				999.6996
		10	0.0400	1036.9	(90)	0.000103	0.000159	1034.51	2.3938	-0.000056	5.730				999.6996
		10	0.0800	1074.6	(90)	0.000129	0.000168	1071.00	3.5968	-0.000039	12.937				999.6996
		10	0.1200	1113.1	(90)	0.000151	0.000177	1109.22	3.8760	-0.000026	15.023				999.6996
		10	0.1600	1153.0	(90)	0.000169	0.000187	1149.18	3.8184	-0.000018	14.580				999.6996
		10	0.2000	1194.1	(90)	0.000186	0.000197	1190.86	3.2386	-0.000011	10.489				999.6996
		10	0.2400	1236.6	(90)	0.000202	0.000208	1234.21	2.3884	-0.000007	5.705				999.6996
		10	0.2800	1280.4	(90)	0.000217	0.000220	1279.13	1.2680	-0.000003	1.608				999.6996
		10	0.3000	1302.8	(90)	0.000225	0.000226	1302.13	0.6669	-0.000001	0.445				999.6996
		10	0.3500	1360.0	(90)	0.000243	0.000242	1360.99	-0.9879	0.000002	0.976				999.6996
		10	0.4000	1419.5	(90)	0.000261	0.000259	1421.27	-1.7729	0.000002	3.143				999.6996
		10	0.4500	1481.5	(90)	0.000277	0.000277	1482.12	-0.6162	0.000001	0.380				999.6996
		10	0.5000	1546.2	(90)	0.000293	0.000296	1542.29	3.9068	-0.000003	15.263				999.6996
		20	0.0100	1007.2	(90)	0.000107	0.000159	1006.67	0.5290	-0.000052	0.280				998.2041
		20	0.0200	1016.3	(90)	0.000110	0.000161	1015.24	1.0604	-0.000051	1.124				998.2041
		20	0.0400	1034.5	(90)	0.000123	0.000166	1032.69	1.8148	-0.000042	3.294				998.2041
	0.47395	20	0.0622	1052.6	(41)	0.000170	0.000170	1052.57	0.0337	0.000000	0.001			0.9479	998.2041

															Density
molality	molarity	t °C	mass frac	Density exp kg/m³	Ref	App vol exp m³/kg	App vol Calc m³/kg	Density calc kg/m³	Density Residual kg/m³	App Vol Residual m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Normality	Density of water / kg/m³
		20	0.0800	1071.5	(90)	0.000145	0.000174	1068.83	2.6725	-0.000029	7.142				998.2041
	0.91	20	0.1143	1100.3	(41)	0.000189	0.000182	1101.18	-0.8761	0.000006	0.767			1.82	998.2041
		20	0.1200	1109.6	(90)	0.000164	0.000184	1106.66	2.9368	-0.000020	8.625				998.2041
		20	0.1600	1149.0	(90)	0.000180	0.000193	1146.20	2.7956	-0.000013	7.815				998.2041
	1.39	20	0.1669	1151.4	(41)	0.000203	0.000195	1153.15	-1.7512	0.000008	3.067			2.78	998.2041
		20	0.2000	1189.8	(90)	0.000195	0.000204	1187.44	2.3637	-0.000008	5.587				998.2041
	1.808	20	0.2092	1194.5	(41)	0.000215	0.000206	1197.15	-2.6547	0.000009	7.048			3.616	998.2041
		20	0.2400	1232.0	(90)	0.000210	0.000214	1230.31	1.6919	-0.000005	2.863				998.2041
	2.2105	20	0.2474	1234.9	(41)	0.000226	0.000216	1238.42	-3.5179	0.000009	12.376			4.421	998.2041
		20	0.2800	1275.6	(90)	0.000224	0.000226	1274.72	0.8785	-0.000002	0.772				998.2041
	2.634	20	0.2852	1276.4	(41)	0.000236	0.000227	1280.62	-4.2230	0.000009	17.834			5.268	998.2041
		20	0.3000	1297.9	(90)	0.000231	0.000232	1297.46	0.4405	-0.000001	0.194				998.2041
	3.0485	20	0.3202	1315.9	(41)	0.000246	0.000238	1320.74	-4.8432	0.000009	23.457			6.097	998.2041
		20	0.3500	1354.8	(90)	0.000248	0.000247	1355.63	-0.8343	0.000001	0.696				998.2041
	3.556	20	0.3606	1363.1	(41)	0.000258	0.000251	1368.13	-5.0318	0.000007	25.319			7.112	998.2041
		20	0.4000	1414.1	(90)	0.000265	0.000264	1415.22	-1.1208	0.000001	1.256				998.2041
		20	0.4500	1475.9	(90)	0.000281	0.000282	1475.37	0.5289	-0.000001	0.280				998.2041
		20	0.5000	1540.4	(90)	0.000297	0.000301	1534.90	5.5048	-0.000005	30.303				998.2041
0.30004		25	0.0398	1032.1	(73)	0.000147	0.000168	1031.21	0.8866	-0.000021	0.786				997.0449
0.39988		25	0.0524	1043.3	(73)	0.000154	0.000171	1042.33	0.9750	-0.000017	0.951				997.0449
0.49976		25	0.0646	1054.3	(73)	0.000160	0.000174	1053.31	0.9883	-0.000014	0.977				997.0449
0.59989		25	0.0766	1065.1	(73)	0.000166	0.000176	1064.20	0.9041	-0.000010	0.817				997.0449
0.69969		25	0.0882	1075.8	(73)	0.000170	0.000179	1074.91	0.8852	-0.000009	0.784				997.0449
0.79944		25	0.0995	1086.3	(73)	0.000175	0.000182	1085.50	0.8007	-0.000007	0.641				997.0449
0.89994		25	0.1106	1096.8	(73)	0.000178	0.000184	1096.03	0.7671	-0.000006	0.588				997.0449
	0.47235	30	0.0622	1049.0	(41)	0.000184	0.000176	1049.54	-0.5384	0.000008	0.290			0.9447	995.6473
	0.9065	30	0.1143	1096.4	(41)	0.000197	0.000187	1097.68	-1.2807	0.000009	1.640			1.813	995.6473
	1.384	30	0.1668	1146.8	(41)	0.000211	0.000200	1149.17	-2.3677	0.000011	5.606			2.768	995.6473
	1.801	30	0.2092	1189.9	(41)	0.000221	0.000211	1192.83	-2.9254	0.000010	8.558			3.602	995.6473
	2.2015	30	0.2474	1229.9	(41)	0.000231	0.000221	1233.72	-3.8193	0.000010	14.587			4.403	995.6473
	2.623	30	0.2851	1271.7	(41)	0.000240	0.000232	1275.40	-3.7021	0.000008	13.706			5.246	995.6473
	3.0365	30	0.3202	1310.8	(41)	0.000250	0.000242	1315.32	-4.5173	0.000008	20.406			6.073	995.6473
	3.542	30	0.3605	1357.8	(41)	0.000261	0.000255	1362.32	-4.5228	0.000007	20.455			7.084	995.6473
		35	0.1604	1142.3	(29)	0.000192	0.000200	1140.53	1.7706	-0.000008	3.135				994.0319
		35	0.2021	1184.2	(29)	0.000207	0.000211	1183.02	1.1841	-0.000004	1.402				994.0319
		35	0.2439	1226.1	(29)	0.000225	0.000222	1227.38	-1.2753	0.000003	1.626				994.0319
		35	0.2815	1266.1	(29)	0.000238	0.000232	1268.71	-2.6054	0.000006	6.788				994.0319
		35	0.3599	1354.4	(29)	0.000262	0.000256	1358.60	-4.2026	0.000006	17.662				994.0319
		35	0.3970	1397.6	(29)	0.000274	0.000268	1402.44	-4.8398	0.000006	23.424				994.0319
		35	0.4395	1448.7	(29)	0.000288	0.000283	1453.13	-4.4332	0.000005	19.653				994.0319
		35	0.4834	1505.3	(29)	0.000299	0.000299	1505.35	-0.0494	0.000000	0.002				994.0319

														Density
molarity	t °C	mass frac	Density exp kg/m³	Ref	App vol exp m³/kg	App vol Calc m³/kg	Density calc kg/m³	Density Residual kg/m³	App Vol Residual m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Normality	Density of water / kg/m³
	35	0.5165	1542.2	(29)	0.000314	0.000312	1544.06	-1.8565	0.000002	3.447				994.0319
	35	0.5242	1554.7	(29)	0.000314	0.000315	1552.92	1.7798	-0.000001	3.168				994.0319
	40	0.0100	1001.0	(90)	0.000123	0.000169	1000.54	0.4571	-0.000046	0.209				992.2158
	40	0.0200	1009.8	(90)	0.000130	0.000171	1008.97	0.8301	-0.000041	0.689				992.2158
	40	0.0400	1027.6	(90)	0.000140	0.000175	1026.13	1.4736	-0.000035	2.172				992.2158
0.47085	40	0.0623	1045.3	(41)	0.000186	0.000180	1045.70	-0.3991	0.000006	0.159			0.9417	992.2158
	40	0.0800	1064.0	(90)	0.000158	0.000184	1061.67	2.3322	-0.000026	5.439				992.2158
0.903	40	0.1143	1092.0	(41)	0.000202	0.000191	1093.46	-1.4624	0.000011	2.139			1.806	992.2158
	40	0.1200	1101.3	(90)	0.000176	0.000193	1098.87	2.4254	-0.000017	5.882				992.2158
	40	0.1600	1139.9	(90)	0.000192	0.000202	1137.76	2.1368	-0.000010	4.566				992.2158
1.3785	40	0.1668	1142.2	(41)	0.000214	0.000204	1144.55	-2.3485	0.000011	5.516			2.757	992.2158
	40	0.2000	1180.1	(90)	0.000206	0.000212	1178.32	1.7751	-0.000006	3.151				992.2158
1.7935	40	0.2092	1185.0	(41)	0.000224	0.000214	1187.87	-2.8728	0.000010	8.253			3.587	992.2158
	40	0.2400	1221.9	(90)	0.000218	0.000222	1220.52	1.3822	-0.000004	1.910				992.2158
2.1925	40	0.2474	1224.8	(41)	0.000234	0.000224	1228.51	-3.7116	0.000010	13.776			4.385	992.2158
	40	0.2800	1265.2	(90)	0.000231	0.000233	1264.26	0.9438	-0.000002	0.891				992.2158
2.6125	40	0.2851	1266.3	(41)	0.000243	0.000235	1269.99	-3.6907	0.000008	13.621			5.225	992.2158
	40	0.3000	1287.3	(90)	0.000238	0.000239	1286.66	0.6368	-0.000001	0.406				992.2158
3.0245	40	0.3202	1305.4	(41)	0.000253	0.000245	1309.66	-4.2596	0.000008	18.144			6.049	992.2158
	40	0.3500	1344.0	(90)	0.000254	0.000254	1344.05	-0.0497	0.000000	0.002				992.2158
3.5285	40	0.3606	1352.5	(41)	0.000263	0.000257	1356.41	-3.9095	0.000006	15.285			7.057	992.2158
	40	0.4000	1402.9	(90)	0.000270	0.000270	1402.95	-0.0460	0.000000	0.002				992.2158
	40	0.4500	1464.4	(90)	0.000286	0.000288	1462.57	1.8298	-0.000002	3.348				992.2158
	40	0.5000	1528.5	(90)	0.000301	0.000306	1521.82	6.6832	-0.000006	44.665				992.2158
	50	0.1604	1132.4	(29)	0.000208	0.000205	1132.99	-0.5902	0.000003	0.348				988.0363
	50	0.2021	1172.9	(29)	0.000223	0.000215	1175.09	-2.1852	0.000008	4.775				988.0363
	50	0.2411	1213.1	(29)	0.000233	0.000225	1216.07	-2.9744	0.000008	8.847				988.0363
	50	0.2819	1259.5	(29)	0.000238	0.000236	1260.55	-1.0508	0.000002	1.104				988.0363
	50	0.4395	1440.1	(29)	0.000289	0.000285	1444.01	-3.9123	0.000004	15.306				988.0363
	60	0.0100	991.9	(90)	0.000125	0.000175	991.41	0.4904	-0.000050	0.240				983.1989
	60	0.0200	1000.5	(90)	0.000138	0.000177	999.72	0.7802	-0.000039	0.609				983.1989
	60	0.0400	1018.0	(90)	0.000148	0.000181	1016.64	1.3579	-0.000033	1.844				983.1989
	60	0.0800	1053.8	(90)	0.000165	0.000189	1051.72	2.0842	-0.000024	4.344				983.1989
	60	0.1200	1090.6	(90)	0.000182	0.000197	1088.46	2.1378	-0.000015	4.570				983.1989
	60	0.1600	1129.0	(90)	0.000196	0.000206	1126.91	2.0924	-0.000010	4.378				983.1989
	60	0.2000	1169.0	(90)	0.000209	0.000216	1167.06	1.9436	-0.000007	3.778				983.1989
	60	0.2400	1210.6	(90)	0.000221	0.000226	1208.88	1.7170	-0.000005	2.948				983.1989
	60	0.2411	1209.5	(29)	0.000228	0.000226	1210.06	-0.5564	0.000002	0.310				983.1989
	60	0.2800	1253.8	(90)	0.000233	0.000236	1252.32	1.4775	-0.000003	2.183				983.1989
	60	0.3000	1275.9	(90)	0.000239	0.000242	1274.61	1.2869	-0.000003	1.656				983.1989
	60	0.3206	1294.6	(29)	0.000254	0.000248	1297.94	-3.3429	0.000006	11.175				983.1989

														Density
t °C	mass frac	Density exp kg/m³	Ref	App vol exp m³/kg	App vol Calc m³/kg	Density calc kg/m³	Density Residual kg/m³	App Vol Residual m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Normality	Density of water / kg/m³	
60	0.3500	1332.4	(90)	0.000255	0.000256	1331.84	0.5646	-0.000001	0.319				983.1989	
60	0.4000	1391.3	(90)	0.000271	0.000272	1390.81	0.4945	-0.000001	0.244				983.1989	
60	0.4500	1452.8	(90)	0.000287	0.000289	1450.83	1.9730	-0.000002	3.893				983.1989	
60	0.4804	1484.7	(29)	0.000302	0.000299	1487.42	-2.7222	0.000003	7.410				983.1989	
60	0.5000	1516.9	(90)	0.000301	0.000307	1510.90	6.0044	-0.000005	36.053				983.1989	
60	0.5242	1541.5	(29)	0.000314	0.000316	1539.59	1.9093	-0.000002	3.646				983.1989	
60	0.5404	1564.3	(29)	0.000318	0.000322	1558.53	5.7666	-0.000004	33.254				983.1989	
70	0.1604	1122.9	(29)	0.000199	0.000207	1121.14	1.7598	-0.000009	3.097				977.7696	
70	0.2021	1163.3	(29)	0.000216	0.000217	1162.92	0.3826	-0.000001	0.146				977.7696	
70	0.2411	1201.7	(29)	0.000232	0.000227	1203.68	-1.9775	0.000006	3.911				977.7696	
70	0.2819	1247.4	(29)	0.000239	0.000237	1248.01	-0.6099	0.000001	0.372				977.7696	
70	0.3607	1333.3	(29)	0.000267	0.000259	1338.06	-4.7640	0.000007	22.696				977.7696	
70	0.3970	1378.4	(29)	0.000274	0.000270	1381.17	-2.7669	0.000004	7.656				977.7696	
70	0.4395	1428.2	(29)	0.000289	0.000284	1432.49	-4.2922	0.000005	18.423				977.7696	
80	0.0100	980.3	(90)	0.000137	0.000177	979.91	0.3892	-0.000041	0.151				971.7978	
80	0.0200	988.9	(90)	0.000139	0.000179	988.12	0.7757	-0.000040	0.602				971.7978	
80	0.0400	1006.3	(90)	0.000147	0.000183	1004.86	1.4435	-0.000036	2.084				971.7978	
80	0.0800	1041.8	(90)	0.000165	0.000190	1039.57	2.2323	-0.000026	4.983				971.7978	
80	0.1200	1078.6	(90)	0.000180	0.000199	1075.98	2.6151	-0.000019	6.839				971.7978	
80	0.1600	1117.0	(90)	0.000193	0.000207	1114.15	2.8511	-0.000014	8.129				971.7978	
80	0.1604	1116.9	(29)	0.000196	0.000207	1114.54	2.3605	-0.000012	5.572				971.7978	
80	0.2000	1157.0	(90)	0.000205	0.000216	1154.08	2.9182	-0.000011	8.516				971.7978	
80	0.2400	1198.6	(90)	0.000218	0.000226	1195.78	2.8198	-0.000008	7.951				971.7978	
80	0.2411	1196.0	(29)	0.000229	0.000226	1196.95	-0.9516	0.000003	0.905				971.7978	
80	0.2800	1241.8	(90)	0.000230	0.000236	1239.21	2.5941	-0.000006	6.729				971.7978	
80	0.2819	1244.7	(29)	0.000229	0.000236	1241.31	3.3896	-0.000008	11.490				971.7978	
80	0.3000	1264.0	(90)	0.000236	0.000241	1261.54	2.4576	-0.000005	6.040				971.7978	
80	0.3500	1320.6	(90)	0.000252	0.000255	1319.07	1.5284	-0.000003	2.336				971.7978	
80	0.3599	1327.9	(29)	0.000262	0.000258	1330.73	-2.8257	0.000004	7.985				971.7978	
80	0.3607	1328.5	(29)	0.000263	0.000258	1331.67	-3.1709	0.000005	10.055				971.7978	
80	0.4000	1379.5	(90)	0.000269	0.000270	1378.69	0.8076	-0.000001	0.652				971.7978	
80	0.4500	1440.8	(90)	0.000285	0.000286	1439.81	0.9900	-0.000001	0.980				971.7978	
80	0.5000	1504.8	(90)	0.000300	0.000303	1501.54	3.2615	-0.000003	10.637				971.7978	
90	0.1604	1110.4	(29)	0.000192	0.000207	1107.52	2.8836	-0.000015	8.315				965.3201	
90	0.2021	1150.3	(29)	0.000212	0.000216	1149.15	1.1491	-0.000004	1.320				965.3201	
90	0.2439	1193.6	(29)	0.000224	0.000226	1192.87	0.7293	-0.000002	0.532				965.3201	
90	0.2815	1234.0	(29)	0.000235	0.000235	1233.87	0.1273	0.000000	0.016				965.3201	
90	0.2819	1233.9	(29)	0.000236	0.000235	1234.32	-0.4172	0.000001	0.174				965.3201	
100	0.0100	967.0	(90)	0.000112	0.000177	966.39	0.6081	-0.000065	0.370				958.3637	
100	0.0200	975.6	(90)	0.000122	0.000178	974.52	1.0776	-0.000057	1.161				958.3637	
100	0.0800	1029.1	(90)	0.000147	0.000189	1025.52	3.5841	-0.000042	12.846				958.3637	

K2CO3.xls

															Density
molality	molarity	t °C	mass frac	Density exp kg/m³	Ref	App vol exp m³/kg	App vol Calc m³/kg	Density calc kg/m³	Density Residual kg/m³	App Vol Residual m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Normality	Density of water / kg/m³
		100	0.1200	1066.3	(90)	0.000163	0.000197	1061.70	4.6049	-0.000034	21.205				958.3637
		100	0.1600	1104.9	(90)	0.000179	0.000205	1099.69	5.2096	-0.000027	27.140				958.3637
		100	0.2000	1145.1	(90)	0.000193	0.000214	1139.55	5.5547	-0.000021	30.855				958.3637
		100	0.2400	1186.9	(90)	0.000206	0.000223	1181.28	5.6174	-0.000017	31.555				958.3637
		100	0.2439	1189.8	(29)	0.000211	0.000224	1185.45	4.3472	-0.000013	18.899				958.3637
		100	0.2800	1230.1	(90)	0.000220	0.000233	1224.90	5.2041	-0.000012	27.082				958.3637
		100	0.2819	1229.4	(29)	0.000227	0.000233	1227.01	2.3864	-0.000006	5.695				958.3637
		100	0.3000	1252.2	(90)	0.000227	0.000238	1247.39	4.8064	-0.000010	23.101				958.3637
		100	0.3500	1308.9	(90)	0.000245	0.000251	1305.57	3.3337	-0.000006	11.114				958.3637
		100	0.3607	1317.2	(29)	0.000255	0.000254	1318.35	-1.1548	0.000002	1.334				958.3637
		100	0.4000	1367.8	(90)	0.000263	0.000265	1366.25	1.5452	-0.000002	2.388				958.3637
		100	0.4500	1429.0	(90)	0.000280	0.000280	1428.98	0.0183	0.000000	0.000				958.3637
		100	0.4623	1440.8	(29)	0.000288	0.000284	1444.65	-3.8458	0.000004	14.791				958.3637
		100	0.5000	1492.8	(90)	0.000296	0.000296	1493.00	-0.1973	0.000000	0.039				958.3637
		100	0.5824	1590.4	(29)	0.000331	0.000326	1598.19	-7.7914	0.000005	60.706				958.3637
Average Res									0.5097	-0.000010	1329.961	Sum chi sqr			
Std dev Res									2.7583	0.000020					
Avg - 4std									-10.5236	-0.000089					
Avg + 4std									11.5429	0.000070					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	-1.431325
c1	2.49168
c2	1.102783
c3	0.013116
c4	2835.978
Min T	0
Max T	100
Min w	0.0100
Max w	0.5824
Avg dens res	0.5097
Std dens res	2.7583
Avg app vol res *10 ³	-0.00978
Std app vol res *10 ³	0.019844
No of points in corr	170
No of inconsistent pair	1

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

100	0.0400	995.1	(90)	0.000080	0.000182	991.09	4.0053	-0.000102	16.043			!		958.3637
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Density of aqueous solutions of **KNO3**

- References (7) Berchiesi, M. A.; Berchiesi, G.; Lobbia, G. G. Apparent Molal Volumes of Alkali Metal Nitrates at 30°C. *J. Chem. Eng. Data* **1974**, *19*, 326-328
- (22) Doan, T. H.; Sangster, J. Viscosities of Concentrated Aqueous Solutions of some 1:1, 2:1, and 3:1 Nitrates at 25°C. *J. Chem. Eng. Data* **1981**, *26*, 141-144
- (45) Isono, T. Densities, Viscosities, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions at Several Temperatures. Alkaline-Earth Chlorides, LaCl_3 , Na_2SO_4 , NaNO_3 , NaBr , KNO_3 , KBr , and $\text{Cd}(\text{NO}_3)_2$. *J. Chem. Eng. Data* **1984**, *29*, 45-52
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, *61*, 1492-1498
- (79) Olofsson, Inger V.; Apparent molar heat capacities and volumes of aqueous NaCl , KCl , and KNO_3 at 298.15 K. Comparison of Picker flow calorimeter with other calorimeters, *J. Chem. Thermodynamics*, **1979**, *11*, 1005-1014
- (82) Patterson, B. A.; Woolley, E. M.; Thermodynamics for Ionization of Water at Temperatures from 278.15 K to 393.15 K and at the Pressure 0.35 MPa: Apparent Molar Volumes and Apparent Molar Heat Capacities of Aqueous Solutions of Potassium and Sodium Nitrates and Nitric Acid, *J. Chem. Thermodynamics*, **2002**, *34*, 535 - 556
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997
- (110) Roy, Mahendra Nath; Jha, Anupam; Choudhury, Ankan, Densities, Viscosities and Adiabatic Compressibilities of Some Mineral Salts in Water at Different Temperatures, *J. Chem. Eng. Data* **2004**, *49*, 291-296.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta Density / kg/m³	Density of water / kg/m³
		0	0.0100	1006.54	(90)	0.000334	0.000351	1006.4	0.1691	-0.000017	0.029					999.8395
		0	0.0200	1013.26	(90)	0.000338	0.000353	1013.0	0.3089	-0.000015	0.095					999.8395
		0	0.0400	1026.77	(90)	0.000344	0.000356	1026.3	0.5097	-0.000012	0.260					999.8395
		0	0.0800	1054.19	(90)	0.000356	0.000363	1053.5	0.6994	-0.000008	0.489					999.8395
		0	0.1200	1082.21	(90)	0.000366	0.000370	1081.6	0.6415	-0.000005	0.412					999.8395
0.0298		5	0.0030	1001.95	(82)	0.000341	0.000358	1001.9	0.0531	-0.000018	0.003			34.43		999.9638
0.05965		5	0.0060	1003.94	(82)	0.000340	0.000359	1003.8	0.1126	-0.000019	0.013			34.38		999.9638
0.11873		5	0.0119	1007.81	(82)	0.000343	0.000360	1007.6	0.1962	-0.000016	0.038			34.72		999.9638
0.24826		5	0.0245	1016.21	(82)	0.000347	0.000362	1015.8	0.3724	-0.000015	0.139			35.096		999.9638
0.49588		5	0.0477	1031.64	(82)	0.000357	0.000366	1031.2	0.4545	-0.000009	0.207			36.08		999.9638
		10	0.0100	1006.15	(90)	0.000359	0.000367	1006.1	0.0823	-0.000008	0.007					999.6996
		10	0.0200	1012.62	(90)	0.000362	0.000369	1012.5	0.1361	-0.000007	0.019					999.6996
		10	0.0400	1025.66	(90)	0.000367	0.000372	1025.5	0.1972	-0.000005	0.039					999.6996
		10	0.0800	1052.26	(90)	0.000376	0.000378	1052.0	0.2362	-0.000003	0.056					999.6996
		10	0.1200	1079.63	(90)	0.000383	0.000385	1079.4	0.2081	-0.000001	0.043					999.6996
0.0298		15	0.0030	1001.04	(82)	0.000354	0.000373	1001.0	0.0587	-0.000019	0.003			35.77		999.0996
0.05		15	0.0050	1002.34	(45)	0.000358	0.000374	1002.3	0.0810	-0.000016	0.007					999.0996
0.05965		15	0.0060	1002.94	(82)	0.000362	0.000374	1002.9	0.0702	-0.000012	0.005			36.61		999.0996
0.1		15	0.0100	1005.46	(45)	0.000368	0.000374	1005.4	0.0613	-0.000006	0.004					999.0996
0.11873		15	0.0119	1006.70	(82)	0.000364	0.000375	1006.6	0.1308	-0.000011	0.017			36.78		999.0996
0.24826		15	0.0245	1014.80	(82)	0.000368	0.000377	1014.6	0.2103	-0.000008	0.044			37.235		999.0996
0.49588		15	0.0477	1029.83	(82)	0.000375	0.000380	1029.6	0.2524	-0.000005	0.064			37.936		999.0996
0.5		15	0.0481	1029.92	(45)	0.000378	0.000380	1029.8	0.0928	-0.000002	0.009					999.0996
1		15	0.0918	1058.62	(45)	0.000388	0.000387	1058.7	-0.1189	0.000001	0.014					999.0996
1.5		15	0.1317	1085.53	(45)	0.000396	0.000393	1086.0	-0.4638	0.000003	0.215					999.0996
2		15	0.1682	1111.35	(45)	0.000400	0.000398	1111.7	-0.3824	0.000002	0.146					999.0996
0.05		20	0.0050	1001.36	(45)	0.000374	0.000380	1001.3	0.0316	-0.000006	0.001					998.2041
		20	0.0100	1004.47	(90)	0.000377	0.000381	1004.4	0.0425	-0.000004	0.002					998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta Density / kg/m³	Density of water / kg/m³
0.1		20	0.0100	1004.47	(45)	0.000377	0.000381	1004.4	0.0368	-0.000004	0.001					998.2041
		20	0.0200	1010.75	(90)	0.000380	0.000383	1010.7	0.0514	-0.000003	0.003					998.2041
		20	0.0400	1023.44	(90)	0.000384	0.000386	1023.4	0.0531	-0.000001	0.003					998.2041
0.5		20	0.0481	1028.61	(45)	0.000386	0.000387	1028.6	0.0158	0.000000	0.000					998.2041
		20	0.0800	1049.40	(90)	0.000391	0.000391	1049.4	0.0354	0.000000	0.001					998.2041
1		20	0.0918	1057.00	(45)	0.000395	0.000393	1057.2	-0.1991	0.000002	0.040					998.2041
		20	0.1200	1076.20	(90)	0.000397	0.000397	1076.2	0.0216	0.000000	0.000					998.2041
1.5		20	0.1317	1083.61	(45)	0.000402	0.000399	1084.2	-0.5649	0.000004	0.319					998.2041
		20	0.1600	1103.92	(90)	0.000402	0.000402	1103.9	0.0479	0.000000	0.002					998.2041
2		20	0.1682	1109.36	(45)	0.000405	0.000404	1109.7	-0.2994	0.000001	0.090					998.2041
		20	0.2000	1132.61	(90)	0.000407	0.000408	1132.5	0.1172	0.000000	0.014					998.2041
2.5		20	0.2018	1133.15	(45)	0.000410	0.000408	1133.8	-0.6251	0.000002	0.391					998.2041
3		20	0.2327	1156.23	(45)	0.000413	0.000412	1156.6	-0.4009	0.000001	0.161					998.2041
		20	0.2400	1162.33	(90)	0.000412	0.000413	1162.1	0.2390	-0.000001	0.057					998.2041
0.010347		25	0.0010	997.69	(73)	0.000378	0.000386	997.7	0.0087	-0.000008	0.000				0.65	997.0449
0.0298		25	0.0030	998.92	(82)	0.000375	0.000386	998.9	0.0326	-0.000011	0.001			37.96		997.0449
0.05		25	0.0050	1000.16	(45)	0.000382	0.000387	1000.1	0.0238	-0.000005	0.001					997.0449
0.05965		25	0.0060	1000.79	(82)	0.000377	0.000387	1000.7	0.0595	-0.000010	0.004			38.1		997.0449
0.06145		25	0.0062	1000.88	(79)	0.000380	0.000387	1000.8	0.0425	-0.000007	0.002			38.41		997.0449
0.06959		25	0.0070	1001.35	(79)	0.000385	0.000387	1001.3	0.0122	-0.000002	0.000			38.94		997.0449
0.07455		25	0.0075	1001.67	(79)	0.000383	0.000387	1001.6	0.0262	-0.000003	0.001			38.77		997.0449
0.0866		25	0.0087	1002.40	(79)	0.000385	0.000387	1002.4	0.0147	-0.000002	0.000			38.97		997.0449
0.1		25	0.0100	1003.24	(45)	0.000384	0.000387	1003.2	0.0315	-0.000003	0.001					997.0449
0.100904		25	0.0101	1003.28	(73)	0.000385	0.000387	1003.3	0.0190	-0.000002	0.000				6.238	997.0449
0.10443		25	0.0104	1003.50	(79)	0.000385	0.000387	1003.5	0.0214	-0.000002	0.000			38.96		997.0449
0.11873		25	0.0119	1004.43	(82)	0.000381	0.000388	1004.4	0.0799	-0.000007	0.006			38.51		997.0449
0.12041		25	0.0120	1004.48	(79)	0.000386	0.000388	1004.5	0.0213	-0.000002	0.000			39.01		997.0449
0.14066		25	0.0140	1005.71	(79)	0.000386	0.000388	1005.7	0.0205	-0.000001	0.000			39.07		997.0449
0.16696		25	0.0166	1007.32	(79)	0.000387	0.000388	1007.3	0.0221	-0.000001	0.000			39.12		997.0449
0.19737		25	0.0196	1009.16	(79)	0.000387	0.000389	1009.1	0.0266	-0.000001	0.001			39.16		997.0449
0.201495		25	0.0200	1009.39	(73)	0.000388	0.000389	1009.4	0.0060	0.000000	0.000				12.348	997.0449
0.24826		25	0.0245	1012.35	(82)	0.000384	0.000389	1012.2	0.1378	-0.000005	0.019			38.809		997.0449
0.300997		25	0.0295	1015.36	(73)	0.000390	0.000390	1015.4	-0.0110	0.000000	0.000				18.314	997.0449
0.33905		25	0.0331	1017.65	(79)	0.000390	0.000391	1017.6	0.0090	0.000000	0.000			39.46		997.0449
0.34078		25	0.0333	1017.82	(79)	0.000388	0.000391	1017.7	0.0815	-0.000002	0.007			39.25		997.0449
0.39972		25	0.0388	1021.21	(73)	0.000392	0.000391	1021.2	-0.0269	0.000001	0.001				24.163	997.0449
0.49588		25	0.0477	1027.04	(82)	0.000389	0.000393	1026.9	0.1633	-0.000003	0.027			39.363		997.0449
0.498781		25	0.0480	1027.00	(73)	0.000394	0.000393	1027.0	-0.0450	0.000001	0.002				29.96	997.0449
0.5		25	0.0481	1027.20	(22)	0.000391	0.000393	1027.1	0.0790	-0.000002	0.006					997.0449
0.5		25	0.0481	1027.11	(45)	0.000393	0.000393	1027.1	-0.0110	0.000000	0.000					997.0449
0.5593		25	0.0535	1030.54	(79)	0.000394	0.000393	1030.6	-0.0273	0.000000	0.001			39.82		997.0449
0.599216		25	0.0571	1032.80	(73)	0.000395	0.000394	1032.9	-0.0714	0.000001	0.005				35.759	997.0449
0.69984		25	0.0661	1038.58	(73)	0.000396	0.000395	1038.6	-0.0662	0.000001	0.004				41.531	997.0449
0.7017		25	0.0662	1038.70	(79)	0.000396	0.000395	1038.7	-0.0441	0.000001	0.002			40.01		997.0449
0.75		25	0.0705	1041.60	(22)	0.000394	0.000396	1041.5	0.1089	-0.000001	0.012					997.0449
0.798286		25	0.0747	1044.13	(73)	0.000397	0.000396	1044.2	-0.0869	0.000001	0.008				47.086	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta Density / kg/m³	Density of water / kg/m³
0.898592		25	0.0833	1049.74	(73)	0.000398	0.000397	1049.8	-0.0878	0.000001	0.008				52.7	997.0449
0.9059		25	0.0839	1050.21	(79)	0.000398	0.000398	1050.2	-0.0273	0.000000	0.001			40.22		997.0449
0.9864		25	0.0907	1054.67	(79)	0.000399	0.000398	1054.7	-0.0272	0.000000	0.001			40.31		997.0449
0.999685		25	0.0918	1055.31	(73)	0.000400	0.000399	1055.4	-0.1174	0.000001	0.014				58.263	997.0449
1		25	0.0918	1055.50	(22)	0.000398	0.000399	1055.4	0.0574	-0.000001	0.003					997.0449
1		25	0.0918	1055.22	(45)	0.000401	0.000399	1055.4	-0.2226	0.000002	0.050					997.0449
1.1649		25	0.1054	1064.33	(79)	0.000401	0.000400	1064.4	-0.0923	0.000001	0.009			40.56		997.0449
1.2361		25	0.1111	1068.21	(79)	0.000401	0.000401	1068.3	-0.0389	0.000000	0.002			40.59		997.0449
1.248		25	0.1120	1068.80	(79)	0.000402	0.000401	1068.9	-0.0864	0.000001	0.007			40.64		997.0449
1.5		25	0.1317	1082.30	(22)	0.000403	0.000404	1082.2	0.1372	-0.000001	0.019					997.0449
1.5		25	0.1317	1081.60	(45)	0.000408	0.000404	1082.2	-0.5628	0.000004	0.317					997.0449
1.5869		25	0.1383	1086.66	(79)	0.000405	0.000405	1086.7	0.0032	0.000000	0.000			40.92		997.0449
1.6803		25	0.1452	1091.47	(79)	0.000405	0.000406	1091.4	0.0412	0.000000	0.002			40.99		997.0449
1.75		25	0.1503	1095.10	(22)	0.000406	0.000406	1095.0	0.1348	-0.000001	0.018					997.0449
2		25	0.1682	1107.60	(22)	0.000408	0.000409	1107.4	0.1834	-0.000001	0.034					997.0449
2		25	0.1682	1107.15	(45)	0.000410	0.000409	1107.4	-0.2666	0.000001	0.071					997.0449
2.0732		25	0.1733	1111.13	(79)	0.000409	0.000409	1111.0	0.1314	-0.000001	0.017			41.32		997.0449
2.25		25	0.1853	1119.70	(22)	0.000410	0.000411	1119.5	0.1684	-0.000001	0.028					997.0449
2.4653		25	0.1995	1130.11	(79)	0.000411	0.000413	1129.7	0.4056	-0.000002	0.165			41.56		997.0449
2.5		25	0.2018	1131.60	(22)	0.000412	0.000413	1131.3	0.2762	-0.000001	0.076					997.0449
2.5		25	0.2018	1130.82	(45)	0.000415	0.000413	1131.3	-0.5038	0.000002	0.254					997.0449
2.75		25	0.2175	1143.20	(22)	0.000414	0.000415	1142.8	0.3938	-0.000001	0.155					997.0449
3		25	0.2327	1154.40	(22)	0.000416	0.000417	1154.0	0.4089	-0.000001	0.167					997.0449
3		25	0.2327	1153.82	(45)	0.000417	0.000417	1154.0	-0.1711	0.000001	0.029					997.0449
0.05		30	0.0050	998.73	(45)	0.000388	0.000392	998.7	0.0220	-0.000004	0.000					995.6473
	0.07935	30	0.0080	1000.55	(7)	0.000391	0.000393	1000.5	0.0177	-0.000002	0.000					995.6473
	0.09394	30	0.0095	1001.49	(7)	0.000387	0.000393	1001.4	0.0616	-0.000006	0.004					995.6473
0.1		30	0.0100	1001.76	(45)	0.000392	0.000393	1001.8	0.0100	-0.000001	0.000					995.6473
	0.19776	30	0.0198	1007.81	(7)	0.000393	0.000394	1007.8	0.0195	-0.000001	0.000					995.6473
	0.39703	30	0.0394	1019.90	(7)	0.000398	0.000397	1019.9	-0.0243	0.000001	0.001					995.6473
	0.41281	30	0.0409	1020.90	(7)	0.000397	0.000397	1020.9	0.0202	0.000000	0.000					995.6473
0.5		30	0.0481	1025.40	(45)	0.000399	0.000398	1025.4	-0.0324	0.000001	0.001					995.6473
	0.51984	30	0.0511	1027.58	(7)	0.000394	0.000398	1027.3	0.2351	-0.000004	0.055					995.6473
	0.62315	30	0.0610	1033.52	(7)	0.000401	0.000400	1033.6	-0.0548	0.000001	0.003					995.6473
1		30	0.0918	1053.26	(45)	0.000406	0.000404	1053.5	-0.2339	0.000002	0.055					995.6473
	1.0733	30	0.1023	1060.37	(7)	0.000405	0.000405	1060.4	-0.0268	0.000000	0.001					995.6473
1.5		30	0.1317	1079.46	(45)	0.000412	0.000409	1080.0	-0.5213	0.000003	0.272					995.6473
	1.73791	30	0.1598	1099.59	(7)	0.000410	0.000412	1099.2	0.3950	-0.000002	0.156					995.6473
2		30	0.1682	1104.77	(45)	0.000415	0.000413	1105.0	-0.2569	0.000001	0.066					995.6473
2.5		30	0.2018	1128.27	(45)	0.000419	0.000417	1128.7	-0.4777	0.000002	0.228					995.6473
3		30	0.2327	1151.14	(45)	0.000421	0.000421	1151.2	-0.1084	0.000000	0.012					995.6473
0.0298		35	0.0030	995.87	(82)	0.000389	0.000397	995.8	0.0263	-0.000009	0.001			39.29		994.0319
0.05		35	0.0050	997.09	(45)	0.000393	0.000398	997.1	0.0257	-0.000005	0.001					994.0319
0.05965		35	0.0060	997.70	(82)	0.000388	0.000398	997.6	0.0567	-0.000010	0.003			39.26		994.0319
0.1		35	0.0100	1000.08	(45)	0.000398	0.000398	1000.1	0.0017	0.000000	0.000					994.0319
0.11873		35	0.0119	1001.28	(82)	0.000392	0.000399	1001.2	0.0725	-0.000006	0.005			39.68		994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta Density / kg/m³	Density of water / kg/m³
0.24826		35	0.0245	1008.96	(82)	0.000398	0.000400	1008.9	0.0545	-0.000002	0.003			40.236		994.0319
0.49588		35	0.0477	1023.39	(82)	0.000401	0.000403	1023.3	0.0805	-0.000002	0.006			40.588		994.0319
0.5		35	0.0481	1023.50	(45)	0.000404	0.000403	1023.5	-0.0486	0.000001	0.002					994.0319
1		35	0.0918	1051.14	(45)	0.000411	0.000408	1051.4	-0.2323	0.000002	0.054					994.0319
1.5		35	0.1317	1077.13	(45)	0.000417	0.000413	1077.6	-0.5190	0.000003	0.269					994.0319
2		35	0.1682	1102.29	(45)	0.000419	0.000418	1102.5	-0.2181	0.000001	0.048					994.0319
2.5		35	0.2018	1125.68	(45)	0.000423	0.000421	1126.1	-0.3839	0.000002	0.147					994.0319
3		35	0.2327	1148.42	(45)	0.000425	0.000425	1148.4	0.0014	0.000000	0.000					994.0319
		40	0.0100	998.25	(90)	0.000399	0.000403	998.2	0.0452	-0.000005	0.002					992.2158
		40	0.0200	1004.30	(90)	0.000402	0.000404	1004.2	0.0575	-0.000003	0.003					992.2158
		40	0.0400	1016.52	(90)	0.000405	0.000407	1016.5	0.0537	-0.000001	0.003					992.2158
		40	0.0800	1041.52	(90)	0.000411	0.000411	1041.5	-0.0066	0.000000	0.000					992.2158
		40	0.1200	1067.40	(90)	0.000416	0.000416	1067.4	-0.0424	0.000000	0.002					992.2158
		40	0.1600	1094.32	(90)	0.000420	0.000420	1094.3	0.0576	0.000000	0.003					992.2158
		40	0.2000	1122.40	(90)	0.000423	0.000425	1122.0	0.3606	-0.000001	0.130					992.2158
		40	0.2400	1151.75	(90)	0.000426	0.000429	1150.8	0.9200	-0.000003	0.846	!				992.2158
0.0298		45	0.0030	992.00	(82)	0.000403	0.000407	992.0	0.0121	-0.000004	0.000			40.71		990.2132
0.05		45	0.0050	993.20	(45)	0.000406	0.000407	993.2	0.0044	-0.000001	0.000					990.2132
0.05965		45	0.0060	993.80	(82)	0.000401	0.000407	993.8	0.0344	-0.000006	0.001			40.57		990.2132
0.1		45	0.0100	996.15	(45)	0.000409	0.000408	996.2	-0.0102	0.000001	0.000					990.2132
0.11873		45	0.0119	997.32	(82)	0.000403	0.000408	997.3	0.0578	-0.000005	0.003			40.73		990.2132
0.24826		45	0.0245	1004.93	(82)	0.000406	0.000409	1004.8	0.0863	-0.000003	0.007			41.017		990.2132
0.49588		45	0.0477	1019.15	(82)	0.000409	0.000412	1019.0	0.1289	-0.000003	0.017			41.37		990.2132
0.5		45	0.0481	1019.24	(45)	0.000412	0.000412	1019.3	-0.0182	0.000000	0.000					990.2132
1		45	0.0918	1046.48	(45)	0.000419	0.000417	1046.7	-0.1904	0.000002	0.036					990.2132
1.5		45	0.1317	1072.16	(45)	0.000424	0.000421	1072.6	-0.4288	0.000003	0.184					990.2132
2		45	0.1682	1097.02	(45)	0.000425	0.000425	1097.1	-0.1163	0.000001	0.014					990.2132
2.5		45	0.2018	1120.13	(45)	0.000429	0.000428	1120.4	-0.2920	0.000001	0.085					990.2132
3		45	0.2327	1142.70	(45)	0.000431	0.000431	1142.5	0.1567	-0.000001	0.025					990.2132
0.0298		55	0.0030	987.48	(82)	0.000406	0.000414	987.4	0.0259	-0.000009	0.001			41		985.6952
0.05		55	0.0050	988.64	(45)	0.000414	0.000415	988.6	0.0043	-0.000001	0.000					985.6952
0.05965		55	0.0060	989.25	(82)	0.000407	0.000415	989.2	0.0445	-0.000008	0.002			41.16		985.6952
0.1		55	0.0100	991.54	(45)	0.000417	0.000415	991.6	-0.0191	0.000002	0.000					985.6952
0.11873		55	0.0119	992.70	(82)	0.000411	0.000415	992.6	0.0551	-0.000005	0.003			41.51		985.6952
0.24826		55	0.0245	1000.23	(82)	0.000412	0.000417	1000.1	0.1018	-0.000004	0.010			41.695		985.6952
0.49588		55	0.0477	1014.26	(82)	0.000416	0.000419	1014.1	0.1402	-0.000003	0.020			42.061		985.6952
0.5		55	0.0481	1014.33	(45)	0.000419	0.000419	1014.4	-0.0204	0.000000	0.000					985.6952
1		55	0.0918	1041.28	(45)	0.000425	0.000423	1041.4	-0.1511	0.000002	0.023					985.6952
1.5		55	0.1317	1066.68	(45)	0.000430	0.000427	1067.1	-0.3892	0.000003	0.152					985.6952
2		55	0.1682	1091.33	(45)	0.000431	0.000430	1091.4	-0.0513	0.000000	0.003					985.6952
2.5		55	0.2018	1114.22	(45)	0.000435	0.000434	1114.5	-0.2508	0.000001	0.063					985.6952
3		55	0.2327	1136.54	(45)	0.000436	0.000436	1136.4	0.1095	0.000000	0.012					985.6952
		60	0.0100	989.00	(90)	0.000421	0.000418	989.0	-0.0217	0.000002	0.000					983.1989
		60	0.0200	994.90	(90)	0.000419	0.000419	994.9	0.0049	0.000000	0.000					983.1989
		60	0.0400	1006.80	(90)	0.000421	0.000421	1006.8	0.0036	0.000000	0.000					983.1989
		60	0.0800	1031.30	(90)	0.000424	0.000425	1031.2	0.0611	-0.000001	0.004					983.1989

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta Density / kg/m³	Density of water / kg/m³
		60	0.1200	1056.70	(90)	0.000428	0.000428	1056.6	0.1226	-0.000001	0.015					983.1989
		60	0.1600	1083.10	(90)	0.000431	0.000432	1082.9	0.2332	-0.000001	0.054					983.1989
		60	0.2000	1110.60	(90)	0.000434	0.000435	1110.2	0.4330	-0.000002	0.187					983.1989
		60	0.2400	1139.10	(90)	0.000437	0.000439	1138.5	0.5577	-0.000002	0.311					983.1989
0.0298		65	0.0030	982.32	(82)	0.000411	0.000420	982.3	0.0270	-0.000009	0.001			41.57		980.5548
0.05965		65	0.0060	984.06	(82)	0.000414	0.000421	984.0	0.0418	-0.000007	0.002			41.81		980.5548
0.11873		65	0.0119	987.49	(82)	0.000416	0.000421	987.4	0.0573	-0.000005	0.003			42.09		980.5548
0.24826		65	0.0245	994.94	(82)	0.000418	0.000422	994.8	0.1172	-0.000005	0.014			42.216		980.5548
0.49588		65	0.0477	1008.85	(82)	0.000421	0.000424	1008.7	0.1853	-0.000004	0.034			42.527		980.5548
0.0298		75	0.0030	976.57	(82)	0.000425	0.000425	976.6	0.0000	0.000000	0.000			42.98		974.849
0.05965		75	0.0060	978.33	(82)	0.000416	0.000425	978.3	0.0524	-0.000009	0.003			42.08		974.849
0.11873		75	0.0119	981.73	(82)	0.000420	0.000426	981.7	0.0689	-0.000006	0.005			42.44		974.849
0.24826		75	0.0245	989.14	(82)	0.000420	0.000427	989.0	0.1521	-0.000006	0.023			42.508		974.849
0.49588		75	0.0477	1002.93	(82)	0.000424	0.000429	1002.7	0.2153	-0.000004	0.046			42.88		974.849
		80	0.0100	977.60	(90)	0.000418	0.000427	977.5	0.0874	-0.000009	0.008					971.7978
		80	0.0200	983.40	(90)	0.000422	0.000428	983.3	0.1192	-0.000006	0.014					971.7978
		80	0.0400	995.10	(90)	0.000427	0.000430	995.0	0.1196	-0.000003	0.014					971.7978
		80	0.0800	1019.20	(90)	0.000431	0.000433	1019.1	0.1432	-0.000002	0.021					971.7978
		80	0.1200	1044.20	(90)	0.000434	0.000435	1044.1	0.1155	-0.000001	0.013					971.7978
		80	0.1600	1070.30	(90)	0.000437	0.000438	1070.1	0.1742	-0.000001	0.030					971.7978
		80	0.2000	1097.40	(90)	0.000440	0.000441	1097.2	0.1516	-0.000001	0.023					971.7978
		80	0.2400	1125.60	(90)	0.000443	0.000443	1125.5	0.0740	0.000000	0.005					971.7978
0.0298		85	0.0030	970.34	(82)	0.000425	0.000428	970.3	0.0098	-0.000003	0.000			42.96		968.6203
0.05965		85	0.0060	972.08	(82)	0.000419	0.000429	972.0	0.0534	-0.000009	0.003			42.38		968.6203
0.11873		85	0.0119	975.46	(82)	0.000422	0.000429	975.4	0.0786	-0.000007	0.006			42.67		968.6203
0.24826		85	0.0245	982.83	(82)	0.000423	0.000430	982.7	0.1635	-0.000007	0.027			42.763		968.6203
0.49588		85	0.0477	996.53	(82)	0.000427	0.000431	996.3	0.2242	-0.000005	0.050			43.144		968.6203
0.0298		95	0.0030	963.60	(82)	0.000430	0.000430	963.6	0.0000	0.000000	0.000			43.52		961.9004
0.05965		95	0.0060	965.37	(82)	0.000416	0.000431	965.3	0.0806	-0.000014	0.006			42.08		961.9004
0.11873		95	0.0119	968.72	(82)	0.000422	0.000431	968.6	0.0951	-0.000009	0.009			42.71		961.9004
0.24826		95	0.0245	976.08	(82)	0.000423	0.000432	975.9	0.2100	-0.000009	0.044			42.74		961.9004
0.49588		95	0.0477	989.72	(82)	0.000427	0.000433	989.5	0.2646	-0.000006	0.070			43.217		961.9004
		100	0.0100	964.10	(90)	0.000423	0.000431	964.0	0.0821	-0.000009	0.007					958.3637
		100	0.0200	969.90	(90)	0.000423	0.000432	969.7	0.1713	-0.000009	0.029					958.3637
		100	0.0400	981.60	(90)	0.000426	0.000433	981.3	0.2758	-0.000007	0.076					958.3637
		100	0.0800	1005.60	(90)	0.000431	0.000435	1005.2	0.3630	-0.000004	0.132					958.3637
		100	0.1200	1030.40	(90)	0.000436	0.000437	1030.2	0.2334	-0.000002	0.054					958.3637
		100	0.1600	1056.20	(90)	0.000439	0.000439	1056.2	0.0165	0.000000	0.000					958.3637
		100	0.2000	1083.10	(90)	0.000443	0.000441	1083.4	-0.2648	0.000001	0.070					958.3637
		100	0.2400	1111.00	(90)	0.000446	0.000443	1111.8	-0.7945	0.000003	0.631					958.3637
Average Res									0.0328	-0.000003	10.1093	Sum Chi sqr				
Std dev Res									0.219617	0.000005						
Avg - 4std									-0.84566	-0.000021						
Avg + 4std									0.911279	0.000016						

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta Density / kg/m³	Density of water / kg/m³
Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$																
c0	7.543551															
c1	26.38746															
c2	1.239547															
c3	0.011656															
c4	2213.955															
Min T	0															
Max T	100															
Min w	0.0010															
Max w	0.2400															
Avg dens res	0.03281															
Std dens res	0.219617															
Avg app vol res *10 ³	-0.002788															
Std app vol res *10 ³	0.004575															
No of points in corr	206															
No of inconsistent pair	27															
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)																
1.25	25	0.1122	1066.00	(22)	0.000425	0.000401	1069.0	-2.9941	0.000023	8.964	!	!				997.0449
0.01205	29.85	0.0012	996.25	(110)	0.000545	0.000392	996.4	-0.1857	0.000153	0.034		!				995.6924
0.06026	29.85	0.0061	998.77	(110)	0.000497	0.000392	999.4	-0.6371	0.000105	0.406		!				995.6924
0.10847	29.85	0.0109	1001.59	(110)	0.000464	0.000393	1002.4	-0.7828	0.000071	0.613		!				995.6924
0.16874	29.85	0.0170	1005.39	(110)	0.000433	0.000394	1006.1	-0.6799	0.000040	0.462		!				995.6924
0.22899	29.85	0.0229	1009.09	(110)	0.000423	0.000395	1009.8	-0.6667	0.000029	0.445		!				995.6924
0.01203	34.85	0.0012	994.55	(110)	0.000620	0.000397	994.8	-0.2697	0.000223	0.073		!				994.0833
0.06009	34.85	0.0061	996.67	(110)	0.000578	0.000398	997.8	-1.0909	0.000180	1.190	!	!				994.0833
0.10819	34.85	0.0109	999.11	(110)	0.000544	0.000398	1000.7	-1.5913	0.000145	2.532	!	!				994.0833
0.16829	34.85	0.0170	1002.76	(110)	0.000493	0.000399	1004.4	-1.6047	0.000094	2.575	!	!				994.0833
0.22839	34.85	0.0229	1006.25	(110)	0.000476	0.000400	1008.0	-1.7713	0.000076	3.138	!	!				994.0833
0.01202	39.85	0.0012	992.68	(110)	0.000670	0.000402	993.0	-0.3238	0.000268	0.105		!				992.273
0.01202	39.85	0.0012	992.68	(110)	0.000670	0.000402	993.0	-0.3238	0.000268	0.105		!				992.273
0.02997	39.85	0.0030	994.61	(110)	0.000231	0.000402	994.1	0.5171	-0.000172	0.267		!				992.273
0.10785	39.85	0.0109	997.05	(110)	0.000566	0.000403	998.8	-1.7769	0.000163	3.158	!	!				992.273
0.16779	39.85	0.0170	1000.16	(110)	0.000539	0.000404	1002.5	-2.3025	0.000135	5.302	!	!				992.273
0.22776	39.85	0.0229	1003.72	(110)	0.000507	0.000405	1006.1	-2.3688	0.000102	5.611	!	!				992.273
0.01199	44.85	0.0012	990.67	(110)	0.000682	0.000406	991.0	-0.3305	0.000275	0.109		!				990.2759
0.05985	44.85	0.0061	992.51	(110)	0.000637	0.000407	993.9	-1.3833	0.000230	1.913	!	!				990.2759
0.1076	44.85	0.0109	994.90	(110)	0.000581	0.000408	996.8	-1.8766	0.000173	3.522	!	!				990.2759
0.16748	44.85	0.0170	997.97	(110)	0.000551	0.000408	1000.4	-2.4182	0.000143	5.848	!	!				990.2759
0.22726	44.85	0.0229	1001.48	(110)	0.000517	0.000409	1004.0	-2.5032	0.000109	6.266	!	!				990.2759
0.01198	49.85	0.0012	988.45	(110)	0.000723	0.000410	988.8	-0.3743	0.000313	0.140		!				988.104
0.05976	49.85	0.0061	990.16	(110)	0.000668	0.000411	991.7	-1.5379	0.000257	2.365	!	!				988.104
0.10744	49.85	0.0110	991.23	(110)	0.000721	0.000412	994.6	-3.3414	0.000309	11.165	!	!				988.104
0.16729	49.85	0.0170	995.82	(110)	0.000550	0.000412	998.2	-2.3329	0.000138	5.443	!	!				988.104
0.22712	49.85	0.0230	999.08	(110)	0.000528	0.000413	1001.7	-2.6566	0.000115	7.057	!	!				988.104

Density of aqueous solutions of **KOH**

- References (4) Akerlof, G.; Bender, P. The Density of Aqueous Solutions of Potassium Hydroxide. *J. Am. Chem. Soc.* **1941**, 63, 1085-1088.
- (41) Hitchcock, L. B.; McIlhenny, J. S. Viscosity and Density of Pure Alkaline Solutions and their Mixtures. *Ind. Engng. Chem.* **1935**, 27, 461-466
- (69) Mashovets, V. P.; Dibrov, I. A.; Krumgal'z, B. S.; Mateeva, R. P. Density of Aqueous KOH Solutions at High Temperatures over a Wide Range of Concentrations. *J. Appl. Chem. USSR* **1965**, 38, 2344-2347.
- (81) Patterson, B. A.; Call, T. G.; Jardine, J. J.; Origlia-Luster, M. L.; Woolley, E. M.; Thermodynamics for Ionization of Water at Temperatures from 278.15 K to 393.15 K and at the Pressure 0.35 MPa: Apparent Molar Volumes of Aqueous KCl, KOH, and NaOH and Apparent Molar Heat Capacities of Aqueous HCl, KCl, KOH, and NaOH, *J. Chem. Thermodynamics*, **2001**, 33, 1237-1262
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (109) Roux, A. H.; Perron, G.; Desnoyers, J. E. Capacités calorifiques, volumes, expansibilités et compressibilités des solutions aqueuses concentrées de LiOH, NaOH et KOH. *Can. J. Chem.* **1984**, 62, 878-885
- (127) Tham, M. K.; Gubbins, K. E.; Walker Jr., R. D. Densities of Potassium Hydroxide Solutions *J. Chem. Eng. Data* **1967**, 12, 525-526.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
		0	0.0200	1019.3	(4)	0.000046	0.000100	1018.2	1.1172	-0.000054	1.248			19.45		999.8395
		0	0.0400	1038.5	(4)	0.000069	0.000111	1036.7	1.7930	-0.000042	3.215			38.67		999.8395
		0	0.0600	1057.75	(4)	0.000088	0.000122	1055.5	2.2780	-0.000034	5.189			57.91		999.8395
		0	0.0800	1077.08	(4)	0.000104	0.000132	1074.4	2.6425	-0.000029	6.983			77.24		999.8395
		0	0.1000	1096.52	(4)	0.000118	0.000143	1093.6	2.9074	-0.000024	8.453			96.68		999.8395
		0	0.1200	1116.09	(4)	0.000132	0.000153	1113.0	3.0935	-0.000021	9.570			116.25		999.8395
		0	0.1400	1135.78	(4)	0.000145	0.000163	1132.6	3.1920	-0.000018	10.189			135.94		999.8395
		0	0.1600	1155.59	(4)	0.000158	0.000173	1152.4	3.2039	-0.000015	10.265			155.75		999.8395
		0	0.1800	1175.48	(4)	0.000170	0.000182	1172.4	3.0908	-0.000012	9.553			175.64		999.8395
		0	0.2000	1195.44	(4)	0.000182	0.000192	1192.6	2.8441	-0.000010	8.089			195.6		999.8395
		0	0.2200	1215.34	(4)	0.000194	0.000201	1213.0	2.3358	-0.000007	5.456			215.5		999.8395
		0	0.2400	1235.77	(4)	0.000205	0.000210	1233.6	2.1578	-0.000006	4.656			235.93		999.8395
		0	0.2600	1256.44	(4)	0.000215	0.000219	1254.4	2.0223	-0.000005	4.090			256.6		999.8395
		0	0.2800	1277.32	(4)	0.000224	0.000228	1275.4	1.9018	-0.000004	3.617			277.48		999.8395
		0	0.3000	1298.42	(4)	0.000234	0.000237	1296.6	1.8087	-0.000004	3.271			298.58		999.8395
		0	0.3200	1319.75	(4)	0.000243	0.000246	1318.0	1.7560	-0.000003	3.084			319.91		999.8395
		0	0.3400	1341.34	(4)	0.000251	0.000254	1339.6	1.7768	-0.000003	3.157			341.5		999.8395
		0	0.3600	1363.16	(4)	0.000260	0.000262	1361.3	1.8444	-0.000003	3.402			363.32		999.8395
		0	0.3800	1385.26	(4)	0.000268	0.000271	1383.2	2.0123	-0.000003	4.049			385.42		999.8395
		0	0.4000	1407.67	(4)	0.000276	0.000279	1405.4	2.3143	-0.000003	5.356			407.83		999.8395
		0	0.4200	1430.39	(4)	0.000283	0.000287	1427.6	2.7546	-0.000003	7.588			430.55		999.8395
		0	0.4400	1453.49	(4)	0.000291	0.000294	1450.1	3.4073	-0.000004	11.610			453.65		999.8395
		0	0.4600	1477.02	(4)	0.000298	0.000302	1472.7	4.3272	-0.000004	18.724			477.18		999.8395
		0	0.4800	1500.99	(4)	0.000304	0.000310	1495.5	5.5289	-0.000005	30.569			501.15		999.8395
0.02032		4	0.0011	1001.06	(109)	0.000043	0.000093	1001.0	0.0573	-0.000050	0.003			1.091		999.972
0.04087		4	0.0023	1002.16	(109)	0.000044	0.000094	1002.0	0.1156	-0.000050	0.013			2.193		999.972
0.06173		4	0.0035	1003.29	(109)	0.000043	0.000095	1003.1	0.1799	-0.000052	0.032			3.315		999.972
0.08157		4	0.0046	1004.35	(109)	0.000043	0.000095	1004.1	0.2385	-0.000052	0.057			4.378		999.972
0.10222		4	0.0057	1005.45	(109)	0.000045	0.000096	1005.2	0.2908	-0.000050	0.085			5.474		999.972

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.2018		4	0.0112	1010.70	(109)	0.000052	0.000099	1010.2	0.5358	-0.000047	0.287			10.728		999.972
0.3035		4	0.0167	1015.99	(109)	0.000059	0.000102	1015.2	0.7467	-0.000043	0.557			16.014		999.972
0.5122		4	0.0279	1026.65	(109)	0.000070	0.000108	1025.5	1.1237	-0.000038	1.263			26.679		999.972
1.0068		4	0.0535	1050.98	(109)	0.000092	0.000122	1049.2	1.7297	-0.000029	2.992			51.004		999.972
1.0132		4	0.0538	1051.27	(109)	0.000093	0.000122	1049.5	1.7258	-0.000029	2.978			51.301		999.972
2.019		4	0.1018	1097.23	(109)	0.000129	0.000147	1095.0	2.1891	-0.000018	4.792			97.259		999.972
3.542		4	0.1658	1159.52	(109)	0.000170	0.000178	1157.7	1.8649	-0.000008	3.478			159.551		999.972
4.972		4	0.2181	1211.63	(109)	0.000199	0.000203	1210.4	1.2191	-0.000004	1.486			211.659		999.972
7.541		4	0.2973	1293.64	(109)	0.000236	0.000238	1292.9	0.7678	-0.000002	0.589			293.673		999.972
10.254		4	0.3652	1367.01	(109)	0.000265	0.000266	1366.0	0.9944	-0.000001	0.989			367.043		999.972
15.51		4	0.4653	1480.63	(109)	0.000302	0.000305	1477.7	2.9300	-0.000003	8.585			480.659		999.972
0.015		5	0.0008	1000.78	(81)	0.000025	0.000094	1000.7	0.0582	-0.000069	0.003				1.4	999.9638
0.03005		5	0.0017	1001.63	(81)	0.000012	0.000095	1001.5	0.1401	-0.000083	0.020				0.65	999.9638
0.06006		5	0.0034	1003.23	(81)	0.000031	0.000095	1003.0	0.2191	-0.000065	0.048				1.72	999.9638
0.12604		5	0.0070	1006.77	(81)	0.000038	0.000098	1006.3	0.4249	-0.000060	0.181				2.12	999.9638
0.24963		5	0.0138	1013.18	(81)	0.000056	0.000101	1012.5	0.6468	-0.000046	0.418				3.12	999.9638
0.49992		5	0.0273	1025.87	(81)	0.000075	0.000109	1024.9	0.9749	-0.000034	0.950				4.187	999.9638
0.02032		10	0.0011	1000.78	(109)	0.000053	0.000099	1000.7	0.0523	-0.000046	0.003			1.079		999.6996
0.04087		10	0.0023	1001.85	(109)	0.000062	0.000100	1001.8	0.0867	-0.000038	0.008			2.15		999.6996
0.06173		10	0.0035	1002.94	(109)	0.000064	0.000100	1002.8	0.1282	-0.000037	0.016			3.242		999.6996
0.08157		10	0.0046	1003.98	(109)	0.000065	0.000101	1003.8	0.1677	-0.000037	0.028			4.279		999.6996
0.10222		10	0.0057	1005.06	(109)	0.000064	0.000102	1004.8	0.2171	-0.000038	0.047			5.365		999.6996
0.2018		10	0.0112	1010.19	(109)	0.000073	0.000105	1009.8	0.3639	-0.000032	0.132			10.487		999.6996
0.3035		10	0.0167	1015.35	(109)	0.000079	0.000108	1014.9	0.4890	-0.000028	0.239			15.653		999.6996
		10	0.0200	1018.44	(4)	0.000080	0.000109	1017.8	0.6100	-0.000029	0.372			18.74		999.6996
0.5122		10	0.0279	1025.79	(109)	0.000089	0.000114	1025.1	0.7117	-0.000024	0.507			26.095		999.6996
		10	0.0400	1037.03	(4)	0.000100	0.000120	1036.2	0.8573	-0.000020	0.735			37.33		999.6996
1.0068		10	0.0535	1049.70	(109)	0.000109	0.000127	1048.6	1.0552	-0.000018	1.113			50.002		999.6996
1.0132		10	0.0538	1049.99	(109)	0.000110	0.000127	1048.9	1.0422	-0.000018	1.086			50.288		999.6996
		10	0.0600	1055.70	(4)	0.000116	0.000130	1054.7	0.9717	-0.000015	0.944			56.00		999.6996
		10	0.0800	1074.51	(4)	0.000130	0.000141	1073.5	1.0131	-0.000011	1.026			74.81		999.6996
		10	0.1000	1093.49	(4)	0.000142	0.000151	1092.5	1.0116	-0.000008	1.023			93.79		999.6996
2.019		10	0.1018	1095.33	(109)	0.000142	0.000152	1094.2	1.1716	-0.000010	1.373			95.628		999.6996
		10	0.1200	1112.65	(4)	0.000154	0.000161	1111.7	0.9773	-0.000007	0.955			112.95		999.6996
		10	0.1400	1131.99	(4)	0.000165	0.000170	1131.1	0.9104	-0.000005	0.829			132.29		999.6996
		10	0.1600	1151.52	(4)	0.000176	0.000180	1150.7	0.8214	-0.000004	0.675			151.82		999.6996
3.542		10	0.1658	1157.11	(109)	0.000180	0.000183	1156.4	0.6888	-0.000003	0.474			157.407		999.6996
		10	0.1800	1171.20	(4)	0.000187	0.000189	1170.5	0.6708	-0.000003	0.450			171.50		999.6996
		10	0.2000	1191.04	(4)	0.000197	0.000198	1190.6	0.4693	-0.000002	0.220			191.34		999.6996
4.972		10	0.2181	1208.91	(109)	0.000207	0.000207	1208.9	-0.0022	0.000000	0.000			209.212		999.6996
		10	0.2200	1210.91	(4)	0.000207	0.000208	1210.8	0.0878	0.000000	0.008			211.21		999.6996
		10	0.2400	1231.16	(4)	0.000217	0.000216	1231.3	-0.1227	0.000000	0.015			231.46		999.6996
		10	0.2600	1251.67	(4)	0.000226	0.000225	1252.0	-0.2811	0.000001	0.079			251.97		999.6996

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
7.541		10	0.2800	1272.41	(4)	0.000235	0.000234	1272.8	-0.4159	0.000001	0.173			272.71		999.6996
		10	0.2973	1290.61	(109)	0.000242	0.000241	1291.1	-0.4603	0.000001	0.212			290.908		999.6996
		10	0.3000	1293.40	(4)	0.000243	0.000242	1293.9	-0.5058	0.000001	0.256			293.70		999.6996
		10	0.3200	1314.64	(4)	0.000251	0.000250	1315.2	-0.5490	0.000001	0.301			314.94		999.6996
		10	0.3400	1336.13	(4)	0.000260	0.000259	1336.7	-0.5435	0.000001	0.295			336.43		999.6996
10.254		10	0.3600	1357.88	(4)	0.000267	0.000267	1358.4	-0.4774	0.000001	0.228			358.18		999.6996
		10	0.3652	1363.70	(109)	0.000269	0.000269	1364.0	-0.3431	0.000001	0.118			364.005		999.6996
		10	0.3800	1379.91	(4)	0.000275	0.000275	1380.2	-0.3284	0.000000	0.108			380.21		999.6996
		10	0.4000	1402.21	(4)	0.000282	0.000282	1402.3	-0.1041	0.000000	0.011			402.51		999.6996
		10	0.4200	1424.81	(4)	0.000290	0.000290	1424.6	0.2284	0.000000	0.052			425.11		999.6996
15.51		10	0.4400	1447.73	(4)	0.000297	0.000297	1447.0	0.6918	-0.000001	0.479			448.03		999.6996
		10	0.4600	1471.01	(4)	0.000304	0.000305	1469.7	1.3292	-0.000001	1.767			471.31		999.6996
		10	0.4653	1477.00	(109)	0.000306	0.000307	1475.7	1.2711	-0.000001	1.616			477.299		999.6996
		10	0.4800	1494.64	(4)	0.000310	0.000312	1492.5	2.1340	-0.000002	4.554			494.94		999.6996
		10	0.5000	1518.83	(4)	0.000317	0.000319	1515.5	3.3197	-0.000003	11.021			519.13		999.6996
0.015		15	0.0008	999.88	(81)	0.000068	0.000104	999.9	0.0304	-0.000036	0.001				3.8	999.0996
0.03005		15	0.0017	1000.70	(81)	0.000051	0.000104	1000.6	0.0896	-0.000053	0.008				2.87	999.0996
0.06006		15	0.0034	1002.26	(81)	0.000060	0.000105	1002.1	0.1517	-0.000045	0.023				3.38	999.0996
0.12604		15	0.0070	1005.68	(81)	0.000069	0.000107	1005.4	0.2711	-0.000038	0.074				3.87	999.0996
		15	0.0100	1008.30	(90)	0.000088	0.000109	1008.1	0.2148	-0.000021	0.046					999.0996
0.24963		15	0.0138	1011.92	(81)	0.000083	0.000111	1011.5	0.3942	-0.000028	0.155				4.651	999.0996
		15	0.0200	1017.50	(90)	0.000096	0.000114	1017.1	0.3759	-0.000018	0.141					999.0996
0.49992		15	0.0273	1024.27	(81)	0.000099	0.000118	1023.7	0.5268	-0.000018	0.278				5.581	999.0996
		15	0.0400	1035.90	(90)	0.000112	0.000125	1035.4	0.5376	-0.000013	0.289					999.0996
		15	0.0600	1054.40	(90)	0.000126	0.000135	1053.8	0.5850	-0.000009	0.342					999.0996
		15	0.0800	1073.00	(90)	0.000139	0.000145	1072.5	0.5176	-0.000006	0.268					999.0996
		15	0.1000	1091.80	(90)	0.000151	0.000155	1091.4	0.4352	-0.000004	0.189					999.0996
		15	0.1500	1139.60	(90)	0.000178	0.000179	1139.5	0.0866	0.000000	0.008					999.0996
		15	0.2000	1188.40	(90)	0.000204	0.000202	1189.0	-0.6082	0.000002	0.370					999.0996
		15	0.2500	1238.70	(90)	0.000226	0.000224	1239.8	-1.1453	0.000003	1.312					999.0996
		15	0.3000	1290.50	(90)	0.000248	0.000245	1292.0	-1.5151	0.000003	2.295					999.0996
		15	0.3500	1344.00	(90)	0.000267	0.000265	1345.5	-1.5025	0.000002	2.257					999.0996
		15	0.4000	1399.10	(90)	0.000286	0.000284	1400.3	-1.1860	0.000002	1.407					999.0996
		15	0.4500	1455.80	(90)	0.000303	0.000303	1456.3	-0.5372	0.000001	0.289					999.0996
		15	0.5000	1514.30	(90)	0.000320	0.000320	1513.6	0.6795	-0.000001	0.462					999.0996
		15	0.5170	1535.50	(90)	0.000325	0.000326	1533.4	2.1299	-0.000002	4.537					999.0996
		20	0.0200	1016.43	(4)	0.000103	0.000119	1016.1	0.3126	-0.000015	0.098			18.2		998.2041
		20	0.0400	1034.57	(4)	0.000121	0.000129	1034.3	0.3200	-0.000007	0.102			36.4		998.2041
		20	0.0453	1039.00	(69)	0.000133	0.000132	1039.1	-0.0954	0.000002	0.009					998.2041
	0.8385	20	0.0453	1038.50	(41)	0.000144	0.000132	1039.1	-0.5986	0.000012	0.358					998.2041
		20	0.0600	1052.82	(4)	0.000136	0.000139	1052.6	0.2215	-0.000003	0.049			54.6		998.2041
		20	0.0800	1071.26	(4)	0.000148	0.000149	1071.2	0.0963	-0.000001	0.009			73.1		998.2041
	1.6396	20	0.0856	1074.80	(41)	0.000168	0.000152	1076.4	-1.6000	0.000016	2.560					998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
		20	0.0879	1078.00	(69)	0.000158	0.000153	1078.6	-0.5611	0.000005	0.315					998.2041
		20	0.1000	1089.90	(4)	0.000159	0.000159	1090.0	-0.0466	0.000000	0.002			91.7		998.2041
		20	0.1200	1108.75	(4)	0.000169	0.000168	1109.0	-0.1975	0.000001	0.039			110.6		998.2041
	2.495	20	0.1259	1111.90	(41)	0.000188	0.000171	1114.6	-2.7028	0.000017	7.305					998.2041
		20	0.1400	1127.83	(4)	0.000179	0.000177	1128.2	-0.3372	0.000002	0.114			129.6		998.2041
	3.246	20	0.1593	1143.50	(41)	0.000203	0.000186	1146.9	-3.4018	0.000016	11.572					998.2041
		20	0.1600	1147.14	(4)	0.000189	0.000187	1147.6	-0.4660	0.000002	0.217			148.9		998.2041
		20	0.1659	1153.00	(69)	0.000191	0.000189	1153.4	-0.3866	0.000002	0.149					998.2041
		20	0.1800	1166.65	(4)	0.000198	0.000196	1167.3	-0.6144	0.000003	0.378			168.5		998.2041
	3.964	20	0.1896	1173.10	(41)	0.000214	0.000200	1176.8	-3.6808	0.000014	13.549					998.2041
		20	0.2000	1186.37	(4)	0.000207	0.000205	1187.1	-0.7726	0.000003	0.597			188.2		998.2041
		20	0.2200	1206.20	(4)	0.000217	0.000213	1207.2	-1.0407	0.000003	1.083			208.0		998.2041
	4.879	20	0.2263	1209.70	(41)	0.000228	0.000216	1213.6	-3.9235	0.000012	15.394					998.2041
		20	0.2356	1222.00	(69)	0.000223	0.000220	1223.1	-1.0740	0.000003	1.153					998.2041
		20	0.2400	1226.34	(4)	0.000225	0.000222	1227.6	-1.2187	0.000003	1.485			228.1		998.2041
	5.606	20	0.2541	1237.90	(41)	0.000238	0.000228	1242.0	-4.1183	0.000011	16.961					998.2041
		20	0.2600	1246.70	(4)	0.000234	0.000230	1248.1	-1.3966	0.000003	1.951			248.5		998.2041
		20	0.2800	1267.32	(4)	0.000242	0.000239	1268.9	-1.5342	0.000003	2.354			269.1		998.2041
	6.366	20	0.2819	1266.90	(41)	0.000248	0.000239	1270.9	-3.9857	0.000009	15.886					998.2041
		20	0.2982	1286.00	(69)	0.000250	0.000246	1287.9	-1.9384	0.000004	3.757					998.2041
		20	0.3000	1288.19	(4)	0.000250	0.000247	1289.8	-1.6412	0.000003	2.693			290.0		998.2041
		20	0.3200	1309.33	(4)	0.000258	0.000255	1311.0	-1.6970	0.000003	2.880			311.1		998.2041
		20	0.3400	1330.73	(4)	0.000266	0.000263	1332.4	-1.7111	0.000003	2.928			332.5		998.2041
		20	0.3548	1346.00	(69)	0.000272	0.000268	1348.4	-2.4317	0.000004	5.913					998.2041
		20	0.3600	1352.39	(4)	0.000273	0.000270	1354.1	-1.6827	0.000003	2.832			354.2		998.2041
		20	0.3800	1374.33	(4)	0.000280	0.000278	1375.9	-1.5910	0.000002	2.531			376.1		998.2041
		20	0.4000	1396.54	(4)	0.000287	0.000286	1398.0	-1.4448	0.000002	2.088			398.3		998.2041
		20	0.4062	1403.00	(69)	0.000290	0.000288	1404.9	-1.8724	0.000002	3.506					998.2041
		20	0.4200	1419.04	(4)	0.000294	0.000293	1420.3	-1.2231	0.000001	1.496			420.8		998.2041
		20	0.4400	1441.84	(4)	0.000301	0.000300	1442.8	-0.9144	0.000001	0.836			443.6		998.2041
		20	0.4531	1457.00	(69)	0.000306	0.000305	1457.6	-0.6051	0.000001	0.366					998.2041
		20	0.4600	1464.97	(4)	0.000308	0.000307	1465.5	-0.4872	0.000000	0.237			466.8		998.2041
		20	0.4800	1488.40	(4)	0.000314	0.000314	1488.4	0.0302	0.000000	0.001			490.2		998.2041
		20	0.4960	1507.00	(69)	0.000320	0.000320	1506.9	0.1462	0.000000	0.021					998.2041
		20	0.5000	1512.31	(4)	0.000321	0.000321	1511.5	0.8196	-0.000001	0.672			514.1		998.2041
0.015		25	0.0008	997.82	(81)	0.000078	0.000113	997.8	0.0293	-0.000035	0.001				4.38	997.0449
0.02032		25	0.0011	998.08	(109)	0.000086	0.000113	998.1	0.0307	-0.000027	0.001			1.039		997.0449
0.03005		25	0.0017	998.63	(81)	0.000057	0.000114	998.5	0.0945	-0.000056	0.009				3.21	997.0449
0.04087		25	0.0023	999.12	(109)	0.000093	0.000114	999.1	0.0476	-0.000021	0.002			2.074		997.0449
0.05172		25	0.0029	999.66	(109)	0.000096	0.000114	999.6	0.0537	-0.000019	0.003			2.617		997.0449
0.06006		25	0.0034	1000.14	(81)	0.000078	0.000114	1000.0	0.1238	-0.000037	0.015				4.35	997.0449
0.06173		25	0.0035	1000.16	(109)	0.000097	0.000114	1000.1	0.0598	-0.000017	0.004			3.118		997.0449
0.08157		25	0.0046	1001.16	(109)	0.000099	0.000115	1001.1	0.0740	-0.000016	0.005			4.112		997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.1022		25	0.0057	1002.19	(109)	0.000100	0.000116	1002.1	0.0918	-0.000016	0.008			5.147		997.0449
0.1056		25	0.0059	1002.36	(109)	0.000101	0.000116	1002.3	0.0894	-0.000015	0.008			5.312		997.0449
0.12604		25	0.0070	1003.47	(81)	0.000089	0.000116	1003.3	0.1933	-0.000027	0.037				4.99	997.0449
0.2018		25	0.0112	1007.12	(109)	0.000107	0.000118	1007.0	0.1309	-0.000012	0.017			10.074		997.0449
0.2084		25	0.0116	1007.43	(109)	0.000108	0.000119	1007.3	0.1213	-0.000010	0.015			10.387		997.0449
0.24963		25	0.0138	1009.57	(81)	0.000102	0.000120	1009.3	0.2459	-0.000017	0.060				5.74	997.0449
0.3035		25	0.0167	1012.10	(109)	0.000112	0.000121	1011.9	0.1557	-0.000009	0.024			15.051		997.0449
0.3115		25	0.0172	1012.48	(109)	0.000113	0.000121	1012.3	0.1558	-0.000009	0.024			15.439		997.0449
0.49992		25	0.0273	1021.65	(81)	0.000118	0.000127	1021.4	0.2508	-0.000009	0.063				6.611	997.0449
0.5122		25	0.0279	1022.15	(109)	0.000121	0.000127	1022.0	0.1727	-0.000006	0.030			25.109		997.0449
0.5199		25	0.0283	1022.53	(109)	0.000121	0.000127	1022.3	0.1823	-0.000006	0.033			25.486		997.0449
1.0068		25	0.0535	1045.27	(109)	0.000138	0.000140	1045.1	0.1262	-0.000002	0.016			48.225		997.0449
1.0132		25	0.0538	1045.57	(109)	0.000138	0.000140	1045.4	0.1282	-0.000002	0.016			48.521		997.0449
1.014		25	0.0538	1045.60	(109)	0.000138	0.000140	1045.5	0.1285	-0.000002	0.017			48.558		997.0449
1.0175		25	0.0540	1045.77	(109)	0.000138	0.000140	1045.6	0.1307	-0.000002	0.017			48.721		997.0449
2.019		25	0.1018	1089.77	(109)	0.000164	0.000163	1089.9	-0.1492	0.000001	0.022			92.728		997.0449
2.025		25	0.1020	1090.00	(109)	0.000165	0.000163	1090.2	-0.1737	0.000001	0.030			92.959		997.0449
3.508		25	0.1645	1149.28	(109)	0.000195	0.000192	1150.0	-0.7116	0.000003	0.506			152.24		997.0449
3.542		25	0.1658	1150.50	(109)	0.000196	0.000192	1151.3	-0.7954	0.000004	0.633			153.454		997.0449
4.94		25	0.2170	1200.83	(109)	0.000219	0.000215	1202.1	-1.2233	0.000004	1.497			203.785		997.0449
4.972		25	0.2181	1201.67	(109)	0.000220	0.000215	1203.2	-1.4875	0.000005	2.213			204.626		997.0449
7.427		25	0.2941	1279.44	(109)	0.000250	0.000247	1281.3	-1.8165	0.000004	3.300			282.393		997.0449
7.541		25	0.2973	1282.68	(109)	0.000252	0.000248	1284.6	-1.9069	0.000004	3.636			285.633		997.0449
10.244		25	0.3650	1355.04	(109)	0.000277	0.000274	1357.0	-1.9464	0.000003	3.788			357.995		997.0449
10.254		25	0.3652	1355.50	(109)	0.000277	0.000274	1357.2	-1.7347	0.000003	3.009			358.453		997.0449
15.51		25	0.4653	1467.72	(109)	0.000312	0.000310	1469.1	-1.3732	0.000001	1.886			470.673		997.0449
		30	0.0200	1013.53	(4)	0.000118	0.000127	1013.3	0.1794	-0.000009	0.032			17.88		995.6473
		30	0.0400	1031.36	(4)	0.000135	0.000137	1031.3	0.0903	-0.000002	0.008			35.71		995.6473
		30	0.0600	1049.34	(4)	0.000148	0.000147	1049.4	-0.0687	0.000001	0.005			53.69		995.6473
		30	0.0800	1067.51	(4)	0.000159	0.000156	1067.8	-0.2593	0.000003	0.067			71.86		995.6473
		30	0.1000	1085.91	(4)	0.000170	0.000166	1086.4	-0.4429	0.000004	0.196			90.26		995.6473
		30	0.1200	1104.55	(4)	0.000179	0.000175	1105.2	-0.6111	0.000004	0.373			108.90		995.6473
		30	0.1400	1123.44	(4)	0.000188	0.000184	1124.2	-0.7552	0.000004	0.570			127.79		995.6473
		30	0.1600	1142.57	(4)	0.000197	0.000193	1143.5	-0.8866	0.000004	0.786			146.92		995.6473
	3.522	30	0.1713	1153.60	(41)	0.000202	0.000198	1154.4	-0.8422	0.000004	0.709					995.6473
		30	0.1800	1161.95	(4)	0.000206	0.000202	1162.9	-0.9965	0.000004	0.993			166.30		995.6473
		30	0.2000	1181.57	(4)	0.000214	0.000210	1182.7	-1.0964	0.000004	1.202			185.92		995.6473
		30	0.2200	1201.34	(4)	0.000223	0.000219	1202.6	-1.2772	0.000004	1.631			205.69		995.6473
		30	0.2400	1221.44	(4)	0.000231	0.000227	1222.8	-1.3602	0.000004	1.850			225.79		995.6473
		30	0.2600	1241.66	(4)	0.000239	0.000235	1243.2	-1.5563	0.000004	2.422			246.01		995.6473
		30	0.2800	1262.16	(4)	0.000247	0.000243	1263.9	-1.7066	0.000004	2.913			266.51		995.6473
		30	0.3000	1282.92	(4)	0.000255	0.000251	1284.7	-1.8320	0.000004	3.356			287.27		995.6473
	7.157	30	0.3107	1292.30	(41)	0.000262	0.000255	1296.1	-3.7666	0.000007	14.187					995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
		30	0.3200	1303.96	(4)	0.000262	0.000259	1305.9	-1.9132	0.000004	3.660			308.31		995.6473
		30	0.3400	1325.26	(4)	0.000270	0.000266	1327.2	-1.9710	0.000003	3.885			329.61		995.6473
		30	0.3600	1346.84	(4)	0.000277	0.000274	1348.8	-1.9860	0.000003	3.944			351.19		995.6473
		30	0.3800	1368.69	(4)	0.000284	0.000281	1370.7	-1.9688	0.000003	3.876			373.04		995.6473
		30	0.4000	1390.83	(4)	0.000291	0.000288	1392.7	-1.8999	0.000002	3.610			395.18		995.6473
		30	0.4200	1413.25	(4)	0.000298	0.000296	1415.0	-1.7895	0.000002	3.202			417.60		995.6473
		30	0.4400	1435.97	(4)	0.000304	0.000303	1437.6	-1.6180	0.000002	2.618			440.32		995.6473
		30	0.4600	1459.01	(4)	0.000311	0.000310	1460.4	-1.3654	0.000001	1.864			463.36		995.6473
		30	0.4800	1482.34	(4)	0.000317	0.000316	1483.4	-1.0618	0.000001	1.127			486.69		995.6473
		30	0.5000	1506.12	(4)	0.000324	0.000323	1506.7	-0.5471	0.000000	0.299			510.47		995.6473
0.015		35	0.0008	994.78	(81)	0.000111	0.000122	994.8	0.0092	-0.000011	0.000				6.21	994.0319
0.03005		35	0.0017	995.56	(81)	0.000091	0.000122	995.5	0.0519	-0.000031	0.003				5.11	994.0319
0.06006		35	0.0034	997.05	(81)	0.000099	0.000123	997.0	0.0818	-0.000024	0.007				5.53	994.0319
0.12604		35	0.0070	1000.30	(81)	0.000108	0.000125	1000.2	0.1198	-0.000017	0.014				6.05	994.0319
0.24963		35	0.0138	1006.29	(81)	0.000119	0.000128	1006.2	0.1348	-0.000010	0.018				6.655	994.0319
0.49992		35	0.0273	1018.15	(81)	0.000133	0.000135	1018.1	0.0609	-0.000002	0.004				7.447	994.0319
0.02032		40	0.0011	993.24	(109)	0.000095	0.000126	993.2	0.0344	-0.000031	0.001			1.024		992.2158
0.04087		40	0.0023	994.25	(109)	0.000107	0.000127	994.2	0.0452	-0.000020	0.002			2.034		992.2158
0.06173		40	0.0035	995.28	(109)	0.000110	0.000127	995.2	0.0605	-0.000018	0.004			3.062		992.2158
0.08157		40	0.0046	996.25	(109)	0.000113	0.000128	996.2	0.0668	-0.000015	0.004			4.03		992.2158
0.2018		40	0.0112	1002.06	(109)	0.000123	0.000131	1002.0	0.0882	-0.000008	0.008			9.848		992.2158
0.3035		40	0.0167	1006.92	(109)	0.000129	0.000134	1006.8	0.0863	-0.000005	0.007			14.708		992.2158
		40	0.0200	1009.88	(4)	0.000127	0.000135	1009.7	0.1770	-0.000009	0.031			17.66		992.2158
0.5122		40	0.0279	1016.77	(109)	0.000137	0.000139	1016.7	0.0729	-0.000003	0.005			24.555		992.2158
		40	0.0400	1027.52	(4)	0.000142	0.000145	1027.4	0.1115	-0.000003	0.012			35.30		992.2158
	0.8316	40	0.0452	1031.30	(41)	0.000164	0.000147	1032.1	-0.7841	0.000016	0.615					992.2158
1.0068		40	0.0535	1039.46	(109)	0.000151	0.000151	1039.5	0.0080	0.000000	0.000			47.248		992.2158
1.0132		40	0.0538	1039.72	(109)	0.000152	0.000151	1039.7	-0.0210	0.000000	0.000			47.508		992.2158
		40	0.0600	1045.31	(4)	0.000155	0.000154	1045.3	-0.0288	0.000000	0.001			53.09		992.2158
		40	0.0800	1063.32	(4)	0.000165	0.000164	1063.5	-0.1762	0.000002	0.031			71.10		992.2158
	1.6273	40	0.0856	1066.80	(41)	0.000185	0.000166	1068.6	-1.8073	0.000019	3.267					992.2158
		40	0.1000	1081.56	(4)	0.000175	0.000173	1081.9	-0.3230	0.000003	0.104			89.34		992.2158
2.019		40	0.1018	1083.27	(109)	0.000175	0.000173	1083.5	-0.2366	0.000002	0.056			91.053		992.2158
		40	0.1200	1100.05	(4)	0.000185	0.000181	1100.5	-0.4514	0.000003	0.204			107.83		992.2158
	2.475	40	0.1259	1103.20	(41)	0.000202	0.000184	1106.0	-2.8154	0.000018	7.926					992.2158
		40	0.1400	1118.80	(4)	0.000193	0.000190	1119.3	-0.5539	0.000003	0.307			126.58		992.2158
	3.22	40	0.1593	1134.40	(41)	0.000215	0.000198	1137.7	-3.3344	0.000016	11.118					992.2158
		40	0.1600	1137.82	(4)	0.000202	0.000199	1138.4	-0.6226	0.000003	0.388			145.60		992.2158
3.542		40	0.1658	1143.36	(109)	0.000204	0.000201	1144.0	-0.6516	0.000003	0.425			151.142		992.2158
		40	0.1800	1157.09	(4)	0.000210	0.000207	1157.8	-0.6799	0.000003	0.462			164.87		992.2158
	3.932	40	0.1896	1163.60	(41)	0.000225	0.000211	1167.1	-3.5312	0.000014	12.469					992.2158
		40	0.2000	1176.62	(4)	0.000218	0.000216	1177.3	-0.7180	0.000003	0.516			184.40		992.2158
4.972		40	0.2181	1194.37	(109)	0.000226	0.000223	1195.3	-0.9039	0.000003	0.817			202.157		992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
		40	0.2200	1196.33	(4)	0.000226	0.000224	1197.1	-0.8191	0.000003	0.671			204.11		992.2158
	4.84	40	0.2263	1199.90	(41)	0.000237	0.000226	1203.5	-3.5629	0.000011	12.694					992.2158
		40	0.2400	1216.38	(4)	0.000234	0.000232	1217.2	-0.8255	0.000002	0.681			224.16		992.2158
	5.561	40	0.2541	1227.90	(41)	0.000247	0.000237	1231.5	-3.6020	0.000009	12.974					992.2158
		40	0.2600	1236.54	(4)	0.000242	0.000240	1237.5	-0.9693	0.000002	0.940			244.32		992.2158
		40	0.2800	1256.94	(4)	0.000250	0.000247	1258.1	-1.1228	0.000003	1.261			264.72		992.2158
	6.315	40	0.2819	1256.80	(41)	0.000255	0.000248	1260.1	-3.2563	0.000007	10.603					992.2158
7.541		40	0.2973	1274.66	(109)	0.000257	0.000254	1276.1	-1.3985	0.000003	1.956			282.446		992.2158
		40	0.3000	1277.61	(4)	0.000257	0.000255	1278.9	-1.2580	0.000003	1.583			285.39		992.2158
		40	0.3200	1298.55	(4)	0.000265	0.000262	1299.9	-1.3772	0.000003	1.897			306.33		992.2158
		40	0.3400	1319.77	(4)	0.000272	0.000270	1321.2	-1.4725	0.000002	2.168			327.55		992.2158
		40	0.3600	1341.27	(4)	0.000279	0.000277	1342.8	-1.5458	0.000002	2.390			349.05		992.2158
10.254		40	0.3652	1346.77	(109)	0.000281	0.000279	1348.5	-1.7148	0.000003	2.941			354.553		992.2158
		40	0.3800	1363.06	(4)	0.000286	0.000284	1364.6	-1.5893	0.000002	2.526			370.84		992.2158
		40	0.4000	1385.13	(4)	0.000293	0.000291	1386.7	-1.6149	0.000002	2.608			392.91		992.2158
		40	0.4200	1407.50	(4)	0.000300	0.000298	1409.1	-1.6046	0.000002	2.575			415.28		992.2158
		40	0.4400	1430.18	(4)	0.000306	0.000305	1431.7	-1.5504	0.000002	2.404			437.96		992.2158
		40	0.4600	1453.18	(4)	0.000313	0.000311	1454.6	-1.4440	0.000001	2.085			460.96		992.2158
		40	0.4800	1476.48	(4)	0.000319	0.000318	1477.8	-1.3074	0.000001	1.709			484.26		992.2158
		40	0.5000	1500.25	(4)	0.000325	0.000324	1501.2	-0.9722	0.000001	0.945			508.03		992.2158
0.015		45	0.0008	990.97	(81)	0.000093	0.000130	990.9	0.0305	-0.000037	0.001				5.22	990.2132
0.03005		45	0.0017	991.73	(81)	0.000090	0.000130	991.7	0.0669	-0.000040	0.004				5.05	990.2132
0.06006		45	0.0034	993.20	(81)	0.000106	0.000131	993.1	0.0822	-0.000025	0.007				5.97	990.2132
0.12604		45	0.0070	996.44	(81)	0.000112	0.000133	996.3	0.1480	-0.000021	0.022				6.27	990.2132
0.24963		45	0.0138	1002.36	(81)	0.000124	0.000136	1002.2	0.1690	-0.000012	0.029				6.96	990.2132
0.49992		45	0.0273	1014.09	(81)	0.000138	0.000143	1014.0	0.1222	-0.000004	0.015				7.758	990.2132
		50	0.0200	1005.57	(4)	0.000130	0.000143	1005.3	0.2632	-0.000013	0.069			17.53		988.0363
		50	0.0400	1023.10	(4)	0.000145	0.000152	1022.8	0.2993	-0.000007	0.090			35.06		988.0363
		50	0.0453	1027.00	(69)	0.000164	0.000155	1027.5	-0.4713	0.000010	0.222					988.0363
		50	0.0600	1040.78	(4)	0.000157	0.000161	1040.5	0.2551	-0.000004	0.065			52.74		988.0363
		50	0.0800	1058.67	(4)	0.000168	0.000170	1058.5	0.1877	-0.000002	0.035			70.63		988.0363
		50	0.0879	1066.00	(69)	0.000170	0.000174	1065.6	0.3632	-0.000004	0.132					988.0363
		50	0.1000	1076.81	(4)	0.000178	0.000179	1076.7	0.1338	-0.000001	0.018			88.77		988.0363
		50	0.1200	1095.21	(4)	0.000187	0.000187	1095.1	0.1004	-0.000001	0.010			107.17		988.0363
		50	0.1400	1113.87	(4)	0.000195	0.000196	1113.8	0.0843	0.000000	0.007			125.83		988.0363
		50	0.1600	1132.80	(4)	0.000204	0.000204	1132.7	0.0922	0.000000	0.009			144.76		988.0363
		50	0.1659	1138.00	(69)	0.000208	0.000207	1138.3	-0.3335	0.000002	0.111					988.0363
		50	0.1800	1152.00	(4)	0.000212	0.000212	1151.9	0.1210	-0.000001	0.015			163.96		988.0363
		50	0.2000	1171.46	(4)	0.000220	0.000220	1171.3	0.1573	-0.000001	0.025			183.42		988.0363
		50	0.2200	1191.11	(4)	0.000228	0.000228	1191.0	0.1278	0.000000	0.016			203.07		988.0363
		50	0.2356	1207.00	(69)	0.000233	0.000234	1206.5	0.4917	-0.000001	0.242					988.0363
		50	0.2400	1211.10	(4)	0.000235	0.000236	1210.9	0.1791	-0.000001	0.032			223.06		988.0363
		50	0.2600	1231.23	(4)	0.000243	0.000243	1231.1	0.1080	0.000000	0.012			243.19		988.0363

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
		50	0.2800	1251.54	(4)	0.000251	0.000251	1251.6	-0.0490	0.000000	0.002			263.50		988.0363
		50	0.2982	1270.00	(69)	0.000259	0.000258	1270.4	-0.4443	0.000001	0.197					988.0363
		50	0.3000	1272.12	(4)	0.000259	0.000258	1272.3	-0.2055	0.000000	0.042			284.08		988.0363
		50	0.3200	1292.97	(4)	0.000266	0.000266	1293.3	-0.3647	0.000001	0.133			304.93		988.0363
		50	0.3400	1314.11	(4)	0.000273	0.000273	1314.6	-0.5103	0.000001	0.260			326.07		988.0363
		50	0.3548	1330.00	(69)	0.000279	0.000278	1330.5	-0.5479	0.000001	0.300					988.0363
		50	0.3600	1335.53	(4)	0.000281	0.000280	1336.2	-0.6558	0.000001	0.430			347.49		988.0363
		50	0.3800	1357.24	(4)	0.000288	0.000286	1358.0	-0.7948	0.000001	0.632			369.20		988.0363
		50	0.4000	1379.25	(4)	0.000294	0.000293	1380.2	-0.9208	0.000001	0.848			391.21		988.0363
		50	0.4062	1386.00	(69)	0.000297	0.000295	1387.1	-1.0881	0.000001	1.184					988.0363
		50	0.4200	1401.55	(4)	0.000301	0.000300	1402.6	-1.0475	0.000001	1.097			413.51		988.0363
		50	0.4400	1424.17	(4)	0.000308	0.000306	1425.3	-1.1485	0.000001	1.319			436.13		988.0363
		50	0.4531	1439.00	(69)	0.000312	0.000311	1440.4	-1.3584	0.000001	1.845					988.0363
		50	0.4600	1447.13	(4)	0.000314	0.000313	1448.3	-1.2076	0.000001	1.458			459.09		988.0363
		50	0.4800	1470.40	(4)	0.000320	0.000319	1471.7	-1.2585	0.000001	1.584			482.36		988.0363
		50	0.4960	1489.00	(69)	0.000326	0.000324	1490.5	-1.5313	0.000001	2.345					988.0363
		50	0.5000	1494.14	(4)	0.000326	0.000325	1495.3	-1.1449	0.000001	1.311			506.10		988.0363
0.015		55	0.0008	986.43	(81)	0.000112	0.000138	986.4	0.0208	-0.000025	0.000				6.3	985.6952
0.03005		55	0.0017	987.19	(81)	0.000100	0.000138	987.1	0.0625	-0.000038	0.004				5.61	985.6952
0.06006		55	0.0034	988.64	(81)	0.000113	0.000139	988.6	0.0838	-0.000026	0.007				6.36	985.6952
0.10558		55	0.0059	990.82	(109)	0.000124	0.000140	990.7	0.0909	-0.000016	0.008			5.12		985.6952
0.12604		55	0.0070	991.85	(81)	0.000118	0.000141	991.7	0.1536	-0.000022	0.024				6.64	985.6952
0.2084		55	0.0116	995.70	(109)	0.000132	0.000143	995.6	0.1183	-0.000010	0.014			10.007		985.6952
0.24963		55	0.0138	997.73	(81)	0.000129	0.000144	997.5	0.2072	-0.000015	0.043				7.218	985.6952
0.3115		55	0.0172	1000.59	(109)	0.000135	0.000145	1000.4	0.1706	-0.000010	0.029			14.895		985.6952
0.49992		55	0.0273	1009.37	(81)	0.000142	0.000150	1009.2	0.2091	-0.000008	0.044				7.988	985.6952
0.5199		55	0.0283	1010.31	(109)	0.000142	0.000150	1010.1	0.2283	-0.000008	0.052			24.615		985.6952
1.014		55	0.0538	1032.64	(109)	0.000158	0.000162	1032.4	0.2373	-0.000004	0.056			46.949		985.6952
1.0175		55	0.0540	1032.81	(109)	0.000158	0.000162	1032.6	0.2440	-0.000004	0.060			47.111		985.6952
2.019		55	0.1018	1075.86	(109)	0.000179	0.000183	1075.4	0.4325	-0.000004	0.187			90.164		985.6952
2.025		55	0.1020	1076.11	(109)	0.000179	0.000183	1075.7	0.4308	-0.000004	0.186			90.41		985.6952
3.508		55	0.1645	1134.20	(109)	0.000207	0.000209	1133.8	0.3623	-0.000002	0.131			148.503		985.6952
4.94		55	0.2170	1185.13	(109)	0.000228	0.000229	1184.7	0.4016	-0.000001	0.161			199.438		985.6952
7.427		55	0.2941	1262.95	(109)	0.000257	0.000258	1262.7	0.2043	0.000000	0.042			277.256		985.6952
10.244		55	0.3650	1337.68	(109)	0.000283	0.000282	1338.1	-0.4138	0.000001	0.171			351.987		985.6952
15.51		55	0.4653	1449.30	(109)	0.000317	0.000315	1451.2	-1.9081	0.000002	3.641			463.604		985.6952
		59.9	0.0617	1038.10	(127)	0.000146	0.000168	1036.6	1.4823	-0.000022	2.197					983.2503
		59.9	0.1150	1086.30	(127)	0.000178	0.000191	1084.6	1.7431	-0.000013	3.039					983.2503
		59.9	0.2090	1175.80	(127)	0.000220	0.000228	1173.5	2.3056	-0.000008	5.316					983.2503
		59.9	0.2780	1244.80	(127)	0.000248	0.000254	1242.6	2.2367	-0.000005	5.003					983.2503
		59.9	0.3600	1329.40	(127)	0.000281	0.000282	1329.1	0.2966	0.000000	0.088					983.2503
		59.9	0.4300	1408.00	(127)	0.000304	0.000305	1407.1	0.9460	-0.000001	0.895					983.2503
		59.9	0.4720	1456.00	(127)	0.000317	0.000318	1455.7	0.2730	0.000000	0.075					983.2503

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
		59.9	0.5037	1495.70	(127)	0.000325	0.000327	1493.4	2.2522	-0.000002	5.072					983.2503
		60	0.0200	1000.66	(4)	0.000130	0.000150	1000.3	0.4068	-0.000020	0.165			17.5		983.1989
		60	0.0400	1018.12	(4)	0.000145	0.000159	1017.5	0.5811	-0.000014	0.338			34.9		983.1989
		60	0.0600	1035.73	(4)	0.000157	0.000168	1035.1	0.6693	-0.000010	0.448			52.5		983.1989
		60	0.0800	1053.56	(4)	0.000168	0.000176	1052.8	0.7374	-0.000008	0.544			70.4		983.1989
		60	0.1000	1071.64	(4)	0.000178	0.000185	1070.8	0.8116	-0.000007	0.659			88.4		983.1989
		60	0.1200	1089.98	(4)	0.000187	0.000193	1089.1	0.8978	-0.000006	0.806			106.8		983.1989
		60	0.1400	1108.58	(4)	0.000195	0.000201	1107.6	0.9921	-0.000006	0.984			125.4		983.1989
		60	0.1600	1127.46	(4)	0.000204	0.000209	1126.3	1.1102	-0.000005	1.232			144.3		983.1989
		60	0.1800	1146.60	(4)	0.000212	0.000217	1145.4	1.2279	-0.000005	1.508			163.4		983.1989
		60	0.2000	1166.00	(4)	0.000220	0.000225	1164.7	1.3408	-0.000005	1.798			182.8		983.1989
		60	0.2200	1185.60	(4)	0.000228	0.000232	1184.2	1.3848	-0.000004	1.918			202.4		983.1989
		60	0.2400	1205.55	(4)	0.000235	0.000240	1204.0	1.5051	-0.000004	2.265			222.4		983.1989
		60	0.2600	1225.66	(4)	0.000243	0.000247	1224.2	1.5072	-0.000004	2.272			242.5		983.1989
		60	0.2800	1245.92	(4)	0.000251	0.000254	1244.5	1.3766	-0.000003	1.895			262.7		983.1989
		60	0.3000	1266.43	(4)	0.000259	0.000261	1265.2	1.2084	-0.000003	1.460			283.2		983.1989
		60	0.3200	1287.23	(4)	0.000266	0.000268	1286.2	1.0378	-0.000002	1.077			304.0		983.1989
		60	0.3400	1308.30	(4)	0.000274	0.000275	1307.5	0.8398	-0.000001	0.705			325.1		983.1989
		60	0.3600	1329.66	(4)	0.000281	0.000282	1329.0	0.6294	-0.000001	0.396			346.5		983.1989
		60	0.3800	1351.31	(4)	0.000288	0.000289	1350.9	0.4014	-0.000001	0.161			368.1		983.1989
		60	0.4000	1373.25	(4)	0.000295	0.000295	1373.1	0.1507	0.000000	0.023			390.1		983.1989
		60	0.4200	1395.50	(4)	0.000302	0.000301	1395.6	-0.1082	0.000000	0.012			412.3		983.1989
		60	0.4400	1418.07	(4)	0.000308	0.000308	1418.4	-0.3707	0.000000	0.137			434.9		983.1989
		60	0.4600	1440.98	(4)	0.000315	0.000314	1441.6	-0.6225	0.000001	0.387			457.8		983.1989
		60	0.4800	1464.21	(4)	0.000321	0.000320	1465.1	-0.8891	0.000001	0.790			481.0		983.1989
		60	0.5000	1487.92	(4)	0.000327	0.000326	1488.9	-1.0164	0.000001	1.033			504.7		983.1989
0.015		65	0.0008	981.30	(81)	0.000096	0.000145	981.3	0.0399	-0.000049	0.002				5.37	980.5548
0.03005		65	0.0017	982.04	(81)	0.000101	0.000145	982.0	0.0727	-0.000045	0.005				5.64	980.5548
0.06006		65	0.0034	983.49	(81)	0.000114	0.000146	983.4	0.1045	-0.000032	0.011				6.39	980.5548
0.12604		65	0.0070	986.69	(81)	0.000117	0.000148	986.5	0.2068	-0.000030	0.043				6.59	980.5548
0.24963		65	0.0138	992.52	(81)	0.000130	0.000151	992.2	0.2845	-0.000021	0.081				7.284	980.5548
0.49992		65	0.0273	1004.13	(81)	0.000142	0.000157	1003.7	0.3918	-0.000014	0.154				7.992	980.5548
		70	0.0200	995.17	(4)	0.000129	0.000157	994.6	0.5567	-0.000028	0.310			17.4		977.7696
		70	0.0400	1012.57	(4)	0.000144	0.000165	1011.7	0.8752	-0.000021	0.766			34.8		977.7696
		70	0.0600	1030.14	(4)	0.000156	0.000174	1029.0	1.1212	-0.000018	1.257			52.4		977.7696
		70	0.0800	1047.92	(4)	0.000167	0.000182	1046.6	1.3300	-0.000015	1.769			70.2		977.7696
		70	0.1000	1065.95	(4)	0.000177	0.000190	1064.4	1.5369	-0.000014	2.362			88.2		977.7696
		70	0.1200	1084.25	(4)	0.000186	0.000198	1082.5	1.7570	-0.000012	3.087			106.5		977.7696
		70	0.1400	1102.81	(4)	0.000194	0.000206	1100.8	1.9754	-0.000012	3.902			125.0		977.7696
		70	0.1600	1121.64	(4)	0.000203	0.000214	1119.4	2.1969	-0.000011	4.826			143.9		977.7696
		70	0.1800	1140.75	(4)	0.000211	0.000221	1138.3	2.4265	-0.000010	5.888			163.0		977.7696
		70	0.2000	1160.12	(4)	0.000219	0.000229	1157.5	2.6386	-0.000010	6.962			182.4		977.7696
		70	0.2200	1179.69	(4)	0.000227	0.000236	1176.9	2.7679	-0.000009	7.661			201.9		977.7696

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
		70	0.2400	1199.61	(4)	0.000235	0.000243	1196.7	2.9587	-0.000009	8.754			221.8		977.7696
		70	0.2600	1219.70	(4)	0.000242	0.000250	1216.7	3.0253	-0.000008	9.152			241.9		977.7696
		70	0.2800	1239.94	(4)	0.000250	0.000257	1237.0	2.9416	-0.000007	8.653			262.2		977.7696
		70	0.3000	1260.42	(4)	0.000258	0.000264	1257.6	2.7917	-0.000006	7.794			282.7		977.7696
		70	0.3200	1281.17	(4)	0.000266	0.000271	1278.6	2.5993	-0.000005	6.756			303.4		977.7696
		70	0.3400	1302.20	(4)	0.000273	0.000277	1299.8	2.3679	-0.000004	5.607			324.4		977.7696
		70	0.3600	1323.52	(4)	0.000281	0.000284	1321.4	2.1011	-0.000003	4.414			345.8		977.7696
		70	0.3800	1345.12	(4)	0.000288	0.000290	1343.3	1.7819	-0.000003	3.175			367.4		977.7696
		70	0.4000	1367.01	(4)	0.000295	0.000297	1365.6	1.4136	-0.000002	1.998			389.2		977.7696
		70	0.4200	1389.20	(4)	0.000302	0.000303	1388.2	0.9989	-0.000001	0.998			411.4		977.7696
		70	0.4400	1411.70	(4)	0.000308	0.000309	1411.2	0.5405	-0.000001	0.292			433.9		977.7696
		70	0.4600	1434.53	(4)	0.000315	0.000315	1434.5	0.0509	0.000000	0.003			456.8		977.7696
		70	0.4800	1457.67	(4)	0.000321	0.000321	1458.2	-0.4976	0.000000	0.248			479.9		977.7696
		70	0.5000	1481.27	(4)	0.000327	0.000327	1482.2	-0.9631	0.000001	0.927			503.5		977.7696
0.015		75	0.0008	975.59	(81)	0.000104	0.000152	975.5	0.0382	-0.000048	0.001				5.83	974.849
0.03005		75	0.0017	976.35	(81)	0.000091	0.000152	976.2	0.0984	-0.000061	0.010				5.09	974.849
0.06006		75	0.0034	977.77	(81)	0.000113	0.000153	977.6	0.1289	-0.000040	0.017				6.32	974.849
0.12604		75	0.0070	980.98	(81)	0.000114	0.000154	980.7	0.2758	-0.000041	0.076				6.37	974.849
0.24963		75	0.0138	986.79	(81)	0.000127	0.000157	986.4	0.4038	-0.000030	0.163				7.14	974.849
0.49992		75	0.0273	998.39	(81)	0.000139	0.000163	997.7	0.6448	-0.000024	0.416				7.816	974.849
		79.9	0.0617	1026.90	(127)	0.000135	0.000180	1024.0	2.9158	-0.000045	8.502					971.8601
		79.9	0.1150	1074.60	(127)	0.000174	0.000201	1071.0	3.6385	-0.000027	13.239					971.8601
		79.9	0.2780	1232.90	(127)	0.000245	0.000259	1227.0	5.8585	-0.000014	34.322					971.8601
		79.9	0.3600	1318.00	(127)	0.000278	0.000286	1313.5	4.5246	-0.000007	20.472					971.8601
		79.9	0.4300	1397.30	(127)	0.000300	0.000307	1392.0	5.3070	-0.000006	28.165					971.8601
		79.9	0.4720	1444.20	(127)	0.000316	0.000319	1441.4	2.8351	-0.000003	8.038					971.8601
		79.9	0.5037	1484.80	(127)	0.000323	0.000328	1479.8	4.9798	-0.000004	24.798					971.8601
0.015		85	0.0008	969.36	(81)	0.000091	0.000158	969.3	0.0530	-0.000067	0.003				5.1	968.6203
0.03005		85	0.0017	970.12	(81)	0.000085	0.000158	970.0	0.1164	-0.000074	0.014				4.76	968.6203
0.06006		85	0.0034	971.54	(81)	0.000108	0.000159	971.4	0.1618	-0.000051	0.026				6.06	968.6203
0.12604		85	0.0070	974.74	(81)	0.000109	0.000161	974.4	0.3447	-0.000052	0.119				6.11	968.6203
0.24963		85	0.0138	980.58	(81)	0.000121	0.000163	980.0	0.5601	-0.000042	0.314				6.8	968.6203
0.49992		85	0.0273	992.17	(81)	0.000134	0.000169	991.2	0.9254	-0.000034	0.856				7.543	968.6203
0.015		95	0.0008	962.66	(81)	0.000059	0.000164	962.6	0.0819	-0.000105	0.007		!		3.3	961.9004
0.03005		95	0.0017	963.41	(81)	0.000069	0.000164	963.3	0.1487	-0.000095	0.022		!		3.87	961.9004
0.06006		95	0.0034	964.84	(81)	0.000095	0.000165	964.6	0.2173	-0.000070	0.047				5.35	961.9004
0.12604		95	0.0070	968.05	(81)	0.000100	0.000166	967.6	0.4388	-0.000067	0.193				5.59	961.9004
0.24963		95	0.0138	973.91	(81)	0.000112	0.000169	973.2	0.7498	-0.000057	0.562				6.272	961.9004
0.49992		95	0.0273	985.54	(81)	0.000126	0.000174	984.3	1.2863	-0.000049	1.654				7.058	961.9004
		99.2	0.5540	1532.40	(127)	0.000338	0.000340	1530.4	1.9916	-0.000002	3.966					958.9373
		99.2	0.5946	1580.90	(127)	0.000353	0.000350	1585.3	-4.4170	0.000003	19.510					958.9373
		100	0.0453	999.00	(69)	0.000106	0.000184	995.5	3.4860	-0.000077	12.152					958.3637
		100	0.0879	1037.00	(69)	0.000143	0.000200	1031.7	5.3084	-0.000056	28.179					958.3637

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
		100	0.2982	1234.00	(69)	0.000262	0.000270	1230.4	3.5632	-0.000008	12.696					958.3637
		100	0.3548	1294.00	(69)	0.000281	0.000286	1290.5	3.4790	-0.000006	12.104					958.3637
		100	0.4062	1349.00	(69)	0.000300	0.000301	1347.9	1.1034	-0.000001	1.218					958.3637
		100	0.4531	1403.00	(69)	0.000314	0.000314	1402.8	0.2297	0.000000	0.053					958.3637
		100	0.4960	1452.00	(69)	0.000328	0.000325	1455.2	-3.2274	0.000003	10.416					958.3637
								Average Res	0.1538	-0.000010	978.626	Sum chi sqr				
								Std dev Res	1.5187	0.000019						
								Avg - 4std	-5.9208	-0.000085						
								Avg + 4std	6.2285	0.000065						

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	194.8493
c1	407.3076
c2	0.14542
c3	0.00204
c4	1180.944
Min T	0
Max T	100
Min w	0.000841
Max w	0.5946
Avg dens res	0.153825
Std dens res	1.518665
Avg app vol res *10 ³	-0.00991
Std app vol res *10 ³	0.018786
No of points in corr	421
No of inconsistent pair	9

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

		0	0.5000	1525.67	(4)	0.000311	0.000317	1518.4	7.2877	-0.000006	53.111	!		525.83		999.8395
15.51		40	0.4653	446.4	(109)	0.003656	0.000313	1460.7	#####	0.003343	#####	!	!	446.423		992.2158
	10.21	30	0.4101	1396.90	(41)	0.000301	0.000292	1404.0	-7.0703	0.000009	49.989	!				995.6473
		79.9	0.2090	1165.20	(127)	0.000212	0.000236	1158.6	6.6396	-0.000024	44.085	!				971.8601
		99.2	0.3600	1307.3	(127)	0.000271	0.000288	1296.9	10.3839	-0.000017	107.826	!				958.9373
		99.2	0.4300	1385.8	(127)	0.000296	0.000308	1376.1	9.6839	-0.000012	93.779	!				958.9373
		99.2	0.4397	1396.9	(127)	0.000299	0.000310	1387.5	9.3854	-0.000011	88.086	!				958.9373
		100	0.1659	1108.00	(69)	0.000194	0.000227	1101.3	6.7160	-0.000033	45.105	!				958.3637
		100	0.2356	1174.00	(69)	0.000230	0.000250	1167.5	6.5364	-0.000020	42.725	!				958.3637

Density of aqueous solutions of **K2SO4**

- References (20) Dedick, Eugene A.; Hershey, J. Peter; Sotolongo, Sara; Stade, David J.; Millero, Frank J. The PVT Properties of Concentrated Aqueous Electrolytes IX. The Volume Properties of KCl and K₂SO₄ and their Mixtures with NaCl and Na₂SO₄ as a Function of Temperature, *J. Solution Chem.* **1990**, *19*, 353-374
- (49) Kaminsky, M. Concentration and Temperature Dependence of the Viscosity of Aqueous Solutions of Strong Electrolytes. III. KCl, K₂SO₄, MgCl₂, BeSO₄, and MgSO₄ Solutions. *Z. Phys. Chem. N. F.* **1957**, *12*, 206-231.
- (72) Millero, F. J.; Knox, J. H. Apparent Molal Volumes of Aqueous NaF, Na₂SO₄, KCl, K₂SO₄, MgCl₂, and MgSO₄ Solutions at 0° and 50°C. *J. Chem. Eng. Data* **1973**, *18*, 407-411.
- (78) Olofsson, I. V.; Spitzer, J. J.; Hepler, L. G. Apparent Molar Heat Capacities and Volumes of Aqueous Electrolytes at 25°C: Na₂SO₄, K₂SO₄, Na₂S₂O₃, Na₂S₂O₈, K₂S₂O₈, K₂CrO₄, Na₂MoO₄, and Na₂WO₄. *Can. J. Chem.* **1978**, *56*, 1871-1873.
- (88) Perron, G.; Desnoyers, J. E.; Millero, F. J., "Apparent molal volumes and heat capacities of some sulfates and carbonates in water at 25 °C.", *Can. J. Chem.*, **1975**, *53*, 1134-1138
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (114) Saluja, P. P. S.; Lemire, R. J.; LeBlanc, J. C.; High-Temperature Thermodynamics of Aqueous Alkali-Metal Salts; *J. Chem. Thermodynamics*, **1992**, *24*, 181-203

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	delta density kg/m³	relative density	Molal volume / cm³/mole	Density of water / kg/m³
0.003007		0	0.0005	1000.29	(72)	0.000139	0.000168	1000.28	0.0154	-0.000029	0.000			0.4511			999.8395
0.004334		0	0.0008	1000.49	(72)	0.000139	0.000168	1000.47	0.0221	-0.000029	0.000			0.6501			999.8395
0.005597		0	0.0010	1000.68	(72)	0.000140	0.000168	1000.65	0.0278	-0.000029	0.001			0.8387			999.8395
0.007897		0	0.0014	1001.02	(72)	0.000140	0.000169	1000.98	0.0397	-0.000029	0.002			1.1835			999.8395
0.010278		0	0.0018	1001.38	(72)	0.000142	0.000169	1001.33	0.0480	-0.000027	0.002			1.5363			999.8395
0.014715		0	0.0026	1002.03	(72)	0.000145	0.000169	1001.97	0.0620	-0.000024	0.004			2.1919			999.8395
0.01492		0	0.0026	1002.11	(72)	0.000125	0.000169	1002.00	0.1142	-0.000044	0.013			2.2738			999.8395
0.019454		0	0.0034	1002.73	(72)	0.000146	0.000169	1002.65	0.0798	-0.000023	0.006			2.8944			999.8395
0.027948		0	0.0048	1003.98	(72)	0.000148	0.000170	1003.88	0.1037	-0.000021	0.011			4.1439			999.8395
0.034366		0	0.0060	1004.92	(72)	0.000150	0.000170	1004.80	0.1184	-0.000020	0.014			5.0833			999.8395
0.036851		0	0.0064	1005.29	(72)	0.000151	0.000170	1005.16	0.1231	-0.000019	0.015			5.4457			999.8395
0.048361		0	0.0084	1006.96	(72)	0.000154	0.000171	1006.82	0.1447	-0.000017	0.021			7.1219			999.8395
0.054081		0	0.0093	1007.79	(72)	0.000155	0.000171	1007.64	0.1531	-0.000016	0.023			7.9512			999.8395
0.069961		0	0.0120	1010.08	(72)	0.000158	0.000172	1009.91	0.1712	-0.000014	0.029			10.2435			999.8395
0.099044		0	0.0170	1014.25	(72)	0.000163	0.000174	1014.06	0.1869	-0.000011	0.035			14.4057			999.8395
0.13033		0	0.0222	1018.66	(72)	0.000168	0.000175	1018.49	0.1671	-0.000007	0.028			18.8196			999.8395
0.15934		0	0.0270	1022.78	(72)	0.000170	0.000177	1022.58	0.1970	-0.000007	0.039			22.9357			999.8395
0.21831		0	0.0366	1030.95	(72)	0.000177	0.000180	1030.81	0.1419	-0.000004	0.020			31.1124			999.8395
0.28097		0	0.0467	1039.48	(72)	0.000183	0.000184	1039.45	0.0286	-0.000001	0.001			39.6358			999.8395
0.36472		0	0.0598	1050.71	(72)	0.000190	0.000188	1050.81	-0.1048	0.000002	0.011			50.8675			999.8395
0.04984		5	0.0086	1007.14	(20)	0.000173	0.000180	1007.07	0.0654	-0.000007	0.004			7.175			999.9638
0.09856		5	0.0169	1014.00	(20)	0.000180	0.000183	1013.95	0.0422	-0.000002	0.002			14.033			999.9638
0.1476		5	0.0251	1020.82	(20)	0.000185	0.000186	1020.81	0.0078	0.000000	0.000			20.856			999.9638
0.19721		5	0.0332	1027.67	(20)	0.000188	0.000188	1027.68	-0.0054	0.000000	0.000			27.709			999.9638
0.2471		5	0.0413	1034.33	(20)	0.000195	0.000191	1034.51	-0.1849	0.000004	0.034			34.362			999.9638
0.29668		5	0.0492	1040.95	(20)	0.000199	0.000194	1041.23	-0.2825	0.000005	0.080			40.982			999.9638
0.34765		5	0.0571	1047.64	(20)	0.000203	0.000197	1048.06	-0.4169	0.000007	0.174			47.678			999.9638
0.39755		5	0.0648	1054.20	(20)	0.000206	0.000199	1054.67	-0.4722	0.000007	0.223			54.235			999.9638
	0.0025	12.5	0.0004	999.81	(49)	0.000151	0.000189	999.79	0.0165	-0.000038	0.000				1.00037		999.4388
	0.005	12.5	0.0009	1000.18	(49)	0.000151	0.000189	1000.15	0.0332	-0.000038	0.001				1.00074		999.4388

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	delta density kg/m³	relative density	Molal volume / cm³/mole	Density of water / kg/m³
	0.01001	12.5	0.0017	1000.91	(49)	0.000158	0.000190	1000.85	0.0556	-0.000032	0.003				1.00147		999.4388
	0.04006	12.5	0.0069	1005.30	(49)	0.000161	0.000191	1005.08	0.2121	-0.000030	0.045				1.00586		999.4388
	0.07853	12.5	0.0135	1010.86	(49)	0.000165	0.000194	1010.47	0.3898	-0.000028	0.152				1.01143		999.4388
	0.09015	12.5	0.0155	1012.53	(49)	0.000167	0.000194	1012.09	0.4370	-0.000027	0.191				1.0131		999.4388
	0.0025	15	0.0004	999.47	(49)	0.000152	0.000193	999.45	0.0179	-0.000041	0.000				1.00037		999.0996
	0.005	15	0.0009	999.83	(49)	0.000163	0.000193	999.80	0.0259	-0.000030	0.001				1.00073		999.0996
	0.01001	15	0.0017	1000.56	(49)	0.000164	0.000193	1000.51	0.0509	-0.000029	0.003				1.00146		999.0996
	0.04004	15	0.0069	1004.78	(49)	0.000185	0.000195	1004.72	0.0657	-0.000009	0.004				1.00569		999.0996
0.0491		15	0.0085	1006.02	(20)	0.000190	0.000195	1005.97	0.0468	-0.000005	0.002			6.916			999.0996
	0.07849	15	0.0135	1010.35	(49)	0.000178	0.000197	1010.08	0.2662	-0.000019	0.071				1.01126		999.0996
	0.09011	15	0.0155	1011.99	(49)	0.000179	0.000198	1011.70	0.2891	-0.000018	0.084				1.0129		999.0996
0.09771		15	0.0167	1012.73	(20)	0.000196	0.000198	1012.70	0.0322	-0.000002	0.001			13.633			999.0996
0.14812		15	0.0252	1019.59	(20)	0.000202	0.000201	1019.61	-0.0187	0.000001	0.000			20.49			999.0996
0.19683		15	0.0332	1026.10	(20)	0.000207	0.000204	1026.21	-0.1136	0.000003	0.013			26.999			999.0996
0.2472		15	0.0413	1032.79	(20)	0.000210	0.000206	1032.97	-0.1747	0.000004	0.031			33.693			999.0996
0.297		15	0.0492	1039.32	(20)	0.000214	0.000209	1039.57	-0.2562	0.000005	0.066			40.216			999.0996
0.39701		15	0.0647	1052.22	(20)	0.000220	0.000215	1052.61	-0.3913	0.000005	0.153			53.12			999.0996
	0.0025	20	0.0004	998.56	(49)	0.000175	0.000199	998.55	0.0102	-0.000023	0.000				1.00036		998.2041
	0.005	20	0.0009	998.92	(49)	0.000175	0.000199	998.90	0.0205	-0.000024	0.000				1.00072		998.2041
	0.01	20	0.0017	999.63	(49)	0.000181	0.000199	999.60	0.0314	-0.000018	0.001				1.00143		998.2041
	0.04	20	0.0069	1003.84	(49)	0.000191	0.000201	1003.78	0.0677	-0.000010	0.005				1.00565		998.2041
		20	0.0100	1006.30	(90)	0.000196	0.000202	1006.24	0.0616	-0.000006	0.004						998.2041
	0.0784	20	0.0135	1009.19	(49)	0.000196	0.000203	1009.10	0.0984	-0.000007	0.010				1.01101		998.2041
	0.09	20	0.0155	1010.77	(49)	0.000199	0.000204	1010.70	0.0739	-0.000005	0.005				1.01259		998.2041
		20	0.0200	1014.50	(90)	0.000197	0.000205	1014.34	0.1646	-0.000008	0.027						998.2041
		20	0.0400	1031.00	(90)	0.000205	0.000212	1030.71	0.2900	-0.000007	0.084						998.2041
		20	0.0600	1047.70	(90)	0.000213	0.000219	1047.31	0.3905	-0.000006	0.152						998.2041
		20	0.0800	1064.60	(90)	0.000221	0.000226	1064.11	0.4883	-0.000005	0.238						998.2041
		20	0.1000	1081.70	(90)	0.000229	0.000234	1081.09	0.6102	-0.000005	0.372						998.2041
0.03115		24.04	0.0054	1001.87	(114)	0.000154	0.000205	1001.59	0.2748	-0.000051	0.076						997.2867
0.10648		24.04	0.0182	1012.18	(114)	0.000193	0.000209	1011.88	0.2985	-0.000016	0.089						997.2867
0.19911		24.04	0.0335	1024.53	(114)	0.000208	0.000214	1024.31	0.2267	-0.000006	0.051						997.2867
0.29559		24.04	0.0490	1036.93	(114)	0.000220	0.000219	1036.98	-0.0469	0.000001	0.002						997.2867
0.40209		24.04	0.0655	1050.73	(114)	0.000224	0.000225	1050.64	0.0940	-0.000001	0.009						997.2867
	0.0025	25	0.0004	997.40	(49)	0.000177	0.000204	997.39	0.0119	-0.000027	0.000				1.00036		997.0449
0.00491		25	0.0009	997.74	(88)	0.000189	0.000204	997.72	0.0127	-0.000015	0.000			0.692			997.0449
	0.00499	25	0.0009	997.75	(49)	0.000186	0.000204	997.74	0.0154	-0.000018	0.000				1.00071		997.0449
0.01001		25	0.0017	998.45	(88)	0.000191	0.000204	998.43	0.0229	-0.000013	0.001			1.407			997.0449
	0.00999	25	0.0017	998.45	(49)	0.000193	0.000204	998.43	0.0199	-0.000011	0.000				1.00141		997.0449
0.01299		25	0.0023	998.86	(88)	0.000195	0.000205	998.84	0.0214	-0.000009	0.000			1.817			997.0449
0.01891		25	0.0033	999.69	(88)	0.000194	0.000205	999.66	0.0357	-0.000011	0.001			2.648			997.0449
0.02255		25	0.0039	1000.19	(88)	0.000196	0.000205	1000.16	0.0360	-0.000009	0.001			3.15			997.0449
0.03099		25	0.0054	1001.37	(88)	0.000197	0.000206	1001.32	0.0463	-0.000009	0.002			4.322			997.0449
0.03226		25	0.0056	1001.54	(88)	0.000197	0.000206	1001.50	0.0497	-0.000009	0.002			4.5			997.0449
	0.03995	25	0.0069	1002.63	(49)	0.000199	0.000206	1002.58	0.0529	-0.000008	0.003				1.0056		997.0449
0.04178		25	0.0072	1002.86	(78)	0.000198	0.000206	1002.80	0.0573	-0.000008	0.003					34.57	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	delta density kg/m³	relative density	Molal volume / cm³/mole	Density of water / kg/m³
0.04553		25	0.0079	1003.36	(88)	0.000200	0.000206	1003.32	0.0479	-0.000006	0.002			6.32			997.0449
0.04935		25	0.0085	1003.89	(20)	0.000201	0.000207	1003.84	0.0504	-0.000006	0.003			6.846			997.0449
0.05055		25	0.0087	1004.04	(78)	0.000203	0.000207	1004.00	0.0368	-0.000004	0.001					35.3	997.0449
0.05483		25	0.0095	1004.62	(78)	0.000203	0.000207	1004.59	0.0334	-0.000003	0.001					35.46	997.0449
0.06473		25	0.0112	1005.98	(78)	0.000204	0.000208	1005.94	0.0405	-0.000004	0.002					35.54	997.0449
0.06622		25	0.0114	1006.21	(88)	0.000202	0.000208	1006.15	0.0626	-0.000005	0.004			9.165			997.0449
0.0734		25	0.0126	1007.14	(78)	0.000207	0.000208	1007.13	0.0138	-0.000001	0.000					36.06	997.0449
	0.0783	25	0.0135	1007.96	(49)	0.000200	0.000208	1007.85	0.1077	-0.000008	0.012				1.01095		997.0449
0.07975		25	0.0137	1008.06	(78)	0.000203	0.000208	1007.99	0.0719	-0.000005	0.005					35.41	997.0449
0.08078		25	0.0139	1008.19	(78)	0.000204	0.000208	1008.13	0.0582	-0.000004	0.003					35.6	997.0449
	0.08989	25	0.0155	1009.51	(49)	0.000205	0.000209	1009.45	0.0625	-0.000004	0.004				1.0125		997.0449
0.09855		25	0.0169	1010.58	(20)	0.000207	0.000209	1010.54	0.0332	-0.000002	0.001			13.533			997.0449
0.10587		25	0.0181	1011.57	(78)	0.000208	0.000210	1011.54	0.0330	-0.000002	0.001					36.25	997.0449
0.10711		25	0.0183	1011.76	(78)	0.000207	0.000210	1011.70	0.0605	-0.000003	0.004					36.01	997.0449
0.11654		25	0.0199	1013.02	(88)	0.000208	0.000210	1012.98	0.0415	-0.000002	0.002			15.975			997.0449
0.11959		25	0.0204	1013.43	(78)	0.000209	0.000211	1013.39	0.0412	-0.000002	0.002					36.35	997.0449
0.13098		25	0.0223	1014.97	(88)	0.000209	0.000211	1014.92	0.0419	-0.000002	0.002			17.922			997.0449
0.13389		25	0.0228	1015.31	(78)	0.000212	0.000211	1015.32	-0.0095	0.000000	0.000					36.9	997.0449
0.1478		25	0.0251	1017.20	(20)	0.000212	0.000212	1017.18	0.0123	0.000000	0.000			20.152			997.0449
0.16619		25	0.0281	1019.65	(78)	0.000213	0.000213	1019.65	0.0016	0.000000	0.000					37.13	997.0449
0.19363		25	0.0326	1023.27	(88)	0.000215	0.000215	1023.30	-0.0292	0.000001	0.001			26.225			997.0449
0.19795		25	0.0333	1023.88	(88)	0.000215	0.000215	1023.87	0.0036	0.000000	0.000			26.831			997.0449
0.2465		25	0.0412	1030.18	(20)	0.000220	0.000218	1030.28	-0.0907	0.000002	0.008			33.14			997.0449
0.26345		25	0.0439	1032.45	(88)	0.000219	0.000218	1032.49	-0.0477	0.000001	0.002			35.402			997.0449
0.29538		25	0.0490	1036.54	(20)	0.000222	0.000220	1036.65	-0.1115	0.000002	0.012			39.495			997.0449
0.33066		25	0.0545	1041.12	(88)	0.000224	0.000222	1041.21	-0.0931	0.000002	0.009			44.071			997.0449
0.34659		25	0.0570	1043.09	(20)	0.000226	0.000223	1043.25	-0.1657	0.000003	0.027			46.044			997.0449
0.39755		25	0.0648	1049.54	(20)	0.000229	0.000226	1049.75	-0.2085	0.000003	0.043			52.494			997.0449
	0.00249	35	0.0004	994.38	(49)	0.000199	0.000212	994.37	0.0055	-0.000013	0.000				1.00035		994.0319
	0.00498	35	0.0009	994.73	(49)	0.000199	0.000212	994.72	0.0111	-0.000013	0.000				1.0007		994.0319
	0.00996	35	0.0017	995.41	(49)	0.000205	0.000213	995.40	0.0128	-0.000007	0.000				1.00139		994.0319
	0.03983	35	0.0069	999.53	(49)	0.000209	0.000214	999.49	0.0341	-0.000005	0.001				1.00553		994.0319
0.05091		35	0.0088	1001.01	(20)	0.000208	0.000215	1000.95	0.0581	-0.000007	0.003			6.981			994.0319
	0.07806	35	0.0135	1004.76	(49)	0.000213	0.000216	1004.71	0.0479	-0.000004	0.002				1.01079		994.0319
	0.08961	35	0.0155	1006.33	(49)	0.000214	0.000217	1006.28	0.0484	-0.000003	0.002				1.01237		994.0319
0.10041		35	0.0172	1007.65	(20)	0.000215	0.000217	1007.61	0.0401	-0.000002	0.002			13.622			994.0319
0.14747		35	0.0251	1013.89	(20)	0.000220	0.000220	1013.88	0.0116	0.000000	0.000			19.858			994.0319
0.24422		35	0.0408	1026.49	(20)	0.000227	0.000225	1026.55	-0.0634	0.000001	0.004			32.458			994.0319
0.34405		35	0.0566	1039.22	(20)	0.000233	0.000231	1039.34	-0.1251	0.000002	0.016			45.185			994.0319
0.39666		35	0.0647	1045.84	(20)	0.000235	0.000233	1045.96	-0.1184	0.000002	0.014			51.812			994.0319
0.44506		35	0.0720	1051.83	(20)	0.000238	0.000236	1051.98	-0.1450	0.000002	0.021			57.803			994.0319
0.49574		35	0.0795	1058.07	(20)	0.000240	0.000239	1058.21	-0.1340	0.000002	0.018			64.04			994.0319
0.54892		35	0.0873	1064.59	(20)	0.000242	0.000242	1064.66	-0.0652	0.000001	0.004			70.559			994.0319
0.59751		35	0.0943	1070.45	(20)	0.000245	0.000244	1070.48	-0.0293	0.000000	0.001			76.414			994.0319
0.65018		35	0.1018	1076.74	(20)	0.000247	0.000247	1076.70	0.0343	0.000000	0.001			82.705			994.0319
	0.00248	42.5	0.0004	991.58	(49)	0.000199	0.000216	991.58	0.0074	-0.000017	0.000				1.00035		991.237

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	delta density kg/m³	relative density	Molal volume / cm³/mole	Density of water / kg/m³
	0.00496	42.5	0.0009	991.92	(49)	0.000211	0.000216	991.92	0.0050	-0.000006	0.000				1.00069		991.237
	0.00993	42.5	0.0017	992.60	(49)	0.000211	0.000217	992.60	0.0092	-0.000005	0.000				1.00138		991.237
	0.03972	42.5	0.0069	996.70	(49)	0.000213	0.000218	996.66	0.0381	-0.000006	0.001				1.00551		991.237
	0.07784	42.5	0.0135	1001.89	(49)	0.000216	0.000220	1001.84	0.0552	-0.000004	0.003				1.01075		991.237
	0.08936	42.5	0.0155	1003.46	(49)	0.000217	0.000221	1003.40	0.0622	-0.000004	0.004				1.01233		991.237
0.02002		45	0.0035	992.96	(20)	0.000206	0.000218	992.92	0.0422	-0.000012	0.002			2.748			990.2132
0.06143		45	0.0106	998.56	(20)	0.000213	0.000221	998.48	0.0767	-0.000007	0.006			8.343			990.2132
0.12751		45	0.0217	1007.31	(20)	0.000221	0.000224	1007.25	0.0584	-0.000003	0.003			17.096			990.2132
0.18956		45	0.0320	1015.40	(20)	0.000227	0.000227	1015.37	0.0245	-0.000001	0.001			25.184			990.2132
0.25584		45	0.0427	1023.91	(20)	0.000231	0.000231	1023.93	-0.0138	0.000000	0.000			33.698			990.2132
0.32073		45	0.0529	1032.16	(20)	0.000235	0.000234	1032.17	-0.0129	0.000000	0.000			41.948			990.2132
0.3855		45	0.0630	1040.25	(20)	0.000238	0.000238	1040.29	-0.0320	0.000000	0.001			50.04			990.2132
0.45271		45	0.0731	1048.57	(20)	0.000241	0.000241	1048.57	-0.0024	0.000000	0.000			58.356			990.2132
0.51582		45	0.0825	1056.34	(20)	0.000243	0.000245	1056.23	0.1038	-0.000001	0.011			66.122			990.2132
0.58051		45	0.0919	1064.12	(20)	0.000246	0.000248	1063.96	0.1553	-0.000001	0.024			73.903			990.2132
0.65002		45	0.1018	1072.38	(20)	0.000249	0.000252	1072.13	0.2539	-0.000002	0.064			82.169			990.2132
0.01042		48.75	0.0018	990.25	(114)	0.000082	0.000219	990.00	0.2430	-0.000137	0.059		!				988.5963
0.03115		48.75	0.0054	993.07	(114)	0.000168	0.000220	992.79	0.2774	-0.000052	0.077						988.5963
0.10648		48.75	0.0182	1003.11	(114)	0.000208	0.000224	1002.82	0.2927	-0.000016	0.086						988.5963
0.19911		48.75	0.0335	1015.16	(114)	0.000222	0.000229	1014.92	0.2394	-0.000007	0.057						988.5963
0.29559		48.75	0.0490	1027.08	(114)	0.000238	0.000234	1027.27	-0.1945	0.000004	0.038						988.5963
0.40209		48.75	0.0655	1040.79	(114)	0.000237	0.000240	1040.59	0.2054	-0.000003	0.042						988.5963
0.001994		50	0.0003	988.31	(72)	0.000198	0.000219	988.31	0.0071	-0.000021	0.000			0.2761			988.0363
0.003113		50	0.0005	988.47	(72)	0.000199	0.000219	988.46	0.0105	-0.000020	0.000			0.4304			988.0363
0.004975		50	0.0009	988.72	(72)	0.000201	0.000219	988.71	0.0151	-0.000018	0.000			0.6861			988.0363
0.007964		50	0.0014	989.13	(72)	0.000203	0.000219	989.11	0.0216	-0.000016	0.000			1.0954			988.0363
0.012674		50	0.0022	989.78	(72)	0.000205	0.000220	989.74	0.0309	-0.000014	0.001			1.7388			988.0363
0.018302		50	0.0032	990.54	(72)	0.000207	0.000220	990.50	0.0387	-0.000012	0.001			2.5036			988.0363
0.027868		50	0.0048	991.82	(72)	0.000213	0.000220	991.79	0.0368	-0.000008	0.001			3.7863			988.0363
0.035209		50	0.0061	992.81	(72)	0.000214	0.000221	992.77	0.0401	-0.000007	0.002			4.7737			988.0363
0.04877		50	0.0084	994.62	(72)	0.000217	0.000221	994.58	0.0333	-0.000004	0.001			6.5807			988.0363
0.067813		50	0.0117	997.16	(72)	0.000219	0.000222	997.12	0.0404	-0.000003	0.002			9.126			988.0363
0.096542		50	0.0165	1000.97	(72)	0.000221	0.000224	1000.93	0.0420	-0.000003	0.002			12.9375			988.0363
0.10892		50	0.0186	1002.58	(72)	0.000224	0.000225	1002.57	0.0158	-0.000001	0.000			14.5455			988.0363
0.13386		50	0.0228	1005.87	(72)	0.000225	0.000226	1005.85	0.0234	-0.000001	0.001			17.8327			988.0363
0.16999		50	0.0288	1010.56	(72)	0.000228	0.000228	1010.57	-0.0092	0.000000	0.000			22.5195			988.0363
0.20329		50	0.0342	1014.88	(72)	0.000230	0.000230	1014.88	0.0022	0.000000	0.000			26.8477			988.0363
0.22523		50	0.0378	1017.71	(72)	0.000231	0.000231	1017.71	-0.0012	0.000000	0.000			29.671			988.0363
0.25632		50	0.0428	1021.64	(72)	0.000234	0.000232	1021.69	-0.0493	0.000001	0.002			33.6047			988.0363
0.31119		50	0.0514	1028.60	(72)	0.000236	0.000235	1028.65	-0.0499	0.000001	0.002			40.5636			988.0363
0.3627		50	0.0594	1035.01	(72)	0.000239	0.000238	1035.10	-0.0927	0.000001	0.009			46.9749			988.0363
0.3688		50	0.0604	1035.82	(72)	0.000239	0.000238	1035.86	-0.0415	0.000001	0.002			47.7854			988.0363
0.52848		50	0.0843	1055.32	(72)	0.000247	0.000247	1055.35	-0.0300	0.000000	0.001			67.2859			988.0363
0.70706		50	0.1097	1076.56	(72)	0.000253	0.000256	1076.27	0.2907	-0.000002	0.085			88.5197			988.0363
0.05256		55	0.0091	992.75	(20)	0.000220	0.000223	992.73	0.0273	-0.000003	0.001			7.059			985.6952
0.09846		55	0.0169	998.80	(20)	0.000225	0.000225	998.80	-0.0011	0.000000	0.000			13.108			985.6952

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	delta density kg/m³	relative density	Molal volume / cm³/mole	Density of water / kg/m³
0.14613		55	0.0248	1005.00	(20)	0.000230	0.000228	1005.05	-0.0582	0.000002	0.003			19.3			985.6952
0.25008		55	0.0418	1018.27	(20)	0.000237	0.000233	1018.46	-0.1870	0.000004	0.035			32.575			985.6952
0.34613		55	0.0569	1030.29	(20)	0.000243	0.000238	1030.57	-0.2818	0.000005	0.079			44.592			985.6952
0.39353		55	0.0642	1036.14	(20)	0.000245	0.000240	1036.45	-0.3095	0.000004	0.096			50.444			985.6952
0.44485		55	0.0719	1042.40	(20)	0.000247	0.000243	1042.74	-0.3428	0.000004	0.118			56.704			985.6952
0.49648		55	0.0796	1048.70	(20)	0.000249	0.000246	1049.00	-0.3016	0.000003	0.091			63			985.6952
0.54761		55	0.0871	1054.81	(20)	0.000252	0.000248	1055.12	-0.3100	0.000003	0.096			69.11			985.6952
0.65016		55	0.1018	1066.95	(20)	0.000255	0.000254	1067.16	-0.2107	0.000002	0.044			81.253			985.6952
0.06426		65	0.0111	989.18	(20)	0.000217	0.000224	989.10	0.0734	-0.000007	0.005			8.621			980.5548
0.19267		65	0.0325	1005.91	(20)	0.000229	0.000230	1005.84	0.0641	-0.000002	0.004			25.354			980.5548
0.24794		65	0.0414	1012.94	(20)	0.000233	0.000233	1012.91	0.0317	-0.000001	0.001			32.388			980.5548
0.32068		65	0.0529	1022.06	(20)	0.000237	0.000237	1022.08	-0.0203	0.000000	0.000			41.507			980.5548
0.38598		65	0.0630	1030.16	(20)	0.000241	0.000240	1030.19	-0.0278	0.000000	0.001			49.607			980.5548
0.45192		65	0.0730	1038.23	(20)	0.000244	0.000243	1038.26	-0.0290	0.000000	0.001			57.672			980.5548
0.51723		65	0.0827	1046.12	(20)	0.000247	0.000247	1046.12	-0.0061	0.000000	0.000			65.564			980.5548
0.58483		65	0.0925	1054.21	(20)	0.000249	0.000250	1054.14	0.0671	-0.000001	0.005			73.656			980.5548
0.64975		65	0.1017	1061.89	(20)	0.000252	0.000253	1061.72	0.1713	-0.000001	0.029			81.34			980.5548
0.01042		73.77	0.0018	977.17	(114)	0.000104	0.000220	976.97	0.2013	-0.000116	0.041		!				975.5797
0.03115		73.77	0.0054	979.94	(114)	0.000180	0.000221	979.73	0.2136	-0.000041	0.046						975.5797
0.10648		73.77	0.0182	989.91	(114)	0.000211	0.000225	989.65	0.2609	-0.000015	0.068						975.5797
0.19911		73.77	0.0335	1001.81	(114)	0.000225	0.000230	1001.64	0.1709	-0.000005	0.029						975.5797
0.29559		73.77	0.0490	1013.46	(114)	0.000243	0.000234	1013.89	-0.4297	0.000009	0.185						975.5797
0.40209		73.77	0.0655	1027.22	(114)	0.000238	0.000240	1027.11	0.1039	-0.000002	0.011						975.5797
0.03044		75	0.0053	978.96	(20)	0.000210	0.000221	978.90	0.0587	-0.000012	0.003			4.11			974.849
0.0651		75	0.0112	983.56	(20)	0.000216	0.000223	983.48	0.0774	-0.000007	0.006			8.712			974.849
0.0662		75	0.0114	983.72	(20)	0.000215	0.000223	983.63	0.0904	-0.000008	0.008			8.87			974.849
0.12651		75	0.0216	991.61	(20)	0.000222	0.000226	991.53	0.0798	-0.000004	0.006			16.757			974.849
0.12666		75	0.0216	991.63	(20)	0.000222	0.000226	991.55	0.0843	-0.000004	0.007			16.781			974.849
0.25786		75	0.0430	1008.40	(20)	0.000232	0.000232	1008.39	0.0075	0.000000	0.000			33.55			974.849
0.32113		75	0.0530	1016.32	(20)	0.000236	0.000235	1016.35	-0.0314	0.000001	0.001			41.47			974.849
0.32144		75	0.0530	1016.40	(20)	0.000235	0.000235	1016.39	0.0068	0.000000	0.000			41.547			974.849
0.3866		75	0.0631	1024.46	(20)	0.000239	0.000239	1024.47	-0.0135	0.000000	0.000			49.61			974.849
0.3875		75	0.0633	1024.55	(20)	0.000239	0.000239	1024.58	-0.0344	0.000001	0.001			49.7			974.849
0.45013		75	0.0727	1032.25	(20)	0.000242	0.000242	1032.24	0.0118	0.000000	0.000			57.406			974.849
0.51624		75	0.0825	1040.19	(20)	0.000245	0.000245	1040.21	-0.0271	0.000000	0.001			65.337			974.849
0.02788		85	0.0048	972.39	(20)	0.000205	0.000219	972.33	0.0621	-0.000014	0.004			3.768			968.6203
0.03223		85	0.0056	972.98	(20)	0.000204	0.000219	972.90	0.0806	-0.000015	0.007			4.363			968.6203
0.06563		85	0.0113	977.41	(20)	0.000211	0.000220	977.31	0.0996	-0.000009	0.010			8.792			968.6203
0.13054		85	0.0222	985.89	(20)	0.000220	0.000223	985.80	0.0845	-0.000004	0.007			17.266			968.6203
0.19073		85	0.0322	993.61	(20)	0.000225	0.000226	993.58	0.0331	-0.000001	0.001			24.99			968.6203
0.25913		85	0.0432	1002.34	(20)	0.000228	0.000229	1002.30	0.0443	-0.000001	0.002			33.724			968.6203
0.38611		85	0.0630	1018.08	(20)	0.000237	0.000235	1018.17	-0.0907	0.000001	0.008			49.461			968.6203
0.44989		85	0.0727	1025.87	(20)	0.000240	0.000238	1025.99	-0.1185	0.000002	0.014			57.247			968.6203
0.51712		85	0.0827	1034.02	(20)	0.000243	0.000242	1034.11	-0.0868	0.000001	0.008			65.4			968.6203
0.58604		85	0.0927	1042.29	(20)	0.000245	0.000245	1042.31	-0.0172	0.000000	0.000			73.672			968.6203
0.64987		85	0.1017	1049.76	(20)	0.000248	0.000248	1049.79	-0.0303	0.000000	0.001			81.144			968.6203

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	delta density kg/m³	relative density	Molal volume / cm³/mole	Density of water / kg/m³
0.01295		95	0.0023	963.66	(20)	0.000197	0.000214	963.62	0.0362	-0.000017	0.001			1.759			961.9004
0.02577		95	0.0045	965.39	(20)	0.000199	0.000215	965.32	0.0667	-0.000016	0.004			3.491			961.9004
0.03393		95	0.0059	966.48	(20)	0.000201	0.000215	966.41	0.0758	-0.000014	0.006			4.581			961.9004
0.12915		95	0.0220	979.02	(20)	0.000214	0.000219	978.90	0.1164	-0.000006	0.014			17.115			961.9004
0.19078		95	0.0322	986.93	(20)	0.000220	0.000222	986.87	0.0669	-0.000002	0.004			25.033			961.9004
0.25859		95	0.0431	995.53	(20)	0.000225	0.000225	995.52	0.0069	0.000000	0.000			33.631			961.9004
0.38658		95	0.0631	1011.43	(20)	0.000233	0.000231	1011.55	-0.1253	0.000002	0.016			49.529			961.9004
0.51539		95	0.0824	1027.12	(20)	0.000239	0.000237	1027.27	-0.1581	0.000002	0.025			65.215			961.9004
0.58329		95	0.0923	1035.28	(20)	0.000241	0.000240	1035.39	-0.1158	0.000001	0.013			73.375			961.9004
0.65016		95	0.1018	1043.30	(20)	0.000243	0.000243	1043.27	0.0234	0.000000	0.001			81.395			961.9004
0.01042		98.67	0.0018	960.99	(114)	0.000043	0.000212	960.70	0.2838	-0.000170	0.081		!				959.3157
0.03115		98.67	0.0054	963.80	(114)	0.000145	0.000213	963.45	0.3421	-0.000068	0.117						959.3157
0.10648		98.67	0.0182	973.92	(114)	0.000184	0.000217	973.36	0.5625	-0.000033	0.316						959.3157
0.19911		98.67	0.0335	985.88	(114)	0.000205	0.000221	985.36	0.5230	-0.000016	0.274						959.3157
0.29559		98.67	0.0490	997.65	(114)	0.000225	0.000225	997.63	0.0230	0.000000	0.001						959.3157
0.40209		98.67	0.0655	1011.47	(114)	0.000222	0.000230	1010.91	0.5512	-0.000008	0.304						959.3157
Average Res									0.0375	-0.000009	5.850	Sum chi sqr					
Std dev Res									0.1553	0.000019							
Avg - 4std									-0.5839	-0.000086							
Avg + 4std									0.6589	0.000068							

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	-2.67E-05
c1	3.04E-05
c2	0.971179
c3	0.019816
c4	4366.045
Min T	0
Max T	98.67
Min w	0.000347
Max w	0.109699
Avg dens res	0.037501
Std dens res	0.155345
Avg app vol res *10 ³	-0.009149
Std app vol res *10 ³	0.019272
No of points in corr	230
No of inconsistent poin	7

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

0.24662	15	0.0412	1045.76	(20)	-0.000083	0.000206	1032.89	12.8677	-0.000289	165.577	!	!	46.658				999.0996
0.51831	35	0.0828	1059.60	(20)	0.000255	0.000240	1060.95	-1.3539	0.000015	1.833	!		65.568				994.0319
0.01015	45	0.0018	994.34	(20)	-0.001366	0.000218	991.59	2.7568	-0.001584	7.600	!	!	4.13				990.2132
0.02912	65	0.0050	988.38	(20)	-0.000579	0.000222	984.44	3.9377	-0.000802	15.505	!	!	7.825				980.5548
0.14377	75	0.0244	1000.26	(20)	-0.000040	0.000227	993.77	6.4883	-0.000267	42.099	!	!	25.408				974.849
0.56016	75	0.0889	1056.04	(20)	0.000139	0.000247	1045.44	10.6008	-0.000108	112.377	!	!	81.194				974.849
0.64975	75	0.1017	1057.06	(20)	0.000241	0.000251	1055.95	1.1172	-0.000010	1.248	!		82.214				974.849

Density of aqueous solutions of LiCl

- References (28) Gates, J. A.; Wood, R. H. Densities of Aqueous Solutions of NaCl, MgCl₂, KCl, NaBr, LiCl, and CaCl₂ from 0.05 to 5.0 mol kg⁻¹ and 0.1013 to 40 MPa at 298.15K. *J. Chem. Eng. Data* **1985**, 30, 44-49.
- (45) Isono, T. Densities, Viscosities, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions at Several Temperatures. Alkaline-Earth Chlorides, LaCl₃, Na₂SO₄, NaNO₃, NaBr, KNO₃, KBr, and Cd(NO₃)₂. *J. Chem. Eng. Data* **1984**, 29, 45-52.
- (62) Lengyel, S.; Tamás, J.; Gibber, J.; Holderith, J. Study of Viscosity of Aqueous Alkali Halide Solutions. *Acta Chim. Acad. Sci. Hung.* **1964**, 40, 125-143.
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, 61, 1492-1498.
- (80) Out, D. J. P.; Los, J. M. Viscosity of Aqueous Solutions of Univalent Electrolytes from 5 to 95°C. *J. Sol. Chem.* **1980**, 9, 19-35.
- (130) Vaslow, F. The Apparent Molal Volumes of the Lithium and Sodium Halides. Critical Type Transitions in Aqueous Solution. *J. Phys. Chem.* **1969**, 73, 3745-3750.
- (133) Wimby, J. M.; Berntsson, T. S. Viscosity and Density of Aqueous Solutions of LiBr, LiCl, ZnBr₂, CaCl₂, and LiNO₃. 1. Single Salt Solutions. *J. Chem. Eng. Data* **1994**, 39, 68-72.

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm ³ /mol	Delta density kg/m ³	Density of water / kg/m ³
0.05		5	0.0021	1001.3	(130)	0.000387	0.000463	1001.10	0.1605	-0.000076	0.026			16.42		999.9638
0.1		5	0.0042	1002.5	(130)	0.000391	0.000463	1002.24	0.3069	-0.000072	0.094			16.57		999.9638
0.1189		5	0.0050	1003.1	(80)	0.000385	0.000463	1002.66	0.3970	-0.000079	0.158					999.9638
0.2		5	0.0084	1005.1	(130)	0.000396	0.000464	1004.49	0.5770	-0.000068	0.333			16.77		999.9638
0.2383		5	0.0100	1006.1	(80)	0.000393	0.000464	1005.36	0.7133	-0.000071	0.509					999.9638
0.3		5	0.0126	1007.6	(130)	0.000399	0.000464	1006.74	0.8221	-0.000065	0.676			16.93		999.9638
0.3581		5	0.0150	1009.1	(80)	0.000398	0.000464	1008.04	1.0071	-0.000066	1.014					999.9638
0.4		5	0.0167	1010.0	(130)	0.000402	0.000464	1008.98	1.0502	-0.000062	1.103			17.06		999.9638
0.4786		5	0.0199	1012.0	(80)	0.000402	0.000464	1010.73	1.2620	-0.000062	1.593					999.9638
0.4786		5	0.0199	1012.0	(80)	0.000402	0.000464	1010.73	1.2620	-0.000062	1.593					999.9638
0.5		5	0.0208	1012.5	(130)	0.000405	0.000465	1011.20	1.2601	-0.000059	1.588			17.18		999.9638
0.6		5	0.0248	1014.9	(130)	0.000408	0.000465	1013.42	1.4549	-0.000057	2.117			17.29		999.9638
0.7		5	0.0288	1017.3	(130)	0.000410	0.000465	1015.62	1.6373	-0.000055	2.681			17.39		999.9638
0.721		5	0.0297	1017.8	(80)	0.000409	0.000465	1016.08	1.7303	-0.000056	2.994					999.9638
0.8		5	0.0328	1019.6	(130)	0.000413	0.000466	1017.81	1.8023	-0.000053	3.248			17.49		999.9638
0.9		5	0.0368	1021.9	(130)	0.000415	0.000466	1019.99	1.9588	-0.000051	3.837			17.58		999.9638
1		5	0.0407	1024.3	(130)	0.000417	0.000466	1022.16	2.0998	-0.000049	4.409			17.67		999.9638
1.2		5	0.0484	1028.8	(130)	0.000421	0.000467	1026.46	2.3591	-0.000046	5.565			17.83		999.9638
1.2128		5	0.0489	1029.2	(80)	0.000420	0.000467	1026.74	2.4421	-0.000047	5.964					999.9638
1.4		5	0.0560	1033.3	(130)	0.000424	0.000467	1030.73	2.5634	-0.000043	6.571			17.99		999.9638
1.6		5	0.0635	1037.7	(130)	0.000428	0.000468	1034.95	2.7446	-0.000040	7.533			18.13		999.9638
1.8		5	0.0709	1042.0	(130)	0.000431	0.000468	1039.13	2.8962	-0.000038	8.388			18.26		999.9638
2		5	0.0782	1046.3	(130)	0.000434	0.000469	1043.26	3.0038	-0.000035	9.023			18.39		999.9638
2.5		5	0.0958	1056.6	(130)	0.000441	0.000470	1053.44	3.1662	-0.000030	10.025			18.68		999.9638
3		5	0.1128	1066.5	(130)	0.000447	0.000472	1063.37	3.1728	-0.000025	10.067			18.94		999.9638
3.5		5	0.1292	1076.2	(130)	0.000452	0.000473	1073.07	3.1362	-0.000021	9.836			19.15		999.9638
0.05		15	0.0021	1000.3	(45)	0.000414	0.000461	1000.24	0.0993	-0.000047	0.010					999.0996
0.1		15	0.0042	1001.5	(45)	0.000423	0.000461	1001.38	0.1612	-0.000038	0.026					999.0996
0.1189		15	0.0050	1002.1	(80)	0.000399	0.000461	1001.81	0.3118	-0.000062	0.097					999.0996
0.2383		15	0.0100	1005.1	(80)	0.000407	0.000462	1004.51	0.5494	-0.000054	0.302					999.0996
0.3581		15	0.0150	1008.0	(80)	0.000412	0.000462	1007.20	0.7653	-0.000050	0.586					999.0996

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm³/mol	Delta density kg/m³	Density of water / kg/m³
0.4786		15	0.0199	1010.9	(80)	0.000416	0.000463	1009.90	0.9529	-0.000047	0.908					999.0996
0.4786		15	0.0199	1010.9	(80)	0.000416	0.000463	1009.90	0.9529	-0.000047	0.908					999.0996
0.5		15	0.0208	1011.2	(45)	0.000423	0.000463	1010.37	0.8365	-0.000039	0.700					999.0996
0.5		15	0.0208	1011.2	(45)	0.000423	0.000463	1010.37	0.8365	-0.000039	0.700					999.0996
0.721		15	0.0297	1016.5	(80)	0.000422	0.000464	1015.26	1.2688	-0.000041	1.610					999.0996
1		15	0.0407	1022.5	(45)	0.000438	0.000465	1021.35	1.1192	-0.000026	1.253					999.0996
1.009		15	0.0410	1023.2	(62)	0.000426	0.000465	1021.55	1.6543	-0.000039	2.737					999.0996
1.2128		15	0.0489	1027.7	(80)	0.000431	0.000466	1025.94	1.7640	-0.000034	3.112					999.0996
2		15	0.0782	1044.1	(45)	0.000449	0.000468	1042.47	1.6225	-0.000019	2.633					999.0996
2.5925		15	0.0990	1056.6	(62)	0.000451	0.000470	1054.48	2.1169	-0.000019	4.481					999.0996
3		15	0.1128	1064.1	(45)	0.000459	0.000471	1062.54	1.5554	-0.000012	2.419					999.0996
4		15	0.1450	1082.8	(45)	0.000467	0.000474	1081.67	1.1748	-0.000007	1.380					999.0996
4.1814		15	0.1506	1086.2	(62)	0.000468	0.000474	1085.04	1.1631	-0.000007	1.353					999.0996
5.7128		15	0.1950	1113.5	(62)	0.000473	0.000478	1112.40	1.1021	-0.000005	1.215					999.0996
6		15	0.2028	1118.0	(45)	0.000476	0.000479	1117.32	0.6400	-0.000003	0.410					999.0996
7.2417		15	0.2349	1137.8	(62)	0.000481	0.000481	1137.89	-0.0948	0.000000	0.009					999.0996
8		15	0.2533	1149.1	(45)	0.000485	0.000483	1149.93	-0.8451	0.000003	0.714					999.0996
8.8268		15	0.2723	1162.1	(62)	0.000485	0.000484	1162.61	-0.5089	0.000001	0.259					999.0996
9.863		15	0.2948	1177.1	(62)	0.000488	0.000486	1177.90	-0.8030	0.000002	0.645					999.0996
10		15	0.2977	1178.9	(45)	0.000488	0.000486	1179.88	-0.9971	0.000002	0.994					999.0996
10.913		15	0.3163	1191.9	(62)	0.000489	0.000487	1192.76	-0.8591	0.000002	0.738					999.0996
11.963		15	0.3365	1206.0	(62)	0.000491	0.000489	1207.01	-1.0103	0.000002	1.021					999.0996
12.923		15	0.3539	1219.4	(62)	0.000490	0.000490	1219.54	-0.1425	0.000000	0.020					999.0996
14.067		15	0.3736	1233.6	(62)	0.000492	0.000491	1233.89	-0.2941	0.000001	0.086					999.0996
15.063		15	0.3897	1246.3	(62)	0.000491	0.000492	1245.90	0.3970	-0.000001	0.158					999.0996
15.827		15	0.4015	1254.8	(62)	0.000493	0.000493	1254.82	-0.0245	0.000000	0.001					999.0996
17.249		15	0.4224	1271.3	(62)	0.000494	0.000494	1270.80	0.5028	-0.000001	0.253					999.0996
17.906		15	0.4315	1278.0	(62)	0.000495	0.000495	1277.91	0.0871	0.000000	0.008					999.0996
18.729		15	0.4426	1287.4	(62)	0.000494	0.000496	1286.60	0.7970	-0.000001	0.635					999.0996
19.584		15	0.4536	1296.8	(62)	0.000494	0.000496	1295.38	1.4218	-0.000002	2.021					999.0996
		17	0.4539	1292.6	(133)	0.000500	0.000497	1294.80	-2.2156	0.000003	4.909					998.7749
		18.84	0.3591	1221.7	(133)	0.000492	0.000491	1222.20	-0.4751	0.000001	0.226					998.4364
		18.99	0.3932	1247.6	(133)	0.000493	0.000493	1247.23	0.3562	-0.000001	0.127					998.4072
		19.21	0.3001	1179.8	(133)	0.000488	0.000487	1180.53	-0.6915	0.000002	0.478					998.3639
		19.29	0.1003	1056.8	(133)	0.000450	0.000470	1054.53	2.2307	-0.000020	4.976					998.348
		19.33	0.2022	1116.6	(133)	0.000477	0.000479	1116.17	0.3997	-0.000002	0.160					998.3401
		19.55	0.4156	1264.1	(133)	0.000495	0.000495	1263.96	0.1116	0.000000	0.012					998.2959
0.05		20	0.0021	999.4	(45)	0.000416	0.000460	999.35	0.0919	-0.000044	0.008					998.2041
0.1		20	0.0042	1000.7	(45)	0.000422	0.000460	1000.49	0.1611	-0.000038	0.026					998.2041
0.5		20	0.0208	1010.3	(45)	0.000426	0.000462	1009.50	0.7468	-0.000035	0.558					998.2041
0.5		20	0.0208	1010.3	(45)	0.000426	0.000462	1009.50	0.7468	-0.000035	0.558					998.2041
1		20	0.0407	1021.4	(45)	0.000442	0.000464	1020.50	0.9207	-0.000022	0.848					998.2041
1.009		20	0.0410	1022.1	(62)	0.000431	0.000464	1020.69	1.4054	-0.000033	1.975					998.2041
2		20	0.0782	1043.1	(45)	0.000450	0.000467	1041.64	1.4334	-0.000017	2.055					998.2041
2.5925		20	0.0990	1055.3	(62)	0.000454	0.000469	1053.65	1.6451	-0.000015	2.706					998.2041
3		20	0.1128	1062.9	(45)	0.000461	0.000471	1061.71	1.2054	-0.000009	1.453					998.2041
4		20	0.1450	1081.6	(45)	0.000469	0.000474	1080.82	0.7507	-0.000004	0.564					998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm³/mol	Delta density kg/m³	Density of water / kg/m³
4.1814		20	0.1506	1084.7	(62)	0.000471	0.000474	1084.19	0.5134	-0.000003	0.264					998.2041
5.7128		20	0.1950	1112.0	(62)	0.000476	0.000478	1111.49	0.5065	-0.000002	0.257					998.2041
6		20	0.2028	1116.3	(45)	0.000479	0.000479	1116.40	-0.1426	0.000001	0.020					998.2041
7.2417		20	0.2349	1136.4	(62)	0.000483	0.000481	1136.91	-0.5117	0.000002	0.262					998.2041
8		20	0.2533	1147.7	(45)	0.000487	0.000483	1148.90	-1.1856	0.000004	1.406					998.2041
8.8268		20	0.2723	1160.7	(62)	0.000487	0.000485	1161.52	-0.8241	0.000002	0.679					998.2041
9.863		20	0.2948	1175.7	(62)	0.000489	0.000486	1176.74	-1.0430	0.000003	1.088					998.2041
10		20	0.2977	1177.5	(45)	0.000490	0.000487	1178.71	-1.2567	0.000003	1.579					998.2041
10.913		20	0.3163	1190.4	(62)	0.000490	0.000488	1191.52	-1.1171	0.000002	1.248					998.2041
11.963		20	0.3365	1204.7	(62)	0.000491	0.000489	1205.68	-0.9815	0.000002	0.963					998.2041
12.923		20	0.3539	1217.8	(62)	0.000491	0.000491	1218.13	-0.3310	0.000001	0.110					998.2041
14.067		20	0.3736	1231.9	(62)	0.000493	0.000492	1232.38	-0.4803	0.000001	0.231					998.2041
15.063		20	0.3897	1244.5	(62)	0.000493	0.000493	1244.30	0.2023	0.000000	0.041					998.2041
15.827		20	0.4015	1253.0	(62)	0.000494	0.000494	1253.15	-0.1477	0.000000	0.022					998.2041
17.249		20	0.4224	1269.4	(62)	0.000495	0.000496	1268.98	0.4151	-0.000001	0.172					998.2041
17.906		20	0.4315	1276.2	(62)	0.000496	0.000496	1276.04	0.1627	0.000000	0.026					998.2041
18.729		20	0.4426	1285.6	(62)	0.000496	0.000497	1284.65	0.9525	-0.000001	0.907					998.2041
19.584		20	0.4536	1294.9	(62)	0.000496	0.000498	1293.34	1.5608	-0.000002	2.436					998.2041
		20.17	0.4303	1274.8	(133)	0.000497	0.000496	1275.02	-0.2198	0.000000	0.048					998.1689
		20.19	0.2486	1145.6	(133)	0.000483	0.000483	1145.80	-0.2056	0.000001	0.042					998.1647
0.05		25	0.0021	998.3	(45)	0.000416	0.000458	998.19	0.0878	-0.000042	0.008					997.0449
0.0502		25	0.0021	998.3	(28)	0.000408	0.000458	998.20	0.1061	-0.000050	0.011				1.258	997.0449
0.0999		25	0.0042	999.5	(28)	0.000411	0.000458	999.33	0.2008	-0.000048	0.040				2.49	997.0449
0.1		25	0.0042	999.5	(45)	0.000426	0.000458	999.34	0.1337	-0.000032	0.018					997.0449
0.10782		25	0.0046	999.7	(73)	0.000409	0.000458	999.51	0.2250	-0.000049	0.051					997.0449
0.1189		25	0.0050	1000.0	(80)	0.000408	0.000458	999.77	0.2520	-0.000050	0.064					997.0449
0.21689		25	0.0091	1002.4	(73)	0.000415	0.000459	1002.00	0.4015	-0.000044	0.161					997.0449
0.2383		25	0.0100	1002.9	(80)	0.000416	0.000459	1002.48	0.4358	-0.000043	0.190					997.0449
0.2506		25	0.0105	1003.2	(28)	0.000420	0.000459	1002.76	0.4079	-0.000039	0.166				6.126	997.0449
0.32518		25	0.0136	1005.0	(73)	0.000419	0.000459	1004.45	0.5507	-0.000040	0.303					997.0449
0.3581		25	0.0150	1005.8	(80)	0.000420	0.000459	1005.19	0.5986	-0.000040	0.358					997.0449
0.43406		25	0.0181	1007.6	(73)	0.000423	0.000460	1006.90	0.6814	-0.000037	0.464					997.0449
0.4786		25	0.0199	1008.6	(80)	0.000424	0.000460	1007.90	0.7337	-0.000036	0.538					997.0449
0.4786		25	0.0199	1008.6	(80)	0.000424	0.000460	1007.90	0.7337	-0.000036	0.538					997.0449
0.5		25	0.0208	1009.0	(45)	0.000430	0.000460	1008.37	0.6453	-0.000031	0.416					997.0449
0.5		25	0.0208	1009.0	(45)	0.000430	0.000460	1008.37	0.6453	-0.000031	0.416					997.0449
0.5019		25	0.0208	1009.1	(28)	0.000427	0.000460	1008.42	0.7057	-0.000033	0.498				12.078	997.0449
0.65179		25	0.0269	1012.7	(73)	0.000428	0.000461	1011.75	0.8977	-0.000033	0.806					997.0449
0.721		25	0.0297	1014.2	(80)	0.000430	0.000461	1013.28	0.9570	-0.000031	0.916					997.0449
0.76073		25	0.0312	1015.1	(73)	0.000431	0.000461	1014.16	0.9809	-0.000030	0.962					997.0449
0.87037		25	0.0356	1017.6	(73)	0.000433	0.000462	1016.57	1.0631	-0.000029	1.130					997.0449
0.97888		25	0.0398	1020.1	(73)	0.000435	0.000462	1018.94	1.1343	-0.000027	1.287					997.0449
1		25	0.0407	1020.1	(45)	0.000446	0.000462	1019.40	0.6849	-0.000016	0.469					997.0449
1.004		25	0.0408	1020.6	(28)	0.000436	0.000462	1019.48	1.1068	-0.000026	1.225				23.544	997.0449
1.009		25	0.0410	1020.2	(62)	0.000448	0.000462	1019.59	0.6093	-0.000014	0.371					997.0449
1.08789		25	0.0441	1022.5	(73)	0.000436	0.000463	1021.30	1.2086	-0.000026	1.461					997.0449
1.2128		25	0.0489	1025.3	(80)	0.000438	0.000463	1024.00	1.2849	-0.000025	1.651					997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm³/mol	Delta density kg/m³	Density of water / kg/m³
2		25	0.0782	1041.6	(45)	0.000454	0.000466	1040.56	1.0665	-0.000013	1.137					997.0449
2.015		25	0.0787	1042.3	(28)	0.000449	0.000466	1040.87	1.4723	-0.000017	2.168				45.3	997.0449
2.5925		25	0.0990	1053.9	(62)	0.000457	0.000468	1052.59	1.3094	-0.000012	1.714					997.0449
2.977		25	0.1121	1061.6	(28)	0.000459	0.000470	1060.20	1.3489	-0.000011	1.820				64.506	997.0449
3		25	0.1128	1061.5	(45)	0.000463	0.000470	1060.65	0.8774	-0.000007	0.770					997.0449
4		25	0.1450	1080.2	(45)	0.000471	0.000473	1079.75	0.4286	-0.000003	0.184					997.0449
4.1814		25	0.1506	1083.4	(62)	0.000472	0.000474	1083.12	0.2839	-0.000002	0.081					997.0449
4.974		25	0.1741	1097.1	(28)	0.000478	0.000476	1097.48	-0.3864	0.000002	0.149				100.045	997.0449
5.7128		25	0.1950	1110.4	(62)	0.000478	0.000478	1110.38	0.0165	0.000000	0.000					997.0449
6		25	0.2028	1114.8	(45)	0.000480	0.000479	1115.28	-0.4621	0.000002	0.214					997.0449
7.2417		25	0.2349	1134.8	(62)	0.000485	0.000482	1135.74	-0.9368	0.000003	0.878					997.0449
8		25	0.2533	1146.3	(45)	0.000487	0.000483	1147.68	-1.4208	0.000004	2.019					997.0449
8.8268		25	0.2723	1159.1	(62)	0.000488	0.000485	1160.26	-1.1612	0.000003	1.348					997.0449
9.863		25	0.2948	1174.2	(62)	0.000490	0.000487	1175.41	-1.2134	0.000003	1.472					997.0449
10		25	0.2977	1175.9	(45)	0.000491	0.000487	1177.37	-1.4778	0.000004	2.184					997.0449
10.913		25	0.3163	1188.8	(62)	0.000492	0.000489	1190.11	-1.3140	0.000003	1.727					997.0449
11.963		25	0.3365	1203.1	(62)	0.000492	0.000490	1204.20	-1.1000	0.000002	1.210					997.0449
12.923		25	0.3539	1216.1	(62)	0.000493	0.000492	1216.57	-0.4741	0.000001	0.225					997.0449
14.067		25	0.3736	1230.1	(62)	0.000494	0.000493	1230.73	-0.6298	0.000001	0.397					997.0449
15.063		25	0.3897	1242.7	(62)	0.000494	0.000494	1242.56	0.1370	0.000000	0.019					997.0449
15.827		25	0.4015	1251.1	(62)	0.000496	0.000495	1251.35	-0.2470	0.000000	0.061					997.0449
17.249		25	0.4224	1267.6	(62)	0.000496	0.000497	1267.06	0.5412	-0.000001	0.293					997.0449
17.906		25	0.4315	1274.3	(62)	0.000497	0.000498	1274.05	0.2477	0.000000	0.061					997.0449
18.729		25	0.4426	1283.7	(62)	0.000497	0.000498	1282.59	1.1119	-0.000002	1.236					997.0449
19.584		25	0.4536	1293.1	(62)	0.000497	0.000499	1291.20	1.8980	-0.000003	3.603					997.0449
		26.97	0.3932	1243.8	(133)	0.000496	0.000495	1244.42	-0.6005	0.000001	0.361					996.5215
		27.1	0.4539	1288.7	(133)	0.000502	0.000500	1290.50	-1.7671	0.000002	3.123					996.4856
		28.63	0.3591	1218.4	(133)	0.000494	0.000493	1219.05	-0.6161	0.000001	0.380					996.0527
		29.5	0.1003	1053.9	(133)	0.000453	0.000468	1052.20	1.6646	-0.000015	2.771					995.7971
		29.54	0.4156	1260.3	(133)	0.000497	0.000497	1260.12	0.1984	0.000000	0.039					995.7852
		29.64	0.3001	1176.6	(133)	0.000490	0.000487	1177.61	-1.0113	0.000002	1.023					995.7554
		29.65	0.2022	1113.5	(133)	0.000479	0.000478	1113.72	-0.1754	0.000001	0.031					995.7524
0.05		30	0.0021	996.9	(45)	0.000408	0.000456	996.80	0.1014	-0.000048	0.010					995.6473
0.1		30	0.0042	998.1	(45)	0.000424	0.000456	997.95	0.1334	-0.000032	0.018					995.6473
0.5		30	0.0208	1007.6	(45)	0.000430	0.000458	1007.01	0.5864	-0.000028	0.344					995.6473
0.5		30	0.0208	1007.6	(45)	0.000430	0.000458	1007.01	0.5864	-0.000028	0.344					995.6473
1		30	0.0407	1018.7	(45)	0.000445	0.000461	1018.06	0.6462	-0.000015	0.418					995.6473
1.009		30	0.0410	1019.3	(62)	0.000436	0.000461	1018.26	1.0401	-0.000024	1.082					995.6473
2		30	0.0782	1040.1	(45)	0.000455	0.000465	1039.27	0.8657	-0.000010	0.749					995.6473
2.5925		30	0.0990	1052.4	(62)	0.000457	0.000467	1051.32	1.0835	-0.000010	1.174					995.6473
3		30	0.1128	1060.0	(45)	0.000464	0.000469	1059.38	0.6550	-0.000005	0.429					995.6473
4		30	0.1450	1078.7	(45)	0.000471	0.000472	1078.49	0.2019	-0.000001	0.041					995.6473
4.1814		30	0.1506	1081.8	(62)	0.000473	0.000473	1081.85	-0.0519	0.000000	0.003					995.6473
5.7128		30	0.1950	1108.4	(62)	0.000480	0.000477	1109.09	-0.6946	0.000003	0.483					995.6473
6		30	0.2028	1113.3	(45)	0.000481	0.000478	1113.99	-0.6555	0.000003	0.430					995.6473
7.2417		30	0.2349	1133.2	(62)	0.000485	0.000481	1134.40	-1.1972	0.000004	1.433					995.6473
8		30	0.2533	1144.7	(45)	0.000488	0.000483	1146.31	-1.5982	0.000005	2.554					995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm³/mol	Delta density kg/m³	Density of water / kg/m³
8.8268		30	0.2723	1157.7	(62)	0.000488	0.000485	1158.85	-1.1475	0.000003	1.317					995.6473
9.863		30	0.2948	1172.7	(62)	0.000490	0.000487	1173.94	-1.2419	0.000003	1.542					995.6473
10		30	0.2977	1174.3	(45)	0.000491	0.000487	1175.89	-1.5783	0.000004	2.491					995.6473
10.913		30	0.3163	1187.3	(62)	0.000492	0.000489	1188.58	-1.2778	0.000003	1.633					995.6473
11.963		30	0.3365	1201.5	(62)	0.000493	0.000491	1202.59	-1.0936	0.000002	1.196					995.6473
12.923		30	0.3539	1214.4	(62)	0.000493	0.000492	1214.90	-0.4999	0.000001	0.250					995.6473
14.067		30	0.3736	1228.4	(62)	0.000495	0.000494	1228.97	-0.5707	0.000001	0.326					995.6473
15.827		30	0.4015	1249.3	(62)	0.000497	0.000496	1249.45	-0.1505	0.000000	0.023					995.6473
17.249		30	0.4224	1265.7	(62)	0.000497	0.000498	1265.05	0.6531	-0.000001	0.427					995.6473
17.906		30	0.4315	1272.4	(62)	0.000498	0.000499	1271.99	0.4139	-0.000001	0.171					995.6473
18.729		30	0.4426	1281.7	(62)	0.000498	0.000500	1280.45	1.2469	-0.000002	1.555					995.6473
19.584		30	0.4536	1291.1	(62)	0.000498	0.000500	1288.99	2.1052	-0.000003	4.432					995.6473
		30.09	0.2486	1143.5	(133)	0.000482	0.000483	1143.24	0.2954	-0.000001	0.087					995.6201
		30.16	0.4303	1271.2	(133)	0.000498	0.000499	1270.98	0.2173	0.000000	0.047					995.5988
0.05		35	0.0021	995.3	(45)	0.000414	0.000454	995.19	0.0823	-0.000039	0.007					994.0319
0.1		35	0.0042	996.5	(45)	0.000423	0.000454	996.34	0.1298	-0.000031	0.017					994.0319
0.1		35	0.0042	996.5	(130)	0.000414	0.000454	996.34	0.1654	-0.000039	0.027			17.57		994.0319
0.1189		35	0.0050	997.0	(80)	0.000409	0.000454	996.77	0.2251	-0.000045	0.051					994.0319
0.2		35	0.0084	998.9	(130)	0.000419	0.000454	998.64	0.2940	-0.000035	0.086			17.78		994.0319
0.2383		35	0.0100	999.9	(80)	0.000418	0.000455	999.51	0.3695	-0.000037	0.137					994.0319
0.3		35	0.0126	1001.3	(130)	0.000423	0.000455	1000.92	0.4065	-0.000032	0.165			17.92		994.0319
0.3581		35	0.0150	1002.7	(80)	0.000422	0.000455	1002.24	0.4938	-0.000033	0.244					994.0319
0.4		35	0.0167	1003.7	(130)	0.000426	0.000456	1003.19	0.5038	-0.000030	0.254			18.04		994.0319
0.4786		35	0.0199	1005.6	(80)	0.000427	0.000456	1004.96	0.5911	-0.000029	0.349					994.0319
0.4786		35	0.0199	1005.6	(80)	0.000427	0.000456	1004.96	0.5911	-0.000029	0.349					994.0319
0.5		35	0.0208	1006.0	(45)	0.000431	0.000456	1005.44	0.5195	-0.000025	0.270					994.0319
0.5		35	0.0208	1006.0	(45)	0.000431	0.000456	1005.44	0.5195	-0.000025	0.270					994.0319
0.5		35	0.0208	1006.0	(130)	0.000428	0.000456	1005.44	0.5916	-0.000028	0.350			18.14		994.0319
0.6		35	0.0248	1008.3	(130)	0.000430	0.000457	1007.68	0.6640	-0.000026	0.441			18.24		994.0319
0.7		35	0.0288	1010.6	(130)	0.000432	0.000457	1009.91	0.7347	-0.000025	0.540			18.32		994.0319
0.721		35	0.0297	1011.1	(80)	0.000432	0.000457	1010.38	0.7507	-0.000025	0.564					994.0319
0.8		35	0.0328	1012.9	(130)	0.000434	0.000458	1012.13	0.7937	-0.000024	0.630			18.4		994.0319
0.9		35	0.0368	1015.2	(130)	0.000436	0.000458	1014.33	0.8499	-0.000022	0.722			18.47		994.0319
1		35	0.0407	1017.1	(45)	0.000445	0.000459	1016.53	0.5637	-0.000013	0.318					994.0319
1		35	0.0407	1017.4	(130)	0.000437	0.000459	1016.53	0.8961	-0.000021	0.803			18.54		994.0319
1.009		35	0.0410	1017.6	(62)	0.000438	0.000459	1016.72	0.8770	-0.000021	0.769					994.0319
1.2		35	0.0484	1021.8	(130)	0.000440	0.000460	1020.87	0.9705	-0.000019	0.942			18.67		994.0319
1.2128		35	0.0489	1022.1	(80)	0.000440	0.000460	1021.15	0.9897	-0.000019	0.979					994.0319
1.4		35	0.0560	1026.2	(130)	0.000443	0.000461	1025.17	1.0223	-0.000017	1.045			18.79		994.0319
1.6		35	0.0635	1030.5	(130)	0.000446	0.000462	1029.42	1.0568	-0.000016	1.117			18.9		994.0319
1.8		35	0.0709	1034.7	(130)	0.000448	0.000462	1033.63	1.0795	-0.000014	1.165			19		994.0319
2		35	0.0782	1038.6	(45)	0.000454	0.000463	1037.79	0.7899	-0.000009	0.624					994.0319
2		35	0.0782	1038.8	(130)	0.000451	0.000463	1037.79	1.0361	-0.000012	1.074			19.12		994.0319
2.5		35	0.0958	1049.0	(130)	0.000456	0.000465	1048.00	1.0236	-0.000010	1.048			19.32		994.0319
2.5925		35	0.0990	1050.7	(62)	0.000458	0.000466	1049.85	0.8462	-0.000008	0.716					994.0319
3		35	0.1128	1058.5	(45)	0.000463	0.000467	1057.93	0.5468	-0.000004	0.299					994.0319
4		35	0.1450	1077.1	(45)	0.000471	0.000471	1077.05	0.0589	0.000000	0.003					994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm³/mol	Delta density kg/m³	Density of water / kg/m³
4.1814		35	0.1506	1080.0	(62)	0.000474	0.000472	1080.42	-0.4159	0.000002	0.173					994.0319
5.7128		35	0.1950	1106.8	(62)	0.000480	0.000477	1107.65	-0.8492	0.000004	0.721					994.0319
6		35	0.2028	1111.8	(45)	0.000481	0.000478	1112.54	-0.7851	0.000003	0.616					994.0319
7.2417		35	0.2349	1131.4	(62)	0.000486	0.000481	1132.92	-1.5155	0.000005	2.297					994.0319
8		35	0.2533	1143.2	(45)	0.000488	0.000483	1144.80	-1.6504	0.000005	2.724					994.0319
8.8268		35	0.2723	1156.2	(62)	0.000488	0.000485	1157.31	-1.1060	0.000003	1.223					994.0319
9.863		35	0.2948	1171.2	(62)	0.000490	0.000487	1172.35	-1.1515	0.000003	1.326					994.0319
10		35	0.2977	1172.7	(45)	0.000491	0.000487	1174.29	-1.6109	0.000004	2.595					994.0319
10.913		35	0.3163	1185.7	(62)	0.000492	0.000489	1186.93	-1.2314	0.000003	1.516					994.0319
11.963		35	0.3365	1199.9	(62)	0.000493	0.000491	1200.89	-0.9857	0.000002	0.972					994.0319
12.923		35	0.3539	1212.7	(62)	0.000494	0.000493	1213.13	-0.4316	0.000001	0.186					994.0319
14.067		35	0.3736	1226.6	(62)	0.000495	0.000494	1227.13	-0.5264	0.000001	0.277					994.0319
15.827		35	0.4015	1247.5	(62)	0.000497	0.000497	1247.48	0.0181	0.000000	0.000					994.0319
17.249		35	0.4224	1263.9	(62)	0.000497	0.000499	1262.97	0.9271	-0.000001	0.859					994.0319
17.906		35	0.4315	1270.5	(62)	0.000499	0.000500	1269.86	0.6377	-0.000001	0.407					994.0319
18.729		35	0.4426	1279.9	(62)	0.000498	0.000501	1278.27	1.6338	-0.000002	2.669					994.0319
19.584		35	0.4536	1289.1	(62)	0.000498	0.000502	1286.74	2.3586	-0.000003	5.563					994.0319
		37.14	0.4539	1284.8	(133)	0.000504	0.000502	1285.98	-1.2096	0.000002	1.463					993.2783
		38.63	0.3591	1214.9	(133)	0.000494	0.000493	1215.44	-0.5504	0.000001	0.303					992.7325
		39.36	0.4156	1256.7	(133)	0.000498	0.000499	1256.08	0.6465	-0.000001	0.418					992.4589
		39.63	0.1003	1050.4	(133)	0.000453	0.000464	1049.09	1.2881	-0.000012	1.659					992.3567
		39.7	0.3932	1240.1	(133)	0.000496	0.000497	1239.49	0.6080	-0.000001	0.370					992.3301
		39.71	0.3001	1173.2	(133)	0.000490	0.000487	1174.30	-1.0671	0.000003	1.139					992.3263
		39.83	0.2022	1111.0	(133)	0.000475	0.000477	1110.64	0.3802	-0.000002	0.145					992.2807
		39.97	0.4303	1267.2	(133)	0.000500	0.000500	1266.79	0.3692	-0.000001	0.136					992.2272
		40.03	0.2486	1139.1	(133)	0.000485	0.000482	1140.14	-1.0010	0.000003	1.002					992.2043
0.05		45	0.0021	991.5	(45)	0.000385	0.000448	991.38	0.1300	-0.000063	0.017					990.2132
0.1		45	0.0042	992.7	(45)	0.000420	0.000448	992.54	0.1168	-0.000028	0.014					990.2132
0.1189		45	0.0050	993.2	(80)	0.000408	0.000448	992.98	0.1980	-0.000040	0.039					990.2132
0.2383		45	0.0100	996.1	(80)	0.000416	0.000449	995.74	0.3275	-0.000033	0.107					990.2132
0.3581		45	0.0150	998.9	(80)	0.000421	0.000450	998.49	0.4275	-0.000029	0.183					990.2132
0.4786		45	0.0199	1001.7	(80)	0.000426	0.000451	1001.24	0.5013	-0.000025	0.251					990.2132
0.4786		45	0.0199	1001.7	(80)	0.000426	0.000451	1001.24	0.5013	-0.000025	0.251					990.2132
0.5		45	0.0208	1002.2	(45)	0.000428	0.000451	1001.72	0.4756	-0.000023	0.226					990.2132
0.5		45	0.0208	1002.2	(45)	0.000428	0.000451	1001.72	0.4756	-0.000023	0.226					990.2132
0.721		45	0.0297	1007.3	(80)	0.000431	0.000452	1006.70	0.6359	-0.000021	0.404					990.2132
1		45	0.0407	1013.4	(45)	0.000443	0.000454	1012.90	0.4508	-0.000011	0.203					990.2132
1.2128		45	0.0489	1018.4	(80)	0.000439	0.000455	1017.56	0.8128	-0.000016	0.661					990.2132
2		45	0.0782	1034.9	(45)	0.000452	0.000459	1034.30	0.6259	-0.000007	0.392					990.2132
3		45	0.1128	1054.9	(45)	0.000461	0.000464	1054.55	0.3645	-0.000003	0.133					990.2132
4		45	0.1450	1073.6	(45)	0.000469	0.000468	1073.73	-0.1052	0.000001	0.011					990.2132
6		45	0.2028	1108.5	(45)	0.000479	0.000475	1109.24	-0.7838	0.000003	0.614					990.2132
8		45	0.2533	1139.8	(45)	0.000487	0.000482	1141.45	-1.6417	0.000005	2.695					990.2132
10		45	0.2977	1169.3	(45)	0.000490	0.000487	1170.82	-1.5071	0.000004	2.271					990.2132
		47.28	0.4539	1280.7	(133)	0.000504	0.000503	1281.34	-0.6312	0.000001	0.398					989.2415
		48.58	0.3591	1211.2	(133)	0.000494	0.000493	1211.61	-0.4240	0.000001	0.180					988.6716
		49.32	0.4156	1252.6	(133)	0.000498	0.000499	1251.87	0.7725	-0.000001	0.597					988.3422

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm³/mol	Delta density kg/m³	Density of water / kg/m³
		49.63	0.1003	1046.4	(133)	0.000451	0.000460	1045.40	1.0148	-0.000009	1.030					988.2031
		49.65	0.3932	1236.3	(133)	0.000495	0.000497	1235.44	0.8382	-0.000001	0.703					988.1941
		49.71	0.3001	1169.7	(133)	0.000489	0.000486	1170.67	-0.9844	0.000002	0.969					988.1671
		49.92	0.2022	1107.3	(133)	0.000473	0.000474	1107.10	0.1939	-0.000001	0.038					988.0724
		49.94	0.4303	1263.2	(133)	0.000500	0.000501	1262.45	0.7125	-0.000001	0.508					988.0634
		50	0.2486	1135.5	(133)	0.000483	0.000480	1136.62	-1.0908	0.000003	1.190					988.0363
0.05		55	0.0021	987.0	(45)	0.000380	0.000441	986.88	0.1246	-0.000060	0.016					985.6952
0.1		55	0.0042	988.2	(45)	0.000415	0.000441	988.05	0.1082	-0.000026	0.012					985.6952
0.1189		55	0.0050	988.7	(80)	0.000402	0.000441	988.50	0.1944	-0.000040	0.038					985.6952
0.2383		55	0.0100	991.6	(80)	0.000411	0.000442	991.29	0.3030	-0.000031	0.092					985.6952
0.3581		55	0.0150	994.5	(80)	0.000417	0.000443	994.07	0.3929	-0.000027	0.154					985.6952
0.4786		55	0.0199	997.3	(80)	0.000421	0.000444	996.84	0.4571	-0.000023	0.209					985.6952
0.4786		55	0.0199	997.3	(80)	0.000421	0.000444	996.84	0.4571	-0.000023	0.209					985.6952
0.5		55	0.0208	997.8	(45)	0.000422	0.000444	997.33	0.4663	-0.000023	0.217					985.6952
0.5		55	0.0208	997.8	(45)	0.000422	0.000444	997.33	0.4663	-0.000023	0.217					985.6952
0.721		55	0.0297	1002.9	(80)	0.000426	0.000446	1002.37	0.5749	-0.000019	0.330					985.6952
1		55	0.0407	1009.0	(45)	0.000438	0.000447	1008.62	0.3883	-0.000009	0.151					985.6952
1.2128		55	0.0489	1014.1	(80)	0.000434	0.000449	1013.32	0.7360	-0.000015	0.542					985.6952
2		55	0.0782	1030.8	(45)	0.000447	0.000454	1030.22	0.5546	-0.000007	0.308					985.6952
3		55	0.1128	1050.9	(45)	0.000457	0.000459	1050.60	0.2987	-0.000002	0.089					985.6952
4		55	0.1450	1069.8	(45)	0.000464	0.000464	1069.89	-0.0975	0.000001	0.009					985.6952
6		55	0.2028	1104.8	(45)	0.000475	0.000472	1105.53	-0.7056	0.000003	0.498					985.6952
8		55	0.2533	1136.3	(45)	0.000484	0.000479	1137.76	-1.4554	0.000004	2.118					985.6952
10		55	0.2977	1165.7	(45)	0.000488	0.000485	1167.07	-1.3299	0.000003	1.769					985.6952
		57.43	0.4539	1276.5	(133)	0.000504	0.000504	1276.75	-0.2520	0.000000	0.063					984.5009
		58.41	0.3591	1207.4	(133)	0.000493	0.000492	1207.71	-0.2814	0.000001	0.079					984.0091
		59.3	0.4156	1248.5	(133)	0.000498	0.000499	1247.64	0.8935	-0.000001	0.798					983.5574
		59.67	0.3932	1232.3	(133)	0.000494	0.000496	1231.31	1.0251	-0.000002	1.051					983.3683
		59.9	0.4303	1259.1	(133)	0.000499	0.000501	1258.14	0.9315	-0.000001	0.868					983.2503
		59.93	0.3001	1165.9	(133)	0.000486	0.000484	1166.74	-0.8533	0.000002	0.728					983.2349
		59.96	0.2486	1131.7	(133)	0.000480	0.000477	1132.80	-1.0795	0.000003	1.165					983.2194
0.1189		65	0.0050	983.6	(80)	0.000394	0.000433	983.39	0.1872	-0.000039	0.035					980.5548
0.2383		65	0.0100	986.5	(80)	0.000403	0.000434	986.22	0.2989	-0.000031	0.089					980.5548
0.3581		65	0.0150	989.4	(80)	0.000409	0.000435	989.04	0.3825	-0.000026	0.146					980.5548
0.4786		65	0.0199	992.3	(80)	0.000413	0.000436	991.85	0.4412	-0.000023	0.195					980.5548
0.4786		65	0.0199	992.3	(80)	0.000413	0.000436	991.85	0.4412	-0.000023	0.195					980.5548
0.721		65	0.0297	998.0	(80)	0.000419	0.000438	997.44	0.5398	-0.000018	0.291					980.5548
1.2128		65	0.0489	1009.2	(80)	0.000427	0.000441	1008.53	0.7007	-0.000014	0.491					980.5548
		67.49	0.4539	1272.3	(133)	0.000503	0.000503	1272.36	-0.0887	0.000000	0.008					979.1851
		69.24	0.4156	1244.6	(133)	0.000496	0.000497	1243.51	1.1225	-0.000002	1.260					978.2018
		69.64	0.3932	1228.3	(133)	0.000492	0.000494	1227.25	1.0897	-0.000002	1.187					977.9747
		69.89	0.3001	1162.0	(133)	0.000483	0.000481	1162.77	-0.8036	0.000002	0.646					977.8324
		69.89	0.4303	1255.0	(133)	0.000498	0.000499	1253.94	1.0612	-0.000002	1.126					977.8324
		69.91	0.2486	1127.8	(133)	0.000476	0.000473	1128.76	-0.9758	0.000003	0.952					977.821
		69.96	0.2022	1099.5	(133)	0.000463	0.000465	1098.98	0.5494	-0.000002	0.302					977.7924
0.1189		75	0.0050	977.9	(80)	0.000386	0.000423	977.73	0.1792	-0.000037	0.032					974.849
0.2383		75	0.0100	980.9	(80)	0.000394	0.000424	980.60	0.2878	-0.000030	0.083					974.849

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molar volume / cm³/mol	Delta density kg/m³	Density of water / kg/m³
0.3581		75	0.0150	983.8	(80)	0.000400	0.000425	983.46	0.3690	-0.000026	0.136					974.849
0.4786		75	0.0199	986.7	(80)	0.000404	0.000426	986.31	0.4259	-0.000022	0.181					974.849
0.4786		75	0.0199	986.7	(80)	0.000404	0.000426	986.31	0.4259	-0.000022	0.181					974.849
0.721		75	0.0297	992.5	(80)	0.000410	0.000428	991.99	0.5230	-0.000018	0.273					974.849
1.2128		75	0.0489	1003.9	(80)	0.000418	0.000432	1003.23	0.6883	-0.000014	0.474					974.849
0.1189		85	0.0050	971.7	(80)	0.000374	0.000411	971.55	0.1778	-0.000038	0.032					968.6203
0.2383		85	0.0100	974.8	(80)	0.000383	0.000412	974.47	0.2770	-0.000029	0.077					968.6203
0.3581		85	0.0150	977.7	(80)	0.000389	0.000414	977.38	0.3496	-0.000024	0.122					968.6203
0.4786		85	0.0199	980.7	(80)	0.000394	0.000415	980.28	0.3983	-0.000021	0.159					968.6203
0.4786		85	0.0199	980.7	(80)	0.000394	0.000415	980.28	0.3983	-0.000021	0.159					968.6203
0.721		85	0.0297	986.5	(80)	0.000400	0.000417	986.05	0.4811	-0.000017	0.231					968.6203
1.2128		85	0.0489	998.1	(80)	0.000409	0.000422	997.47	0.6353	-0.000013	0.404					968.6203
0.1189		95	0.0050	965.1	(80)	0.000361	0.000398	964.89	0.1714	-0.000037	0.029					961.9004
0.2383		95	0.0100	968.1	(80)	0.000372	0.000399	967.87	0.2548	-0.000027	0.065					961.9004
0.3581		95	0.0150	971.1	(80)	0.000378	0.000400	970.83	0.3124	-0.000022	0.098					961.9004
0.4786		95	0.0199	974.1	(80)	0.000383	0.000402	973.78	0.3466	-0.000018	0.120					961.9004
0.4786		95	0.0199	974.1	(80)	0.000383	0.000402	973.78	0.3466	-0.000018	0.120					961.9004
0.721		95	0.0297	980.1	(80)	0.000390	0.000404	979.66	0.4123	-0.000014	0.170					961.9004
1.2128		95	0.0489	991.8	(80)	0.000398	0.000409	991.29	0.5293	-0.000011	0.280					961.9004
Average Res									0.3421	-0.000017	324.529	Sum chi	sqr			
Std dev Res									0.9290	0.000020						
Avg - 4std									-3.3739	-0.000095						
Avg + 4std									4.0581	0.000062						

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	17.80668
c1	32.01066
c2	1.395136
c3	-0.00623
c4	-2131.59
Min T	5
Max T	95
Min w	0.0021
Max w	0.4539
Avg dens res	0.3421
Std dens res	0.93
Avg app vol res *10 ³	-0.01654
Std app vol res *10 ³	0.019592
No of points in corr	332
No of inconsistent pair	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **Li2SO4**

- References (12) Cartón, A.; Sobrón, F.; Bolado, S.; Gerbolés, J. I. Density, Viscosity, and Electrical Conductivity of Aqueous Solutions of Lithium Sulfate. *J. Chem. Eng. Data* **1995**, *40*, 987-991.
- (48) Kaminsky, M. Concentration and Temperature Dependence of the Viscosity of Aqueous Solutions of Strong Electrolytes. II. NaCl, Li2SO4, FeCl2, and CeCl3 Solutions. *Z. Physik. Chem. N. F.* **1956**, *8*, 173-191.
- (85) Pearce, J. N.; Eckstrom, H. C. Vapor Pressures and Partial Molal Volumes of Aqueous Solutions of the Alkali Sulfates at 25°C. *J. Am. Chem. Soc.* **1937**, *59*, 2689-2691.
- (134) Wirth, H. E.; Lo Surdo, A. Temperature Dependence of Volume Changes of Aqueous Solutions of Ammonium Chloride and Ammonium Nitrate at 25°C. *J. Chem. Eng. Data* **1968**, *13*, 226-231.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density water / kg/m³	Density of
1.3334		0	0.1279	1116.29	(134)	0.000184	0.000185	1116.10	0.1847	-0.000001	0.034				999.8395
2.9853		5	0.2471	1229.08	(12)	0.000246	0.000246	1229.05	0.0253	0.000000	0.001				999.9638
3.066		5	0.2521	1234.54	(12)	0.000246	0.000248	1233.94	0.5971	-0.000002	0.357				999.9638
3.1248		5	0.2557	1238.10	(12)	0.000248	0.000249	1237.47	0.6299	-0.000002	0.397				999.9638
3.1992		5	0.2602	1242.26	(12)	0.000250	0.000251	1241.89	0.3680	-0.000001	0.135				999.9638
1.3334		5.12	0.1279	1115.19	(134)	0.000192	0.000191	1115.34	-0.1473	0.000001	0.022				999.9618
0.4057		10	0.0427	1037.18	(12)	0.000154	0.000154	1037.16	0.0217	0.000000	0.000				999.6996
0.7952		10	0.0804	1071.19	(12)	0.000170	0.000173	1070.91	0.2822	-0.000003	0.080				999.6996
1.1924		10	0.1159	1103.09	(12)	0.000191	0.000190	1103.28	-0.1899	0.000001	0.036				999.6996
1.5788		10	0.1479	1132.37	(12)	0.000208	0.000205	1132.95	-0.5823	0.000003	0.339				999.6996
1.9562		10	0.1770	1160.00	(12)	0.000219	0.000218	1160.34	-0.3387	0.000001	0.115				999.6996
2.603		10	0.2225	1202.86	(12)	0.000241	0.000238	1203.95	-1.0902	0.000003	1.189				999.6996
2.9853		10	0.2471	1227.65	(12)	0.000249	0.000248	1227.93	-0.2831	0.000001	0.080				999.6996
3.066		10	0.2521	1233.09	(12)	0.000249	0.000250	1232.84	0.2525	-0.000001	0.064				999.6996
3.1248		10	0.2557	1237.05	(12)	0.000250	0.000251	1236.38	0.6725	-0.000002	0.452				999.6996
3.1992		10	0.2602	1241.27	(12)	0.000252	0.000253	1240.82	0.4534	-0.000001	0.206				999.6996
2.9853		15	0.2471	1226.13	(12)	0.000251	0.000250	1226.61	-0.4830	0.000001	0.233				999.0996
3.066		15	0.2521	1231.65	(12)	0.000251	0.000252	1231.54	0.1136	0.000000	0.013				999.0996
3.1248		15	0.2557	1235.29	(12)	0.000252	0.000253	1235.09	0.1990	-0.000001	0.040				999.0996
3.1992		15	0.2602	1239.96	(12)	0.000254	0.000255	1239.55	0.4101	-0.000001	0.168				999.0996
1.3334		15.04	0.1279	1112.68	(134)	0.000202	0.000200	1112.97	-0.2960	0.000002	0.088				999.0936
	0.00085	15.1	0.0001	999.16	(48)	0.000145	0.000139	999.16	-0.0005	0.000005	0.000			1.00008	999.0845
	0.00172	15.1	0.0002	999.25	(48)	0.000102	0.000140	999.25	0.0071	-0.000038	0.000			1.00017	999.0845
	0.00423	15.1	0.0005	999.49	(48)	0.000119	0.000140	999.48	0.0095	-0.000020	0.000			1.00041	999.0845
	0.00858	15.1	0.0009	999.91	(48)	0.000121	0.000140	999.90	0.0178	-0.000019	0.000			1.00083	999.0845
	0.01694	15.1	0.0019	1000.71	(48)	0.000126	0.000140	1000.69	0.0273	-0.000015	0.001			1.00163	999.0845
	0.0429	15.1	0.0047	1003.19	(48)	0.000130	0.000142	1003.13	0.0582	-0.000012	0.003			1.00411	999.0845
	0.08579	15.1	0.0094	1007.25	(48)	0.000135	0.000144	1007.16	0.0897	-0.000009	0.008			1.00817	999.0845
	0.17348	15.1	0.0188	1015.42	(48)	0.000144	0.000149	1015.32	0.1002	-0.000005	0.010			1.01635	999.0845
	0.00084	20	0.0001	998.28	(48)	0.000136	0.000146	998.28	0.0010	-0.000010	0.000			1.00008	998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Density of water / kg/m³
	0.00171	20	0.0002	998.37	(48)	0.000098	0.000146	998.36	0.0091	-0.000048	0.000			1.00017	998.2041
	0.00423	20	0.0005	998.61	(48)	0.000120	0.000146	998.60	0.0120	-0.000026	0.000			1.00041	998.2041
	0.00857	20	0.0009	999.03	(48)	0.000121	0.000146	999.01	0.0240	-0.000025	0.001			1.00083	998.2041
	0.01692	20	0.0019	999.83	(48)	0.000126	0.000147	999.79	0.0395	-0.000021	0.002			1.00163	998.2041
	0.04285	20	0.0047	1002.30	(48)	0.000132	0.000148	1002.22	0.0787	-0.000017	0.006			1.0041	998.2041
	0.08571	20	0.0094	1006.34	(48)	0.000137	0.000150	1006.21	0.1279	-0.000013	0.016			1.00815	998.2041
	0.17332	20	0.0188	1014.47	(48)	0.000146	0.000155	1014.31	0.1639	-0.000008	0.027			1.0163	998.2041
0.4057		20	0.0427	1035.09	(12)	0.000166	0.000166	1035.08	0.0136	0.000000	0.000				998.2041
0.7952		20	0.0804	1068.70	(12)	0.000180	0.000183	1068.41	0.2932	-0.000003	0.086				998.2041
1.1924		20	0.1159	1100.32	(12)	0.000200	0.000198	1100.48	-0.1636	0.000001	0.027				998.2041
1.5788		20	0.1479	1129.42	(12)	0.000215	0.000212	1129.98	-0.5643	0.000003	0.318				998.2041
1.9562		20	0.1770	1156.94	(12)	0.000225	0.000224	1157.30	-0.3621	0.000002	0.131				998.2041
2.603		20	0.2225	1199.70	(12)	0.000246	0.000242	1200.99	-1.2949	0.000004	1.677				998.2041
2.9853		20	0.2471	1224.68	(12)	0.000252	0.000251	1225.13	-0.4485	0.000001	0.201				998.2041
3.066		20	0.2521	1230.23	(12)	0.000252	0.000253	1230.07	0.1565	0.000000	0.025				998.2041
3.1248		20	0.2557	1233.66	(12)	0.000254	0.000254	1233.64	0.0153	0.000000	0.000				998.2041
3.1992		20	0.2602	1238.32	(12)	0.000255	0.000256	1238.13	0.1944	0.000000	0.038				998.2041
1.3334		24.6	0.1279	1109.74	(134)	0.000207	0.000206	1109.83	-0.0995	0.000001	0.010				997.1467
	0.00171	25	0.0002	997.21	(48)	0.000099	0.000152	997.20	0.0100	-0.000053	0.000			1.00017	997.0449
	0.00422	25	0.0005	997.45	(48)	0.000119	0.000152	997.44	0.0152	-0.000033	0.000			1.00041	997.0449
	0.00856	25	0.0009	997.87	(48)	0.000121	0.000152	997.84	0.0294	-0.000031	0.001			1.00083	997.0449
	0.0169	25	0.0019	998.67	(48)	0.000126	0.000153	998.62	0.0501	-0.000027	0.003			1.00163	997.0449
	0.0428	25	0.0047	1001.12	(48)	0.000134	0.000154	1001.03	0.0953	-0.000020	0.009			1.00409	997.0449
	0.08559	25	0.0094	1005.15	(48)	0.000139	0.000156	1004.99	0.1620	-0.000017	0.026			1.00813	997.0449
0.1		25	0.0109	1006.48	(85)	0.000139	0.000157	1006.28	0.1980	-0.000018	0.039				997.0449
	0.17309	25	0.0188	1013.26	(48)	0.000149	0.000160	1013.03	0.2286	-0.000012	0.052			1.01626	997.0449
0.2		25	0.0215	1015.63	(85)	0.000150	0.000162	1015.37	0.2560	-0.000012	0.066				997.0449
0.4		25	0.0421	1033.37	(85)	0.000166	0.000171	1033.16	0.2087	-0.000005	0.044				997.0449
0.4057		25	0.0427	1033.72	(12)	0.000170	0.000171	1033.66	0.0634	-0.000001	0.004				997.0449
0.6		25	0.0619	1050.53	(85)	0.000178	0.000179	1050.43	0.1035	-0.000002	0.011				997.0449
0.7952		25	0.0804	1067.20	(12)	0.000183	0.000187	1066.81	0.3932	-0.000004	0.155				997.0449
0.8		25	0.0808	1067.22	(85)	0.000187	0.000187	1067.20	0.0151	0.000000	0.000				997.0449
1		25	0.0991	1083.42	(85)	0.000196	0.000195	1083.51	-0.0844	0.000001	0.007				997.0449
1.1924		25	0.1159	1098.74	(12)	0.000202	0.000202	1098.76	-0.0238	0.000000	0.001				997.0449
1.5		25	0.1416	1122.18	(85)	0.000213	0.000212	1122.33	-0.1414	0.000001	0.020				997.0449
1.5788		25	0.1479	1127.79	(12)	0.000217	0.000215	1128.20	-0.4136	0.000002	0.171				997.0449
1.9562		25	0.1770	1155.28	(12)	0.000227	0.000226	1155.51	-0.2294	0.000001	0.053				997.0449
2		25	0.1803	1158.51	(85)	0.000227	0.000227	1158.59	-0.0767	0.000000	0.006				997.0449
2.5		25	0.2156	1192.68	(85)	0.000240	0.000240	1192.55	0.1316	0.000000	0.017				997.0449
2.603		25	0.2225	1198.09	(12)	0.000247	0.000243	1199.28	-1.1872	0.000004	1.409				997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Density of water / kg/m³
2.9853		25	0.2471	1223.05	(12)	0.000253	0.000252	1223.50	-0.4542	0.000001	0.206				997.0449
3.066		25	0.2521	1228.70	(12)	0.000253	0.000253	1228.47	0.2270	-0.000001	0.052				997.0449
3.0944		25	0.2538	1231.00	(85)	0.000252	0.000254	1230.21	0.7900	-0.000002	0.624				997.0449
3.1248		25	0.2557	1232.11	(12)	0.000255	0.000255	1232.06	0.0475	0.000000	0.002				997.0449
3.1992		25	0.2602	1236.80	(12)	0.000256	0.000256	1236.57	0.2325	-0.000001	0.054				997.0449
3.1248		27	0.2557	1231.40	(12)	0.000255	0.000255	1231.40	0.0044	0.000000	0.000				996.5132
3.1992		27	0.2602	1235.96	(12)	0.000256	0.000256	1235.91	0.0492	0.000000	0.002				996.5132
	0.00084	30	0.0001	995.73	(48)	0.000138	0.000157	995.73	0.0018	-0.000019	0.000			1.00008	995.6473
	0.00171	30	0.0002	995.82	(48)	0.000100	0.000157	995.81	0.0107	-0.000057	0.000			1.00017	995.6473
	0.00854	30	0.0009	996.47	(48)	0.000120	0.000158	996.44	0.0348	-0.000037	0.001			1.00083	995.6473
	0.0169	30	0.0019	997.27	(48)	0.000127	0.000158	997.21	0.0572	-0.000031	0.003			1.00163	995.6473
	0.04276	30	0.0047	999.73	(48)	0.000132	0.000159	999.60	0.1268	-0.000027	0.016			1.0041	995.6473
	0.08545	30	0.0094	1003.73	(48)	0.000140	0.000161	1003.53	0.1998	-0.000021	0.040			1.00812	995.6473
	0.17278	30	0.0188	1011.77	(48)	0.000152	0.000165	1011.51	0.2536	-0.000013	0.064			1.01619	995.6473
0.4057		30	0.0427	1032.20	(12)	0.000171	0.000175	1032.02	0.1809	-0.000004	0.033				995.6473
0.7952		30	0.0804	1065.59	(12)	0.000184	0.000191	1065.01	0.5824	-0.000006	0.339				995.6473
1.1924		30	0.1159	1097.05	(12)	0.000203	0.000205	1096.86	0.1882	-0.000001	0.035				995.6473
1.5788		30	0.1479	1126.05	(12)	0.000218	0.000217	1126.26	-0.2060	0.000001	0.042				995.6473
1.9562		30	0.1770	1153.55	(12)	0.000228	0.000228	1153.56	-0.0134	0.000000	0.000				995.6473
2.603		30	0.2225	1196.32	(12)	0.000247	0.000244	1197.43	-1.1065	0.000003	1.224				995.6473
2.9853		30	0.2471	1221.34	(12)	0.000253	0.000252	1221.76	-0.4175	0.000001	0.174				995.6473
3.066		30	0.2521	1226.98	(12)	0.000253	0.000254	1226.75	0.2277	-0.000001	0.052				995.6473
3.1248		30	0.2557	1230.40	(12)	0.000255	0.000255	1230.36	0.0384	0.000000	0.001				995.6473
3.1992		30	0.2602	1234.95	(12)	0.000256	0.000257	1234.89	0.0574	0.000000	0.003				995.6473
3.1248		32	0.2557	1229.66	(12)	0.000255	0.000255	1229.65	0.0092	0.000000	0.000				995.0262
3.1992		32	0.2602	1233.28	(12)	0.000259	0.000257	1234.19	-0.9127	0.000002	0.833				995.0262
1.3334		34.93	0.1279	1106.04	(134)	0.000209	0.000211	1105.71	0.3311	-0.000002	0.110				994.0559
	0.00084	35	0.0001	994.11	(48)	0.000140	0.000162	994.11	0.0020	-0.000022	0.000			1.00008	994.0319
	0.0017	35	0.0002	994.20	(48)	0.000096	0.000162	994.19	0.0122	-0.000066	0.000			1.00017	994.0319
	0.00421	35	0.0005	994.44	(48)	0.000120	0.000162	994.42	0.0193	-0.000042	0.000			1.00041	994.0319
	0.01684	35	0.0019	995.66	(48)	0.000120	0.000163	995.58	0.0783	-0.000042	0.006			1.00164	994.0319
	0.04266	35	0.0047	998.11	(48)	0.000132	0.000164	997.96	0.1498	-0.000032	0.022			1.0041	994.0319
	0.08531	35	0.0094	1002.10	(48)	0.000140	0.000166	1001.86	0.2397	-0.000026	0.057			1.00812	994.0319
	0.1725	35	0.0188	1010.11	(48)	0.000153	0.000170	1009.79	0.3108	-0.000016	0.097			1.01617	994.0319
2.9853		35	0.2471	1219.51	(12)	0.000253	0.000252	1219.90	-0.3908	0.000001	0.153				994.0319
3.066		35	0.2521	1225.13	(12)	0.000253	0.000254	1224.92	0.2065	-0.000001	0.043				994.0319
3.1248		35	0.2557	1228.58	(12)	0.000255	0.000255	1228.55	0.0261	0.000000	0.001				994.0319
3.1248		37	0.2557	1227.82	(12)	0.000255	0.000255	1227.80	0.0171	0.000000	0.000				993.3287
3.066		38	0.2521	1223.98	(12)	0.000253	0.000254	1223.78	0.2020	-0.000001	0.041				992.9653
3.1248		39	0.2557	1227.07	(12)	0.000255	0.000255	1227.04	0.0334	0.000000	0.001				992.5943

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Density of water / kg/m³
0.4057		40	0.0427	1028.62	(12)	0.000172	0.000183	1028.17	0.4538	-0.000010	0.206				992.2158
0.7952		40	0.0804	1061.89	(12)	0.000185	0.000196	1060.88	1.0078	-0.000011	1.016				992.2158
1.1924		40	0.1159	1093.27	(12)	0.000204	0.000209	1092.58	0.6918	-0.000005	0.479				992.2158
1.5788		40	0.1479	1122.31	(12)	0.000218	0.000220	1121.92	0.3879	-0.000002	0.150				992.2158
1.9562		40	0.1770	1150.11	(12)	0.000226	0.000230	1149.27	0.8410	-0.000004	0.707				992.2158
2.603		40	0.2225	1192.81	(12)	0.000246	0.000244	1193.38	-0.5663	0.000002	0.321				992.2158
2.9853		40	0.2471	1217.67	(12)	0.000253	0.000252	1217.94	-0.2729	0.000001	0.074				992.2158
3.066		40	0.2521	1223.23	(12)	0.000253	0.000253	1223.00	0.2349	-0.000001	0.055				992.2158
3.1248		40	0.2557	1226.71	(12)	0.000254	0.000255	1226.65	0.0622	0.000000	0.004				992.2158
3.1248		41	0.2557	1226.30	(12)	0.000254	0.000254	1226.26	0.0448	0.000000	0.002				991.8298
	0.00084	42.5	0.0001	991.33	(48)	0.000034	0.000168	991.31	0.0122	-0.000134	0.000		!	1.00009	991.237
	0.00169	42.5	0.0002	991.41	(48)	0.000094	0.000168	991.39	0.0137	-0.000074	0.000			1.00017	991.237
	0.0042	42.5	0.0005	991.65	(48)	0.000099	0.000168	991.62	0.0315	-0.000069	0.001			1.00042	991.237
	0.00851	42.5	0.0009	992.06	(48)	0.000122	0.000168	992.02	0.0433	-0.000047	0.002			1.00083	991.237
	0.0168	42.5	0.0019	992.86	(48)	0.000121	0.000169	992.78	0.0876	-0.000048	0.008			1.00164	991.237
	0.04255	42.5	0.0047	995.31	(48)	0.000130	0.000170	995.13	0.1839	-0.000040	0.034			1.00411	991.237
	0.08508	42.5	0.0094	999.30	(48)	0.000140	0.000172	999.00	0.2978	-0.000032	0.089			1.00813	991.237
	0.171999	42.5	0.0188	1007.27	(48)	0.000154	0.000175	1006.86	0.4071	-0.000021	0.166			1.01617	991.237
3.066		43	0.2521	1221.94	(12)	0.000253	0.000253	1221.79	0.1474	0.000000	0.022				991.0358
2.9853		45	0.2471	1215.59	(12)	0.000252	0.000251	1215.89	-0.2995	0.000001	0.090				990.2132
3.066		45	0.2521	1221.31	(12)	0.000252	0.000253	1220.97	0.3373	-0.000001	0.114				990.2132
1.3334		45.02	0.1279	1101.95	(134)	0.000209	0.000215	1101.08	0.8765	-0.000006	0.768				990.2049
1.3334		45.12	0.1279	1101.94	(134)	0.000209	0.000215	1101.03	0.9081	-0.000006	0.825				990.163
3.066		47	0.2521	1220.47	(12)	0.000252	0.000252	1220.14	0.3317	-0.000001	0.110				989.3628
2.9853		50	0.2471	1213.36	(12)	0.000252	0.000250	1213.74	-0.3845	0.000001	0.148				988.0363
3.066		50	0.2521	1219.11	(12)	0.000251	0.000252	1218.86	0.2501	-0.000001	0.063				988.0363
2.9853		51	0.2471	1213.12	(12)	0.000251	0.000250	1213.30	-0.1847	0.000001	0.034				987.5809
2.9853		52	0.2471	1212.62	(12)	0.000251	0.000250	1212.86	-0.2414	0.000001	0.058				987.119
2.9853		53	0.2471	1212.39	(12)	0.000250	0.000250	1212.41	-0.0245	0.000000	0.001				986.6508
2.9853		54	0.2471	1211.92	(12)	0.000250	0.000250	1211.96	-0.0440	0.000000	0.002				986.1761
2.9853		55	0.2471	1211.67	(12)	0.000249	0.000249	1211.51	0.1600	0.000000	0.026				985.6952
2.9853		58	0.2471	1210.05	(12)	0.000249	0.000248	1210.13	-0.0768	0.000000	0.006				984.2156
2.9853		60	0.2471	1209.13	(12)	0.000248	0.000248	1209.19	-0.0570	0.000000	0.003				983.1989
2.9853		63	0.2471	1207.96	(12)	0.000246	0.000247	1207.75	0.2093	-0.000001	0.044				981.6297
2.9853		65	0.2471	1206.97	(12)	0.000246	0.000246	1206.78	0.1946	-0.000001	0.038				980.5548
Average Res									0.0457	-0.000010	18.726	Sum chi sqr			
Std dev Res									0.3577	0.000019					
Avg - 4std									-1.3851	-0.000087					
Avg + 4std									1.4764	0.000067					

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density water	Density of water / kg/m³
Curve fit for the model App vol=(w+c2+c3*t °C)/(c0*w + c1)/e^(0.000001*(t °C+c4)^2)															
c0		0.001473													
c1		0.002693													
c2		0.176989													
c3		0.004132													
c4		3640.732													
Min T		0													
Max T		65													
Min w		0.0001													
Max w		0.2602													
Avg dens res		0.0457													
Std dens res		0.3577													
Avg app vol res *10³	-0.010136														
Std app vol res *10³	0.019234														
No of points in corr	145														
No of inconsistent pair	1														
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)															
	0.00084	25	0.0001	997.9	(48)	-0.007768	0.000152	997.12	0.7293	-0.007920	0.532		!	1.00081	997.0449

Density of aqueous solutions of **MgCl2**

- References
- (9) Call, T. G.; Ballerat-Busserolles, K.; Origlia, M. L.; Ford, T. D.; Woolley, E. M. Apparent Molar Volumes and Heat Capacities of Aqueous Magnesium Chloride and Cadmium Chloride at Temperatures from 278.15 K to 393.15 K at the Pressure 0.35 MPa: a Comparison of Ion-Ion Interactions. *J. Chem. Thermodynamics* **2000**, 32, 1525-1538.
 - (13) Chen, C.-T. A.; Chen, J. H.; Millero, F. J. Densities of NaCl, MgCl₂, Na₂SO₄, and MgSO₄ Aqueous Solutions at 1 atm. from 0 to 50°C and from 0.001 to 1.5 m. *J. Chem. Eng. Data* **1980**, 25, 307-310.
 - (28) Gates, J. A.; Wood, R. H. Densities of Aqueous Solutions of NaCl, MgCl₂, KCl, NaBr, LiCl, and CaCl₂ from 0.05 to 5.0 mol kg⁻¹ and 0.1013 to 40 MPa at 298.15K. *J. Chem. Eng. Data* **1985**, 30, 44-49.
 - (45) Isono, T. Densities, Viscosities, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions at Several Temperatures. Alkaline-Earth Chlorides, LaCl₃, Na₂SO₄, NaNO₃, NaBr, KNO₃, KBr, and Cd(NO₃)₂. *J. Chem. Eng. Data* **1984**, 29, 45-52.
 - (49) Kaminsky, M. Concentration and Temperature Dependence of the Viscosity of Aqueous Solutions of Strong Electrolytes. III. KCl, K₂SO₄, MgCl₂, BeSO₄, and MgSO₄ Solutions. *Z. Phys. Chem. N. F.* **1957**, 12, 206-231.
 - (72) Millero, F. J.; Knox, J. H. Apparent Molal Volumes of Aqueous NaF, Na₂SO₄, KCl, K₂SO₄, MgCl₂, and MgSO₄ Solutions at 0° and 50°C. *J. Chem. Eng. Data* **1973**, 18, 407-411.
 - (87) Perron, G.; Desnoyers, J. E. Apparent Molal Volumes and Heat Capacities of Alkaline Earth Chlorides in Water at 25°C. *Can. J. Chem.* **1974**, 52, 3738-3741.
 - (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
 - (113) Saluja, P. P. S.; LeBlanc, J. C. Apparent Molar Heat Capacities and Volumes of Aqueous Solutions of MgCl₂, CaCl₂, and SrCl₂ at Elevated Temperatures. *J. Chem. Eng. Data* **1987**, 32, 72-76.
 - (129) Vasilev, Y. A.; Fedyanov, N. V.; Kurenkov, V. V. Specific Heats and Specific Volumes of Isopiestic Aqueous Solutions of Beryllium-Subgroup Metal Chlorides. *Russ. J. Phys. Chem.* **1973**, 47, 2799-2803

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	(Relative density - 1)*10 ⁴	Delta density / kg/m³	Density of water at t°C / kg/m³
0.00469		0	0.0004	1000.23	(13)	0.000124	0.000167	1000.21	0.0190	-0.000042	0.000					0.391	999.8395
0.008785		0	0.0008	1000.58	(72)	0.000117	0.000167	1000.54	0.0419	-0.000050	0.002					0.7386	999.8395
0.00978		0	0.0009	1000.66	(13)	0.000117	0.000167	1000.62	0.0464	-0.000050	0.002					0.822	999.8395
0.010774		0	0.0010	1000.75	(72)	0.000117	0.000167	1000.69	0.0512	-0.000050	0.003					0.9056	999.8395
0.015048		0	0.0014	1001.10	(72)	0.000119	0.000167	1001.03	0.0687	-0.000048	0.005					1.2617	999.8395
0.018179		0	0.0017	1001.36	(72)	0.000120	0.000167	1001.28	0.0821	-0.000047	0.007					1.5231	999.8395
0.01972		0	0.0019	1001.48	(13)	0.000124	0.000167	1001.40	0.0820	-0.000044	0.007					1.645	999.8395
0.025081		0	0.0024	1001.93	(72)	0.000123	0.000167	1001.83	0.1062	-0.000044	0.011					2.0935	999.8395
0.026659		0	0.0025	1002.06	(72)	0.000123	0.000167	1001.95	0.1126	-0.000044	0.013					2.2248	999.8395
0.031383		0	0.0030	1002.45	(72)	0.000125	0.000168	1002.33	0.1275	-0.000043	0.016					2.6133	999.8395
0.04137		0	0.0039	1003.26	(13)	0.000130	0.000168	1003.11	0.1480	-0.000037	0.022					3.423	999.8395
0.043333		0	0.0041	1003.43	(72)	0.000129	0.000168	1003.27	0.1626	-0.000039	0.026					3.5927	999.8395
0.04851		0	0.0046	1003.86	(13)	0.000129	0.000168	1003.68	0.1793	-0.000039	0.032					4.018	999.8395
0.056311		0	0.0053	1004.49	(72)	0.000131	0.000168	1004.29	0.1997	-0.000037	0.040					4.6538	999.8395
0.0789		0	0.0075	1006.32	(13)	0.000137	0.000169	1006.07	0.2450	-0.000032	0.060					6.478	999.8395
0.07966		0	0.0075	1006.40	(72)	0.000134	0.000169	1006.13	0.2678	-0.000035	0.072					6.5606	999.8395
0.09627		0	0.0091	1007.75	(13)	0.000136	0.000170	1007.44	0.3112	-0.000034	0.097					7.909	999.8395
0.09649		0	0.0091	1007.77	(72)	0.000135	0.000170	1007.45	0.3201	-0.000035	0.102					7.9352	999.8395
0.1372		0	0.0129	1011.06	(72)	0.000140	0.000171	1010.64	0.4130	-0.000031	0.171					11.2162	999.8395
0.17359		0	0.0163	1013.96	(72)	0.000144	0.000172	1013.48	0.4790	-0.000029	0.229					14.1197	999.8395
0.195		0	0.0182	1015.65	(13)	0.000146	0.000173	1015.14	0.5064	-0.000027	0.256					15.811	999.8395
0.19525		0	0.0183	1015.70	(13)	0.000145	0.000173	1015.16	0.5320	-0.000028	0.283					15.856	999.8395
		0	0.0200	1016.80	(90)	0.000166	0.000174	1016.64	0.1570	-0.000008	0.025						999.8395
0.25072		0	0.0233	1020.06	(72)	0.000150	0.000175	1019.46	0.6077	-0.000025	0.369					20.2238	999.8395
0.28278		0	0.0262	1022.57	(13)	0.000152	0.000176	1021.92	0.6466	-0.000024	0.418					22.731	999.8395

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	(Relative density - 1)*10 ⁴	Delta density / kg/m³	Density of water at t°C / kg/m³
0.34124		0	0.0315	1027.12	(72)	0.000156	0.000178	1026.40	0.7186	-0.000022	0.516					27.2805	999.8395
0.37485		0	0.0345	1029.71	(13)	0.000158	0.000179	1028.96	0.7525	-0.000021	0.566					29.875	999.8395
0.40811		0	0.0374	1032.27	(13)	0.000160	0.000180	1031.49	0.7874	-0.000020	0.620					32.434	999.8395
0.42814		0	0.0392	1033.79	(72)	0.000162	0.000180	1033.00	0.7853	-0.000019	0.617					33.9473	999.8395
		0	0.0400	1033.80	(90)	0.000179	0.000181	1033.72	0.0846	-0.000002	0.007						999.8395
0.50904		0	0.0462	1039.96	(72)	0.000166	0.000183	1039.09	0.8716	-0.000017	0.760					40.1183	999.8395
0.55193		0	0.0499	1043.18	(13)	0.000168	0.000184	1042.29	0.8928	-0.000016	0.797					43.342	999.8395
0.62437		0	0.0561	1048.61	(72)	0.000171	0.000187	1047.66	0.9449	-0.000015	0.893					48.7665	999.8395
0.63404		0	0.0569	1049.33	(13)	0.000172	0.000187	1048.37	0.9537	-0.000015	0.910					49.489	999.8395
0.70544		0	0.0629	1054.56	(72)	0.000176	0.000189	1053.62	0.9392	-0.000013	0.882					54.7187	999.8395
0.79758		0	0.0706	1061.39	(13)	0.000178	0.000192	1060.32	1.0697	-0.000013	1.144					61.551	999.8395
0.82932		0	0.0732	1063.66	(72)	0.000180	0.000193	1062.61	1.0501	-0.000013	1.103					63.823	999.8395
		0	0.0800	1068.30	(90)	0.000199	0.000195	1068.63	-0.3286	0.000004	0.108						999.8395
0.9741		0	0.0849	1074.09	(13)	0.000186	0.000197	1072.95	1.1375	-0.000012	1.294					74.252	999.8395
1.01833		0	0.0884	1077.25	(72)	0.000187	0.000199	1076.08	1.1707	-0.000011	1.371					77.4084	999.8395
1.0184		0	0.0884	1077.25	(72)	0.000187	0.000199	1076.08	1.1708	-0.000011	1.371					77.4134	999.8395
		0	0.1200	1103.50	(90)	0.000217	0.000210	1104.48	-0.9835	0.000007	0.967						999.8395
		0	0.1600	1139.50	(90)	0.000234	0.000226	1141.15	-1.6492	0.000008	2.720						999.8395
		0	0.2000	1176.40	(90)	0.000250	0.000242	1178.45	-2.0530	0.000007	4.215						999.8395
		0	0.2500	1224.60	(90)	0.000266	0.000263	1225.64	-1.0392	0.000003	1.080						999.8395
		0	0.3000	1275.40	(90)	0.000280	0.000285	1272.92	2.4785	-0.000005	6.143						999.8395
0.00469		5	0.0004	1000.35	(13)	0.000140	0.000172	1000.33	0.0144	-0.000032	0.000					0.384	999.9638
0.00837		5	0.0008	1000.68	(9)	0.000095	0.000172	1000.62	0.0613	-0.000077	0.004			9.09			999.9638
0.00978		5	0.0009	1000.78	(13)	0.000124	0.000172	1000.73	0.0454	-0.000049	0.002					0.816	999.9638
0.01646		5	0.0016	1001.35	(9)	0.000118	0.000173	1001.26	0.0853	-0.000054	0.007			11.26			999.9638
0.01972		5	0.0019	1001.58	(13)	0.000140	0.000173	1001.52	0.0621	-0.000033	0.004					1.615	999.9638
0.03278		5	0.0031	1002.65	(9)	0.000141	0.000173	1002.54	0.1020	-0.000033	0.010			13.38			999.9638
0.04137		5	0.0039	1003.34	(13)	0.000141	0.000173	1003.22	0.1272	-0.000032	0.016					3.381	999.9638
0.04851		5	0.0046	1003.93	(13)	0.000141	0.000174	1003.78	0.1532	-0.000033	0.023					3.967	999.9638
0.06562		5	0.0062	1005.29	(9)	0.000147	0.000174	1005.12	0.1704	-0.000027	0.029			14			999.9638
0.0789		5	0.0075	1006.35	(13)	0.000149	0.000175	1006.16	0.1954	-0.000026	0.038					6.388	999.9638
0.09627		5	0.0091	1007.77	(13)	0.000147	0.000175	1007.51	0.2565	-0.000028	0.066					7.805	999.9638
0.13064		5	0.0123	1010.51	(9)	0.000151	0.000176	1010.19	0.3207	-0.000026	0.103			14.35			999.9638
0.195		5	0.0182	1015.59	(13)	0.000156	0.000178	1015.17	0.4183	-0.000022	0.175					15.624	999.9638
0.19525		5	0.0183	1015.59	(13)	0.000157	0.000178	1015.19	0.3990	-0.000021	0.159					15.624	999.9638
0.26767		5	0.0249	1021.14	(9)	0.000166	0.000181	1020.75	0.3912	-0.000015	0.153			15.76			999.9638
0.28278		5	0.0262	1022.39	(13)	0.000163	0.000181	1021.91	0.4858	-0.000018	0.236					22.428	999.9638
0.37485		5	0.0345	1029.45	(13)	0.000169	0.000184	1028.90	0.5484	-0.000015	0.301					29.484	999.9638
0.40811		5	0.0374	1031.98	(13)	0.000171	0.000185	1031.41	0.5723	-0.000014	0.327					32.016	999.9638
0.52476		5	0.0476	1040.48	(9)	0.000182	0.000189	1040.13	0.3548	-0.000007	0.126			17.3			999.9638
0.55193		5	0.0499	1042.79	(13)	0.000177	0.000189	1042.14	0.6523	-0.000012	0.425					42.831	999.9638
0.63404		5	0.0569	1048.86	(13)	0.000181	0.000192	1048.19	0.6679	-0.000011	0.446					48.895	999.9638
0.76535		5	0.0679	1058.26	(9)	0.000189	0.000196	1057.74	0.5156	-0.000007	0.266			18			999.9638
0.99851		5	0.0868	1074.55	(9)	0.000200	0.000203	1074.34	0.2173	-0.000002	0.047			19.09			999.9638
	0.0025	15	0.0002	999.31	(49)	0.000119	0.000181	999.29	0.0149	-0.000062	0.000				2.1		999.0996
0.00469		15	0.0004	999.48	(13)	0.000155	0.000181	999.46	0.0117	-0.000026	0.000					0.377	999.0996
	0.005	15	0.0005	999.51	(49)	0.000140	0.000181	999.49	0.0198	-0.000042	0.000				4.1		999.0996
0.00837		15	0.0008	999.82	(9)	0.000093	0.000181	999.75	0.0704	-0.000088	0.005			8.85			999.0996

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	(Relative density - 1)*10 ⁴	Delta density / kg/m³	Density of water at t°C / kg/m³
0.00978	0.01	15	0.0009	999.89	(13)	0.000151	0.000181	999.86	0.0284	-0.000031	0.001					0.79	999.0996
		15	0.0010	999.92	(49)	0.000140	0.000181	999.88	0.0397	-0.000042	0.002				8.2		999.0996
0.01646	0.02002	15	0.0016	1000.47	(9)	0.000124	0.000182	1000.38	0.0897	-0.000057	0.008			11.84			999.0996
0.01972		15	0.0019	1000.69	(13)	0.000151	0.000182	1000.63	0.0582	-0.000031	0.003					1.593	999.0996
	0.03002	15	0.0019	1000.73	(49)	0.000146	0.000182	1000.66	0.0685	-0.000036	0.005				16.3		999.0996
		15	0.0029	1001.53	(49)	0.000151	0.000182	1001.44	0.0895	-0.000031	0.008				24.3		999.0996
0.03278	0.04004	15	0.0031	1001.75	(9)	0.000151	0.000182	1001.65	0.0975	-0.000031	0.010			14.37			999.0996
		15	0.0038	1002.33	(49)	0.000154	0.000182	1002.22	0.1095	-0.000029	0.012				32.3		999.0996
0.04137	0.05	15	0.0039	1002.42	(13)	0.000156	0.000182	1002.32	0.1029	-0.000026	0.011					3.319	999.0996
0.04851		15	0.0046	1002.99	(13)	0.000157	0.000183	1002.87	0.1163	-0.000025	0.014					3.886	999.0996
0.06562	0.09008	15	0.0047	1003.10	(45)	0.000158	0.000183	1002.98	0.1153	-0.000024	0.013						999.0996
0.0789		15	0.0062	1004.32	(9)	0.000164	0.000183	1004.19	0.1229	-0.000020	0.015			15.57			999.0996
	0.16014	15	0.0075	1005.37	(13)	0.000163	0.000184	1005.22	0.1540	-0.000020	0.024					6.275	999.0996
		15	0.0085	1006.28	(49)	0.000163	0.000184	1006.10	0.1835	-0.000021	0.034				71.9		999.0996
0.09627	0.1	15	0.0091	1006.76	(13)	0.000162	0.000184	1006.56	0.2036	-0.000022	0.041					7.665	999.0996
0.13064		15	0.0094	1006.99	(45)	0.000169	0.000184	1006.85	0.1415	-0.000015	0.020						999.0996
	0.19525	15	0.0123	1009.36	(9)	0.000172	0.000185	1009.21	0.1587	-0.000013	0.025			16.42			999.0996
		15	0.0151	1011.72	(49)	0.000173	0.000186	1011.51	0.2072	-0.000013	0.043				126.3		999.0996
0.26767	0.37485	15	0.0183	1014.43	(13)	0.000172	0.000187	1014.15	0.2835	-0.000015	0.080					15.334	999.0996
0.37485		15	0.0249	1019.85	(9)	0.000182	0.000189	1019.65	0.1982	-0.000008	0.039			17.29			999.0996
0.40811	0.5	15	0.0345	1028.09	(13)	0.000182	0.000192	1027.71	0.3861	-0.000011	0.149					28.994	999.0996
		15	0.0374	1030.56	(13)	0.000184	0.000193	1030.19	0.3755	-0.000009	0.141					31.464	999.0996
0.52476	0.63404	15	0.0454	1037.20	(45)	0.000192	0.000196	1036.99	0.2071	-0.000004	0.043						999.0996
0.55193		15	0.0476	1038.92	(9)	0.000195	0.000197	1038.81	0.1083	-0.000002	0.012			18.54			999.0996
0.63404	0.76535	15	0.0499	1041.21	(13)	0.000190	0.000198	1040.81	0.4017	-0.000007	0.161					42.109	999.0996
0.76535		15	0.0569	1047.20	(13)	0.000193	0.000200	1046.79	0.4135	-0.000007	0.171					48.105	999.0996
0.9741	0.99851	15	0.0679	1056.46	(9)	0.000201	0.000204	1056.24	0.2199	-0.000003	0.048			19.12			999.0996
0.99851		15	0.0849	1071.41	(13)	0.000205	0.000210	1070.97	0.4353	-0.000004	0.189					72.309	999.0996
1	0.0025	15	0.0868	1072.58	(9)	0.000211	0.000210	1072.67	-0.0894	0.000001	0.008			20.1			999.0996
2		15	0.0869	1072.67	(45)	0.000211	0.000210	1072.78	-0.1057	0.000001	0.011						999.0996
3	0.005	15	0.1600	1138.28	(45)	0.000236	0.000236	1138.19	0.0862	0.000000	0.007						999.0996
4		15	0.2222	1194.63	(45)	0.000264	0.000260	1195.85	-1.2206	0.000004	1.490						999.0996
	0.01	15	0.2758	1247.60	(45)	0.000278	0.000281	1246.38	1.2223	-0.000003	1.494						999.0996
		20	0.0002	998.40	(49)	0.000162	0.000185	998.40	0.0055	-0.000023	0.000				2		998.2041
	0.02	20	0.0005	998.61	(49)	0.000141	0.000185	998.59	0.0211	-0.000044	0.000				4.1		998.2041
		20	0.0010	999.01	(49)	0.000151	0.000185	998.98	0.0323	-0.000034	0.001				8.1		998.2041
	0.03	20	0.0019	999.82	(49)	0.000151	0.000185	999.76	0.0652	-0.000034	0.004				16.2		998.2041
		20	0.0029	1000.62	(49)	0.000155	0.000186	1000.53	0.0887	-0.000031	0.008				24.2		998.2041
	0.04	20	0.0038	1001.41	(49)	0.000159	0.000186	1001.31	0.1029	-0.000027	0.011				32.1		998.2041
		20	0.0047	1002.17	(45)	0.000165	0.000186	1002.07	0.1006	-0.000021	0.010						998.2041
	0.05	20	0.0085	1005.35	(49)	0.000166	0.000187	1005.17	0.1824	-0.000021	0.033				71.6		998.2041
		20	0.0094	1006.05	(45)	0.000173	0.000188	1005.91	0.1363	-0.000014	0.019						998.2041
	0.1	20	0.0151	1010.68	(49)	0.000181	0.000190	1010.55	0.1269	-0.000008	0.016				125		998.2041
		20	0.0200	1014.60	(90)	0.000192	0.000191	1014.63	-0.0251	0.000001	0.001						998.2041
	0.5	20	0.0400	1031.10	(90)	0.000203	0.000198	1031.32	-0.2207	0.000005	0.049						998.2041
		20	0.0454	1036.09	(45)	0.000196	0.000199	1035.91	0.1769	-0.000004	0.031						998.2041
	1	20	0.0800	1064.60	(90)	0.000221	0.000211	1065.51	-0.9081	0.000010	0.825						998.2041
		20	0.0869	1071.59	(45)	0.000213	0.000213	1071.54	0.0464	0.000000	0.002						998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	(Relative density - 1)*10 ⁴	Delta density / kg/m³	Density of water at t°C / kg/m³
		20	0.1200	1098.90	(90)	0.000237	0.000224	1100.70	-1.7952	0.000012	3.223						998.2041
		20	0.1600	1136.82	(45)	0.000238	0.000239	1136.76	0.0647	0.000000	0.004						998.2041
		20	0.1600	1134.20	(90)	0.000251	0.000239	1136.78	-2.5812	0.000013	6.662						998.2041
		20	0.2000	1170.60	(90)	0.000264	0.000253	1173.63	-3.0298	0.000011	9.179						998.2041
		20	0.2222	1193.03	(45)	0.000265	0.000261	1194.33	-1.3031	0.000004	1.698						998.2041
		20	0.2500	1218.40	(90)	0.000278	0.000272	1220.49	-2.0881	0.000006	4.360						998.2041
		20	0.2758	1245.89	(45)	0.000280	0.000282	1244.90	0.9914	-0.000002	0.983						998.2041
		20	0.3000	1268.80	(90)	0.000290	0.000292	1267.80	0.9959	-0.000002	0.992						998.2041
0.10844		24.04	0.0102	1005.76	(113)	0.000176	0.000190	1005.61	0.1473	-0.000014	0.022			16.78			997.2867
0.19711		24.04	0.0184	1012.59	(113)	0.000180	0.000193	1012.35	0.2461	-0.000013	0.061			17.14			997.2867
0.28126		24.04	0.0261	1018.98	(113)	0.000184	0.000195	1018.68	0.3072	-0.000011	0.094			17.53			997.2867
0.38842		24.04	0.0357	1027.03	(113)	0.000188	0.000198	1026.65	0.3787	-0.000010	0.143			17.94			997.2867
0.52775		24.04	0.0478	1037.30	(113)	0.000194	0.000202	1036.89	0.4102	-0.000008	0.168			18.51			997.2867
	0.0025	25	0.0002	997.24	(49)	0.000163	0.000188	997.24	0.0060	-0.000025	0.000				2		997.0449
0.00386		25	0.0004	997.36	(87)	0.000152	0.000188	997.34	0.0132	-0.000036	0.000					0.311	997.0449
0.00469		25	0.0004	997.42	(13)	0.000165	0.000188	997.41	0.0102	-0.000023	0.000					0.372	997.0449
	0.00499	25	0.0005	997.44	(49)	0.000161	0.000188	997.43	0.0128	-0.000027	0.000				4		997.0449
0.00837		25	0.0008	997.75	(9)	0.000108	0.000188	997.69	0.0632	-0.000080	0.004			10.32			997.0449
0.00978		25	0.0009	997.83	(13)	0.000155	0.000188	997.80	0.0308	-0.000033	0.001					0.785	997.0449
0.00989		25	0.0009	997.84	(13)	0.000151	0.000188	997.81	0.0344	-0.000037	0.001					0.797	997.0449
0.00989		25	0.0009	997.85	(13)	0.000146	0.000188	997.81	0.0394	-0.000042	0.002					0.802	997.0449
	0.00998	25	0.0010	997.85	(49)	0.000151	0.000188	997.82	0.0356	-0.000038	0.001				8.1		997.0449
0.01332		25	0.0013	998.11	(87)	0.000158	0.000188	998.07	0.0380	-0.000030	0.001					1.065	997.0449
0.01646		25	0.0016	998.40	(9)	0.000131	0.000188	998.31	0.0902	-0.000058	0.008			12.43			997.0449
0.01972		25	0.0019	998.62	(13)	0.000158	0.000188	998.56	0.0561	-0.000030	0.003					1.576	997.0449
	0.01998	25	0.0019	998.64	(49)	0.000162	0.000188	998.59	0.0504	-0.000027	0.003				16		997.0449
0.0232		25	0.0022	998.89	(87)	0.000161	0.000189	998.83	0.0613	-0.000028	0.004					1.849	997.0449
	0.02996	25	0.0029	999.44	(49)	0.000162	0.000189	999.36	0.0772	-0.000027	0.006				24		997.0449
0.0312		25	0.0030	999.52	(28)	0.000164	0.000189	999.45	0.0728	-0.000025	0.005					2.476	997.0449
0.03278		25	0.0031	999.66	(9)	0.000159	0.000189	999.57	0.0921	-0.000030	0.008			15.16			997.0449
0.03312		25	0.0031	999.67	(87)	0.000164	0.000189	999.60	0.0792	-0.000025	0.006					2.63	997.0449
	0.03995	25	0.0038	1000.23	(49)	0.000164	0.000189	1000.13	0.0939	-0.000025	0.009				31.9		997.0449
0.04851		25	0.0046	1000.90	(13)	0.000163	0.000189	1000.78	0.1210	-0.000026	0.015					3.854	997.0449
0.05		25	0.0047	1001.00	(45)	0.000167	0.000189	1000.89	0.1078	-0.000023	0.012						997.0449
0.05038		25	0.0048	1001.04	(13)	0.000165	0.000189	1000.92	0.1175	-0.000025	0.014					3.994	997.0449
0.05038		25	0.0048	1001.04	(13)	0.000164	0.000189	1000.92	0.1225	-0.000026	0.015					3.999	997.0449
0.06562		25	0.0062	1002.20	(9)	0.000172	0.000190	1002.09	0.1100	-0.000018	0.012			16.39			997.0449
0.0661		25	0.0063	1002.26	(87)	0.000169	0.000190	1002.13	0.1322	-0.000021	0.017					5.214	997.0449
0.0789		25	0.0075	1003.26	(13)	0.000170	0.000190	1003.11	0.1503	-0.000020	0.023					6.212	997.0449
	0.08989	25	0.0085	1004.12	(49)	0.000173	0.000190	1003.98	0.1465	-0.000017	0.021				71		997.0449
0.0912		25	0.0086	1004.21	(28)	0.000171	0.000191	1004.05	0.1670	-0.000019	0.028					7.169	997.0449
0.0997		25	0.0094	1004.89	(13)	0.000170	0.000191	1004.70	0.1939	-0.000020	0.038					7.845	997.0449
0.0997		25	0.0094	1004.89	(13)	0.000170	0.000191	1004.70	0.1989	-0.000021	0.040					7.85	997.0449
0.1		25	0.0094	1004.87	(45)	0.000175	0.000191	1004.72	0.1511	-0.000016	0.023						997.0449
0.13064		25	0.0123	1007.22	(9)	0.000179	0.000192	1007.05	0.1622	-0.000013	0.026			17.01			997.0449
0.13161		25	0.0124	1007.33	(87)	0.000175	0.000192	1007.13	0.2045	-0.000016	0.042					10.287	997.0449
	0.1598	25	0.0151	1009.51	(49)	0.000181	0.000193	1009.34	0.1701	-0.000011	0.029				125		997.0449
0.195		25	0.0182	1012.23	(13)	0.000178	0.000194	1011.93	0.2974	-0.000016	0.088					15.185	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	(Relative density - 1)*10 ⁴	Delta density / kg/m³	Density of water at t°C / kg/m³
0.19525		25	0.0183	1012.22	(13)	0.000179	0.000194	1011.95	0.2655	-0.000014	0.071					15.172	997.0449
0.1973		25	0.0184	1012.36	(87)	0.000180	0.000194	1012.11	0.2547	-0.000013	0.065					15.316	997.0449
0.19893		25	0.0186	1012.52	(13)	0.000178	0.000194	1012.23	0.2916	-0.000015	0.085					15.476	997.0449
0.19893		25	0.0186	1012.52	(13)	0.000178	0.000194	1012.23	0.2906	-0.000015	0.084					15.475	997.0449
0.2518		25	0.0234	1016.53	(28)	0.000182	0.000195	1016.21	0.3181	-0.000013	0.101					19.483	997.0449
0.2633		25	0.0245	1017.36	(87)	0.000184	0.000195	1017.07	0.2853	-0.000011	0.081					20.313	997.0449
0.26767		25	0.0249	1017.58	(9)	0.000188	0.000196	1017.40	0.1844	-0.000007	0.034			17.94			997.0449
0.28278		25	0.0262	1018.86	(13)	0.000184	0.000196	1018.53	0.3313	-0.000012	0.110					21.818	997.0449
0.34096		25	0.0314	1023.19	(87)	0.000188	0.000198	1022.87	0.3165	-0.000010	0.100					26.142	997.0449
0.37485		25	0.0345	1025.75	(13)	0.000189	0.000199	1025.38	0.3609	-0.000010	0.130					28.701	997.0449
0.4636		25	0.0423	1031.68	(129)	0.000207	0.000201	1031.93	-0.2453	0.000005	0.060						997.0449
0.4893		25	0.0445	1034.17	(28)	0.000194	0.000202	1033.81	0.3587	-0.000008	0.129					37.121	997.0449
0.49487		25	0.0450	1034.62	(13)	0.000194	0.000202	1034.21	0.4026	-0.000008	0.162					37.572	997.0449
0.49487		25	0.0450	1034.62	(13)	0.000194	0.000202	1034.21	0.4056	-0.000008	0.165					37.575	997.0449
0.5		25	0.0454	1034.79	(45)	0.000198	0.000202	1034.59	0.2009	-0.000004	0.040						997.0449
0.5008		25	0.0455	1034.38	(129)	0.000208	0.000202	1034.65	-0.2675	0.000005	0.072						997.0449
0.52476		25	0.0476	1036.50	(9)	0.000201	0.000203	1036.39	0.1055	-0.000002	0.011			19.11			997.0449
0.55193		25	0.0499	1038.76	(13)	0.000196	0.000204	1038.37	0.3933	-0.000007	0.155					41.719	997.0449
0.63404		25	0.0569	1044.69	(13)	0.000200	0.000206	1044.30	0.3841	-0.000006	0.148					47.644	997.0449
0.71531		25	0.0638	1050.55	(13)	0.000202	0.000208	1050.12	0.4237	-0.000006	0.179					53.503	997.0449
0.7405		25	0.0659	1051.23	(129)	0.000218	0.000209	1051.92	-0.6871	0.000009	0.472						997.0449
0.76535		25	0.0679	1053.89	(9)	0.000207	0.000209	1053.68	0.2051	-0.000003	0.042			19.67			997.0449
0.79758		25	0.0706	1056.37	(13)	0.000205	0.000210	1055.96	0.4122	-0.000005	0.170					59.328	997.0449
0.9778		25	0.0852	1067.50	(129)	0.000226	0.000215	1068.55	-1.0549	0.000011	1.113						997.0449
0.99097		25	0.0862	1069.90	(13)	0.000211	0.000215	1069.47	0.4319	-0.000004	0.187					72.852	997.0449
0.99097		25	0.0862	1069.89	(13)	0.000211	0.000215	1069.47	0.4299	-0.000004	0.185					72.85	997.0449
0.9917		25	0.0863	1069.69	(28)	0.000214	0.000215	1069.52	0.1725	-0.000002	0.030					72.643	997.0449
0.99851		25	0.0868	1069.92	(9)	0.000216	0.000215	1069.99	-0.0665	0.000001	0.004			20.58			997.0449
1		25	0.0869	1070.40	(45)	0.000212	0.000216	1070.09	0.3118	-0.000003	0.097						997.0449
1.0851		25	0.0936	1074.70	(129)	0.000229	0.000218	1075.93	-1.2295	0.000011	1.512						997.0449
1.2621		25	0.1073	1086.40	(129)	0.000234	0.000222	1087.89	-1.4940	0.000012	2.232						997.0449
1.351		25	0.1140	1092.19	(129)	0.000236	0.000224	1093.81	-1.6198	0.000012	2.624						997.0449
1.47531		25	0.1232	1102.46	(13)	0.000224	0.000228	1101.98	0.4850	-0.000003	0.235					105.418	997.0449
1.47531		25	0.1232	1102.47	(13)	0.000224	0.000228	1101.98	0.4890	-0.000003	0.239					105.422	997.0449
1.7281		25	0.1413	1116.02	(129)	0.000246	0.000234	1118.22	-2.1977	0.000012	4.830						997.0449
2		25	0.1600	1135.26	(45)	0.000240	0.000240	1135.14	0.1213	-0.000001	0.015						997.0449
2.262		25	0.1772	1151.44	(28)	0.000244	0.000246	1150.92	0.5178	-0.000002	0.268					154.391	997.0449
2.4934		25	0.1919	1161.46	(129)	0.000263	0.000252	1164.43	-2.9740	0.000011	8.845						997.0449
2.952		25	0.2194	1192.06	(28)	0.000255	0.000261	1190.09	1.9711	-0.000006	3.885					195.012	997.0449
3		25	0.2222	1191.36	(45)	0.000267	0.000263	1192.69	-1.3253	0.000004	1.756						997.0449
3.5081		25	0.2504	1217.10	(129)	0.000279	0.000273	1219.24	-2.1424	0.000006	4.590						997.0449
4		25	0.2758	1244.19	(45)	0.000281	0.000283	1243.34	0.8525	-0.000002	0.727						997.0449
4.6479		25	0.3068	1274.07	(129)	0.000292	0.000295	1272.78	1.2851	-0.000003	1.652						997.0449
5.1139		25	0.3275	1294.63	(129)	0.000299	0.000303	1292.45	2.1818	-0.000004	4.760						997.0449
	0.00249	30	0.0002	995.85	(49)	0.000161	0.000191	995.84	0.0070	-0.000030	0.000				2		995.6473
	0.00498	30	0.0005	996.05	(49)	0.000161	0.000191	996.03	0.0141	-0.000030	0.000				4		995.6473
	0.00997	30	0.0010	996.44	(49)	0.000162	0.000191	996.42	0.0275	-0.000029	0.001				8		995.6473
	0.01995	30	0.0019	997.24	(49)	0.000162	0.000191	997.19	0.0548	-0.000029	0.003				16		995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	(Relative density - 1)*10 ⁴	Delta density / kg/m³	Density of water at t°C / kg/m³
	0.02992	30	0.0029	998.03	(49)	0.000165	0.000191	997.95	0.0735	-0.000026	0.005				23.9		995.6473
	0.0399	30	0.0038	998.81	(49)	0.000167	0.000192	998.72	0.0920	-0.000024	0.008				31.8		995.6473
0.05		30	0.0047	999.58	(45)	0.000170	0.000192	999.48	0.1016	-0.000021	0.010						995.6473
	0.08976	30	0.0085	1002.71	(49)	0.000175	0.000193	1002.55	0.1559	-0.000018	0.024				70.9		995.6473
0.1		30	0.0094	1003.45	(45)	0.000176	0.000193	1003.29	0.1608	-0.000017	0.026						995.6473
	0.15958	30	0.0151	1008.09	(49)	0.000182	0.000195	1007.89	0.2031	-0.000013	0.041				125		995.6473
0.5		30	0.0454	1033.28	(45)	0.000199	0.000204	1033.05	0.2350	-0.000005	0.055						995.6473
1		30	0.0869	1068.44	(45)	0.000217	0.000217	1068.43	0.0073	0.000000	0.000						995.6473
2		30	0.1600	1133.58	(45)	0.000240	0.000241	1133.36	0.2160	-0.000001	0.047						995.6473
3		30	0.2222	1189.65	(45)	0.000267	0.000263	1190.92	-1.2734	0.000004	1.622						995.6473
4		30	0.2758	1242.40	(45)	0.000281	0.000283	1241.71	0.6933	-0.000002	0.481						995.6473
	0.00249	35	0.0002	994.23	(49)	0.000162	0.000193	994.22	0.0071	-0.000030	0.000				2		994.0319
0.00469		35	0.0004	994.39	(13)	0.000186	0.000193	994.39	0.0031	-0.000007	0.000					0.362	994.0319
	0.00498	35	0.0005	994.43	(49)	0.000162	0.000193	994.42	0.0143	-0.000030	0.000				4		994.0319
0.00837		35	0.0008	994.72	(9)	0.000136	0.000193	994.67	0.0444	-0.000056	0.002			12.99			994.0319
	0.00995	35	0.0010	994.83	(49)	0.000162	0.000193	994.80	0.0294	-0.000031	0.001				8		994.0319
0.01646		35	0.0016	995.36	(9)	0.000145	0.000193	995.29	0.0744	-0.000048	0.006			13.81			994.0319
	0.01991	35	0.0019	995.61	(49)	0.000167	0.000193	995.56	0.0487	-0.000026	0.002				15.9		994.0319
	0.02987	35	0.0029	996.40	(49)	0.000169	0.000193	996.33	0.0685	-0.000024	0.005				23.8		994.0319
0.03278		35	0.0031	996.64	(9)	0.000162	0.000193	996.54	0.0987	-0.000032	0.010			15.38			994.0319
	0.03984	35	0.0038	997.18	(49)	0.000170	0.000194	997.09	0.0882	-0.000023	0.008				31.7		994.0319
0.04851		35	0.0046	997.84	(13)	0.000172	0.000194	997.74	0.1018	-0.000022	0.010					3.805	994.0319
0.05		35	0.0047	997.97	(45)	0.000168	0.000194	997.85	0.1215	-0.000026	0.015						994.0319
0.06562		35	0.0062	999.15	(9)	0.000177	0.000194	999.04	0.1105	-0.000018	0.012			16.81			994.0319
0.09627		35	0.0091	1001.58	(13)	0.000171	0.000195	1001.36	0.2163	-0.000024	0.047					7.547	994.0319
	0.09862	35	0.0094	1001.07	(49)	0.000252	0.000195	1001.60	-0.5337	0.000057	0.285				70.8		994.0319
0.1		35	0.0094	1001.83	(45)	0.000176	0.000195	1001.65	0.1849	-0.000020	0.034						994.0319
0.13064		35	0.0123	1004.14	(9)	0.000182	0.000196	1003.96	0.1792	-0.000014	0.032			17.3			994.0319
	0.15932	35	0.0151	1006.45	(49)	0.000183	0.000197	1006.23	0.2183	-0.000014	0.048				124.9		994.0319
0.26767		35	0.0249	1014.47	(9)	0.000191	0.000200	1014.23	0.2394	-0.000009	0.057			18.14			994.0319
0.28278		35	0.0262	1015.72	(13)	0.000187	0.000200	1015.35	0.3667	-0.000014	0.134					21.689	994.0319
0.37485		35	0.0345	1022.59	(13)	0.000191	0.000203	1022.16	0.4310	-0.000012	0.186					28.558	994.0319
0.40811		35	0.0374	1025.02	(13)	0.000193	0.000204	1024.60	0.4194	-0.000011	0.176					30.988	994.0319
0.5		35	0.0454	1031.64	(45)	0.000199	0.000206	1031.30	0.3394	-0.000007	0.115						994.0319
0.52476		35	0.0476	1033.29	(9)	0.000203	0.000207	1033.09	0.1924	-0.000004	0.037			19.32			994.0319
0.55193		35	0.0499	1035.50	(13)	0.000199	0.000207	1035.06	0.4473	-0.000008	0.200					41.473	994.0319
0.76535		35	0.0679	1050.61	(9)	0.000208	0.000213	1050.27	0.3393	-0.000005	0.115			19.84			994.0319
0.99851		35	0.0868	1066.59	(9)	0.000218	0.000219	1066.49	0.1020	-0.000001	0.010			20.73			994.0319
1		35	0.0869	1066.76	(45)	0.000217	0.000219	1066.60	0.1649	-0.000002	0.027						994.0319
2		35	0.1600	1131.82	(45)	0.000240	0.000242	1131.45	0.3737	-0.000002	0.140						994.0319
3		35	0.2222	1187.86	(45)	0.000267	0.000263	1189.06	-1.1987	0.000004	1.437						994.0319
4		35	0.2758	1240.58	(45)	0.000281	0.000282	1240.01	0.5664	-0.000001	0.321						994.0319
		40	0.0200	1008.40	(90)	0.000199	0.000200	1008.38	0.0175	-0.000001	0.000						992.2158
		40	0.0400	1024.80	(90)	0.000207	0.000206	1024.84	-0.0405	0.000001	0.002						992.2158
		40	0.0800	1058.00	(90)	0.000225	0.000218	1058.62	-0.6158	0.000007	0.379						992.2158
		40	0.1200	1092.10	(90)	0.000240	0.000230	1093.50	-1.3988	0.000010	1.957						992.2158
		40	0.1600	1127.20	(90)	0.000254	0.000243	1129.42	-2.2224	0.000011	4.939						992.2158
		40	0.2000	1163.50	(90)	0.000266	0.000256	1166.29	-2.7901	0.000010	7.785						992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	(Relative density - 1)*10 ⁴	Delta density / kg/m³	Density of water at t°C / kg/m³
		40	0.2500	1211.10	(90)	0.000279	0.000273	1213.50	-2.3981	0.000007	5.751						992.2158
		40	0.3000	1261.40	(90)	0.000291	0.000290	1261.62	-0.2237	0.000000	0.050						992.2158
	0.00248	42.5	0.0002	991.44	(49)	0.000162	0.000195	991.43	0.0077	-0.000033	0.000				2		991.237
	0.00497	42.5	0.0005	991.63	(49)	0.000164	0.000195	991.62	0.0148	-0.000031	0.000				4		991.237
	0.00993	42.5	0.0010	992.02	(49)	0.000173	0.000195	992.00	0.0205	-0.000022	0.000				7.9		991.237
	0.01986	42.5	0.0019	992.80	(49)	0.000173	0.000195	992.76	0.0415	-0.000022	0.002				15.8		991.237
	0.02979	42.5	0.0029	993.59	(49)	0.000173	0.000196	993.52	0.0631	-0.000022	0.004				23.7		991.237
	0.03972	42.5	0.0038	994.37	(49)	0.000173	0.000196	994.28	0.0851	-0.000023	0.007				31.6		991.237
	0.08937	42.5	0.0085	998.25	(49)	0.000178	0.000197	998.08	0.1637	-0.000019	0.027				70.7		991.237
	0.15888	42.5	0.0151	1003.63	(49)	0.000183	0.000199	1003.38	0.2515	-0.000017	0.063				125		991.237
0.00837		45	0.0008	990.89	(9)	0.000149	0.000196	990.85	0.0362	-0.000046	0.001			14.23			990.2132
0.01646		45	0.0016	991.55	(9)	0.000142	0.000196	991.46	0.0834	-0.000054	0.007			13.49			990.2132
0.03278		45	0.0031	992.80	(9)	0.000164	0.000196	992.70	0.0993	-0.000032	0.010			15.61			990.2132
0.05		45	0.0047	994.16	(45)	0.000164	0.000197	994.01	0.1546	-0.000033	0.024						990.2132
0.06562		45	0.0062	995.33	(9)	0.000174	0.000197	995.19	0.1425	-0.000023	0.020			16.57			990.2132
0.1		45	0.0094	998.01	(45)	0.000173	0.000198	997.78	0.2317	-0.000025	0.054						990.2132
0.13064		45	0.0123	1000.31	(9)	0.000181	0.000199	1000.08	0.2255	-0.000018	0.051			17.19			990.2132
0.26767		45	0.0249	1010.66	(9)	0.000188	0.000202	1010.29	0.3737	-0.000015	0.140			17.87			990.2132
0.5		45	0.0454	1027.82	(45)	0.000197	0.000208	1027.27	0.5490	-0.000011	0.301						990.2132
0.52476		45	0.0476	1029.42	(9)	0.000202	0.000209	1029.06	0.3588	-0.000007	0.129			19.21			990.2132
0.76535		45	0.0679	1046.72	(9)	0.000207	0.000215	1046.16	0.5526	-0.000007	0.305			19.74			990.2132
0.99851		45	0.0868	1062.69	(9)	0.000217	0.000220	1062.33	0.3661	-0.000004	0.134			20.62			990.2132
1		45	0.0869	1062.91	(45)	0.000215	0.000220	1062.43	0.4812	-0.000005	0.232						990.2132
2		45	0.1600	1128.00	(45)	0.000239	0.000243	1127.22	0.7764	-0.000004	0.603						990.2132
3		45	0.2222	1184.05	(45)	0.000266	0.000263	1185.05	-0.9989	0.000003	0.998						990.2132
4		45	0.2758	1236.76	(45)	0.000280	0.000281	1236.45	0.3064	-0.000001	0.094						990.2132
5		45	0.3225	1286.99	(45)	0.000288	0.000297	1282.03	4.9641	-0.000009	24.642	!					990.2132
0.10844		48.75	0.0102	997.04	(113)	0.000173	0.000199	996.78	0.2636	-0.000026	0.069			16.47			988.5963
0.19711		48.75	0.0184	1003.82	(113)	0.000179	0.000201	1003.41	0.4122	-0.000022	0.170			17.04			988.5963
0.28126		48.75	0.0261	1010.15	(113)	0.000184	0.000203	1009.64	0.5129	-0.000019	0.263			17.52			988.5963
0.38842		48.75	0.0357	1018.15	(113)	0.000188	0.000206	1017.50	0.6477	-0.000018	0.420			17.94			988.5963
0.52775		48.75	0.0478	1028.33	(113)	0.000195	0.000209	1027.59	0.7454	-0.000015	0.556			18.53			988.5963
0.003191		50	0.0003	988.29	(72)	0.000146	0.000196	988.28	0.0149	-0.000050	0.000					0.2568	988.0363
0.007843		50	0.0007	988.67	(72)	0.000149	0.000197	988.63	0.0345	-0.000047	0.001					0.629	988.0363
0.010834		50	0.0010	988.90	(72)	0.000151	0.000197	988.86	0.0460	-0.000046	0.002					0.8671	988.0363
0.026501		50	0.0025	990.15	(72)	0.000155	0.000197	990.04	0.1039	-0.000042	0.011					2.1108	988.0363
0.035536		50	0.0034	990.88	(72)	0.000151	0.000197	990.73	0.1536	-0.000046	0.024					2.8435	988.0363
0.046302		50	0.0044	991.70	(72)	0.000159	0.000198	991.54	0.1647	-0.000038	0.027					3.6677	988.0363
0.055539		50	0.0053	992.43	(72)	0.000161	0.000198	992.24	0.1916	-0.000037	0.037					4.3914	988.0363
0.089625		50	0.0085	995.08	(72)	0.000165	0.000199	994.80	0.2786	-0.000033	0.078					7.0445	988.0363
0.096011		50	0.0091	995.58	(72)	0.000165	0.000199	995.28	0.3029	-0.000034	0.092					7.5486	988.0363
0.12308		50	0.0116	997.67	(72)	0.000169	0.000199	997.31	0.3535	-0.000031	0.125					9.6294	988.0363
0.17339		50	0.0162	1001.52	(72)	0.000173	0.000201	1001.07	0.4536	-0.000028	0.206					13.4882	988.0363
0.24965		50	0.0232	1007.33	(72)	0.000177	0.000203	1006.73	0.5946	-0.000025	0.354					19.2903	988.0363
0.37062		50	0.0341	1016.31	(72)	0.000186	0.000206	1015.62	0.6858	-0.000019	0.470					28.2719	988.0363
0.47693		50	0.0434	1024.14	(72)	0.000191	0.000208	1023.35	0.7939	-0.000017	0.630					36.1026	988.0363
0.64665		50	0.0580	1036.37	(72)	0.000198	0.000212	1035.50	0.8688	-0.000014	0.755					48.3318	988.0363
0.82633		50	0.0729	1049.03	(72)	0.000205	0.000217	1048.13	0.8922	-0.000011	0.796					60.9902	988.0363

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	(Relative density - 1)*10 ⁴	Delta density / kg/m³	Density of water at t°C / kg/m³
0.99421		50	0.0865	1060.63	(72)	0.000211	0.000220	1059.73	0.9011	-0.000009	0.812					72.59	988.0363
0.00837		55	0.0008	986.38	(9)	0.000129	0.000197	986.33	0.0529	-0.000068	0.003			12.26			985.6952
0.01646		55	0.0016	987.02	(9)	0.000147	0.000197	986.94	0.0760	-0.000050	0.006			14.03			985.6952
0.03278		55	0.0031	988.29	(9)	0.000159	0.000198	988.17	0.1180	-0.000039	0.014			15.12			985.6952
0.05		55	0.0047	989.66	(45)	0.000157	0.000198	989.47	0.1917	-0.000041	0.037						985.6952
0.06562		55	0.0062	990.81	(9)	0.000170	0.000198	990.64	0.1713	-0.000028	0.029			16.22			985.6952
0.1		55	0.0094	993.54	(45)	0.000165	0.000199	993.22	0.3171	-0.000034	0.101						985.6952
0.13064		55	0.0123	995.84	(9)	0.000174	0.000200	995.51	0.3222	-0.000026	0.104			16.53			985.6952
0.26767		55	0.0249	1006.20	(9)	0.000183	0.000203	1005.68	0.5169	-0.000021	0.267			17.41			985.6952
0.5		55	0.0454	1023.43	(45)	0.000191	0.000209	1022.60	0.8333	-0.000018	0.694						985.6952
0.52476		55	0.0476	1025.00	(9)	0.000197	0.000210	1024.38	0.6191	-0.000012	0.383			18.77			985.6952
0.76535		55	0.0679	1042.36	(9)	0.000203	0.000215	1041.44	0.9216	-0.000012	0.849			19.29			985.6952
0.99851		55	0.0868	1058.36	(9)	0.000212	0.000220	1057.57	0.7863	-0.000008	0.618			20.21			985.6952
1		55	0.0869	1058.63	(45)	0.000211	0.000220	1057.67	0.9551	-0.000010	0.912						985.6952
2		55	0.1600	1123.86	(45)	0.000235	0.000241	1122.53	1.3288	-0.000007	1.766						985.6952
3		55	0.2222	1180.02	(45)	0.000263	0.000260	1180.69	-0.6693	0.000002	0.448						985.6952
4		55	0.2758	1232.77	(45)	0.000277	0.000278	1232.66	0.1069	0.000000	0.011						985.6952
		60	0.0200	999.50	(90)	0.000188	0.000202	999.21	0.2883	-0.000014	0.083						983.1989
		60	0.0400	1015.90	(90)	0.000199	0.000207	1015.54	0.3605	-0.000009	0.130						983.1989
		60	0.0800	1049.30	(90)	0.000216	0.000218	1049.14	0.1609	-0.000002	0.026						983.1989
		60	0.1200	1083.60	(90)	0.000232	0.000229	1083.99	-0.3850	0.000003	0.148						983.1989
		60	0.1600	1118.80	(90)	0.000247	0.000240	1120.05	-1.2459	0.000006	1.552						983.1989
		60	0.2000	1155.20	(90)	0.000260	0.000252	1157.27	-2.0666	0.000008	4.271						983.1989
		60	0.2500	1203.10	(90)	0.000273	0.000267	1205.29	-2.1933	0.000006	4.810						983.1989
		60	0.3000	1253.50	(90)	0.000286	0.000283	1254.76	-1.2589	0.000003	1.585						983.1989
0.00837		65	0.0008	981.24	(9)	0.000129	0.000197	981.19	0.0520	-0.000068	0.003			12.3			980.5548
0.01646		65	0.0016	981.87	(9)	0.000146	0.000197	981.79	0.0773	-0.000051	0.006			13.9			980.5548
0.03278		65	0.0031	983.16	(9)	0.000152	0.000198	983.02	0.1373	-0.000046	0.019			14.47			980.5548
0.06562		65	0.0062	985.71	(9)	0.000161	0.000198	985.48	0.2274	-0.000038	0.052			15.3			980.5548
0.13064		65	0.0123	990.76	(9)	0.000165	0.000200	990.34	0.4196	-0.000035	0.176			15.72			980.5548
0.26767		65	0.0249	1001.14	(9)	0.000176	0.000203	1000.47	0.6759	-0.000027	0.457			16.75			980.5548
0.52476		65	0.0476	1020.04	(9)	0.000190	0.000209	1019.12	0.9181	-0.000019	0.843			18.12			980.5548
0.76535		65	0.0679	1037.49	(9)	0.000196	0.000214	1036.16	1.3335	-0.000018	1.778			18.65			980.5548
0.99851		65	0.0868	1053.53	(9)	0.000206	0.000219	1052.29	1.2460	-0.000013	1.552			19.63			980.5548
0.10844		73.77	0.0102	984.15	(113)	0.000151	0.000198	983.69	0.4639	-0.000047	0.215			14.42			975.5797
0.19711		73.77	0.0184	991.02	(113)	0.000158	0.000200	990.26	0.7597	-0.000042	0.577			15.07			975.5797
0.28126		73.77	0.0261	997.44	(113)	0.000164	0.000202	996.44	0.9926	-0.000038	0.985			15.6			975.5797
0.38842		73.77	0.0357	1005.50	(113)	0.000170	0.000204	1004.25	1.2507	-0.000035	1.564			16.16			975.5797
0.52775		73.77	0.0478	1015.80	(113)	0.000177	0.000207	1014.29	1.5063	-0.000031	2.269			16.84			975.5797
0.00837		75	0.0008	975.51	(9)	0.000150	0.000196	975.48	0.0345	-0.000046	0.001			14.32			974.849
0.01646		75	0.0016	976.17	(9)	0.000142	0.000196	976.08	0.0810	-0.000054	0.007			13.5			974.849
0.03278		75	0.0031	977.49	(9)	0.000137	0.000196	977.31	0.1775	-0.000060	0.031			13.02			974.849
0.06562		75	0.0062	980.05	(9)	0.000149	0.000197	979.76	0.2896	-0.000049	0.084			14.15			974.849
0.13064		75	0.0123	985.17	(9)	0.000151	0.000199	984.60	0.5646	-0.000047	0.319			14.4			974.849
0.26767		75	0.0249	995.62	(9)	0.000165	0.000202	994.71	0.9087	-0.000037	0.826			15.68			974.849
0.52476		75	0.0476	1014.66	(9)	0.000180	0.000207	1013.34	1.3192	-0.000027	1.740			17.15			974.849
0.76535		75	0.0679	1032.23	(9)	0.000186	0.000212	1030.37	1.8604	-0.000026	3.461			17.74			974.849
0.99851		75	0.0868	1048.38	(9)	0.000197	0.000217	1046.51	1.8707	-0.000020	3.499			18.77			974.849

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	(Relative density - 1)*10 ⁴	Delta density / kg/m³	Density of water at t °C / kg/m³
		80	0.0200	988.30	(90)	0.000170	0.000199	987.73	0.5749	-0.000029	0.331						971.7978
		80	0.0400	1005.00	(90)	0.000179	0.000204	1004.00	1.0050	-0.000025	1.010						971.7978
		80	0.0800	1038.80	(90)	0.000199	0.000214	1037.58	1.2244	-0.000014	1.499						971.7978
		80	0.1200	1073.50	(90)	0.000217	0.000223	1072.56	0.9421	-0.000007	0.888						971.7978
		80	0.1600	1109.20	(90)	0.000232	0.000234	1108.95	0.2528	-0.000001	0.064						971.7978
		80	0.2000	1146.00	(90)	0.000247	0.000244	1146.73	-0.7313	0.000003	0.535						971.7978
		80	0.2500	1194.20	(90)	0.000262	0.000258	1195.87	-1.6688	0.000005	2.785						971.7978
		80	0.3000	1245.10	(90)	0.000276	0.000272	1247.00	-1.9031	0.000004	3.622						971.7978
0.00837		85	0.0008	969.30	(9)	0.000118	0.000194	969.25	0.0569	-0.000076	0.003			11.21			968.6203
0.01646		85	0.0016	969.96	(9)	0.000119	0.000194	969.85	0.1105	-0.000075	0.012			11.32			968.6203
0.03278		85	0.0031	971.29	(9)	0.000120	0.000194	971.07	0.2191	-0.000075	0.048			11.39			968.6203
0.06562		85	0.0062	973.90	(9)	0.000131	0.000195	973.52	0.3738	-0.000063	0.140			12.52			968.6203
0.13064		85	0.0123	979.03	(9)	0.000139	0.000196	978.35	0.6729	-0.000057	0.453			13.25			968.6203
0.26767		85	0.0249	989.59	(9)	0.000152	0.000199	988.45	1.1446	-0.000047	1.310			14.48			968.6203
0.52476		85	0.0476	1008.81	(9)	0.000168	0.000204	1007.06	1.7550	-0.000036	3.080			16			968.6203
0.76535		85	0.0679	1026.51	(9)	0.000175	0.000209	1024.10	2.4111	-0.000034	5.813			16.69			968.6203
0.99851		85	0.0868	1042.79	(9)	0.000187	0.000213	1040.26	2.5307	-0.000027	6.405			17.77			968.6203
0.00837		95	0.0008	962.59	(9)	0.000099	0.000191	962.53	0.0680	-0.000092	0.005			9.39			961.9004
0.01646		95	0.0016	963.27	(9)	0.000098	0.000191	963.13	0.1350	-0.000093	0.018			9.33			961.9004
0.03278		95	0.0031	964.61	(9)	0.000103	0.000191	964.35	0.2570	-0.000089	0.066			9.76			961.9004
0.06562		95	0.0062	967.27	(9)	0.000109	0.000192	966.80	0.4791	-0.000083	0.230			10.42			961.9004
0.13064		95	0.0123	972.44	(9)	0.000122	0.000193	971.62	0.8216	-0.000071	0.675			11.66			961.9004
0.26767		95	0.0249	983.13	(9)	0.000137	0.000196	981.70	1.4241	-0.000059	2.028			13			961.9004
0.52476		95	0.0476	1002.53	(9)	0.000154	0.000201	1000.31	2.2197	-0.000047	4.927			14.69			961.9004
0.76535		95	0.0679	1020.38	(9)	0.000162	0.000205	1017.36	3.0160	-0.000043	9.096			15.47			961.9004
0.99851		95	0.0868	1036.80	(9)	0.000175	0.000209	1033.56	3.2465	-0.000035	10.540			16.62			961.9004
0.10844		98.67	0.0102	968.13	(113)	0.000114	0.000191	967.39	0.7431	-0.000078	0.552			10.84			959.3157
0.19711		98.67	0.0184	975.15	(113)	0.000124	0.000193	973.93	1.2154	-0.000069	1.477			11.78			959.3157
0.28126		98.67	0.0261	981.70	(113)	0.000131	0.000195	980.10	1.5962	-0.000064	2.548			12.49			959.3157
0.38842		98.67	0.0357	990.03	(113)	0.000136	0.000197	987.90	2.1350	-0.000061	4.558			12.91			959.3157
0.52775		98.67	0.0478	1000.62	(113)	0.000143	0.000199	997.93	2.6862	-0.000056	7.216			13.63			959.3157
		100	0.0200	975.30	(90)	0.000137	0.000193	974.24	1.0554	-0.000056	1.114						958.3637
		100	0.0400	992.30	(90)	0.000151	0.000197	990.50	1.8027	-0.000046	3.250						958.3637
		100	0.0800	1026.90	(90)	0.000173	0.000206	1024.14	2.7550	-0.000033	7.590						958.3637
		100	0.1200	1062.20	(90)	0.000193	0.000214	1059.36	2.8436	-0.000021	8.086						958.3637
		100	0.1600	1098.40	(90)	0.000212	0.000224	1096.17	2.2262	-0.000012	4.956						958.3637
		100	0.2000	1135.90	(90)	0.000228	0.000233	1134.63	1.2715	-0.000005	1.617						958.3637
		100	0.2500	1184.70	(90)	0.000246	0.000245	1185.02	-0.3229	0.000001	0.104						958.3637
		100	0.3000	1236.00	(90)	0.000262	0.000258	1237.99	-1.9895	0.000004	3.958						958.3637
							Average Res	0.2345	-0.000021		311.531	Sum chi sq					
							Std dev Res	0.8519	0.000021								
							Avg - 4std	-3.1730	-0.000104								
							Avg + 4std	3.6419	0.000062								

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) \cdot e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0 -0.000515
c1 0.001344
c2 0.583581
c3 0.008583

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	(Relative density - 1)*10⁴	Delta density / kg/m³	Density of water at t°C / kg/m³
c4		3843.612															
Min T		0															
Max T		100															
Min w		0.0002															
Max w		0.3275															
Avg dens res		0.2345															
Std dens res		0.8519															
Avg app vol res *10³	-0.021224																
Std app vol res *10³	0.020814																
No of points in corr	400																
No of inconsistent poin	6																
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)																	
5		15	0.3225	1298.03	(45)	0.000286	0.000300	1290.47	7.5650	-0.000014	57.229	!					999.0996
5		20	0.3225	1296.26	(45)	0.000288	0.000301	1289.13	7.1331	-0.000013	50.881	!					998.2041
5		25	0.3225	1294.50	(45)	0.000288	0.000301	1287.75	6.7451	-0.000013	45.497	!					997.0449
5		30	0.3225	1292.66	(45)	0.000289	0.000301	1286.36	6.3032	-0.000012	39.731	!					995.6473
5		35	0.3225	1290.82	(45)	0.000289	0.000300	1284.94	5.8839	-0.000011	34.620	!					994.0319
5		55	0.323	1288.0	(45)	0.000276	0.000293	1279.00	9.0376	-0.000017	81.679	!					985.6952

Density of aqueous solutions of **MgSO4**

- References (6) Asmus, A., "The viscosities of aqueous solutions of strong electrolytes of high valence type", *Ann. der Physik, ser 5*, **1939**, 35, 1-22
- (13) Chen, C.-T. A.; Chen, J. H.; Millero, F. J. Densities of NaCl, MgCl₂, Na₂SO₄, and MgSO₄ Aqueous Solutions at 1 atm. from 0 to 50°C and from 0.001 to 1.5 m. *J. Chem. Eng. Data* **1980**, 25, 307-310.
- (27) Fabuss, B. M.; Korosi, A.; Huq, A. K. M. S.; Densities of Binary and Ternary Aqueous Solutions of NaCl, Na₂SO₄, and MgSO₄, of Sea Waters, and Sea Water Concentrates, *J. Chem. Eng. Data*, **1966**, 3, 325-331
- (45) Isono, T. Densities, Viscosities, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions at Several Temperatures. Alkaline-Earth Chlorides, LaCl₃, Na₂SO₄, NaNO₃, NaBr, KNO₃, KBr, and Cd(NO₃)₂. *J. Chem. Eng. Data* **1984**, 29, 45-52.
- (49) Kaminsky, M, Concentration and Temperature Dependence of the Viscosity of Aqueous Solutions of Strong Electrolytes. III. KCl, K₂SO₄, MgCl₂, BeSO₄, and MgSO₄ Solutions. *Z. Phys. Chem. N. F.* **1957**, 12, 206-231.
- (52) Korosi, A.; Fabuss, B. M. Viscosities of Binary Aqueous Solutions of NaCl, KCl, Na₂SO₄, and MgSO₄ at Concentrations and Temperatures of Interest in Desalination Processes. *J. Chem. Eng. Data* **1968**, 13, 548-552.
- (72) Millero, F. J.; Knox, J. H. Apparent Molal Volumes of Aqueous NaF, Na₂SO₄, KCl, K₂SO₄, MgCl₂, and MgSO₄ Solutions at 0° and 50°C. *J. Chem. Eng. Data* **1973**, 18, 407-411.
- (74) Motin, M. A., Temperature and Concentration Dependence of Apparent Molar Volumes and Viscosities of NaCl, NH₄Cl, CuCl₂, and MgSO₄ in Pure Water and Water + Urea Mixtures, *J. Chem. Eng. Data*, **2004**, 49, 94-98
- (88) Perron, G., Desnoyers, J. E., Millero, F. J., "Apparent molal volumes and heat capacities of some sulfates and carbonates in water at 25 °C.", *Can. J. Chem.*, **1975**, 53, 1134-1138
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m ³	Apparent molal volume / cm ³ /mol	Relative density	Density of water / kg/m ³
0.00099		0	0.0001	999.97	(13)	-0.000083	-0.000034	999.96	0.0058	-0.000049	0.000			0.129			999.8395
0.00517		0	0.0006	1000.52	(72)	-0.000096	-0.000033	1000.48	0.0392	-0.000063	0.002			0.6822			999.8395
0.00549		0	0.0007	1000.57	(13)	-0.000105	-0.000033	1000.52	0.0472	-0.000071	0.002			0.730			999.8395
0.007469		0	0.0009	1000.82	(72)	-0.000090	-0.000033	1000.77	0.0512	-0.000057	0.003			0.98			999.8395
0.01177		0	0.0014	1001.38	(13)	-0.000086	-0.000033	1001.30	0.0748	-0.000053	0.006			1.538			999.8395
0.014391		0	0.0017	1001.72	(72)	-0.000086	-0.000033	1001.63	0.0918	-0.000053	0.008			1.8805			999.8395
0.01909		0	0.0023	1002.32	(72)	-0.000078	-0.000032	1002.21	0.1065	-0.000046	0.011			2.4784			999.8395
0.027767		0	0.0033	1003.42	(72)	-0.000070	-0.000032	1003.29	0.1305	-0.000039	0.017			3.5784			999.8395
0.02786		0	0.0033	1003.42	(13)	-0.000069	-0.000032	1003.30	0.1245	-0.000037	0.016			3.584			999.8395
0.032379		0	0.0039	1004.00	(72)	-0.000068	-0.000031	1003.86	0.1448	-0.000037	0.021			4.1641			999.8395
0.036607		0	0.0044	1004.53	(72)	-0.000064	-0.000031	1004.38	0.1481	-0.000033	0.022			4.6909			999.8395
0.03855		0	0.0046	1004.78	(13)	-0.000065	-0.000031	1004.62	0.1607	-0.000034	0.026			4.944			999.8395
0.044662		0	0.0053	1005.55	(72)	-0.000062	-0.000030	1005.38	0.1734	-0.000032	0.030			5.7127			999.8395
0.053878		0	0.0064	1006.71	(72)	-0.000059	-0.000030	1006.52	0.1931	-0.000030	0.037			6.8711			999.8395
0.063246		0	0.0076	1007.88	(72)	-0.000056	-0.000029	1007.67	0.2095	-0.000027	0.044			8.0435			999.8395
0.069471		0	0.0083	1008.70	(72)	-0.000059	-0.000028	1008.44	0.2621	-0.000031	0.069			8.8634			999.8395
0.07019		0	0.0084	1008.75	(13)	-0.000054	-0.000028	1008.53	0.2181	-0.000026	0.048			8.908			999.8395
0.089133		0	0.0106	1011.10	(72)	-0.000049	-0.000027	1010.86	0.2423	-0.000022	0.059			11.2628			999.8395
0.100205		0	0.0119	1012.46	(72)	-0.000046	-0.000026	1012.22	0.2449	-0.000020	0.060			12.6247			999.8395
0.11478		0	0.0136	1014.27	(72)	-0.000044	-0.000025	1014.01	0.2631	-0.000019	0.069			14.4291			999.8395
0.11669		0	0.0139	1014.52	(13)	-0.000044	-0.000025	1014.24	0.2782	-0.000020	0.077			14.678			999.8395
0.14239		0	0.0169	1017.66	(72)	-0.000039	-0.000023	1017.38	0.2856	-0.000016	0.082			17.8252			999.8395
		0	0.020	1021.00	(90)	-0.000036	-0.000021	1020.68	0.3174	-0.000015	0.101						999.8395

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Relative density	Density of water / kg/m³
0.18277		0	0.0215	1022.57	(72)	-0.000032	-0.000020	1022.29	0.2781	-0.000012	0.077			22.7279			999.8395
0.24491		0	0.0286	1030.05	(72)	-0.000024	-0.000016	1029.79	0.2626	-0.000009	0.069			30.2141			999.8395
		0	0.0400	1042.30	(90)	-0.000018	-0.000009	1041.87	0.4309	-0.000010	0.186						999.8395
0.36328		0	0.0419	1044.12	(72)	-0.000012	-0.000007	1043.90	0.2190	-0.000005	0.048			44.2783			999.8395
0.49772		0	0.0565	1059.81	(72)	-0.000001	0.000002	1059.64	0.1776	-0.000003	0.032			59.9735			999.8395
0.71312		0	0.0791	1084.41	(72)	0.000014	0.000016	1084.22	0.1832	-0.000002	0.034			84.567			999.8395
		0	0.0800	1085.80	(90)	0.000010	0.000016	1085.26	0.5400	-0.000006	0.292						999.8395
0.89006		0	0.0968	1104.07	(72)	0.000025	0.000026	1103.86	0.2097	-0.000002	0.044			104.2264			999.8395
0.89033		0	0.0968	1104.10	(72)	0.000025	0.000026	1103.89	0.2113	-0.000002	0.045			104.2576			999.8395
		0	0.1200	1130.90	(90)	0.000034	0.000040	1129.98	0.9208	-0.000006	0.848						999.8395
		0	0.1600	1177.70	(90)	0.000056	0.000064	1175.98	1.7205	-0.000008	2.960						999.8395
		0	0.2000	1226.40	(90)	0.000076	0.000087	1223.20	3.2027	-0.000011	10.257						999.8395
0.00099		5	0.0001	1000.09	(13)	-0.000099	-0.000026	1000.09	0.0087	-0.000073	0.000		!	0.131			999.9638
0.00549		5	0.0007	1000.68	(13)	-0.000085	-0.000026	1000.64	0.0392	-0.000059	0.002			0.717			999.9638
0.01177		5	0.0014	1001.48	(13)	-0.000069	-0.000025	1001.42	0.0625	-0.000044	0.004			1.515			999.9638
0.02231		5	0.0027	1002.81	(13)	-0.000061	-0.000024	1002.72	0.0997	-0.000037	0.010			2.851			999.9638
0.02786		5	0.0033	1003.51	(13)	-0.000059	-0.000024	1003.40	0.1166	-0.000035	0.014			3.551			999.9638
0.03855		5	0.0046	1004.85	(13)	-0.000052	-0.000023	1004.71	0.1343	-0.000029	0.018			4.883			999.9638
0.07019		5	0.0084	1008.76	(13)	-0.000041	-0.000021	1008.59	0.1693	-0.000020	0.029			8.797			999.9638
0.11669		5	0.0139	1014.47	(13)	-0.000032	-0.000018	1014.26	0.2049	-0.000014	0.042			14.503			999.9638
0.1201		5	0.0143	1014.87	(13)	-0.000031	-0.000017	1014.68	0.1925	-0.000013	0.037			14.905			999.9638
0.21211		5	0.0249	1025.98	(13)	-0.000018	-0.000011	1025.79	0.1915	-0.000007	0.037			26.013			999.9638
0.23758		5	0.0278	1029.06	(13)	-0.000017	-0.000009	1028.84	0.2200	-0.000007	0.048			29.092			999.9638
1.48251		5	0.1514	1166.25	(13)	0.000058	0.000062	1165.49	0.7623	-0.000004	0.581			166.290			999.9638
		15	0.0001	999.16	(49)	0.000006	-0.000012	999.16	-0.0011	0.000019	0.000					1.00006	999.0996
0.00099		15	0.0001	999.23	(13)	-0.000117	-0.000012	999.22	0.0125	-0.000105	0.000			0.133			999.0996
		15	0.0001	999.23	(49)	-0.000077	-0.000012	999.22	0.0078	-0.000064	0.000					1.00013	999.0996
		15	0.0003	999.42	(49)	-0.000060	-0.000012	999.40	0.0144	-0.000048	0.000					1.00032	999.0996
		15	0.0006	999.73	(49)	-0.000044	-0.000012	999.71	0.0190	-0.000031	0.000					1.00063	999.0996
0.00549		15	0.0007	999.80	(13)	-0.000057	-0.000012	999.77	0.0297	-0.000045	0.001			0.698			999.0996
		15	0.0012	1000.36	(49)	-0.000044	-0.000012	1000.32	0.0384	-0.000032	0.001					1.00126	999.0996
0.01177		15	0.0014	1000.59	(13)	-0.000051	-0.000012	1000.53	0.0558	-0.000039	0.003			1.488			999.0996
		15	0.0024	1001.61	(49)	-0.000039	-0.000011	1001.54	0.0684	-0.000028	0.005					1.00251	999.0996
0.02231		15	0.0027	1001.89	(13)	-0.000040	-0.000011	1001.81	0.0792	-0.000029	0.006			2.792			999.0996
0.02786		15	0.0033	1002.59	(13)	-0.000040	-0.000011	1002.49	0.0995	-0.000030	0.010			3.486			999.0996
0.03855		15	0.0046	1003.89	(13)	-0.000034	-0.000010	1003.78	0.1103	-0.000024	0.012			4.793			999.0996
		15	0.0048	1004.10	(49)	-0.000035	-0.000010	1003.97	0.1232	-0.000025	0.015					1.005	999.0996
0.05		15	0.0060	1005.37	(45)	-0.000042	-0.000009	1005.17	0.2013	-0.000033	0.041						999.0996
		15	0.0060	1005.32	(49)	-0.000032	-0.000009	1005.19	0.1380	-0.000023	0.019					1.00623	999.0996
0.07019		15	0.0084	1007.73	(13)	-0.000022	-0.000008	1007.61	0.1202	-0.000014	0.014			8.629			999.0996
0.1		15	0.0119	1011.40	(45)	-0.000022	-0.000006	1011.20	0.2010	-0.000017	0.040						999.0996
		15	0.0119	1011.44	(49)	-0.000023	-0.000006	1011.23	0.2045	-0.000017	0.042					1.01235	999.0996
0.11669		15	0.0139	1013.34	(13)	-0.000015	-0.000005	1013.20	0.1382	-0.000010	0.019			14.242			999.0996
0.1201		15	0.0143	1013.74	(13)	-0.000013	-0.000005	1013.61	0.1283	-0.000009	0.016			14.641			999.0996
		15	0.0236	1023.48	(49)	-0.000010	0.000000	1023.22	0.2563	-0.000010	0.066					1.0244	999.0996
0.21211		15	0.0249	1024.66	(13)	-0.000002	0.000001	1024.58	0.0801	-0.000003	0.006			25.561			999.0996

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Relative density	Density of water / kg/m³
0.23758		15	0.0278	1027.67	(13)	0.000000	0.000003	1027.59	0.0808	-0.000003	0.007			28.575			999.0996
0.39375		15	0.0453	1045.79	(13)	0.000013	0.000012	1045.86	-0.0659	0.000001	0.004			46.690			999.0996
0.5		15	0.0568	1057.75	(45)	0.000023	0.000018	1058.07	-0.3210	0.000005	0.103						999.0996
0.64325		15	0.0719	1073.98	(13)	0.000030	0.000026	1074.28	-0.2929	0.000004	0.086			74.884			999.0996
0.88167		15	0.0960	1100.18	(13)	0.000043	0.000039	1100.59	-0.4135	0.000004	0.171			101.076			999.0996
1		15	0.1074	1112.59	(45)	0.000051	0.000045	1113.35	-0.7584	0.000006	0.575						999.0996
1.2232		15	0.1283	1137.60	(13)	0.000051	0.000056	1136.89	0.7165	-0.000004	0.513			138.504			999.0996
1.5		15	0.1530	1164.41	(45)	0.000072	0.000068	1165.14	-0.7338	0.000004	0.538						999.0996
2		15	0.1940	1212.95	(45)	0.000091	0.000089	1213.68	-0.7262	0.000003	0.527						999.0996
2.5		15	0.2313	1260.71	(45)	0.000103	0.000107	1259.16	1.5457	-0.000004	2.389						999.0996
		18	0.0001	998.66	(49)	0.000006	-0.000009	998.66	-0.0009	0.000015	0.000					1.00006	998.5956
		18	0.0001	998.73	(49)	-0.000077	-0.000009	998.72	0.0082	-0.000068	0.000					1.00013	998.5956
		18	0.0003	998.92	(49)	-0.000060	-0.000009	998.90	0.0155	-0.000052	0.000					1.00032	998.5956
		18	0.0006	999.22	(49)	-0.000044	-0.000009	999.20	0.0212	-0.000035	0.000					1.00063	998.5956
		18	0.0012	999.84	(49)	-0.000035	-0.000008	999.81	0.0327	-0.000027	0.001					1.00125	998.5956
		18	0.0024	1001.08	(49)	-0.000031	-0.000008	1001.03	0.0571	-0.000024	0.003					1.00249	998.5956
		18	0.0048	1003.55	(49)	-0.000027	-0.000006	1003.45	0.1004	-0.000021	0.010					1.00496	998.5956
		18	0.0060	1004.77	(49)	-0.000024	-0.000006	1004.66	0.1094	-0.000018	0.012					1.00618	998.5956
		18	0.0119	1010.82	(49)	-0.000014	-0.000002	1010.68	0.1365	-0.000011	0.019					1.01224	998.5956
		18	0.0236	1022.71	(49)	0.000000	0.000004	1022.62	0.0869	-0.000004	0.008					1.02415	998.5956
0.05		20	0.0060	1004.38	(45)	-0.000028	-0.000003	1004.23	0.1472	-0.000024	0.022						998.2041
0.1		20	0.0119	1010.40	(45)	-0.000015	0.000000	1010.22	0.1758	-0.000014	0.031						998.2041
		20	0.020	1018.60	(90)	-0.000001	0.000004	1018.49	0.1054	-0.000005	0.011						998.2041
		20	0.0400	1039.20	(90)	0.000014	0.000014	1039.18	0.0187	0.000000	0.000						998.2041
0.5		20	0.0568	1056.47	(45)	0.000029	0.000023	1056.84	-0.3692	0.000006	0.136						998.2041
		20	0.0800	1081.60	(90)	0.000036	0.000035	1081.76	-0.1633	0.000002	0.027						998.2041
1		20	0.1074	1111.16	(45)	0.000054	0.000048	1111.93	-0.7682	0.000006	0.590						998.2041
		20	0.1200	1125.60	(90)	0.000057	0.000054	1125.99	-0.3870	0.000003	0.150						998.2041
1.5		20	0.1530	1162.82	(45)	0.000075	0.000070	1163.67	-0.8548	0.000004	0.731						998.2041
		20	0.1600	1171.70	(90)	0.000075	0.000074	1171.89	-0.1856	0.000001	0.034						998.2041
2		20	0.1940	1211.10	(45)	0.000094	0.000090	1212.29	-1.1881	0.000004	1.412						998.2041
		20	0.2000	1219.80	(90)	0.000092	0.000093	1219.49	0.3133	-0.000001	0.098						998.2041
2.5		20	0.2313	1258.76	(45)	0.000105	0.000108	1257.97	0.7853	-0.000002	0.617						998.2041
		20	0.2600	1296.10	(90)	0.000116	0.000121	1294.13	1.9740	-0.000005	3.897						998.2041
	0.0005	25	0.0001	997.10	(49)	0.000006	-0.000001	997.11	-0.0004	0.000007	0.000					1.00006	997.0449
	0.000587	25	0.0001	997.12	(6)	-0.000129	-0.000001	997.12	0.0090	-0.000128	0.000					1.00008	997.0449
	0.000979	25	0.0001	997.17	(6)	-0.000100	-0.000001	997.16	0.0116	-0.000099	0.000					1.00013	997.0449
0.00099		25	0.0001	997.17	(13)	-0.000077	-0.000001	997.16	0.0091	-0.000076	0.000			0.128			997.0449
	0.001	25	0.0001	997.16	(49)	0.000006	-0.000001	997.17	-0.0009	0.000007	0.000					1.00012	997.0449
	0.001442	25	0.0002	997.24	(6)	-0.000149	-0.000001	997.22	0.0257	-0.000148	0.001					1.0002	997.0449
	0.001949	25	0.0002	997.31	(6)	-0.000148	-0.000001	997.28	0.0344	-0.000147	0.001					1.00027	997.0449
	0.0025	25	0.0003	997.35	(49)	-0.000027	-0.000001	997.35	0.0079	-0.000026	0.000					1.00031	997.0449
	0.00258	25	0.0003	997.39	(6)	-0.000124	-0.000001	997.36	0.0381	-0.000123	0.001					1.00035	997.0449
0.00277		25	0.0003	997.39	(88)	-0.000035	-0.000001	997.38	0.0112	-0.000034	0.000			0.344			997.0449
	0.003388	25	0.0004	997.51	(6)	-0.000149	-0.000001	997.45	0.0604	-0.000149	0.004					1.00047	997.0449
	0.004225	25	0.0005	997.62	(6)	-0.000137	-0.000001	997.55	0.0693	-0.000137	0.005					1.00058	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Relative density	Density of water / kg/m³
	0.005	25	0.0006	997.66	(49)	-0.000027	-0.000001	997.65	0.0158	-0.000026	0.000					1.00062	997.0449
	0.005171	25	0.0006	997.75	(6)	-0.000138	-0.000001	997.67	0.0850	-0.000137	0.007					1.00071	997.0449
0.00549		25	0.0007	997.73	(13)	-0.000044	-0.000001	997.70	0.0286	-0.000043	0.001			0.688			997.0449
0.00972		25	0.0012	998.20	(27)	0.000010	-0.000001	998.21	-0.0121	0.000010	0.000						997.0449
0.00997		25	0.0012	998.28	(88)	-0.000031	0.000000	998.24	0.0368	-0.000031	0.001			1.234			997.0449
	0.01	25	0.0012	998.28	(49)	-0.000027	0.000000	998.25	0.0320	-0.000027	0.001					1.00124	997.0449
0.01177		25	0.0014	998.50	(13)	-0.000032	0.000000	998.46	0.0448	-0.000032	0.002			1.458			997.0449
0.01731		25	0.0021	999.17	(88)	-0.000025	0.000000	999.12	0.0523	-0.000025	0.003			2.13			997.0449
	0.02	25	0.0024	999.51	(49)	-0.000023	0.000000	999.45	0.0555	-0.000023	0.003					1.00247	997.0449
0.02231		25	0.0027	999.79	(13)	-0.000024	0.000000	999.72	0.0649	-0.000024	0.004			2.742			997.0449
0.02472		25	0.0030	1000.07	(88)	-0.000021	0.000000	1000.01	0.0642	-0.000022	0.004			3.03			997.0449
0.025		25	0.0030	1000.10	(52)	-0.000018	0.000000	1000.04	0.0557	-0.000019	0.003						997.0449
0.02786		25	0.0033	1000.47	(13)	-0.000025	0.000001	1000.39	0.0841	-0.000025	0.007			3.426			997.0449
0.03855		25	0.0046	1001.77	(13)	-0.000021	0.000001	1001.67	0.1047	-0.000023	0.011			4.726			997.0449
0.03855		25	0.0046	1001.77	(13)	-0.000022	0.000001	1001.67	0.1057	-0.000023	0.011			4.727			997.0449
	0.04	25	0.0048	1001.95	(49)	-0.000019	0.000001	1001.85	0.0970	-0.000020	0.009					1.00492	997.0449
0.0497		25	0.0059	1003.09	(88)	-0.000013	0.000002	1003.00	0.0910	-0.000015	0.008			6.045			997.0449
0.05		25	0.0060	1003.20	(45)	-0.000026	0.000002	1003.03	0.1653	-0.000027	0.027						997.0449
	0.05	25	0.0060	1003.16	(49)	-0.000015	0.000002	1003.05	0.1050	-0.000017	0.011					1.00613	997.0449
0.07019		25	0.0084	1005.57	(13)	-0.000012	0.000003	1005.44	0.1277	-0.000015	0.016			8.526			997.0449
0.07019		25	0.0084	1005.57	(13)	-0.000012	0.000003	1005.44	0.1297	-0.000015	0.017			8.528			997.0449
0.09722		25	0.0116	1008.60	(27)	0.000010	0.000005	1008.66	-0.0586	0.000005	0.003						997.0449
0.09903		25	0.0118	1008.96	(88)	-0.000002	0.000005	1008.87	0.0843	-0.000007	0.007			11.913			997.0449
0.1		25	0.0119	1009.16	(45)	-0.000009	0.000005	1008.99	0.1712	-0.000014	0.029						997.0449
	0.1	25	0.0119	1009.14	(49)	-0.000005	0.000005	1009.02	0.1158	-0.000010	0.013					1.01213	997.0449
0.11669		25	0.0139	1011.09	(13)	-0.000003	0.000006	1010.97	0.1246	-0.000009	0.016			14.048			997.0449
0.1201		25	0.0143	1011.50	(13)	-0.000003	0.000006	1011.37	0.1316	-0.000009	0.017			14.459			997.0449
0.1201		25	0.0143	1011.51	(13)	-0.000003	0.000006	1011.37	0.1356	-0.000009	0.018			14.463			997.0449
0.14931		25	0.0177	1014.88	(88)	0.000005	0.000008	1014.83	0.0520	-0.000003	0.003			17.833			997.0449
0.177		25	0.0209	1018.20	(52)	0.000004	0.000009	1018.09	0.1114	-0.000005	0.012						997.0449
0.19444		25	0.0229	1020.10	(27)	0.000012	0.000010	1020.14	-0.0380	0.000002	0.001						997.0449
0.19904		25	0.0234	1020.67	(88)	0.000011	0.000011	1020.68	-0.0060	0.000000	0.000			23.627			997.0449
	0.2	25	0.0236	1020.84	(49)	0.000012	0.000011	1020.87	-0.0222	0.000001	0.000					1.02387	997.0449
0.21211		25	0.0249	1022.29	(13)	0.000008	0.000011	1022.21	0.0808	-0.000003	0.007			25.246			997.0449
0.21211		25	0.0249	1022.30	(13)	0.000008	0.000011	1022.21	0.0878	-0.000003	0.008			25.253			997.0449
0.23758		25	0.0278	1025.23	(13)	0.000011	0.000013	1025.19	0.0437	-0.000001	0.002			28.188			997.0449
0.24722		25	0.0289	1026.34	(88)	0.000012	0.000013	1026.31	0.0276	-0.000001	0.001			29.297			997.0449
0.29165		25	0.0339	1031.50	(27)	0.000015	0.000016	1031.48	0.0168	0.000000	0.000						997.0449
0.3639		25	0.0420	1038.80	(52)	0.000042	0.000020	1039.83	-1.0300	0.000023	1.061						997.0449
0.39375		25	0.0453	1043.18	(13)	0.000023	0.000021	1043.26	-0.0805	0.000002	0.006			46.132			997.0449
0.39375		25	0.0453	1043.18	(13)	0.000023	0.000021	1043.26	-0.0745	0.000002	0.006			46.138			997.0449
0.5		25	0.0568	1055.02	(45)	0.000032	0.000027	1055.36	-0.3378	0.000005	0.114						997.0449
0.64325		25	0.0719	1071.13	(13)	0.000038	0.000034	1071.43	-0.2950	0.000004	0.087			74.089			997.0449
0.88167		25	0.0960	1097.09	(13)	0.000050	0.000046	1097.57	-0.4823	0.000004	0.233			100.043			997.0449
0.88167		25	0.0960	1097.09	(13)	0.000050	0.000046	1097.57	-0.4763	0.000004	0.227			100.049			997.0449
0.8848		25	0.0963	1097.50	(52)	0.000049	0.000046	1097.91	-0.4084	0.000004	0.167						997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Relative density	Density of water / kg/m³
1		25	0.1074	1109.26	(45)	0.000059	0.000051	1110.27	-1.0083	0.000008	1.017						997.0449
1.2332		25	0.1293	1134.26	(13)	0.000064	0.000061	1134.77	-0.5051	0.000003	0.255			137.220			997.0449
1.2332		25	0.1293	1134.27	(13)	0.000064	0.000061	1134.77	-0.5021	0.000003	0.252			137.223			997.0449
1.35795		25	0.1405	1147.12	(13)	0.000069	0.000066	1147.60	-0.4749	0.000003	0.226			150.078			997.0449
1.35795		25	0.1405	1147.13	(13)	0.000069	0.000066	1147.60	-0.4709	0.000003	0.222			150.082			997.0449
1.424		25	0.1463	1153.88	(13)	0.000071	0.000069	1154.31	-0.4363	0.000002	0.190			156.831			997.0449
1.424		25	0.1463	1153.89	(13)	0.000071	0.000069	1154.31	-0.4243	0.000002	0.180			156.843			997.0449
1.48251		25	0.1514	1159.78	(13)	0.000074	0.000072	1160.22	-0.4309	0.000002	0.186			162.740			997.0449
1.48251		25	0.1514	1159.79	(13)	0.000074	0.000072	1160.22	-0.4229	0.000002	0.179			162.748			997.0449
1.5		25	0.1530	1160.97	(45)	0.000077	0.000072	1161.97	-1.0024	0.000005	1.005						997.0449
2		25	0.1940	1209.14	(45)	0.000096	0.000091	1210.67	-1.5287	0.000005	2.337						997.0449
2.5		25	0.2313	1256.82	(45)	0.000107	0.000108	1256.55	0.2675	-0.000001	0.072						997.0449
		30	0.0001	995.71	(49)	0.000006	0.000004	995.71	-0.0001	0.000002	0.000					1.00006	995.6473
		30	0.0001	995.78	(49)	-0.000077	0.000004	995.77	0.0097	-0.000081	0.000					1.00013	995.6473
		30	0.0003	995.96	(49)	-0.000027	0.000004	995.95	0.0093	-0.000031	0.000					1.00031	995.6473
		30	0.0006	996.26	(49)	-0.000027	0.000004	996.25	0.0187	-0.000031	0.000					1.00062	995.6473
		30	0.0012	996.88	(49)	-0.000027	0.000004	996.84	0.0379	-0.000032	0.001					1.00124	995.6473
		30	0.0024	998.10	(49)	-0.000019	0.000005	998.04	0.0573	-0.000024	0.003					1.00246	995.6473
		30	0.0048	1000.52	(49)	-0.000013	0.000006	1000.43	0.0903	-0.000019	0.008					1.00489	995.6473
0.05		30	0.0060	1001.76	(45)	-0.000020	0.000007	1001.60	0.1603	-0.000027	0.026						995.6473
		30	0.0060	1001.71	(49)	-0.000009	0.000007	1001.62	0.0940	-0.000016	0.009					1.00609	995.6473
0.1		30	0.0119	1007.69	(45)	-0.000005	0.000010	1007.52	0.1721	-0.000014	0.030						995.6473
		30	0.0119	1007.62	(49)	0.000004	0.000010	1007.55	0.0726	-0.000006	0.005					1.01203	995.6473
		30	0.020	1015.80	(90)	0.000008	0.000013	1015.69	0.1087	-0.000005	0.012						995.6473
		30	0.0236	1019.17	(49)	0.000021	0.000015	1019.33	-0.1535	0.000006	0.024					1.02363	995.6473
		30	0.0400	1036.20	(90)	0.000022	0.000023	1036.16	0.0430	-0.000001	0.002						995.6473
0.5		30	0.0568	1053.37	(45)	0.000035	0.000030	1053.65	-0.2816	0.000004	0.079						995.6473
		30	0.0800	1078.20	(90)	0.000043	0.000041	1078.39	-0.1871	0.000002	0.035						995.6473
1		30	0.1074	1107.46	(45)	0.000061	0.000054	1108.39	-0.9334	0.000007	0.871						995.6473
		30	0.1200	1122.00	(90)	0.000062	0.000059	1122.41	-0.4059	0.000003	0.165						995.6473
1.5		30	0.1530	1159.04	(45)	0.000079	0.000074	1160.06	-1.0206	0.000005	1.042						995.6473
		30	0.1600	1167.90	(90)	0.000079	0.000077	1168.28	-0.3824	0.000002	0.146						995.6473
2		30	0.1940	1207.17	(45)	0.000097	0.000092	1208.84	-1.6714	0.000006	2.794						995.6473
		30	0.2000	1215.90	(90)	0.000095	0.000094	1216.09	-0.1862	0.000001	0.035						995.6473
2.5		30	0.2313	1254.81	(45)	0.000108	0.000107	1254.92	-0.1105	0.000000	0.012						995.6473
		30	0.2600	1292.20	(90)	0.000118	0.000119	1291.56	0.6433	-0.000001	0.414						995.6473
		35	0.0001	994.09	(49)	0.000006	0.000008	994.09	0.0001	-0.000002	0.000					1.00006	994.0319
0.00099		35	0.0001	994.15	(13)	0.000029	0.000008	994.15	-0.0025	0.000021	0.000			0.115			994.0319
		35	0.0001	994.15	(49)	0.000006	0.000008	994.15	0.0003	-0.000002	0.000					1.00012	994.0319
		35	0.0003	994.34	(49)	-0.000027	0.000009	994.33	0.0107	-0.000036	0.000					1.00031	994.0319
		35	0.0006	994.65	(49)	-0.000027	0.000009	994.63	0.0214	-0.000036	0.000					1.00062	994.0319
0.00549		35	0.0007	994.71	(13)	-0.000028	0.000009	994.68	0.0237	-0.000036	0.001			0.675			994.0319
		35	0.0012	995.25	(49)	-0.000019	0.000009	995.22	0.0332	-0.000028	0.001					1.00123	994.0319
0.01177		35	0.0014	995.48	(13)	-0.000025	0.000009	995.43	0.0483	-0.000034	0.002			1.444			994.0319
		35	0.0024	996.47	(49)	-0.000015	0.000009	996.41	0.0579	-0.000024	0.003					1.00245	994.0319
0.02231		35	0.0027	996.75	(13)	-0.000018	0.000010	996.68	0.0739	-0.000028	0.005			2.718			994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Relative density	Density of water / kg/m³
0.02786		35	0.0033	997.43	(13)	-0.000020	0.000010	997.33	0.0982	-0.000030	0.010			3.399			994.0319
0.03855		35	0.0046	998.74	(13)	-0.000020	0.000010	998.60	0.1394	-0.000030	0.019			4.704			994.0319
		35	0.0048	998.86	(49)	-0.000006	0.000011	998.78	0.0815	-0.000017	0.007					1.00486	994.0319
0.05		35	0.0060	1000.14	(45)	-0.000021	0.000011	999.95	0.1915	-0.000032	0.037						994.0319
		35	0.0060	1000.05	(49)	-0.000002	0.000011	999.97	0.0803	-0.000013	0.006					1.00605	994.0319
0.07019		35	0.0084	1002.48	(13)	-0.000006	0.000012	1002.33	0.1555	-0.000018	0.024			8.452			994.0319
0.1		35	0.0119	1006.05	(45)	-0.000004	0.000014	1005.83	0.2177	-0.000018	0.047						994.0319
		35	0.0119	1005.89	(49)	0.000012	0.000014	1005.87	0.0242	-0.000002	0.001					1.01193	994.0319
0.11669		35	0.0139	1007.99	(13)	0.000000	0.000015	1007.79	0.2028	-0.000014	0.041			13.960			994.0319
0.1201		35	0.0143	1008.35	(13)	0.000003	0.000015	1008.19	0.1645	-0.000011	0.027			14.321			994.0319
		35	0.0236	1017.26	(49)	0.000032	0.000019	1017.58	-0.3149	0.000013	0.099					1.02337	994.0319
0.23758		35	0.0278	1022.03	(13)	0.000015	0.000021	1021.85	0.1748	-0.000006	0.031			27.997			994.0319
0.39375		35	0.0453	1039.80	(13)	0.000027	0.000029	1039.75	0.0565	-0.000001	0.003			45.770			994.0319
0.5		35	0.0568	1051.60	(45)	0.000036	0.000034	1051.74	-0.1409	0.000002	0.020						994.0319
0.64325		35	0.0719	1067.58	(13)	0.000042	0.000040	1067.69	-0.1105	0.000001	0.012			73.548			994.0319
0.88167		35	0.0960	1093.36	(13)	0.000053	0.000051	1093.68	-0.3157	0.000003	0.100			99.331			994.0319
1		35	0.1074	1105.55	(45)	0.000062	0.000056	1106.32	-0.7730	0.000006	0.598						994.0319
1.2332		35	0.1293	1130.31	(13)	0.000068	0.000065	1130.76	-0.4485	0.000003	0.201			136.281			994.0319
1.35795		35	0.1405	1143.14	(13)	0.000072	0.000070	1143.58	-0.4379	0.000002	0.192			149.108			994.0319
1.424		35	0.1463	1149.86	(13)	0.000074	0.000072	1150.29	-0.4274	0.000002	0.183			155.833			994.0319
1.48251		35	0.1514	1155.69	(13)	0.000077	0.000074	1156.20	-0.5056	0.000002	0.256			161.662			994.0319
1.5		35	0.1530	1157.05	(45)	0.000079	0.000075	1157.96	-0.9079	0.000004	0.824						994.0319
2		35	0.1940	1205.12	(45)	0.000098	0.000092	1206.82	-1.7042	0.000006	2.904						994.0319
2.5		35	0.2313	1252.87	(45)	0.000108	0.000107	1253.10	-0.2259	0.000001	0.051						994.0319
0.025		40	0.0030	995.20	(52)	0.000001	0.000014	995.16	0.0392	-0.000013	0.002						992.2158
		40	0.020	1012.30	(90)	0.000008	0.000021	1012.03	0.2670	-0.000013	0.071						992.2158
0.177		40	0.0209	1013.10	(52)	0.000012	0.000021	1012.90	0.2022	-0.000009	0.041						992.2158
		40	0.0400	1032.60	(90)	0.000022	0.000030	1032.30	0.3038	-0.000007	0.092						992.2158
0.3639		40	0.0420	1033.40	(52)	0.000051	0.000030	1034.31	-0.9144	0.000020	0.836						992.2158
		40	0.0800	1074.30	(90)	0.000045	0.000046	1074.21	0.0931	-0.000001	0.009						992.2158
0.8848		40	0.0963	1091.60	(52)	0.000055	0.000053	1091.79	-0.1884	0.000002	0.035						992.2158
		40	0.1200	1117.90	(90)	0.000064	0.000063	1118.05	-0.1453	0.000001	0.021						992.2158
		40	0.1600	1163.70	(90)	0.000080	0.000079	1163.91	-0.2140	0.000001	0.046						992.2158
		40	0.2000	1211.70	(90)	0.000095	0.000094	1211.92	-0.2214	0.000001	0.049						992.2158
		40	0.2600	1287.90	(90)	0.000118	0.000117	1288.19	-0.2947	0.000001	0.087						992.2158
		42.5	0.0001	991.30	(49)	0.000006	0.000014	991.30	0.0005	-0.000008	0.000					1.00006	991.237
		42.5	0.0001	991.36	(49)	0.000006	0.000014	991.35	0.0010	-0.000008	0.000					1.00012	991.237
		42.5	0.0003	991.54	(49)	-0.000027	0.000015	991.53	0.0124	-0.000042	0.000					1.00031	991.237
		42.5	0.0006	991.84	(49)	-0.000011	0.000015	991.83	0.0150	-0.000025	0.000					1.00061	991.237
		42.5	0.0012	992.45	(49)	-0.000011	0.000015	992.42	0.0303	-0.000025	0.001					1.00122	991.237
		42.5	0.0024	993.64	(49)	-0.000002	0.000015	993.59	0.0420	-0.000018	0.002					1.00242	991.237
		42.5	0.0048	995.99	(49)	0.000006	0.000016	995.95	0.0495	-0.000010	0.002					1.0048	991.237
		42.5	0.0060	997.15	(49)	0.000011	0.000017	997.12	0.0353	-0.000006	0.001					1.00597	991.237
		42.5	0.0119	1002.88	(49)	0.000027	0.000019	1002.97	-0.0872	0.000007	0.008					1.01175	991.237
		42.5	0.0236	1013.97	(49)	0.000050	0.000024	1014.59	-0.6237	0.000026	0.389					1.02293	991.237
0.00972		45	0.0012	991.20	(27)	0.000150	0.000017	991.35	-0.1527	0.000133	0.023						990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Relative density	Density of water / kg/m³
0.05		45	0.0060	996.31	(45)	-0.000023	0.000019	996.06	0.2475	-0.000042	0.061						990.2132
0.09722		45	0.0116	1001.60	(27)	0.000017	0.000021	1001.56	0.0412	-0.000004	0.002						990.2132
0.1		45	0.0119	1002.21	(45)	-0.000006	0.000021	1001.88	0.3285	-0.000028	0.108						990.2132
0.19444		45	0.0229	1012.90	(27)	0.000021	0.000026	1012.79	0.1091	-0.000005	0.012						990.2132
0.29165		45	0.0339	1024.20	(27)	0.000022	0.000030	1023.91	0.2903	-0.000008	0.084						990.2132
0.5		45	0.0568	1047.58	(45)	0.000036	0.000039	1047.37	0.2118	-0.000003	0.045						990.2132
1		45	0.1074	1101.38	(45)	0.000061	0.000059	1101.65	-0.2749	0.000002	0.076						990.2132
1.5		45	0.1530	1152.67	(45)	0.000079	0.000077	1153.24	-0.5666	0.000003	0.321						990.2132
2		45	0.1940	1200.59	(45)	0.000098	0.000092	1202.27	-1.6833	0.000006	2.834						990.2132
2.5		45	0.2313	1248.60	(45)	0.000106	0.000106	1248.92	-0.3192	0.000001	0.102						990.2132
0.002439		50	0.0003	988.34	(72)	-0.000048	0.000020	988.32	0.0195	-0.000068	0.000			0.3039			988.0363
0.006453		50	0.0008	988.83	(72)	-0.000040	0.000020	988.79	0.0454	-0.000060	0.002			0.7978			988.0363
0.013103		50	0.0016	989.64	(72)	-0.000029	0.000020	989.56	0.0763	-0.000049	0.006			1.6036			988.0363
0.018164		50	0.0022	990.25	(72)	-0.000024	0.000020	990.15	0.0948	-0.000044	0.009			2.2115			988.0363
0.026523		50	0.0032	991.25	(72)	-0.000018	0.000021	991.13	0.1220	-0.000039	0.015			3.2115			988.0363
0.0401		50	0.0048	992.87	(72)	-0.000013	0.000021	992.70	0.1630	-0.000034	0.027			4.8309			988.0363
0.064372		50	0.0077	995.74	(72)	-0.000007	0.000023	995.52	0.2225	-0.000029	0.050			7.7068			988.0363
0.10706		50	0.0127	1000.76	(72)	0.000001	0.000025	1000.46	0.3008	-0.000024	0.090			12.7219			988.0363
		50	0.020	1008.10	(90)	0.000005	0.000027	1007.64	0.4555	-0.000022	0.208						988.0363
0.17204		50	0.0203	1008.31	(72)	0.000009	0.000027	1007.93	0.3768	-0.000018	0.142			20.2727			988.0363
0.24497		50	0.0286	1016.67	(72)	0.000017	0.000031	1016.26	0.4099	-0.000014	0.168			28.6377			988.0363
		50	0.0400	1028.30	(90)	0.000021	0.000035	1027.72	0.5786	-0.000014	0.335						988.0363
0.35275		50	0.0407	1028.88	(72)	0.000026	0.000035	1028.47	0.4079	-0.000009	0.166			40.8393			988.0363
0.44699		50	0.0511	1039.37	(72)	0.000033	0.000039	1039.03	0.3398	-0.000006	0.115			51.3353			988.0363
0.58829		50	0.0661	1054.91	(72)	0.000042	0.000045	1054.69	0.2216	-0.000003	0.049			66.873			988.0363
0.72061		50	0.0798	1069.24	(72)	0.000049	0.000050	1069.15	0.0856	-0.000001	0.007			81.201			988.0363
		50	0.0800	1070.00	(90)	0.000043	0.000050	1069.34	0.6593	-0.000007	0.435						988.0363
0.88872		50	0.0966	1087.17	(72)	0.000057	0.000056	1087.26	-0.0852	0.000001	0.007			99.1366			988.0363
		50	0.1200	1113.50	(90)	0.000062	0.000065	1113.02	0.4820	-0.000003	0.232						988.0363
		50	0.1600	1159.20	(90)	0.000078	0.000080	1158.89	0.3128	-0.000001	0.098						988.0363
		50	0.2000	1207.20	(90)	0.000093	0.000094	1207.09	0.1067	0.000000	0.011						988.0363
		50	0.2600	1283.60	(90)	0.000116	0.000115	1284.13	-0.5316	0.000001	0.283						988.0363
0.05		55	0.0060	991.78	(45)	-0.000026	0.000025	991.48	0.2979	-0.000051	0.089						985.6952
0.1		55	0.0119	997.65	(45)	-0.000008	0.000027	997.24	0.4086	-0.000035	0.167						985.6952
0.5		55	0.0568	1042.88	(45)	0.000035	0.000043	1042.34	0.5407	-0.000009	0.292						985.6952
1		55	0.1074	1096.66	(45)	0.000059	0.000061	1096.36	0.3034	-0.000002	0.092						985.6952
1.5		55	0.1530	1147.93	(45)	0.000077	0.000077	1147.89	0.0354	0.000000	0.001						985.6952
2		55	0.1940	1195.85	(45)	0.000096	0.000091	1197.10	-1.2460	0.000004	1.552						985.6952
2.5		55	0.2313	1243.81	(45)	0.000104	0.000104	1244.10	-0.2867	0.000001	0.082						985.6952
0.025		60	0.0030	986.30	(52)	-0.000049	0.000026	986.08	0.2191	-0.000075	0.048						983.1989
		60	0.020	1003.20	(90)	0.000003	0.000032	1002.61	0.5868	-0.000029	0.344						983.1989
0.177		60	0.0209	1003.90	(52)	0.000012	0.000033	1003.46	0.4384	-0.000021	0.192						983.1989
		60	0.0400	1023.40	(90)	0.000018	0.000039	1022.52	0.8821	-0.000021	0.778						983.1989
0.3639		60	0.0420	1024.20	(52)	0.000047	0.000040	1024.50	-0.3035	0.000007	0.092						983.1989
		60	0.0800	1065.00	(90)	0.000041	0.000053	1063.87	1.1319	-0.000012	1.281						983.1989
0.8848		60	0.0963	1082.20	(52)	0.000050	0.000059	1081.29	0.9095	-0.000008	0.827						983.1989

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Relative density	Density of water / kg/m³
		60	0.1200	1108.30	(90)	0.000060	0.000067	1107.40	0.9022	-0.000006	0.814						983.1989
0.00972		65	0.0012	981.70	(27)	0.000002	0.000028	981.67	0.0295	-0.000026	0.001						980.5548
0.09722		65	0.0116	992.00	(27)	0.000003	0.000032	991.67	0.3291	-0.000029	0.108						980.5548
0.19444		65	0.0229	1003.20	(27)	0.000013	0.000035	1002.69	0.5081	-0.000022	0.258						980.5548
0.29165		65	0.0339	1014.50	(27)	0.000014	0.000039	1013.62	0.8821	-0.000025	0.778						980.5548
0.00972		75	0.0012	976.20	(27)	-0.000189	0.000032	975.95	0.2461	-0.000221	0.061						974.849
0.025		75	0.0030	978.20	(52)	-0.000145	0.000033	977.69	0.5109	-0.000178	0.261						974.849
0.09722		75	0.0116	986.40	(27)	-0.000013	0.000035	985.86	0.5389	-0.000048	0.290						974.849
0.1773		75	0.0209	996.40	(52)	-0.000036	0.000038	994.87	1.5333	-0.000074	2.351						974.849
0.19444		75	0.0229	997.60	(27)	0.000003	0.000039	996.79	0.8134	-0.000036	0.662						974.849
0.29165		75	0.0339	1008.90	(27)	0.000005	0.000042	1007.63	1.2748	-0.000037	1.625						974.849
0.3546		75	0.0409	1015.70	(52)	0.000018	0.000044	1014.60	1.1014	-0.000026	1.213						974.849
0.8865		75	0.0964	1074.80	(52)	0.000037	0.000060	1072.13	2.6656	-0.000024	7.105						974.849
		80	0.0200	991.60	(90)	0.000002	0.000039	990.86	0.7400	-0.000038	0.548						971.7978
		80	0.0400	1011.80	(90)	0.000012	0.000045	1010.45	1.3490	-0.000033	1.820						971.7978
		80	0.0800	1053.40	(90)	0.000033	0.000056	1051.31	2.0915	-0.000024	4.374						971.7978
		80	0.1200	1096.80	(90)	0.000052	0.000067	1094.56	2.2380	-0.000016	5.009						971.7978
0.00972		100	0.0012	959.80	(27)	-0.000293	0.000038	959.44	0.3562	-0.000331	0.127		!				958.3637
0.0251		100	0.0030	961.80	(52)	-0.000194	0.000039	961.15	0.6484	-0.000233	0.420						958.3637
0.09722		100	0.0116	970.20	(27)	-0.000057	0.000041	969.14	1.0635	-0.000098	1.131						958.3637
0.1778		100	0.0210	980.20	(52)	-0.000066	0.000043	978.01	2.1865	-0.000109	4.781						958.3637
0.19444		100	0.0229	981.60	(27)	-0.000037	0.000043	979.84	1.7592	-0.000080	3.095						958.3637
0.29165		100	0.0339	992.70	(27)	-0.000021	0.000046	990.48	2.2239	-0.000067	4.946						958.3637
0.3556		100	0.0410	999.60	(52)	-0.000005	0.000048	997.44	2.1641	-0.000053	4.683						958.3637
0.00972		125	0.0012	940.50	(27)	-0.000404	0.000040	940.04	0.4590	-0.000444	0.211		!				938.9841
0.0253		125	0.0030	943.00	(52)	-0.000429	0.000041	941.73	1.2660	-0.000470	1.603		!				938.9841
0.09722		125	0.0116	951.00	(27)	-0.000098	0.000042	949.53	1.4692	-0.000141	2.158						938.9841
0.1778		125	0.0210	961.30	(52)	-0.000115	0.000044	958.23	3.0685	-0.000159	9.415						938.9841
0.19444		125	0.0229	962.40	(27)	-0.000068	0.000045	960.02	2.3763	-0.000112	5.647						938.9841
0.29165		125	0.0339	973.70	(27)	-0.000054	0.000047	970.46	3.2378	-0.000101	10.483	!					938.9841
0.3577		125	0.0413	981.00	(52)	-0.000040	0.000048	977.52	3.4754	-0.000088	12.078	!					938.9841
0.894		125	0.0972	1040.80	(52)	-0.000007	0.000058	1033.99	6.8128	-0.000065	46.414	!					938.9841
Average Res									0.1689	-0.000026	197.423	Sum chi sqr					
Std dev Res									0.7547	0.000053							
Avg - 4std									-2.8501	-0.000236							
Avg + 4std									3.1879	0.000185							

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0 3.94E-07
c1 1.44E-06
c2 -0.053722
c3 0.002062
c4 4563.25
Min T 0

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Apparent molal volume / cm³/mol	Relative density	Density of water / kg/m³
Max T		125															
Min w		0.000															
Max w		0.260															
Avg dens res		0.16889															
Std dens res		0.754745															
Avg app vol res *10³		-0.02575															
Std app vol res *10³		0.052589															
No of points in corr		331															
No of inconsistent poin		17															
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)																	
		0	0.2600	1303.2	(90)	0.000105	0.000121	1296.12	7.0756	-0.000016	50.064	!					999.8395
0.0625		35	0.0075	993.60	(74)	0.001064	0.000012	1001.42	-7.8194	0.001052	61.143	!	!		128.1		994.0319
0.125		35	0.0148	993.00	(74)	0.001077	0.000015	1008.76	-15.7630	0.001062	248.471	!	!		129.6		994.0319
0.25		35	0.0292	991.66	(74)	0.001088	0.000022	1023.29	-31.6242	0.001067	1000.093	!	!		131		994.0319
0.5		35	0.0568	988.56	(74)	0.001104	0.000034	1051.74	-63.1763	0.001070	3991.243	!	!		132.9		994.0319
1		35	0.1074	982.36	(74)	0.001117	0.000056	1106.32	-123.9678	0.001062	15368.024	!	!		134.5		994.0319
0.0625		40	0.0075	991.74	(74)	0.001073	0.000016	999.56	-7.8286	0.001058	61.288	!	!		129.2		992.2158
0.125		40	0.0148	991.08	(74)	0.001086	0.000019	1006.86	-15.7821	0.001067	249.073	!	!		130.7		992.2158
0.25		40	0.0292	989.65	(74)	0.001097	0.000025	1021.31	-31.6662	0.001072	1002.745	!	!		132.1		992.2158
0.5		40	0.0568	986.41	(74)	0.001112	0.000037	1049.64	-63.2308	0.001076	3998.138	!	!		133.9		992.2158
1		40	0.1074	979.91	(74)	0.001126	0.000058	1104.07	-124.1587	0.001068	15415.385	!	!		135.5		992.2158
0.0625		50	0.0075	987.54	(74)	0.001081	0.000022	995.30	-7.7674	0.001058	60.333	!	!		130.1		988.0363
0.125		50	0.0148	986.85	(74)	0.001094	0.000025	1002.53	-15.6738	0.001069	245.669	!	!		131.7		988.0363
0.25		50	0.0292	985.38	(74)	0.001106	0.000031	1016.84	-31.4614	0.001075	989.821	!	!		133.1		988.0363
0.5		50	0.0568	982.01	(74)	0.001121	0.000041	1044.93	-62.9176	0.001080	3958.620	!	!		135		988.0363
1		50	0.1074	975.34	(74)	0.001135	0.000060	1099.08	-123.7413	0.001074	15311.905	!	!		136.6		988.0363
0.889		100	0.0967	1059.1	(52)	0.000017	0.000061	1054.38	4.7191	-0.000044	22.270	!					958.3637

Density of aqueous solutions of **MnCl2**

- References (37) Herrington, Thelma M.; Roffey, Michael G.; Smith, David P.; Densities of Aqueous Electrolytes MnCl₂, CoCl₂, NiCl₂, ZnCl₂ and CdCl₂ from 25 to 72°C at 1 atm, *J. Chem. Eng. Data*, **1986**, 31, 221-225
- (40) Herz, W. Internal Friction of Salt Solutions (C. A. Trans. from German). *Z. Anorg. Chemie* **1914**, 89, 393-396.
- (92) Phang, S. The Density, Viscosity, and Transference Number of Aqueous Manganese Chloride at 298.15 K. *Aust. J. Chem.* **1980**, 33, 413-417.
- (97) Pogue, R. F.; Atkinson, G. Solution Thermodynamics of First-Row Transition Elements. 2. Apparent Molal Volumes of Aqueous MnCl₂, Mn(ClO₄)₂, CoCl₂, Co(ClO₄)₂, FeCl₂, and Fe(ClO₄)₂, from 15 to 55°C. *J. Chem. Eng. Data* **1989**, 34, 227-232.
- (104) Rard, J. A.; Miller, D. G. Densities and Apparent Molal Volumes of Aqueous Manganese, Cadmium, and Zinc Chlorides at 25 °C. *J. Chem. Eng. Data* **1984**, 29, 151-156.
- (128) Torók, T. I.; Berecz, E. Volumetric Properties and Electrolytic Conductances of Aqueous Ternary Mixtures of Hydrogen Chloride and some Transition Metal Chlorides at 25°C. *J. Sol. Chem.* **1989**, 18, 1117-1131.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density / 1000(rhor-1)	Density of water / kg/m³
0.00971		15	0.0012	1000.14	(97)	0.000149	0.000181	1000.10	0.0389	-0.000032	0.002			1.04	999.0996
0.01972		15	0.0025	1001.21	(97)	0.000150	0.000181	1001.13	0.0776	-0.000031	0.006			2.11	999.0996
0.02927		15	0.0037	1002.23	(97)	0.000150	0.000181	1002.11	0.1146	-0.000031	0.013			3.13	999.0996
0.04979		15	0.0062	1004.39	(97)	0.000153	0.000181	1004.22	0.1749	-0.000028	0.031			5.3	999.0996
0.07421		15	0.0093	1006.98	(97)	0.000154	0.000182	1006.72	0.2589	-0.000028	0.067			7.89	999.0996
0.1005		15	0.0125	1009.74	(97)	0.000156	0.000182	1009.41	0.3267	-0.000026	0.107			10.65	999.0996
0.2028		15	0.0249	1020.37	(97)	0.000162	0.000184	1019.82	0.5456	-0.000021	0.298			21.29	999.0996
0.4018		15	0.0481	1040.72	(97)	0.000169	0.000186	1039.83	0.8923	-0.000017	0.796			41.66	999.0996
0.5992		15	0.0701	1060.47	(97)	0.000175	0.000189	1059.36	1.1184	-0.000014	1.251			61.43	999.0996
0.7945		15	0.0909	1079.62	(97)	0.000180	0.000191	1078.37	1.2478	-0.000012	1.557			80.59	999.0996
0.9978		15	0.1116	1099.14	(97)	0.000184	0.000194	1097.85	1.2936	-0.000010	1.673			100.13	999.0996
1.4979		15	0.1586	1145.62	(97)	0.000194	0.000200	1144.43	1.1870	-0.000006	1.409			146.65	999.0996
1.9854		15	0.1999	1189.05	(97)	0.000201	0.000204	1188.10	0.9456	-0.000003	0.894			190.12	999.0996
2.4993		15	0.2393	1233.00	(97)	0.000207	0.000209	1232.38	0.6190	-0.000002	0.383			234.11	999.0996
3.0071		15	0.2745	1274.78	(97)	0.000212	0.000213	1274.45	0.3305	-0.000001	0.109			275.93	999.0996
3.4336		15	0.3017	1308.65	(97)	0.000216	0.000216	1308.56	0.0903	0.000000	0.008			309.83	999.0996
0.5292		25	0.0624	1050.50	(37)	0.000186	0.000190	1050.18	0.3164	-0.000005	0.100				997.0449
0.8038		25	0.0919	1077.08	(37)	0.000192	0.000194	1076.83	0.2524	-0.000002	0.064				997.0449
1.0684		25	0.1185	1102.01	(37)	0.000197	0.000198	1101.92	0.0863	-0.000001	0.007				997.0449
1.3397		25	0.1443	1126.91	(37)	0.000202	0.000201	1127.08	-0.1741	0.000001	0.030				997.0449
1.6251		25	0.1698	1152.43	(37)	0.000206	0.000204	1152.95	-0.5170	0.000002	0.267				997.0449
1.9287		25	0.1953	1178.89	(37)	0.000211	0.000208	1179.80	-0.9094	0.000003	0.827				997.0449
2.2401		25	0.2199	1205.36	(37)	0.000215	0.000211	1206.66	-1.2986	0.000004	1.686				997.0449
2.5142		25	0.2404	1228.14	(37)	0.000218	0.000213	1229.75	-1.6068	0.000004	2.582				997.0449
2.8098		25	0.2612	1252.24	(37)	0.000221	0.000216	1254.08	-1.8438	0.000004	3.400				997.0449
3.1178		25	0.2818	1276.88	(37)	0.000223	0.000219	1278.84	-1.9610	0.000004	3.846				997.0449
	0.82	25	0.0956	1079.60	(40)	0.000201	0.000195	1080.28	-0.6762	0.000006	0.457				997.0449
	1.64	25	0.1778	1160.70	(40)	0.000208	0.000205	1161.28	-0.5801	0.000002	0.336				997.0449
	2.465	25	0.2502	1239.70	(40)	0.000218	0.000215	1241.16	-1.4618	0.000004	2.137				997.0449
	3.285	25	0.3138	1317.40	(40)	0.000226	0.000223	1319.00	-1.6020	0.000003	2.567				997.0449
0.1009		25	0.0125	1007.65	(92)	0.000161	0.000184	1007.36	0.2867	-0.000023	0.082				997.0449
0.1033		25	0.0128	1007.91	(92)	0.000160	0.000184	1007.61	0.3023	-0.000023	0.091				997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density / 1000(rho-r-1)	Density of water / kg/m³
0.2359		25	0.0288	1021.45	(92)	0.000172	0.000186	1021.03	0.4201	-0.000014	0.177				997.0449
0.4924		25	0.0583	1047.41	(92)	0.000176	0.000190	1046.57	0.8444	-0.000013	0.713				997.0449
0.9873		25	0.1105	1095.03	(92)	0.000191	0.000196	1094.29	0.7391	-0.000006	0.546				997.0449
1.61		25	0.1685	1151.69	(92)	0.000204	0.000204	1151.59	0.0962	0.000000	0.009				997.0449
2.016		25	0.2024	1187.13	(92)	0.000209	0.000208	1187.40	-0.2680	0.000001	0.072				997.0449
2.594		25	0.2461	1235.69	(92)	0.000216	0.000214	1236.37	-0.6836	0.000002	0.467				997.0449
3.083		25	0.2795	1277.04	(92)	0.000216	0.000218	1276.07	0.9662	-0.000002	0.933				997.0449
3.851		25	0.3264	1336.53	(92)	0.000223	0.000224	1335.43	1.1024	-0.000002	1.215				997.0449
4.444		25	0.3587	1380.10	(92)	0.000227	0.000229	1378.92	1.1849	-0.000002	1.404				997.0449
5.16		25	0.3937	1429.99	(92)	0.000232	0.000233	1428.90	1.0889	-0.000001	1.186				997.0449
5.271		25	0.3988	1437.38	(92)	0.000233	0.000234	1436.42	0.9643	-0.000001	0.930				997.0449
5.763		25	0.4204	1469.63	(92)	0.000236	0.000236	1469.00	0.6303	-0.000001	0.397				997.0449
0.00971		25	0.0012	998.07	(97)	0.000157	0.000182	998.04	0.0301	-0.000025	0.001			1.03	997.0449
0.01972		25	0.0025	999.13	(97)	0.000158	0.000182	999.07	0.0601	-0.000024	0.004			2.09	997.0449
0.02927		25	0.0037	1000.14	(97)	0.000158	0.000182	1000.05	0.0884	-0.000024	0.008			3.1	997.0449
0.04979		25	0.0062	1002.28	(97)	0.000162	0.000183	1002.15	0.1316	-0.000021	0.017			5.25	997.0449
0.07421		25	0.0093	1004.84	(97)	0.000162	0.000183	1004.64	0.1992	-0.000021	0.040			7.82	997.0449
0.1005		25	0.0125	1007.57	(97)	0.000164	0.000184	1007.32	0.2511	-0.000020	0.063			10.56	997.0449
0.2028		25	0.0249	1018.09	(97)	0.000170	0.000185	1017.69	0.3989	-0.000015	0.159			21.11	997.0449
0.4018		25	0.0481	1038.24	(97)	0.000176	0.000188	1037.61	0.6331	-0.000012	0.401			41.32	997.0449
0.5992		25	0.0701	1057.78	(97)	0.000182	0.000191	1057.03	0.7503	-0.000010	0.563			60.92	997.0449
0.7945		25	0.0909	1076.75	(97)	0.000186	0.000194	1075.94	0.8134	-0.000008	0.662			79.94	997.0449
0.9978		25	0.1116	1096.08	(97)	0.000191	0.000197	1095.28	0.7993	-0.000006	0.639			99.33	997.0449
1.4979		25	0.1586	1142.17	(97)	0.000199	0.000203	1141.50	0.6792	-0.000003	0.461			145.56	997.0449
1.9854		25	0.1999	1185.27	(97)	0.000206	0.000208	1184.74	0.5263	-0.000002	0.277			188.78	997.0449
2.4993		25	0.2393	1228.89	(97)	0.000212	0.000213	1228.50	0.3830	-0.000001	0.147			232.53	997.0449
3.0071		25	0.2745	1270.37	(97)	0.000217	0.000218	1270.01	0.3626	-0.000001	0.131			274.14	997.0449
3.4336		25	0.3017	1303.95	(97)	0.000221	0.000221	1303.61	0.3354	-0.000001	0.113			307.81	997.0449
0.044493		25	0.0056	1001.75	(104)	0.000157	0.000183	1001.61	0.1440	-0.000026	0.021				997.0449
0.090013		25	0.0112	1006.51	(104)	0.000161	0.000183	1006.25	0.2557	-0.000023	0.065				997.0449
0.16003		25	0.0197	1013.75	(104)	0.000166	0.000185	1013.37	0.3813	-0.000019	0.145				997.0449
0.24995		25	0.0305	1022.96	(104)	0.000170	0.000186	1022.44	0.5169	-0.000016	0.267				997.0449
0.36		25	0.0433	1034.09	(104)	0.000174	0.000188	1033.45	0.6356	-0.000014	0.404				997.0449
0.48896		25	0.0580	1046.95	(104)	0.000178	0.000190	1046.23	0.7232	-0.000011	0.523				997.0449
0.63661		25	0.0742	1061.46	(104)	0.000182	0.000192	1060.68	0.7807	-0.000009	0.610				997.0449
0.80898		25	0.0924	1078.15	(104)	0.000186	0.000194	1077.32	0.8257	-0.000008	0.682				997.0449
1.0001		25	0.1118	1096.34	(104)	0.000190	0.000197	1095.50	0.8409	-0.000006	0.707				997.0449
1.2102		25	0.1322	1115.94	(104)	0.000194	0.000199	1115.15	0.7947	-0.000005	0.632				997.0449
1.4407		25	0.1535	1137.04	(104)	0.000198	0.000202	1136.31	0.7333	-0.000004	0.538				997.0449
1.6897		25	0.1754	1159.36	(104)	0.000202	0.000205	1158.72	0.6432	-0.000003	0.414				997.0449
1.9607		25	0.1979	1183.12	(104)	0.000206	0.000208	1182.59	0.5290	-0.000002	0.280				997.0449
2.2507		25	0.2207	1207.98	(104)	0.000209	0.000211	1207.56	0.4190	-0.000001	0.176				997.0449
2.5608		25	0.2437	1234.01	(104)	0.000213	0.000214	1233.62	0.3883	-0.000001	0.151				997.0449
2.8911		25	0.2668	1261.02	(104)	0.000216	0.000217	1260.68	0.3425	-0.000001	0.117				997.0449
3.2733		25	0.2917	1291.40	(104)	0.000219	0.000220	1291.11	0.2863	-0.000001	0.082				997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density / 1000(rhor-1)	Density of water / kg/m³
3.6024		25	0.3119	1316.87	(104)	0.000222	0.000223	1316.60	0.2689	0.000000	0.072				997.0449
3.9183		25	0.3303	1340.80	(104)	0.000224	0.000225	1340.46	0.3375	-0.000001	0.114				997.0449
4.4054		25	0.3567	1376.35	(104)	0.000228	0.000228	1376.14	0.2065	0.000000	0.043				997.0449
4.8581		25	0.3794	1408.29	(104)	0.000231	0.000231	1408.15	0.1411	0.000000	0.020				997.0449
5.4244		25	0.4057	1446.65	(104)	0.000235	0.000235	1446.70	-0.0505	0.000000	0.003				997.0449
6.0292		25	0.4314	1485.62	(104)	0.000238	0.000238	1486.15	-0.5319	0.000001	0.283				997.0449
1.8478		25	0.1887	1173.28	(128)	0.000204	0.000207	1172.71	0.5708	-0.000002	0.326				997.0449
2.37		25	0.2297	1218.13	(128)	0.000211	0.000212	1217.66	0.4660	-0.000001	0.217				997.0449
3.334		25	0.2956	1296.17	(128)	0.000220	0.000220	1295.86	0.3060	-0.000001	0.094				997.0449
5.5964		25	0.4132	1457.95	(128)	0.000236	0.000236	1458.10	-0.1464	0.000000	0.021				997.0449
6.11		25	0.4347	1490.44	(128)	0.000239	0.000238	1491.29	-0.8537	0.000001	0.729				997.0449
0.5292		35	0.0624	1047.22	(37)	0.000188	0.000191	1046.99	0.2333	-0.000003	0.054				994.0319
0.8038		35	0.0919	1073.68	(37)	0.000194	0.000195	1073.50	0.1804	-0.000002	0.033				994.0319
1.0684		35	0.1185	1098.49	(37)	0.000199	0.000199	1098.45	0.0422	0.000000	0.002				994.0319
1.3397		35	0.1443	1123.27	(37)	0.000204	0.000203	1123.44	-0.1656	0.000001	0.027				994.0319
1.6251		35	0.1698	1148.68	(37)	0.000208	0.000206	1149.10	-0.4151	0.000002	0.172				994.0319
1.9287		35	0.1953	1175.03	(37)	0.000213	0.000210	1175.71	-0.6781	0.000003	0.460				994.0319
2.2401		35	0.2199	1201.37	(37)	0.000216	0.000214	1202.30	-0.9287	0.000003	0.863				994.0319
2.5142		35	0.2404	1224.05	(37)	0.000219	0.000216	1225.13	-1.0823	0.000003	1.171				994.0319
2.8098		35	0.2612	1248.03	(37)	0.000222	0.000219	1249.18	-1.1469	0.000003	1.315				994.0319
3.1178		35	0.2818	1272.54	(37)	0.000225	0.000222	1273.61	-1.0710	0.000002	1.147				994.0319
0.00971		35	0.0012	995.05	(97)	0.000166	0.000182	995.03	0.0196	-0.000016	0.000			1.02	994.0319
0.01972		35	0.0025	996.10	(97)	0.000162	0.000182	996.05	0.0491	-0.000020	0.002			2.08	994.0319
0.02927		35	0.0037	997.10	(97)	0.000162	0.000183	997.03	0.0768	-0.000021	0.006			3.09	994.0319
0.04979		35	0.0062	999.24	(97)	0.000164	0.000183	999.12	0.1191	-0.000019	0.014			5.24	994.0319
0.07421		35	0.0093	1001.77	(97)	0.000167	0.000183	1001.61	0.1560	-0.000017	0.024			7.78	994.0319
0.1005		35	0.0125	1004.48	(97)	0.000168	0.000184	1004.28	0.1973	-0.000016	0.039			10.51	994.0319
0.2028		35	0.0249	1014.93	(97)	0.000174	0.000186	1014.62	0.3052	-0.000012	0.093			21.02	994.0319
0.4018		35	0.0481	1034.90	(97)	0.000181	0.000189	1034.47	0.4310	-0.000008	0.186			41.11	994.0319
0.5992		35	0.0701	1054.27	(97)	0.000186	0.000192	1053.81	0.4637	-0.000006	0.215			60.6	994.0319
0.7945		35	0.0909	1073.12	(97)	0.000190	0.000195	1072.61	0.5049	-0.000005	0.255			79.56	994.0319
0.9978		35	0.1116	1092.28	(97)	0.000195	0.000198	1091.85	0.4343	-0.000003	0.189			98.84	994.0319
1.4979		35	0.1586	1137.99	(97)	0.000204	0.000205	1137.74	0.2506	-0.000001	0.063			144.82	994.0319
1.9854		35	0.1999	1180.73	(97)	0.000210	0.000211	1180.60	0.1286	0.000000	0.017			187.82	994.0319
2.4993		35	0.2393	1224.02	(97)	0.000216	0.000216	1223.90	0.1164	0.000000	0.014			231.37	994.0319
3.0071		35	0.2745	1265.11	(97)	0.000221	0.000221	1264.90	0.2139	0.000000	0.046			272.71	994.0319
3.4336		35	0.3017	1298.38	(97)	0.000224	0.000225	1298.03	0.3541	-0.000001	0.125			306.18	994.0319
0.5292		45	0.0624	1043.26	(37)	0.000187	0.000191	1043.05	0.2100	-0.000003	0.044				990.2132
0.8038		45	0.0919	1069.66	(37)	0.000193	0.000195	1069.47	0.1930	-0.000002	0.037				990.2132
1.0684		45	0.1185	1094.41	(37)	0.000199	0.000199	1094.30	0.1083	-0.000001	0.012				990.2132
1.3397		45	0.1443	1119.14	(37)	0.000203	0.000203	1119.15	-0.0127	0.000000	0.000				990.2132
1.6251		45	0.1698	1144.49	(37)	0.000208	0.000207	1144.65	-0.1570	0.000001	0.025				990.2132
1.9287		45	0.1953	1170.77	(37)	0.000212	0.000211	1171.06	-0.2917	0.000001	0.085				990.2132
2.2401		45	0.2199	1197.03	(37)	0.000216	0.000215	1197.43	-0.3961	0.000001	0.157				990.2132
2.5142		45	0.2404	1219.63	(37)	0.000220	0.000218	1220.04	-0.4127	0.000001	0.170				990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density / 1000(rho-1)	Density of water / kg/m³
2.8098		45	0.2612	1243.50	(37)	0.000222	0.000222	1243.84	-0.3357	0.000001	0.113				990.2132
3.1178		45	0.2818	1267.88	(37)	0.000225	0.000225	1267.99	-0.1094	0.000000	0.012				990.2132
0.00971		45	0.0012	991.21	(97)	0.000175	0.000181	991.21	0.0071	-0.000006	0.000			1.01	990.2132
0.01972		45	0.0025	992.28	(97)	0.000159	0.000181	992.23	0.0538	-0.000022	0.003			2.09	990.2132
0.02927		45	0.0037	993.26	(97)	0.000165	0.000181	993.20	0.0592	-0.000016	0.004			3.08	990.2132
0.04979		45	0.0062	995.38	(97)	0.000168	0.000182	995.30	0.0865	-0.000014	0.007			5.22	990.2132
0.07421		45	0.0093	997.90	(97)	0.000169	0.000182	997.78	0.1175	-0.000013	0.014			7.76	990.2132
0.1005		45	0.0125	1000.58	(97)	0.000172	0.000183	1000.45	0.1330	-0.000011	0.018			10.47	990.2132
0.2028		45	0.0249	1010.93	(97)	0.000178	0.000185	1010.77	0.1605	-0.000006	0.026			20.92	990.2132
0.4018		45	0.0481	1030.73	(97)	0.000185	0.000188	1030.57	0.1673	-0.000003	0.028			40.92	990.2132
0.5992		45	0.0701	1049.91	(97)	0.000191	0.000192	1049.85	0.0657	-0.000001	0.004			60.29	990.2132
0.7945		45	0.0909	1068.55	(97)	0.000195	0.000195	1068.58	-0.0342	0.000000	0.001			79.11	990.2132
0.9978		45	0.1116	1087.64	(97)	0.000199	0.000198	1087.73	-0.0935	0.000001	0.009			98.39	990.2132
1.4979		45	0.1586	1132.88	(97)	0.000208	0.000206	1133.37	-0.4820	0.000002	0.232			144.08	990.2132
1.9854		45	0.1999	1175.18	(97)	0.000215	0.000212	1175.92	-0.7412	0.000003	0.549			186.79	990.2132
2.4993		45	0.2393	1218.20	(97)	0.000220	0.000218	1218.83	-0.6273	0.000002	0.393			230.24	990.2132
3.0071		45	0.2745	1258.89	(97)	0.000225	0.000224	1259.38	-0.4939	0.000001	0.244			271.33	990.2132
3.4336		45	0.3017	1291.45	(97)	0.000229	0.000228	1292.10	-0.6576	0.000001	0.432			304.21	990.2132
0.5292		55	0.0624	1038.68	(37)	0.000186	0.000188	1038.50	0.1812	-0.000003	0.033				985.6952
0.8038		55	0.0919	1065.04	(37)	0.000192	0.000193	1064.87	0.1747	-0.000002	0.031				985.6952
1.0684		55	0.1185	1089.77	(37)	0.000197	0.000198	1089.63	0.1392	-0.000001	0.019				985.6952
1.3397		55	0.1443	1114.47	(37)	0.000202	0.000202	1114.39	0.0792	0.000000	0.006				985.6952
1.6251		55	0.1698	1139.79	(37)	0.000207	0.000207	1139.77	0.0213	0.000000	0.000				985.6952
1.9287		55	0.1953	1166.03	(37)	0.000211	0.000211	1166.04	-0.0074	0.000000	0.000				985.6952
2.2401		55	0.2199	1192.25	(37)	0.000215	0.000215	1192.23	0.0205	0.000000	0.000				985.6952
2.5142		55	0.2404	1214.80	(37)	0.000218	0.000219	1214.68	0.1233	0.000000	0.015				985.6952
2.8098		55	0.2612	1238.62	(37)	0.000221	0.000222	1238.27	0.3504	-0.000001	0.123				985.6952
3.1178		55	0.2818	1262.93	(37)	0.000224	0.000226	1262.20	0.7333	-0.000002	0.538				985.6952
0.00971		55	0.0012	986.70	(97)	0.000167	0.000178	986.69	0.0122	-0.000010	0.000			1.02	985.6952
0.01972		55	0.0025	987.74	(97)	0.000168	0.000178	987.71	0.0243	-0.000010	0.001			2.07	985.6952
0.02927		55	0.0037	988.73	(97)	0.000166	0.000178	988.69	0.0449	-0.000013	0.002			3.08	985.6952
0.04979		55	0.0062	990.83	(97)	0.000170	0.000179	990.78	0.0525	-0.000009	0.003			5.21	985.6952
0.07421		55	0.0093	993.32	(97)	0.000172	0.000179	993.26	0.0621	-0.000007	0.004			7.74	985.6952
0.1005		55	0.0125	996.01	(97)	0.000174	0.000180	995.93	0.0754	-0.000006	0.006			10.46	985.6952
0.2028		55	0.0249	1006.30	(97)	0.000180	0.000182	1006.25	0.0487	-0.000002	0.002			20.9	985.6952
0.4018		55	0.0481	1025.97	(97)	0.000187	0.000186	1026.03	-0.0594	0.000001	0.004			40.86	985.6952
0.5992		55	0.0701	1045.03	(97)	0.000193	0.000190	1045.29	-0.2515	0.000003	0.063			60.2	985.6952
0.7945		55	0.0909	1063.65	(97)	0.000196	0.000193	1063.98	-0.3296	0.000003	0.109			79.09	985.6952
0.9978		55	0.1116	1082.39	(97)	0.000202	0.000197	1083.08	-0.6913	0.000005	0.478			98.1	985.6952
1.4979		55	0.1586	1127.33	(97)	0.000211	0.000205	1128.54	-1.2115	0.000006	1.468			143.69	985.6952
1.9854		55	0.1999	1169.37	(97)	0.000217	0.000212	1170.86	-1.4926	0.000005	2.228			186.34	985.6952
2.4993		55	0.2393	1211.98	(97)	0.000223	0.000219	1213.47	-1.4895	0.000004	2.219			229.57	985.6952
3.0071		55	0.2745	1252.20	(97)	0.000228	0.000225	1253.67	-1.4747	0.000003	2.175			270.37	985.6952
3.4336		55	0.3017	1284.74	(97)	0.000232	0.000229	1286.06	-1.3250	0.000003	1.756			303.38	985.6952
0.5292		65	0.0624	1033.57	(37)	0.000182	0.000184	1033.43	0.1410	-0.000002	0.020				980.5548

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density / 1000(rhor-1)	Density of water / kg/m³
0.8038		65	0.0919	1059.95	(37)	0.000188	0.000190	1059.80	0.1497	-0.000001	0.022				980.5548
1.0684		65	0.1185	1084.70	(37)	0.000194	0.000195	1084.55	0.1493	-0.000001	0.022				980.5548
1.3397		65	0.1443	1109.41	(37)	0.000199	0.000200	1109.28	0.1340	-0.000001	0.018				980.5548
1.6251		65	0.1698	1134.74	(37)	0.000204	0.000204	1134.60	0.1431	-0.000001	0.020				980.5548
1.9287		65	0.1953	1160.97	(37)	0.000208	0.000209	1160.78	0.1868	-0.000001	0.035				980.5548
2.2401		65	0.2199	1187.17	(37)	0.000213	0.000214	1186.87	0.3014	-0.000001	0.091				980.5548
2.5142		65	0.2404	1209.68	(37)	0.000216	0.000218	1209.20	0.4756	-0.000001	0.226				980.5548
2.8098		65	0.2612	1233.44	(37)	0.000219	0.000221	1232.66	0.7805	-0.000002	0.609				980.5548
3.1178		65	0.2818	1257.67	(37)	0.000222	0.000225	1256.43	1.2450	-0.000003	1.550				980.5548
0.5292		75	0.0624	1027.78	(37)	0.000180	0.000178	1027.92	-0.1366	0.000002	0.019				974.849
0.8038		75	0.0919	1054.18	(37)	0.000185	0.000184	1054.36	-0.1784	0.000002	0.032				974.849
1.0684		75	0.1185	1078.96	(37)	0.000191	0.000189	1079.16	-0.1981	0.000001	0.039				974.849
1.3397		75	0.1443	1103.73	(37)	0.000196	0.000194	1103.92	-0.1852	0.000001	0.034				974.849
1.6251		75	0.1698	1129.12	(37)	0.000200	0.000200	1129.25	-0.1300	0.000001	0.017				974.849
1.9287		75	0.1953	1155.41	(37)	0.000205	0.000205	1155.43	-0.0196	0.000000	0.000				974.849
2.2401		75	0.2199	1181.66	(37)	0.000209	0.000210	1181.49	0.1737	-0.000001	0.030				974.849
2.5142		75	0.2404	1204.20	(37)	0.000213	0.000214	1203.78	0.4207	-0.000001	0.177				974.849
2.8098		75	0.2612	1227.94	(37)	0.000216	0.000218	1227.17	0.7690	-0.000002	0.591				974.849
3.1178		75	0.2818	1252.10	(37)	0.000220	0.000223	1250.85	1.2480	-0.000003	1.557				974.849
Average Res									0.0857	-0.000005	72.096	Sum chi sqr			
Std dev Res									0.6183	0.000009					
Avg - 4std									-2.3876	-0.000040					
Avg + 4std									2.5590	0.000030					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4) \cdot ^2)}$

c0	1.87E-06
c1	4.55E-05
c2	1.575826
c3	-0.01078
c4	-4369.86
Min T	15
Max T	75
Min w	0.0012
Max w	0.4347
Avg dens res	0.0857
Std dens res	0.618321
Avg app vol res *10 ³	-0.00496
Std app vol res *10 ³	0.008667
No of points in corr	186
No of inconsistent pair	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **MnSO4**

- Ref (6) Asmus, E, The viscosities of aqueous solutions of strong..., *Ann der Physik*, **1939**, 35, 1-22
- (7) Bakeev, M. I.; Zharmenov, A. A.; Andamasov, R. S.; Baikenova, N. A.; Abdygalimova, S. Sh. Electrical Conductivity and Viscosity of the Binary Systems MeSO4-H2O (Me=Mn2+, Fe2+, Co2+, Zn2+, Cd2+) at 25-75 Degree and the Structure of Electrolyte Solutions. *Izv. Nats. Akad. Nauk Resp. Kaz., Ser. Khim.* **1994**, 6, 25-30.
- (19) Deckwer, W. D., Density, viscosity, vapor pressure, and hydrogen solubility of aqueous MnSO4 solutions, *J. Chem. Eng. Data*, **1980**, 25, 75-76
- (40) Herz, W. Internal Friction of Salt Solutions (C. A. Trans. from German). *Z. Anorg. Chemie* **1914**, 89, 393-396
- (75) National Research Council, International Critical Tables of Physical and Numerical Data, Physics, Chemistry, and Technology., McGraw-Hill, New York, **1928**
- (103) Przepiera, A.; Zielenkiewicz, A.; Apparent Molar Volumes of Aqueous Solution in the MnSO4 + H2SO4 System; *Bull. Pol. Acad. Sci. Chem.*, **2000**, 48, 267-272
- (117) Schmelzer, N.; Einfeldt, J. Density Measurements in Some Aqueous and Non-Aqueous Electrolyte Solutions at 25°C. *Wiss. Z. Uni. Rostock* **1989**, 38, 81-82

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Density of water / kg/m³
		0	0.0100	1010.0	(75)	-0.000006	0.000022	1009.72	0.2818	-0.000028	0.079				999.8395
		0	0.0200	1020.2	(75)	0.000002	0.000025	1019.72	0.4789	-0.000023	0.229				999.8395
		0	0.0400	1040.9	(75)	0.000014	0.000032	1040.11	0.7943	-0.000018	0.631				999.8395
		0	0.0600	1062.0	(75)	0.000024	0.000039	1061.01	0.9928	-0.000015	0.986				999.8395
		0	0.0800	1083.6	(75)	0.000034	0.000046	1082.44	1.1606	-0.000012	1.347				999.8395
		0	0.1000	1105.7	(75)	0.000043	0.000053	1104.42	1.2835	-0.000011	1.647				999.8395
		0	0.1200	1128.2	(75)	0.000052	0.000060	1126.95	1.2472	-0.000008	1.555				999.8395
		0	0.1400	1151.1	(75)	0.000061	0.000067	1150.06	1.0368	-0.000006	1.075				999.8395
		0	0.1600	1174.4	(75)	0.000071	0.000074	1173.76	0.6376	-0.000003	0.407				999.8395
		0	0.1800	1198.2	(75)	0.000080	0.000081	1198.07	0.1345	-0.000001	0.018				999.8395
		10	0.0100	1009.8	(75)	0.000000	0.000027	1009.52	0.2811	-0.000028	0.079				999.6996
		10	0.0200	1019.7	(75)	0.000019	0.000031	1019.46	0.2354	-0.000011	0.055				999.6996
		10	0.0400	1039.9	(75)	0.000034	0.000037	1039.74	0.1568	-0.000004	0.025				999.6996
		10	0.0600	1060.6	(75)	0.000043	0.000044	1060.55	0.0493	-0.000001	0.002				999.6996
		10	0.0800	1081.9	(75)	0.000050	0.000050	1081.90	-0.0030	0.000000	0.000				999.6996
		10	0.1000	1103.6	(75)	0.000059	0.000057	1103.82	-0.2163	0.000002	0.047				999.6996
		10	0.1200	1125.9	(75)	0.000066	0.000063	1126.31	-0.4072	0.000003	0.166				999.6996
		10	0.1400	1148.8	(75)	0.000073	0.000070	1149.39	-0.5928	0.000003	0.351				999.6996
		10	0.1600	1172.3	(75)	0.000080	0.000076	1173.09	-0.7908	0.000004	0.625				999.6996
		10	0.1800	1196.5	(75)	0.000086	0.000083	1197.42	-0.9191	0.000004	0.845				999.6996
		15	0.0100	1008.9	(75)	0.000029	0.000030	1008.89	0.0128	-0.000001	0.000				999.0996
		15	0.0200	1018.8	(75)	0.000033	0.000033	1018.80	-0.0026	0.000000	0.000				999.0996
		15	0.0400	1038.9	(75)	0.000042	0.000039	1039.02	-0.1245	0.000003	0.015				999.0996
		15	0.0600	1059.5	(75)	0.000050	0.000046	1059.78	-0.2813	0.000004	0.079				999.0996
		15	0.0800	1080.7	(75)	0.000056	0.000052	1081.09	-0.3898	0.000004	0.152				999.0996
		15	0.1000	1102.5	(75)	0.000062	0.000058	1102.97	-0.4673	0.000004	0.218				999.0996
		15	0.1200	1124.8	(75)	0.000069	0.000065	1125.43	-0.6314	0.000004	0.399				999.0996
		15	0.1400	1147.8	(75)	0.000075	0.000071	1148.50	-0.7006	0.000004	0.491				999.0996
		15	0.1600	1171.4	(75)	0.000081	0.000077	1172.19	-0.7937	0.000004	0.630				999.0996

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Density of water / kg/m³
		15	0.1800	1195.6	(75)	0.000087	0.000083	1196.53	-0.9301	0.000004	0.865				999.0996
		15	0.2000	1220.5	(75)	0.000093	0.000090	1221.53	-1.0300	0.000003	1.061				999.0996
		15	0.2200	1246.1	(75)	0.000099	0.000096	1247.21	-1.1140	0.000003	1.241				999.0996
		15	0.2400	1272.5	(75)	0.000105	0.000102	1273.60	-1.1033	0.000003	1.217				999.0996
		15	0.2600	1299.7	(75)	0.000111	0.000108	1300.72	-1.0199	0.000002	1.040				999.0996
		15	0.2800	1327.7	(75)	0.000116	0.000114	1328.59	-0.8861	0.000002	0.785				999.0996
		15	0.3000	1356.5	(75)	0.000122	0.000121	1357.23	-0.7251	0.000001	0.526				999.0996
		20	0.0100	1008.0	(75)	0.000028	0.000032	1007.96	0.0405	-0.000004	0.002				998.2041
		20	0.0200	1017.8	(75)	0.000037	0.000035	1017.84	-0.0437	0.000002	0.002				998.2041
		20	0.0400	1037.8	(75)	0.000046	0.000041	1038.01	-0.2073	0.000005	0.043				998.2041
		20	0.0600	1058.3	(75)	0.000054	0.000048	1058.71	-0.4118	0.000006	0.170				998.2041
	0.5	20	0.0706	1069.0	(19)	0.000062	0.000051	1069.94	-0.9388	0.000012	0.881				998.2041
		20	0.0800	1079.4	(75)	0.000060	0.000054	1079.97	-0.5749	0.000006	0.331				998.2041
		20	0.1000	1101.2	(75)	0.000065	0.000060	1101.81	-0.6148	0.000005	0.378				998.2041
		20	0.1200	1123.6	(75)	0.000070	0.000066	1124.25	-0.6504	0.000004	0.423				998.2041
	1	20	0.1327	1138.0	(19)	0.000074	0.000070	1138.80	-0.8018	0.000005	0.643				998.2041
		20	0.1400	1146.7	(75)	0.000075	0.000072	1147.30	-0.6011	0.000003	0.361				998.2041
		20	0.1600	1170.5	(75)	0.000080	0.000078	1170.99	-0.4872	0.000002	0.237				998.2041
		20	0.1800	1195.0	(75)	0.000085	0.000084	1195.33	-0.3296	0.000001	0.109				998.2041
	1.5	20	0.1877	1207.0	(19)	0.000078	0.000086	1204.82	2.1754	-0.000008	4.732				998.2041
	2	20	0.2380	1269.0	(19)	0.000104	0.000101	1269.81	-0.8129	0.000002	0.661				998.2041
	2.5	20	0.2838	1330.0	(19)	0.000121	0.000115	1333.12	-3.1204	0.000006	9.737				998.2041
	3	20	0.3250	1394.0	(19)	0.000127	0.000127	1393.49	0.5106	-0.000001	0.261				998.2041
	3.5	20	0.3640	1452.0	(19)	0.000142	0.000139	1454.11	-2.1087	0.000003	4.447				998.2041
	0.0000676	25	0.0000	997.1	(6)	-0.000173	0.000031	997.05	0.0021	-0.000204	0.000		!	1.000012	997.0449
	0.000122	25	0.0000	997.1	(6)	-0.000083	0.000031	997.06	0.0021	-0.000114	0.000			1.000002	997.0449
	0.000176	25	0.0000	997.1	(6)	0.000025	0.000031	997.07	0.0002	-0.000007	0.000			1.000026	997.0449
	0.00024	25	0.0000	997.1	(6)	-0.000073	0.000031	997.08	0.0038	-0.000105	0.000			1.000039	997.0449
	0.000301	25	0.0000	997.1	(6)	-0.000053	0.000031	997.09	0.0038	-0.000085	0.000			1.000048	997.0449
	0.000344	25	0.0001	997.1	(6)	-0.000056	0.000031	997.10	0.0045	-0.000087	0.000			1.000055	997.0449
	0.000447	25	0.0001	997.1	(6)	0.000010	0.000031	997.11	0.0014	-0.000021	0.000			1.000067	997.0449
	0.000549	25	0.0001	997.1	(6)	-0.000034	0.000031	997.13	0.0054	-0.000066	0.000			1.000086	997.0449
	0.000573	25	0.0001	997.1	(6)	-0.000026	0.000031	997.13	0.0049	-0.000057	0.000			1.000089	997.0449
	0.000649	25	0.0001	997.1	(6)	-0.000017	0.000031	997.14	0.0048	-0.000049	0.000			1.0001	997.0449
	0.000869	25	0.0001	997.2	(6)	-0.000011	0.000031	997.17	0.0055	-0.000042	0.000			1.000133	997.0449
	0.001292	25	0.0002	997.2	(6)	-0.000002	0.000031	997.23	0.0065	-0.000033	0.000			1.000196	997.0449
	0.001761	25	0.0003	997.3	(6)	0.000010	0.000031	997.30	0.0057	-0.000021	0.000			1.000264	997.0449
	0.002275	25	0.0003	997.4	(6)	0.000007	0.000032	997.38	0.0083	-0.000024	0.000			1.000342	997.0449
	0.002781	25	0.0004	997.5	(6)	0.000031	0.000032	997.45	0.0001	0.000000	0.000			1.000408	997.0449
	0.003282	25	0.0005	997.5	(6)	0.000016	0.000032	997.52	0.0076	-0.000015	0.000			1.000489	997.0449
	0.003903	25	0.0006	997.6	(6)	0.000017	0.000032	997.62	0.0085	-0.000014	0.000			1.000581	997.0449
	0.004512	25	0.0007	997.7	(117)	-0.000009	0.000032	997.70	0.0272	-0.000040	0.001				997.0449
		25	0.0007	997.7	(6)	0.000024	0.000032	997.72	0.0053	-0.000008	0.000			1.000681	997.0449
	0.005502	25	0.0008	997.9	(6)	0.000021	0.000032	997.85	0.0090	-0.000011	0.000			1.000816	997.0449
	0.00642	25	0.0010	998.0	(6)	0.000025	0.000032	997.98	0.0064	-0.000007	0.000			1.000948	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Density of water / kg/m³
0.008785	0.007534	25	0.0011	998.2	(6)	0.000023	0.000032	998.15	0.0101	-0.000009	0.000			1.001115	997.0449
		25	0.0013	998.4	(117)	-0.000009	0.000032	998.33	0.0545	-0.000041	0.003				997.0449
	0.008816	25	0.0013	998.3	(6)	0.000026	0.000032	998.33	0.0072	-0.000005	0.000			1.0013	997.0449
	0.011576	25	0.0018	998.7	(6)	0.000028	0.000032	998.74	0.0077	-0.000004	0.000			1.001705	997.0449
	0.014318	25	0.0022	999.1	(6)	0.000027	0.000032	999.14	0.0109	-0.000005	0.000			1.00211	997.0449
0.02148		25	0.0032	1000.3	(117)	0.000006	0.000032	1000.17	0.0859	-0.000027	0.007				997.0449
0.052298		25	0.0078	1004.8	(117)	0.000014	0.000034	1004.65	0.1584	-0.000020	0.025				997.0449
		25	0.0100	1006.8	(75)	0.000031	0.000034	1006.77	0.0326	-0.000003	0.001				997.0449
		25	0.0168	1013.8	(117)	0.000014	0.000036	1013.42	0.3802	-0.000022	0.145				997.0449
0.11293		25	0.0200	1016.5	(75)	0.000043	0.000037	1016.62	-0.1200	0.000006	0.014				997.0449
		25	0.0400	1036.4	(75)	0.000051	0.000043	1036.72	-0.3242	0.000008	0.105				997.0449
		25	0.0432	1041.5	(117)	0.000013	0.000044	1039.98	1.4731	-0.000031	2.170				997.0449
0.29891 0.37445		25	0.0535	1053.3	(117)	0.000003	0.000047	1050.62	2.6509	-0.000045	7.027				997.0449
	0.392	25	0.0562	1052.4	(40)	0.000065	0.000048	1053.46	-1.0551	0.000017	1.113				997.0449
		25	0.0600	1056.9	(75)	0.000056	0.000049	1057.38	-0.4753	0.000007	0.226				997.0449
		25	0.0800	1078.0	(75)	0.000061	0.000055	1078.59	-0.5917	0.000006	0.350				997.0449
		25	0.1000	1099.8	(75)	0.000066	0.000061	1100.39	-0.5928	0.000005	0.351				997.0449
	0.7845	25	0.1070	1107.3	(40)	0.000069	0.000063	1108.14	-0.8428	0.000006	0.710				997.0449
		25	0.1200	1122.4	(75)	0.000069	0.000067	1122.80	-0.3983	0.000003	0.159				997.0449
		25	0.1400	1145.8	(75)	0.000073	0.000073	1145.83	-0.0290	0.000000	0.001				997.0449
		25	0.1600	1169.9	(75)	0.000077	0.000079	1169.51	0.3936	-0.000002	0.155				997.0449
		25	0.1800	1194.8	(75)	0.000081	0.000084	1193.85	0.9472	-0.000004	0.897				997.0449
	1.569	25	0.1952	1214.0	(40)	0.000085	0.000089	1212.76	1.2388	-0.000004	1.535				997.0449
1.6319		25	0.1977	1216.4	(103)	0.000088	0.000090	1215.98	0.4293	-0.000001	0.184				997.0449
		25	0.2000	1220.3	(75)	0.000085	0.000090	1218.89	1.4086	-0.000005	1.984				997.0449
		25	0.2200	1246.4	(75)	0.000091	0.000096	1244.65	1.7536	-0.000005	3.075				997.0449
		25	0.2400	1273.1	(75)	0.000097	0.000102	1271.14	1.9573	-0.000005	3.831				997.0449
	2.3535	25	0.2600	1300.4	(75)	0.000103	0.000108	1298.41	1.9937	-0.000005	3.975				997.0449
		25	0.2704	1314.4	(40)	0.000107	0.000111	1312.86	1.5431	-0.000003	2.381				997.0449
		25	0.2800	1328.3	(75)	0.000110	0.000113	1326.46	1.8357	-0.000004	3.370				997.0449
2.8006		25	0.2972	1351.3	(103)	0.000118	0.000118	1351.26	0.0132	0.000000	0.000				997.0449
		25	0.3000	1356.8	(75)	0.000117	0.000119	1355.34	1.4553	-0.000003	2.118				997.0449
	3.138	25	0.3361	1409.9	(40)	0.000129	0.000130	1409.62	0.2837	0.000000	0.081				997.0449
3.4728		25	0.3440	1425.3	(103)	0.000127	0.000132	1421.92	3.3938	-0.000005	11.518				997.0449
1.6319		35	0.1977	1212.5	(103)	0.000089	0.000090	1212.32	0.1663	-0.000001	0.028				994.0319
2.8006		35	0.2972	1346.4	(103)	0.000120	0.000117	1348.28	-1.8655	0.000003	3.480				994.0319
3.4728		35	0.3440	1420.5	(103)	0.000128	0.000129	1419.68	0.8405	-0.000001	0.706				994.0319
1.6319		45	0.1977	1208.0	(103)	0.000089	0.000090	1207.83	0.1870	-0.000001	0.035				990.2132
2.8006		45	0.2972	1341.7	(103)	0.000120	0.000115	1344.41	-2.6683	0.000005	7.120				990.2132
3.4728		45	0.3440	1416.0	(103)	0.000127	0.000126	1416.50	-0.4681	0.000001	0.219				990.2132
Average Res									0.0183	-0.000011	101.409	Sum chi sqr			
Std dev Res									0.9471	0.000029					
Avg - 4std									-3.7703	-0.000126					
Avg + 4std									3.8068	0.000104					

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Density of water / kg/m³
Curve fit for the model App vol=(w+c2+c3*t °C)/(c0*w + c1)/e^(0.000001*(t °C+c4)^2)															
c0	0.003245														
c1	0.057246														
c2	0.051358														
c3	0.002145														
c4	3287.822														
Min T	0														
Max T	45														
Min w	0.0000														
Max w	0.3640														
Avg dens res	0.0183														
Std dens res	0.947147														
Avg app vol res *10^3	-0.01108														
Std app vol res *10^3	0.02885														
No of points in corr	114														
No of inconsistent point	36														
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)															
		25	0.0005	998.6	(7)	-0.002121	0.000032	997.53	1.0720	-0.002152	1.149		!		997.0449
0.004199		25	0.0006	997.1	(117)	0.000884	0.000032	997.66	-0.5372	0.000852	0.289		!		997.0449
0.006039		25	0.0009	997.1	(117)	0.000986	0.000032	997.93	-0.8653	0.000955	0.749		!		997.0449
0.007229		25	0.0011	997.2	(117)	0.000906	0.000032	998.10	-0.9488	0.000874	0.900		!		997.0449
		25	0.0030	999.6	(7)	0.000148	0.000032	999.95	-0.3481	0.000116	0.121		!		997.0449
		25	0.0200	1020.8	(7)	-0.000163	0.000037	1016.64	4.1602	-0.000200	17.307	!	!		997.0449
		25	0.0701	1081.2	(7)	-0.000110	0.000052	1068.06	13.1398	-0.000162	172.655	!	!		997.0449
0.65005		25	0.0894	1097.4	(117)	-0.000023	0.000058	1088.75	8.6136	-0.000081	74.194	!	!		997.0449
0.82535		25	0.1108	1124.0	(117)	-0.000020	0.000064	1112.43	11.5959	-0.000084	134.465	!	!		997.0449
		25	0.1201	1145.4	(7)	-0.000079	0.000067	1122.86	22.5449	-0.000146	508.274	!	!		997.0449
		25	0.1700	1211.0	(7)	-0.000039	0.000082	1181.64	29.3568	-0.000121	861.822	!	!		997.0449
1.49488		25	0.1842	1249.2	(117)	-0.000096	0.000086	1199.00	50.2005	-0.000182	2520.091	!	!		997.0449
		25	0.2203	1287.5	(7)	-0.000024	0.000096	1245.04	42.4617	-0.000120	1802.998	!	!		997.0449
		25	0.2785	1375.8	(7)	0.000012	0.000113	1324.33	51.4682	-0.000101	2648.975	!	!		997.0449
		25	0.2913	1395.9	(7)	0.000019	0.000117	1342.61	53.2935	-0.000098	2840.196	!	!		997.0449
		25	0.3159	1434.4	(7)	0.000035	0.000124	1378.90	55.5043	-0.000089	3080.727	!	!		997.0449
		50	0.0005	989.6	(7)	-0.002186	0.000040	988.51	1.0891	-0.002227	1.186		!		988.0363
		50	0.0030	992.3	(7)	-0.000437	0.000041	990.89	1.4113	-0.000478	1.992		!		988.0363
		50	0.0200	1009.5	(7)	-0.000063	0.000045	1007.30	2.1984	-0.000108	4.833		!		988.0363
		50	0.0701	1072.2	(7)	-0.000121	0.000058	1058.01	14.1879	-0.000178	201.297	!	!		988.0363
		50	0.1201	1132.0	(7)	-0.000060	0.000070	1112.32	19.6831	-0.000130	387.425	!	!		988.0363
		50	0.1700	1197.5	(7)	-0.000029	0.000082	1170.91	26.5874	-0.000112	706.891	!	!		988.0363
		50	0.2203	1272.0	(7)	-0.000014	0.000095	1234.52	37.4799	-0.000108	1404.740	!	!		988.0363
		50	0.2785	1362.0	(7)	0.000014	0.000109	1314.75	47.2533	-0.000095	2232.872	!	!		988.0363
		50	0.2913	1380.8	(7)	0.000024	0.000112	1333.35	47.4518	-0.000088	2251.670	!	!		988.0363
		50	0.3159	1423.4	(7)	0.000032	0.000118	1370.42	52.9834	-0.000086	2807.246	!	!		988.0363

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Relative density	Density of water / kg/m³
		75	0.0005	977.1	(7)	-0.003701	0.000046	975.31	1.7850	-0.003746	3.186		!		974.849
		75	0.0030	978.3	(7)	-0.000180	0.000046	977.65	0.6500	-0.000227	0.422		!		974.849
		75	0.0200	996.9	(7)	-0.000108	0.000050	993.78	3.1199	-0.000157	9.734		!		974.849
		75	0.0701	1055.0	(7)	-0.000085	0.000060	1043.76	11.2439	-0.000146	126.425	!	!		974.849
		75	0.1201	1117.1	(7)	-0.000062	0.000071	1097.52	19.5787	-0.000133	383.324	!	!		974.849
		75	0.1700	1182.4	(7)	-0.000033	0.000081	1155.84	26.5586	-0.000114	705.358	!			974.849
		75	0.2203	1257.2	(7)	-0.000020	0.000092	1219.53	37.6660	-0.000112	1418.726	!			974.849
		75	0.2785	1346.7	(7)	0.000009	0.000104	1300.48	46.2233	-0.000095	2136.589	!			974.849
		75	0.2913	1363.3	(7)	0.000022	0.000106	1319.35	43.9540	-0.000084	1931.953	!			974.849
		75	0.3159	1407.0	(7)	0.000028	0.000111	1357.07	49.9337	-0.000083	2493.373	!			974.849

Density of aqueous solutions of **NaBr**

- References (24) Doménech, J.; Rivera, S. Viscosity B-Coefficient for Sodium Bromide in Formamide-Water Mixtures. *Z. Physik. Chem. N. F.* **1983**, *136*, 153-161.
- (28) Gates, J. A.; Wood, R. H. Densities of Aqueous Solutions of NaCl, MgCl₂, KCl, NaBr, LiCl, and CaCl₂ from 0.05 to 5.0 mol kg⁻¹ and 0.1013 to 40 MPa at 298.15K. *J. Chem. Eng. Data* **1985**, *30*, 44-49.
- (32) Gucker, F. T.; Stubley, D.; Hill, D. J. The Isentropic Compressibilities of Aqueous Solutions of Some Alkali Halides at 298.15K. *J. Chem. Thermodynamics* **1975**, *7*, 865-869.
- (45) Isono, T. Densities, Viscosities, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions at Several Temperatures. Alkaline-Earth Chlorides, LaCl₃, Na₂SO₄, NaNO₃, NaBr, KNO₃, KBr, and Cd(NO₃)₂. *J. Chem. Eng. Data* **1984**, *29*, 45-52.
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, *61*, 1492-1498.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (118) Scott, A. F.; Durham, E. J.; Studies in the solubilities of the soluble electrolytes, *J. Phys. Chem.*, **1930**, *34*, 1424-1438
- (119) Scott, A. F.; Obenaus, V. M.; Wilson, R. W. The Compressibility Coefficients of Solutions of Eight Alkali Halides. *J. Phys. Chem.* **1934**, *38*, 931-940.
- (130) Vaslow, F. The Apparent Molal Volumes of the Lithium and Sodium Halides. Critical Type Transitions in Aqueous Solution. *J. Phys. Chem.* **1969**, *73*, 3745-3750.

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
0.05		15	0.0051	1003.09	(45)	0.000223	0.000232	1003.04	0.0464	-0.000009	0.002				999.0996
0.1		15	0.0102	1007.14	(45)	0.000216	0.000232	1006.97	0.1662	-0.000016	0.028				999.0996
0.5		15	0.0489	1038.27	(45)	0.000229	0.000236	1037.93	0.3444	-0.000007	0.119				999.0996
1		15	0.0933	1076.03	(45)	0.000234	0.000239	1075.43	0.5959	-0.000006	0.355				999.0996
3		15	0.2359	1214.33	(45)	0.000249	0.000251	1213.62	0.7062	-0.000002	0.499				999.0996
4		15	0.2916	1277.12	(45)	0.000254	0.000255	1276.41	0.7130	-0.000001	0.508				999.0996
6		15	0.3817	1392.05	(45)	0.000261	0.000262	1391.22	0.8343	-0.000001	0.696				999.0996
8		15	0.4515	1494.20	(45)	0.000266	0.000267	1493.66	0.5445	-0.000001	0.296				999.0996
		17	0.0400	1029.80	(90)	0.000247	0.000236	1030.26	-0.4554	0.000011	0.207				998.7749
		17	0.0800	1063.10	(90)	0.000244	0.000240	1063.49	-0.3862	0.000004	0.149				998.7749
		17	0.1000	1080.30	(90)	0.000246	0.000241	1080.81	-0.5054	0.000004	0.255				998.7749
		17	0.1200	1098.10	(90)	0.000247	0.000243	1098.62	-0.5214	0.000004	0.272				998.7749
		17	0.2000	1174.50	(90)	0.000252	0.000249	1175.32	-0.8169	0.000003	0.667				998.7749
0.05		20	0.0051	1002.16	(45)	0.000229	0.000236	1002.13	0.0326	-0.000006	0.001				998.2041
0.1		20	0.0102	1006.17	(45)	0.000223	0.000236	1006.04	0.1332	-0.000013	0.018				998.2041
0.5		20	0.0489	1037.04	(45)	0.000235	0.000239	1036.83	0.2144	-0.000004	0.046				998.2041
1		20	0.0933	1074.50	(45)	0.000239	0.000243	1074.14	0.3630	-0.000003	0.132				998.2041
2		20	0.1707	1145.45	(45)	0.000247	0.000249	1145.10	0.3455	-0.000002	0.119				998.2041
3		20	0.2359	1211.84	(45)	0.000253	0.000254	1211.60	0.2362	-0.000001	0.056				998.2041
4		20	0.2916	1274.28	(45)	0.000257	0.000258	1274.06	0.2196	0.000000	0.048				998.2041
6		20	0.3817	1388.66	(45)	0.000264	0.000264	1388.27	0.3854	-0.000001	0.149				998.2041
8		20	0.4515	1490.45	(45)	0.000269	0.000269	1490.19	0.2631	0.000000	0.069				998.2041

molarity	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.05		25	0.0051	1001.01	(28)	0.000228	0.000239	1000.95	0.0577	-0.000011	0.003			23.43	997.0449
0.05		25	0.0051	1000.97	(45)	0.000235	0.000239	1000.95	0.0223	-0.000004	0.000				997.0449
0.05		25	0.0051	1000.98	(130)	0.000233	0.000239	1000.95	0.0318	-0.000006	0.001			23.95	997.0449
	0.0801	25	0.0082	1003.40	(24)	0.000230	0.000239	1003.32	0.0792	-0.000010	0.006				997.0449
0.1		25	0.0102	1004.95	(45)	0.000228	0.000239	1004.84	0.1133	-0.000011	0.013				997.0449
0.1		25	0.0102	1004.89	(130)	0.000234	0.000239	1004.84	0.0520	-0.000005	0.003			24.11	997.0449
0.1003		25	0.0102	1004.94	(28)	0.000231	0.000239	1004.86	0.0823	-0.000008	0.007			23.81	997.0449
0.10079		25	0.0103	1004.98	(73)	0.000231	0.000239	1004.90	0.0819	-0.000008	0.007				997.0449
	0.11	25	0.0113	1005.80	(24)	0.000227	0.000239	1005.66	0.1397	-0.000012	0.020				997.0449
	0.1499	25	0.0153	1008.70	(24)	0.000245	0.000240	1008.78	-0.0830	0.000005	0.007				997.0449
0.2		25	0.0202	1012.65	(130)	0.000236	0.000240	1012.57	0.0787	-0.000004	0.006			24.32	997.0449
0.20023		25	0.0202	1012.70	(73)	0.000235	0.000240	1012.59	0.1081	-0.000005	0.012				997.0449
0.2507		25	0.0251	1016.59	(28)	0.000236	0.000241	1016.48	0.1143	-0.000004	0.013			24.3	997.0449
0.29966		25	0.0299	1020.36	(73)	0.000237	0.000241	1020.23	0.1284	-0.000004	0.016				997.0449
0.3		25	0.0299	1020.35	(130)	0.000238	0.000241	1020.26	0.0944	-0.000003	0.009			24.48	997.0449
0.39954		25	0.0395	1027.99	(73)	0.000238	0.000242	1027.85	0.1371	-0.000003	0.019				997.0449
0.4		25	0.0395	1027.99	(130)	0.000239	0.000242	1027.89	0.1052	-0.000003	0.011			24.61	997.0449
0.49932		25	0.0489	1035.54	(73)	0.000240	0.000242	1035.41	0.1258	-0.000002	0.016				997.0449
0.5		25	0.0489	1035.58	(45)	0.000240	0.000242	1035.47	0.1145	-0.000002	0.013				997.0449
0.5		25	0.0489	1035.58	(130)	0.000240	0.000242	1035.47	0.1097	-0.000002	0.012			24.73	997.0449
0.5017		25	0.0491	1035.73	(28)	0.000240	0.000242	1035.59	0.1312	-0.000002	0.017			24.69	997.0449
0.59956		25	0.0581	1043.08	(73)	0.000241	0.000243	1042.96	0.1219	-0.000002	0.015				997.0449
0.6		25	0.0581	1043.10	(130)	0.000241	0.000243	1042.99	0.1102	-0.000002	0.012			24.84	997.0449
	0.665503	25	0.0653	1049.00	(32)	0.000242	0.000244	1048.88	0.1238	-0.000002	0.015				997.0449
0.69869		25	0.0671	1050.48	(73)	0.000242	0.000244	1050.37	0.1124	-0.000002	0.013				997.0449
0.7		25	0.0672	1050.57	(130)	0.000242	0.000244	1050.47	0.1021	-0.000001	0.010			24.95	997.0449
0.8		25	0.0761	1057.99	(130)	0.000243	0.000245	1057.89	0.1013	-0.000001	0.010			25.04	997.0449
0.80033		25	0.0761	1058.00	(73)	0.000244	0.000245	1057.91	0.0872	-0.000001	0.008				997.0449
0.89927		25	0.0847	1065.29	(73)	0.000244	0.000245	1065.21	0.0824	-0.000001	0.007				997.0449
0.9		25	0.0848	1065.36	(130)	0.000244	0.000245	1065.26	0.0950	-0.000001	0.009			25.13	997.0449
1		25	0.0933	1072.76	(45)	0.000244	0.000246	1072.58	0.1758	-0.000002	0.031				997.0449
1		25	0.0933	1072.68	(130)	0.000245	0.000246	1072.58	0.0931	-0.000001	0.009			25.21	997.0449
1.00023		25	0.0933	1072.65	(73)	0.000245	0.000246	1072.60	0.0490	0.000000	0.002				997.0449
1.004		25	0.0936	1073.06	(28)	0.000244	0.000246	1072.88	0.1801	-0.000002	0.032			25.13	997.0449
1.2		25	0.1099	1087.15	(130)	0.000247	0.000247	1087.08	0.0634	0.000000	0.004			25.38	997.0449
1.4		25	0.1259	1101.43	(130)	0.000248	0.000248	1101.39	0.0379	0.000000	0.001			25.53	997.0449
	1.39529	25	0.1299	1105.05	(32)	0.000248	0.000249	1105.02	0.0276	0.000000	0.001				997.0449
1.6		25	0.1414	1115.52	(130)	0.000249	0.000250	1115.51	0.0097	0.000000	0.000			25.67	997.0449
1.8		25	0.1563	1129.42	(130)	0.000251	0.000251	1129.44	-0.0177	0.000000	0.000			25.8	997.0449
2		25	0.1707	1143.24	(45)	0.000251	0.000252	1143.19	0.0513	0.000000	0.003				997.0449
2.006		25	0.1711	1143.70	(28)	0.000251	0.000252	1143.60	0.0973	0.000000	0.009			25.86	997.0449

molarity	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
3		25	0.2359	1209.32	(45)	0.000257	0.000257	1209.35	-0.0321	0.000000	0.001				997.0449
3.013		25	0.2367	1210.25	(28)	0.000256	0.000257	1210.18	0.0677	0.000000	0.005			26.38	997.0449
	2.933968	25	0.2472	1221.23	(32)	0.000258	0.000257	1221.55	-0.3160	0.000001	0.100				997.0449
4		25	0.2916	1271.44	(45)	0.000261	0.000260	1271.50	-0.0569	0.000000	0.003				997.0449
	4.20558	25	0.3289	1315.82	(32)	0.000264	0.000263	1316.41	-0.5835	0.000001	0.340				997.0449
4.972		25	0.3385	1327.72	(28)	0.000265	0.000264	1328.40	-0.6758	0.000001	0.457			27.26	997.0449
6		25	0.3817	1385.25	(45)	0.000267	0.000267	1385.15	0.1002	0.000000	0.010				997.0449
	5.53142	25	0.4027	1413.48	(32)	0.000269	0.000268	1414.25	-0.7671	0.000001	0.589				997.0449
8		25	0.4515	1486.63	(45)	0.000271	0.000271	1486.57	0.0591	0.000000	0.003				997.0449
	6.765459	25	0.4629	1503.82	(32)	0.000273	0.000272	1504.46	-0.6402	0.000001	0.410				997.0449
0.05		30	0.0051	999.53	(45)	0.000242	0.000242	999.53	0.0000	0.000000	0.000				995.6473
0.1		30	0.0102	1003.49	(45)	0.000234	0.000243	1003.40	0.0910	-0.000009	0.008				995.6473
	0.1098	30	0.0112	1004.40	(24)	0.000226	0.000243	1004.21	0.1853	-0.000016	0.034				995.6473
	0.1497	30	0.0153	1007.40	(24)	0.000238	0.000243	1007.32	0.0755	-0.000005	0.006				995.6473
0.5		30	0.0489	1033.91	(45)	0.000245	0.000245	1033.87	0.0387	-0.000001	0.002				995.6473
1		30	0.0933	1070.87	(45)	0.000248	0.000249	1070.80	0.0679	-0.000001	0.005				995.6473
2		30	0.1707	1140.97	(45)	0.000255	0.000254	1141.06	-0.0853	0.000000	0.007				995.6473
3		30	0.2359	1206.66	(45)	0.000260	0.000259	1206.90	-0.2363	0.000001	0.056				995.6473
4		30	0.2916	1268.50	(45)	0.000263	0.000263	1268.74	-0.2442	0.000001	0.060				995.6473
6		30	0.3817	1381.77	(45)	0.000269	0.000269	1381.87	-0.0990	0.000000	0.010				995.6473
8		30	0.4515	1482.75	(45)	0.000274	0.000274	1482.83	-0.0847	0.000000	0.007				995.6473
0.05		35	0.0051	997.90	(45)	0.000244	0.000245	997.89	0.0051	-0.000001	0.000				994.0319
0.1		35	0.0102	1001.83	(45)	0.000237	0.000246	1001.74	0.0855	-0.000008	0.007				994.0319
0.5		35	0.0489	1032.07	(45)	0.000248	0.000248	1032.06	0.0061	0.000000	0.000				994.0319
1		35	0.0933	1068.83	(45)	0.000251	0.000252	1068.81	0.0178	0.000000	0.000				994.0319
1.06		35	0.0983	1073.92	(119)	0.000245	0.000252	1073.14	0.7810	-0.000007	0.610				994.0319
2		35	0.1707	1138.58	(45)	0.000258	0.000257	1138.73	-0.1461	0.000001	0.021				994.0319
2.548		35	0.2077	1174.43	(119)	0.000262	0.000260	1175.15	-0.7225	0.000003	0.522				994.0319
3		35	0.2359	1203.95	(45)	0.000262	0.000261	1204.26	-0.3084	0.000001	0.095				994.0319
4		35	0.2916	1265.54	(45)	0.000266	0.000265	1265.82	-0.2845	0.000001	0.081				994.0319
4.654		35	0.3238	1302.94	(119)	0.000269	0.000267	1304.12	-1.1779	0.000002	1.387				994.0319
6		35	0.3817	1378.33	(45)	0.000271	0.000271	1378.45	-0.1239	0.000000	0.015				994.0319
8		35	0.4515	1478.91	(45)	0.000276	0.000275	1479.00	-0.0889	0.000000	0.008				994.0319
9.448		35	0.4929	1544.00	(119)	0.000279	0.000278	1545.33	-1.3273	0.000001	1.762	!			994.0319
9.91		35	0.5049	1565.50	(118)	0.000279	0.000279	1565.46	0.0377	0.000000	0.001				994.0319
0.05		40	0.0051	996.06	(45)	0.000248	0.000248	996.06	0.0004	0.000000	0.000				992.2158
0.1		40	0.0102	999.97	(45)	0.000241	0.000248	999.89	0.0799	-0.000008	0.006				992.2158
0.5		40	0.0489	1030.07	(45)	0.000251	0.000251	1030.06	0.0093	0.000000	0.000				992.2158
1		40	0.0933	1066.64	(45)	0.000254	0.000254	1066.63	0.0081	0.000000	0.000				992.2158
2		40	0.1707	1136.07	(45)	0.000260	0.000259	1136.22	-0.1488	0.000001	0.022				992.2158
3		40	0.2359	1201.15	(45)	0.000265	0.000264	1201.46	-0.3063	0.000001	0.094				992.2158

molarity	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
4		40	0.2916	1262.53	(45)	0.000268	0.000267	1262.76	-0.2255	0.000000	0.051				992.2158
6		40	0.3817	1374.89	(45)	0.000273	0.000273	1374.92	-0.0315	0.000000	0.001				992.2158
8		40	0.4515	1475.03	(45)	0.000277	0.000277	1475.08	-0.0499	0.000000	0.002				992.2158
0.05		45	0.0051	994.04	(45)	0.000250	0.000251	994.04	0.0016	0.000000	0.000				990.2132
0.1		45	0.0102	997.93	(45)	0.000243	0.000251	997.85	0.0797	-0.000008	0.006				990.2132
0.5		45	0.0489	1027.89	(45)	0.000253	0.000254	1027.88	0.0138	0.000000	0.000				990.2132
1		45	0.0933	1064.33	(45)	0.000256	0.000257	1064.28	0.0541	-0.000001	0.003				990.2132
2		45	0.1707	1133.47	(45)	0.000262	0.000262	1133.55	-0.0782	0.000000	0.006				990.2132
3		45	0.2359	1198.28	(45)	0.000266	0.000266	1198.50	-0.2244	0.000001	0.050				990.2132
4		45	0.2916	1259.48	(45)	0.000269	0.000269	1259.55	-0.0714	0.000000	0.005				990.2132
6		45	0.3817	1371.46	(45)	0.000274	0.000275	1371.29	0.1746	0.000000	0.030				990.2132
8		45	0.4515	1471.17	(45)	0.000279	0.000279	1471.09	0.0801	0.000000	0.006				990.2132
10.81		45.21	0.5266	1595.00	(118)	0.000283	0.000283	1594.42	0.5752	0.000000	0.331				990.1252
0.05		50	0.0051	991.85	(45)	0.000252	0.000253	991.84	0.0067	-0.000001	0.000				988.0363
0.1		50	0.0102	995.72	(45)	0.000245	0.000253	995.64	0.0829	-0.000008	0.007				988.0363
0.5		50	0.0489	1025.55	(45)	0.000256	0.000256	1025.52	0.0276	-0.000001	0.001				988.0363
1		50	0.0933	1061.87	(45)	0.000258	0.000259	1061.76	0.1137	-0.000001	0.013				988.0363
2		50	0.1707	1130.79	(45)	0.000263	0.000264	1130.73	0.0637	0.000000	0.004				988.0363
3		50	0.2359	1195.38	(45)	0.000268	0.000268	1195.41	-0.0348	0.000000	0.001				988.0363
4		50	0.2916	1256.41	(45)	0.000271	0.000271	1256.22	0.1861	0.000000	0.035				988.0363
6		50	0.3817	1367.89	(45)	0.000276	0.000276	1367.56	0.3337	0.000000	0.111				988.0363
8		50	0.4515	1467.32	(45)	0.000280	0.000280	1467.04	0.2814	0.000000	0.079				988.0363
11.32		50.21	0.5381	1610.80	(118)	0.000285	0.000285	1610.57	0.2341	0.000000	0.055				987.9412
0.05		55	0.0051	989.50	(45)	0.000252	0.000255	989.48	0.0155	-0.000003	0.000				985.6952
0.1		55	0.0102	993.35	(45)	0.000247	0.000256	993.26	0.0893	-0.000009	0.008				985.6952
0.5		55	0.0489	1023.11	(45)	0.000256	0.000258	1023.01	0.1003	-0.000002	0.010				985.6952
1		55	0.0933	1059.32	(45)	0.000259	0.000261	1059.08	0.2367	-0.000002	0.056				985.6952
2		55	0.1707	1128.03	(45)	0.000264	0.000266	1127.76	0.2668	-0.000001	0.071				985.6952
3		55	0.2359	1192.42	(45)	0.000269	0.000270	1192.20	0.2228	-0.000001	0.050				985.6952
4		55	0.2916	1253.27	(45)	0.000272	0.000273	1252.78	0.4876	-0.000001	0.238				985.6952
6		55	0.3817	1364.46	(45)	0.000277	0.000278	1363.74	0.7174	-0.000001	0.515				985.6952
8		55	0.4515	1463.47	(45)	0.000281	0.000282	1462.93	0.5367	-0.000001	0.288				985.6952
11.45		60.17	0.5409	1607.30	(118)	0.000287	0.000287	1606.82	0.4813	0.000000	0.232				983.1114
11.6		75.44	0.5441	1598.60	(118)	0.000290	0.000290	1599.07	-0.4673	0.000000	0.218				974.5856
11.79		91.95	0.5482	1591.50	(118)	0.000291	0.000291	1591.73	-0.2324	0.000000	0.054				964.0005
Average Res									0.0309	-0.000002	14.38	Sum chi sqr			
Std dev Res									0.3213	0.000004					
Avg - 4std									-1.2543	-0.000017					
Avg + 4std									1.3161	0.000014					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

	molarity	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
c0			109.7728													
c1			513.0387													
c2			1.545407													
c3			0.011019													
c4			1618.137													
Min T			15													
Max T			91.95													
Min w			0.0051													
Max w			0.548161													
Avg dens res			0.030904													
Std dens res			0.321297													
Avg app vol res *10^3			-0.001816													
Std app vol res *10^3			0.003864													
No of points in corr			139													
No of inconsistent pair			20													
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)																
7.78		0	0.4446	1495.70	(118)	0.000254	0.000258	1491.84	3.8564	-0.000004	14.872	!				999.8395
2		15	0.1707	1047.45	(45)	0.000730	0.000246	1146.78	-99.3255	0.000484	9865.554	!		!		999.0996
		17	0.0100	1006.00	(90)	0.000282	0.000234	1006.49	-0.4887	0.000048	0.239			!		998.7749
		17	0.0200	1013.90	(90)	0.000254	0.000235	1014.31	-0.4053	0.000020	0.164			!		998.7749
		17	0.3000	1284.10	(90)	0.000260	0.000257	1285.47	-1.3692	0.000003	1.875	!				998.7749
		17	0.4000	1413.80	(90)	0.000266	0.000264	1415.58	-1.7830	0.000002	3.179	!				998.7749
0.0104		25	0.0011	998.00	(24)	0.000108	0.000239	997.86	0.1397	-0.000131	0.020			!		997.0449
0.0503		25	0.0052	1001.10	(24)	0.000217	0.000239	1000.99	0.1129	-0.000022	0.013			!		997.0449
0.0104		30	0.0011	996.50	(24)	0.000204	0.000242	996.46	0.0403	-0.000038	0.002			!		995.6473
0.0502		30	0.0052	999.90	(24)	0.000177	0.000242	999.57	0.3339	-0.000065	0.112			!		995.6473
0.08		30	0.0082	1002.10	(24)	0.000217	0.000242	1001.89	0.2088	-0.000025	0.044			!		995.6473
0.0104		35	0.0011	1003.20	(24)	-0.007613	0.000245	994.83	8.3652	-0.007857	69.977	!		!		994.0319
0.0501		35	0.0051	1005.90	(24)	-0.001310	0.000245	997.90	8.0002	-0.001555	64.004	!		!		994.0319
0.0799		35	0.0082	1008.10	(24)	-0.000715	0.000245	1000.20	7.9007	-0.000961	62.421	!		!		994.0319
0.1097		35	0.0112	1011.00	(24)	-0.000506	0.000246	1002.49	8.5079	-0.000752	72.384	!		!		994.0319
0.1494		35	0.0152	1013.10	(24)	-0.000242	0.000246	1005.56	7.5393	-0.000488	56.841	!		!		994.0319
0.0103		40	0.0011	1001.40	(24)	-0.007726	0.000248	993.01	8.3916	-0.007973	70.418	!		!		992.2158
0.05		40	0.0051	1005.20	(24)	-0.001536	0.000248	996.06	9.1406	-0.001784	83.550	!		!		992.2158
0.0797		40	0.0081	1007.30	(24)	-0.000846	0.000248	998.34	8.9580	-0.001094	80.245	!		!		992.2158
0.1095		40	0.0112	1010.00	(24)	-0.000583	0.000248	1000.63	9.3730	-0.000831	87.853	!		!		992.2158
0.1492		40	0.0152	1012.90	(24)	-0.000350	0.000249	1003.67	9.2258	-0.000599	85.115	!		!		992.2158

Density of aqueous solutions of **NaCl**

- References (13) Chen, C.-T. A.; Chen, J. H.; Millero, F. J. Densities of NaCl, MgCl₂, Na₂SO₄, and MgSO₄ Aqueous Solutions at 1 atm. from 0 to 50°C and from 0.001 to 1.5 m. *J. Chem. Eng. Data* **1980**, *25*, 307-310.
- (20) Dedick, Eugene A.; Hershey, J. Peter; Sotolongo, Sara; Stade, David J.; Millero, Frank J. The PVT Properties of Concentrated Aqueous Electrolytes IX. The Volume Properties of KCl and K₂SO₄ and their Mixtures with NaCl and Na₂SO₄ as a Function of Temperature, *J. Solution Chem.* **1990**, *19*, 353-374
- (27) Fabuss, B. M.; Korosi, A.; Huq, A. K. M. S.; Densities of Binary and Ternary Aqueous Solutions of NaCl, Na₂SO₄, and MgSO₄, of Sea Waters, and Sea Water Concentrates, *J. Chem. Eng. Data* , **1966**, *3*, 325-331
- (28) Gates, J. A.; Wood, R. H. Densities of Aqueous Solutions of NaCl, MgCl₂, KCl, NaBr, LiCl, and CaCl₂ from 0.05 to 5.0 mol kg⁻¹ and 0.1013 to 40 MPa at 298.15K. *J. Chem. Eng. Data* **1985**, *30*, 44-49.
- (31) Gonçalves, F. Kestin, J. The Viscosity of NaCl and KCl solutions in the range 25-50 °C, *Ber. Bunsenges. Phys. Chem.* **1977**, *81*, 1156-1161
- (32) Gucker, F. T.; Stubble, D.; Hill, D. J. The Isentropic Compressibilities of Aqueous Solutions of Some Alkali Halides at 298.15K. *J. Chem. Thermodynamics* **1975**, *7*, 865-869.
- (44) Isono, T. Measurements of Density, Viscosity, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions. *Rikagaku Kenkyusho Hokoku* **1980**, *56*, 103-114.
- (48) Kaminsky, M. Concentration and Temperature Dependence of the Viscosity of Aqueous Solutions of Strong Electrolytes. II. NaCl, Li₂SO₄, FeCl₂, and CeCl₃ Solutions. *Z. Physik. Chem. N. F.* , **1956** , *8*, 173-191.
- (52) Korosi, A.; Fabuss, B. M. Viscosities of Binary Aqueous Solutions of NaCl, KCl, Na₂SO₄, and MgSO₄ at Concentrations and Temperatures of Interest in Desalination Processes. *J. Chem. Eng. Data* **1968**, *13*, 548-552.
- (62) Lengyel, S.; Tamás, J.; Giber, J.; Holderith, J. Study of Viscosity of Aqueous Alkali Halide Solutions. *Acta Chim. Acad. Sci. Hung.* **1964**, *40*, 125-143.
- (67) Manohar, S.; Puchalska, D.; Atkinson, G. Pressure-Volume-Temperature Properties of Aqueous Mized Electrolyte Solutions: NaCl + BaCl₂ from 25 °C to 140 °C *J. Chem. Eng. Data* **1994**, *39*, 150-154
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, *61* , 1492-1498.
- (74) Motin, M. A., Temperature and Concentration Dependence of Apparent Molar Volumes and Viscosities of NaCl, NH₄Cl, CuCl₂, and MgSO₄ in Pure Water and Water + Urea Mixtures, *J. Chem. Eng. Data* , **2004**, *49*, 94-98
- (79) Olofsson, Inger V.; Apparent molar heat capacities and volumes of aqueous NaCl, KCl, and KNO₃ at 298.15 K. Comparison of Picker flow calorimeter with other calorimeters, *J. Chem. Thermodynamics* , **1979**, *11* , 1005-1014
- (80) Out, D. J. P.; Los, J. M. Viscosity of Aqueous Solutions of Univalent Electrolytes from 5 to 95°C. *J. Sol. Chem.* **1980**, *9* , 19-35.
- (89) Perron, G.; Fortier, J.-L.; Desnoyers, J. E.; Apparent Molar Heat Capacities and Volumes of Aqueous NaCl from 0.01 to 3 mol kg⁻¹ in the Temperature Range 274.65 to 318.15 K., *J. Chem. Thermodynamics* , **1975**, *7* , 1177-1184
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (135) Zhang, H.-L.; Han, S.-J. Viscosity and Density of Water + Sodium Chloride + Potassium Chloride Solutions at 298.15K. *J. Chem. Eng. Data* **1996**, *41* , 516-520

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10 ⁴	Delta density / kg/m ³	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
0.01029		0	0.0006	1000.31	(13)	0.000218	0.000264	1000.3	0.0277	-0.000046	0.001				0.47		999.8395
0.0412		0	0.0024	1001.70	(13)	0.000225	0.000265	1001.6	0.0950	-0.000039	0.009				1.864		999.8395
0.1663		0	0.0096	1007.27	(13)	0.000234	0.000267	1006.9	0.3219	-0.000033	0.104				7.429		999.8395
		0	0.0100	1007.47	(90)	0.000243	0.000267	1007.2	0.2459	-0.000024	0.060						999.8395
		0	0.0200	1015.09	(90)	0.000249	0.000270	1014.7	0.4286	-0.000021	0.184						999.8395
0.5019		0	0.0285	1021.68	(13)	0.000250	0.000272	1021.0	0.6628	-0.000022	0.439				21.845		999.8395
		0	0.0400	1030.38	(90)	0.000259	0.000275	1029.7	0.6870	-0.000016	0.472						999.8395
0.9992		0	0.0552	1042.13	(13)	0.000265	0.000279	1041.2	0.8933	-0.000015	0.798				42.29		999.8395
		0	0.0800	1061.21	(90)	0.000277	0.000286	1060.4	0.8333	-0.000009	0.694						999.8395

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
		0	0.1200	1092.44	(90)	0.000294	0.000298	1091.9	0.5714	-0.000004	0.326						999.8395
		0	0.1600	1124.19	(90)	0.000309	0.000309	1124.1	0.0523	0.000000	0.003						999.8395
		0	0.2000	1156.63	(90)	0.000322	0.000320	1157.1	-0.5131	0.000002	0.263						999.8395
		0	0.2400	1189.99	(90)	0.000334	0.000332	1190.8	-0.8429	0.000002	0.710						999.8395
		0	0.2600	1207.09	(90)	0.000340	0.000338	1207.9	-0.8248	0.000002	0.680						999.8395
0.06845		1.5	0.0040	1002.98	(89)	0.000236	0.000268	1002.8	0.1299	-0.000032	0.017				3.054		999.9214
0.0934		1.5	0.0054	1004.08	(89)	0.000237	0.000269	1003.9	0.1718	-0.000031	0.030				4.158		999.9214
0.12426		1.5	0.0072	1005.44	(89)	0.000239	0.000269	1005.2	0.2208	-0.000030	0.049				5.518		999.9214
0.25724		1.5	0.0148	1011.24	(89)	0.000245	0.000271	1010.8	0.4025	-0.000027	0.162				11.314		999.9214
0.33312		1.5	0.0191	1014.47	(89)	0.000249	0.000272	1014.0	0.4589	-0.000023	0.211				14.549		999.9214
0.48319		1.5	0.0275	1020.85	(89)	0.000254	0.000275	1020.2	0.6059	-0.000021	0.367				20.929		999.9214
0.50786		1.5	0.0288	1021.87	(89)	0.000255	0.000275	1021.3	0.6029	-0.000020	0.364				21.944		999.9214
0.65563		1.5	0.0369	1027.99	(89)	0.000260	0.000277	1027.3	0.6721	-0.000017	0.452				28.071		999.9214
0.84115		1.5	0.0469	1035.58	(89)	0.000265	0.000280	1034.8	0.7456	-0.000015	0.556				35.655		999.9214
1.4309		1.5	0.0772	1058.80	(89)	0.000279	0.000288	1058.0	0.7848	-0.000009	0.616				58.883		999.9214
1.8001		1.5	0.0952	1072.76	(89)	0.000287	0.000293	1072.0	0.7426	-0.000007	0.551				72.841		999.9214
0.01029		5	0.0006	1000.42	(13)	0.000243	0.000274	1000.4	0.0185	-0.000031	0.000				0.455		999.9638
0.02677		5	0.0016	1001.14	(89)	0.000248	0.000274	1001.1	0.0411	-0.000026	0.002				1.176		999.9638
0.0412		5	0.0024	1001.78	(13)	0.000244	0.000275	1001.7	0.0733	-0.000030	0.005				1.819		999.9638
0.06845		5	0.0040	1002.96	(89)	0.000251	0.000275	1002.9	0.0967	-0.000024	0.009				2.994		999.9638
0.0934		5	0.0054	1004.04	(89)	0.000252	0.000275	1003.9	0.1263	-0.000023	0.016				4.076		999.9638
0.09485		5	0.0055	1004.12	(13)	0.000250	0.000275	1004.0	0.1432	-0.000026	0.021				4.154		999.9638
0.1		5	0.0058	1004.29	(80)	0.000259	0.000275	1004.2	0.0985	-0.000017	0.010						999.9638
0.12426		5	0.0072	1005.37	(89)	0.000254	0.000276	1005.2	0.1614	-0.000022	0.026				5.41		999.9638
0.1663		5	0.0096	1007.22	(13)	0.000251	0.000276	1007.0	0.2438	-0.000025	0.059				7.257		999.9638
0.19849		5	0.0115	1008.59	(13)	0.000254	0.000277	1008.3	0.2705	-0.000023	0.073				8.631		999.9638
0.2		5	0.0116	1008.57	(80)	0.000261	0.000277	1008.4	0.1825	-0.000016	0.033						999.9638
0.25724		5	0.0148	1011.06	(89)	0.000259	0.000278	1010.8	0.2868	-0.000019	0.082				11.098		999.9638
0.32		5	0.0184	1013.66	(80)	0.000264	0.000279	1013.4	0.2790	-0.000015	0.078						999.9638
0.33312		5	0.0191	1014.27	(89)	0.000262	0.000279	1013.9	0.3436	-0.000017	0.118				14.304		999.9638
0.48319		5	0.0275	1020.53	(89)	0.000266	0.000281	1020.1	0.4334	-0.000015	0.188				20.569		999.9638
0.5		5	0.0284	1021.17	(80)	0.000269	0.000282	1020.8	0.3832	-0.000013	0.147						999.9638
0.5012		5	0.0285	1021.31	(13)	0.000266	0.000282	1020.8	0.4750	-0.000016	0.226				21.347		999.9638
0.5019		5	0.0285	1021.32	(13)	0.000266	0.000282	1020.9	0.4594	-0.000015	0.211				21.36		999.9638
0.50786		5	0.0288	1021.55	(89)	0.000267	0.000282	1021.1	0.4449	-0.000015	0.198				21.589		999.9638
0.65563		5	0.0369	1027.61	(89)	0.000271	0.000284	1027.1	0.5025	-0.000013	0.253				27.648		999.9638
0.72467		5	0.0406	1030.43	(13)	0.000272	0.000285	1029.9	0.5425	-0.000013	0.294				30.469		999.9638
0.8		5	0.0447	1033.41	(80)	0.000275	0.000286	1032.9	0.5019	-0.000011	0.252						999.9638
0.84115		5	0.0469	1035.09	(89)	0.000276	0.000287	1034.5	0.5414	-0.000011	0.293				35.127		999.9638
0.9471		5	0.0524	1039.30	(89)	0.000278	0.000288	1038.8	0.5500	-0.000010	0.302				39.338		999.9638
0.9992		5	0.0552	1041.38	(13)	0.000279	0.000289	1040.8	0.5778	-0.000010	0.334				41.42		999.9638
1.0012		5	0.0553	1041.48	(13)	0.000279	0.000289	1040.9	0.5911	-0.000010	0.349				41.512		999.9638
1.2		5	0.0655	1049.19	(80)	0.000284	0.000292	1048.6	0.5422	-0.000008	0.294						999.9638
1.49986		5	0.0806	1060.68	(13)	0.000290	0.000296	1060.1	0.5444	-0.000006	0.296				60.719		999.9638
1.95		5	0.1023	1076.71	(20)	0.000303	0.000302	1076.9	-0.2000	0.000002	0.040				76.742		999.9638
0.0986		10	0.0057	1003.90	(62)	0.000270	0.000284	1003.8	0.0830	-0.000014	0.007						999.6996
		10	0.0100	1007.07	(90)	0.000268	0.000285	1006.9	0.1733	-0.000017	0.030						999.6996
		10	0.0200	1014.42	(90)	0.000275	0.000288	1014.1	0.2758	-0.000013	0.076						999.6996

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molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10^4	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.4971		10	0.0282	1020.50	(62)	0.000278	0.000290	1020.1	0.3522	-0.000012	0.124						999.6996
		10	0.0400	1029.20	(90)	0.000284	0.000293	1028.8	0.4104	-0.000010	0.168						999.6996
0.9865		10	0.0545	1040.00	(62)	0.000289	0.000297	1039.5	0.4598	-0.000008	0.211						999.6996
		10	0.0800	1059.07	(90)	0.000299	0.000304	1058.7	0.3949	-0.000004	0.156						999.6996
1.993		10	0.1043	1077.50	(62)	0.000308	0.000310	1077.2	0.2696	-0.000002	0.073						999.6996
		10	0.1200	1089.46	(90)	0.000314	0.000314	1089.3	0.1231	-0.000001	0.015						999.6996
2.9296		10	0.1462	1109.70	(62)	0.000322	0.000321	1109.8	-0.1166	0.000001	0.014						999.6996
		10	0.1600	1120.56	(90)	0.000326	0.000325	1120.7	-0.1877	0.000001	0.035						999.6996
3.4865		10	0.1693	1127.90	(62)	0.000329	0.000328	1128.1	-0.2307	0.000001	0.053						999.6996
3.9873		10	0.1890	1143.60	(62)	0.000334	0.000333	1144.0	-0.3602	0.000001	0.130						999.6996
		10	0.2000	1152.54	(90)	0.000337	0.000336	1152.9	-0.3318	0.000001	0.110						999.6996
		10	0.2400	1185.57	(90)	0.000347	0.000347	1185.7	-0.0933	0.000000	0.009						999.6996
5.4952		10	0.2431	1188.20	(62)	0.000347	0.000347	1188.2	-0.0197	0.000000	0.000						999.6996
5.8023		10	0.2532	1196.80	(62)	0.000350	0.000350	1196.6	0.1524	0.000000	0.023						999.6996
		10	0.2600	1202.54	(90)	0.000351	0.000352	1202.3	0.2480	-0.000001	0.062						999.6996
		12.5	0.0001	999.48	(48)	0.000249	0.000287	999.5	0.0022	-0.000037	0.000			0.44			999.4388
		12.5	0.0001	999.53	(48)	0.000249	0.000287	999.5	0.0044	-0.000037	0.000			0.88			999.4388
		12.5	0.0003	999.66	(48)	0.000253	0.000287	999.6	0.0099	-0.000034	0.000			2.19			999.4388
		12.5	0.0006	999.88	(48)	0.000255	0.000287	999.9	0.0189	-0.000032	0.000			4.37			999.4388
		12.5	0.0012	1000.31	(48)	0.000255	0.000287	1000.3	0.0380	-0.000032	0.001			8.74			999.4388
		12.5	0.0116	1008.01	(48)	0.000269	0.000290	1007.8	0.2442	-0.000021	0.060			85.73			999.4388
		12.5	0.0231	1016.38	(48)	0.000278	0.000293	1016.0	0.3554	-0.000015	0.126			169.46			999.4388
		12.5	0.0287	1020.51	(48)	0.000281	0.000294	1020.1	0.3848	-0.000013	0.148			210.82			999.4388
		15	0.0001	999.14	(48)	0.000267	0.000291	999.1	0.0014	-0.000024	0.000			0.43			999.0996
		15	0.0001	999.19	(48)	0.000258	0.000291	999.2	0.0038	-0.000033	0.000			0.87			999.0996
		15	0.0003	999.32	(48)	0.000260	0.000291	999.3	0.0090	-0.000031	0.000			2.17			999.0996
		15	0.0006	999.53	(48)	0.000260	0.000291	999.5	0.0181	-0.000031	0.000			4.34			999.0996
0.01029		15	0.0006	999.54	(13)	0.000273	0.000291	999.5	0.0108	-0.000018	0.000				0.437		999.0996
		15	0.0012	999.96	(48)	0.000262	0.000291	999.9	0.0334	-0.000029	0.001			8.65			999.0996
0.02677		15	0.0016	1000.24	(89)	0.000267	0.000291	1000.2	0.0369	-0.000024	0.001				1.145		999.0996
0.0412		15	0.0024	1000.85	(13)	0.000272	0.000291	1000.8	0.0465	-0.000019	0.002				1.751		999.0996
0.05		15	0.0029	1001.11	(44)	0.000311	0.000291	1001.2	-0.0575	0.000020	0.003						999.0996
0.06845		15	0.0040	1002.00	(89)	0.000273	0.000292	1001.9	0.0761	-0.000019	0.006				2.905		999.0996
0.0934		15	0.0054	1003.05	(89)	0.000275	0.000292	1003.0	0.0906	-0.000017	0.008				3.947		999.0996
0.09485		15	0.0055	1003.10	(13)	0.000276	0.000292	1003.0	0.0879	-0.000016	0.008				4.004		999.0996
0.1		15	0.0058	1003.21	(44)	0.000295	0.000292	1003.2	-0.0175	0.000003	0.000						999.0996
0.1		15	0.0058	1003.29	(80)	0.000281	0.000292	1003.2	0.0625	-0.000011	0.004						999.0996
0.12426		15	0.0072	1004.33	(89)	0.000277	0.000292	1004.2	0.1094	-0.000015	0.012				5.234		999.0996
0.1663		15	0.0096	1006.09	(13)	0.000279	0.000293	1005.9	0.1385	-0.000014	0.019				6.986		999.0996
0.19656		15	0.0114	1007.32	(89)	0.000281	0.000294	1007.2	0.1408	-0.000012	0.020				8.225		999.0996
0.19849		15	0.0115	1007.41	(13)	0.000281	0.000294	1007.3	0.1490	-0.000013	0.022				8.312		999.0996
0.2		15	0.0116	1007.43	(80)	0.000285	0.000294	1007.3	0.1057	-0.000009	0.011						999.0996
		15	0.0116	1007.59	(48)	0.000276	0.000294	1007.4	0.2111	-0.000018	0.045			84.96			999.0996
0.25724		15	0.0148	1009.47	(89)	0.000306	0.000294	1009.7	-0.1807	0.000012	0.033				10.375		999.0996
0.32		15	0.0184	1012.35	(80)	0.000287	0.000295	1012.2	0.1505	-0.000008	0.023						999.0996
0.33312		15	0.0191	1012.93	(89)	0.000285	0.000295	1012.7	0.1978	-0.000010	0.039				13.828		999.0996
		15	0.0231	1015.88	(48)	0.000284	0.000297	1015.6	0.2959	-0.000012	0.088			167.99			999.0996
0.48319		15	0.0275	1019.00	(89)	0.000289	0.000298	1018.8	0.2451	-0.000009	0.060				19.904		999.0996

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.5		15	0.0284	1019.62	(44)	0.000291	0.000298	1019.4	0.1904	-0.000006	0.036						999.0996
0.5		15	0.0284	1019.62	(80)	0.000291	0.000298	1019.4	0.1904	-0.000006	0.036						999.0996
0.5012		15	0.0285	1019.71	(13)	0.000290	0.000298	1019.5	0.2322	-0.000008	0.054				20.61		999.0996
0.5019		15	0.0285	1019.73	(13)	0.000290	0.000298	1019.5	0.2283	-0.000008	0.052				20.634		999.0996
		15	0.0287	1019.98	(48)	0.000287	0.000298	1019.7	0.3141	-0.000011	0.099			209.02			999.0996
0.50786		15	0.0288	1019.98	(89)	0.000290	0.000298	1019.7	0.2366	-0.000008	0.056				20.88		999.0996
0.65563		15	0.0369	1025.86	(89)	0.000293	0.000300	1025.6	0.2570	-0.000007	0.066				26.759		999.0996
0.72467		15	0.0406	1028.56	(13)	0.000295	0.000301	1028.3	0.2402	-0.000006	0.058				29.457		999.0996
0.8		15	0.0447	1031.48	(80)	0.000297	0.000302	1031.3	0.2177	-0.000005	0.047						999.0996
0.84115		15	0.0469	1033.08	(89)	0.000298	0.000303	1032.9	0.2151	-0.000004	0.046					33.98	999.0996
0.9471		15	0.0524	1037.22	(89)	0.000300	0.000304	1037.0	0.2550	-0.000005	0.065				38.122		999.0996
0.9992		15	0.0552	1039.19	(13)	0.000301	0.000305	1039.0	0.2149	-0.000004	0.046				40.087		999.0996
1		15	0.0552	1039.16	(44)	0.000302	0.000305	1039.0	0.1575	-0.000003	0.025						999.0996
1.0012		15	0.0553	1039.27	(13)	0.000301	0.000305	1039.0	0.2191	-0.000004	0.048				40.168		999.0996
1.2		15	0.0655	1046.81	(80)	0.000305	0.000307	1046.6	0.1840	-0.000003	0.034						999.0996
1.4309		15	0.0772	1055.42	(89)	0.000309	0.000310	1055.3	0.1338	-0.000002	0.018				56.319		999.0996
1.49986		15	0.0806	1057.95	(13)	0.000310	0.000311	1057.8	0.1060	-0.000001	0.011				58.848		999.0996
1.8001		15	0.0952	1068.85	(89)	0.000315	0.000315	1068.8	0.0267	0.000000	0.001				69.746		999.0996
2		15	0.1047	1075.90	(44)	0.000318	0.000317	1076.0	-0.0905	0.000001	0.008						999.0996
2.5333		15	0.1290	1094.32	(89)	0.000326	0.000324	1094.6	-0.2832	0.000002	0.080				95.219		999.0996
3		15	0.1492	1109.76	(44)	0.000332	0.000329	1110.3	-0.5266	0.000003	0.277						999.0996
3.0142		15	0.1498	1110.47	(89)	0.000331	0.000329	1110.8	-0.2847	0.000002	0.081				111.371		999.0996
4		15	0.1895	1141.59	(44)	0.000342	0.000339	1142.1	-0.5142	0.000002	0.264						999.0996
5		15	0.2261	1171.05	(44)	0.000351	0.000349	1171.6	-0.5947	0.000002	0.354						999.0996
0.05		20	0.0029	1000.21	(44)	0.000312	0.000298	1000.3	-0.0403	0.000014	0.002						998.2041
0.0986		20	0.0057	1002.30	(62)	0.000287	0.000299	1002.2	0.0683	-0.000012	0.005						998.2041
0.1		20	0.0058	1002.28	(44)	0.000301	0.000299	1002.3	-0.0087	0.000001	0.000						998.2041
0.4971		20	0.0282	1018.30	(62)	0.000302	0.000305	1018.2	0.0939	-0.000003	0.009						998.2041
0.5		20	0.0284	1018.39	(44)	0.000302	0.000305	1018.3	0.0694	-0.000002	0.005						998.2041
0.9865		20	0.0545	1037.30	(62)	0.000309	0.000311	1037.2	0.1245	-0.000002	0.015						998.2041
1		20	0.0552	1037.66	(44)	0.000312	0.000311	1037.7	-0.0289	0.000000	0.001						998.2041
1.993		20	0.1043	1073.90	(62)	0.000325	0.000324	1074.0	-0.1475	0.000001	0.022						998.2041
2		20	0.1047	1074.07	(44)	0.000326	0.000324	1074.3	-0.2242	0.000002	0.050						998.2041
2.9296		20	0.1462	1105.60	(62)	0.000336	0.000334	1105.9	-0.3353	0.000002	0.112						998.2041
3		20	0.1492	1107.61	(44)	0.000338	0.000335	1108.2	-0.6329	0.000003	0.401						998.2041
3.4865		20	0.1693	1123.50	(62)	0.000342	0.000340	1123.9	-0.3624	0.000002	0.131						998.2041
3.9873		20	0.1890	1139.00	(62)	0.000347	0.000345	1139.4	-0.3617	0.000001	0.131						998.2041
4		20	0.1895	1139.34	(44)	0.000347	0.000345	1139.7	-0.4073	0.000002	0.166						998.2041
5		20	0.2261	1168.59	(44)	0.000356	0.000355	1169.0	-0.4174	0.000001	0.174						998.2041
5.4952		20	0.2431	1183.00	(62)	0.000358	0.000359	1182.7	0.2760	-0.000001	0.076						998.2041
5.8023		20	0.2532	1191.50	(62)	0.000360	0.000361	1191.0	0.5137	-0.000001	0.264						998.2041
	0.001	25	0.0001	997.09	(48)	0.000284	0.000304	997.1	0.0012	-0.000020	0.000			0.42			997.0449
	0.002	25	0.0001	997.13	(48)	0.000284	0.000304	997.1	0.0023	-0.000020	0.000			0.84			997.0449
	0.005	25	0.0003	997.26	(48)	0.000281	0.000304	997.2	0.0068	-0.000023	0.000			2.11			997.0449
0.00784		25	0.0005	997.34	(31)	0.000355	0.000304	997.4	-0.0232	0.000051	0.001		!				997.0449
0.00992		25	0.0006	997.46	(13)	0.000285	0.000304	997.4	0.0113	-0.000020	0.000				0.414		997.0449
	0.01	25	0.0006	997.45	(48)	0.000300	0.000304	997.5	0.0026	-0.000004	0.000			4.11			997.0449
0.01011		25	0.0006	997.46	(73)	0.000288	0.000304	997.5	0.0096	-0.000016	0.000				0.42		997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho(r)-1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.01011	0.02	25	0.0006	997.46	(13)	0.000288	0.000304	997.5	0.0096	-0.000016	0.000				0.42		997.0449
0.01029		25	0.0006	997.47	(13)	0.000290	0.000304	997.5	0.0083	-0.000014	0.000				0.426		997.0449
0.01285		25	0.0008	997.56	(31)	0.000313	0.000304	997.6	-0.0064	0.000009	0.000						997.0449
0.01598		25	0.0009	997.69	(31)	0.000308	0.000304	997.7	-0.0034	0.000004	0.000						997.0449
		25	0.0012	997.88	(48)	0.000284	0.000304	997.9	0.0233	-0.000020	0.001			8.4			997.0449
0.02027		25	0.0012	997.84	(31)	0.000328	0.000304	997.9	-0.0274	0.000023	0.001						997.0449
0.0234		25	0.0014	998.00	(135)	0.000300	0.000304	998.0	0.0058	-0.000004	0.000						997.0449
0.0275		25	0.0016	998.20	(135)	0.000280	0.000304	998.2	0.0396	-0.000025	0.002						997.0449
0.028		25	0.0016	998.20	(135)	0.000293	0.000304	998.2	0.0193	-0.000012	0.000						997.0449
0.0412		25	0.0024	998.74	(13)	0.000294	0.000305	998.7	0.0256	-0.000011	0.001				1.696		997.0449
0.0439	0.05	25	0.0026	998.80	(135)	0.000314	0.000305	998.8	-0.0246	0.000010	0.001						997.0449
0.05		25	0.0029	999.06	(44)	0.000309	0.000305	999.1	-0.0114	0.000004	0.000						997.0449
0.05002		25	0.0029	999.11	(73)	0.000291	0.000305	999.1	0.0407	-0.000014	0.002				2.068		997.0449
0.05002		25	0.0029	999.11	(13)	0.000291	0.000305	999.1	0.0407	-0.000014	0.002				2.068		997.0449
0.05003		25	0.0029	999.11	(13)	0.000292	0.000305	999.1	0.0383	-0.000013	0.001				2.066		997.0449
0.0525		25	0.0031	999.20	(135)	0.000296	0.000305	999.2	0.0275	-0.000009	0.001						997.0449
0.0576		25	0.0034	999.40	(135)	0.000298	0.000305	999.4	0.0213	-0.000006	0.000						997.0449
0.0582		25	0.0034	999.45	(28)	0.000290	0.000305	999.4	0.0489	-0.000014	0.002				2.407		997.0449
0.06177		25	0.0036	999.55	(31)	0.000304	0.000305	999.5	0.0027	-0.000001	0.000						997.0449
0.0632		25	0.0037	999.60	(135)	0.000306	0.000305	999.6	-0.0051	0.000001	0.000						997.0449
0.06662	0.1	25	0.0039	999.81	(79)	0.000287	0.000305	999.7	0.0685	-0.000018	0.005					16.79	997.0449
0.07699		25	0.0045	1000.23	(79)	0.000290	0.000305	1000.2	0.0684	-0.000015	0.005					16.94	997.0449
0.0794		25	0.0046	1000.30	(135)	0.000296	0.000305	1000.3	0.0406	-0.000009	0.002						997.0449
0.08004		25	0.0047	1000.36	(79)	0.000290	0.000305	1000.3	0.0705	-0.000015	0.005					16.95	997.0449
0.0933		25	0.0054	1000.80	(135)	0.000309	0.000305	1000.8	-0.0201	0.000004	0.000						997.0449
0.09485		25	0.0055	1000.94	(13)	0.000295	0.000305	1000.9	0.0563	-0.000010	0.003				3.894		997.0449
0.0986		25	0.0057	1001.10	(62)	0.000294	0.000305	1001.0	0.0662	-0.000012	0.004						997.0449
0.09945		25	0.0058	1001.15	(79)	0.000292	0.000305	1001.1	0.0803	-0.000014	0.006					17.04	997.0449
0.0997		25	0.0058	1001.15	(28)	0.000294	0.000305	1001.1	0.0688	-0.000012	0.005				4.102		997.0449
0.09989		25	0.0058	1001.15	(13)	0.000295	0.000305	1001.1	0.0601	-0.000010	0.004				4.101		997.0449
0.0999	0.164569	25	0.0058	1001.10	(52)	0.000303	0.000305	1001.1	0.0138	-0.000002	0.000						997.0449
0.1		25	0.0058	1001.10	(27)	0.000304	0.000305	1001.1	0.0098	-0.000002	0.000						997.0449
0.1		25	0.0058	1001.10	(44)	0.000304	0.000305	1001.1	0.0098	-0.000002	0.000						997.0449
0.1		25	0.0058	1001.15	(80)	0.000295	0.000305	1001.1	0.0598	-0.000010	0.004						997.0449
0.10039		25	0.0058	1001.17	(73)	0.000294	0.000305	1001.1	0.0680	-0.000012	0.005				4.129		997.0449
0.10039		25	0.0058	1001.17	(13)	0.000294	0.000305	1001.1	0.0680	-0.000012	0.005				4.129		997.0449
0.11094		25	0.0064	1001.58	(31)	0.000298	0.000306	1001.5	0.0491	-0.000008	0.002						997.0449
0.1124		25	0.0065	1001.70	(135)	0.000289	0.000306	1001.6	0.1103	-0.000017	0.012						997.0449
0.11976		25	0.0070	1001.97	(79)	0.000293	0.000306	1001.9	0.0879	-0.000013	0.008					17.13	997.0449
0.14167		25	0.0082	1002.86	(79)	0.000294	0.000306	1002.8	0.0981	-0.000012	0.010					17.19	997.0449
0.1435	0.1735	25	0.0083	1003.00	(135)	0.000287	0.000306	1002.8	0.1596	-0.000019	0.025						997.0449
0.1486		25	0.0086	1003.20	(135)	0.000288	0.000306	1003.0	0.1548	-0.000018	0.024						997.0449
0.1554		25	0.0090	1003.30	(135)	0.000308	0.000306	1003.3	-0.0182	0.000002	0.000						997.0449
0.1648		25	0.0095	1003.80	(135)	0.000295	0.000306	1003.7	0.1047	-0.000011	0.011						997.0449
		25	0.0096	1003.79	(32)	0.000300	0.000306	1003.7	0.0633	-0.000007	0.004						997.0449
		25	0.0100	1004.09	(90)	0.000299	0.000306	1004.0	0.0725	-0.000007	0.005						997.0449
0.1735		25	0.0100	1004.10	(135)	0.000301	0.000306	1004.0	0.0559	-0.000006	0.003						997.0449
0.1769		25	0.0102	1004.30	(79)	0.000295	0.000306	1004.2	0.1170	-0.000011	0.014					17.25	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10 ⁻⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.17842		25	0.0103	1004.36	(79)	0.000295	0.000307	1004.2	0.1164	-0.000011	0.014					17.26	997.0449
0.19749		25	0.0114	1005.12	(79)	0.000297	0.000307	1005.0	0.1142	-0.000010	0.013					17.35	997.0449
0.19849		25	0.0115	1005.14	(13)	0.000298	0.000307	1005.0	0.0962	-0.000008	0.009				8.096		997.0449
0.2		25	0.0116	1005.19	(80)	0.000300	0.000307	1005.1	0.0850	-0.000007	0.007						997.0449
0.20009		25	0.0116	1005.21	(73)	0.000298	0.000307	1005.1	0.0982	-0.000008	0.010				8.162		997.0449
0.20009		25	0.0116	1005.21	(13)	0.000298	0.000307	1005.1	0.0982	-0.000008	0.010				8.162		997.0449
	0.2	25	0.0116	1005.29	(48)	0.000296	0.000307	1005.2	0.1319	-0.000011	0.017			82.68			997.0449
0.2187		25	0.0126	1005.90	(135)	0.000303	0.000307	1005.9	0.0475	-0.000004	0.002						997.0449
0.23631		25	0.0136	1006.63	(31)	0.000302	0.000307	1006.6	0.0747	-0.000005	0.006						997.0449
0.2499		25	0.0144	1007.30	(135)	0.000294	0.000307	1007.1	0.2029	-0.000014	0.041						997.0449
0.288		25	0.0166	1008.77	(28)	0.000299	0.000308	1008.6	0.1598	-0.000009	0.026				11.728		997.0449
0.29972		25	0.0172	1009.19	(73)	0.000302	0.000308	1009.1	0.1114	-0.000006	0.012				12.145		997.0449
0.29972		25	0.0172	1009.19	(13)	0.000302	0.000308	1009.1	0.1114	-0.000006	0.012				12.145		997.0449
	0.298016	25	0.0173	1009.21	(32)	0.000302	0.000308	1009.1	0.1043	-0.000006	0.011						997.0449
0.32		25	0.0184	1009.98	(80)	0.000303	0.000308	1009.9	0.0970	-0.000005	0.009						997.0449
0.3395		25	0.0195	1010.80	(135)	0.000301	0.000309	1010.7	0.1447	-0.000007	0.021						997.0449
		25	0.0200	1011.12	(90)	0.000305	0.000309	1011.0	0.0810	-0.000004	0.007						997.0449
0.3495		25	0.0200	1011.20	(135)	0.000302	0.000309	1011.1	0.1491	-0.000007	0.022						997.0449
0.40009		25	0.0228	1013.16	(73)	0.000305	0.000310	1013.0	0.1131	-0.000005	0.013				16.116		997.0449
0.40009		25	0.0228	1013.16	(13)	0.000305	0.000310	1013.0	0.1131	-0.000005	0.013				16.116		997.0449
	0.4	25	0.0231	1013.37	(48)	0.000303	0.000310	1013.2	0.1670	-0.000007	0.028			163.74			997.0449
0.4057		25	0.0232	1013.50	(135)	0.000300	0.000310	1013.3	0.2313	-0.000010	0.053						997.0449
0.42086		25	0.0240	1014.02	(79)	0.000304	0.000310	1013.9	0.1547	-0.000006	0.024					17.74	997.0449
0.4476		25	0.0255	1015.00	(135)	0.000307	0.000310	1014.9	0.0839	-0.000003	0.007						997.0449
0.4478		25	0.0255	1014.90	(135)	0.000311	0.000310	1014.9	-0.0240	0.000001	0.001						997.0449
0.4708		25	0.0268	1015.98	(28)	0.000305	0.000310	1015.8	0.1549	-0.000006	0.024				18.936		997.0449
0.4971		25	0.0282	1016.90	(62)	0.000309	0.000311	1016.9	0.0444	-0.000002	0.002						997.0449
0.49946		25	0.0284	1017.06	(73)	0.000307	0.000311	1016.9	0.1090	-0.000004	0.012				20.012		997.0449
0.49946		25	0.0284	1017.06	(13)	0.000307	0.000311	1016.9	0.1090	-0.000004	0.012				20.012		997.0449
0.5		25	0.0284	1016.99	(44)	0.000310	0.000311	1017.0	0.0210	-0.000001	0.000						997.0449
0.5		25	0.0284	1017.09	(67)	0.000307	0.000311	1017.0	0.1229	-0.000004	0.015				20.047		997.0449
0.5		25	0.0284	1017.08	(80)	0.000307	0.000311	1017.0	0.1110	-0.000004	0.012						997.0449
0.5012		25	0.0285	1017.14	(13)	0.000307	0.000311	1017.0	0.1260	-0.000004	0.016				20.097		997.0449
0.5019		25	0.0285	1017.16	(13)	0.000307	0.000311	1017.0	0.1146	-0.000004	0.013				20.113		997.0449
	0.5	25	0.0287	1017.37	(48)	0.000305	0.000311	1017.2	0.1662	-0.000006	0.028			203.85			997.0449
	0.522143	25	0.0300	1018.20	(32)	0.000308	0.000311	1018.1	0.1139	-0.000004	0.013						997.0449
0.5614		25	0.0318	1019.60	(135)	0.000305	0.000312	1019.4	0.2358	-0.000007	0.056						997.0449
0.56874		25	0.0322	1019.70	(31)	0.000310	0.000312	1019.6	0.0502	-0.000002	0.003						997.0449
0.59971		25	0.0339	1020.95	(73)	0.000309	0.000312	1020.9	0.0989	-0.000003	0.010				23.907		997.0449
0.59971		25	0.0339	1020.95	(13)	0.000309	0.000312	1020.9	0.0989	-0.000003	0.010				23.907		997.0449
0.6504		25	0.0366	1022.94	(79)	0.000310	0.000313	1022.8	0.1208	-0.000003	0.015					18.1	997.0449
0.652		25	0.0367	1023.00	(79)	0.000310	0.000313	1022.9	0.1219	-0.000003	0.015					18.1	997.0449
0.69917		25	0.0393	1024.78	(73)	0.000311	0.000313	1024.7	0.0867	-0.000002	0.008				27.74		997.0449
0.69917		25	0.0393	1024.78	(13)	0.000311	0.000313	1024.7	0.0867	-0.000002	0.008				27.74		997.0449
0.7023		25	0.0394	1025.00	(135)	0.000309	0.000314	1024.8	0.1813	-0.000004	0.033						997.0449
0.7069		25	0.0397	1025.30	(52)	0.000306	0.000314	1025.0	0.3042	-0.000007	0.093						997.0449
		25	0.0400	1025.30	(90)	0.000312	0.000314	1025.2	0.0714	-0.000002	0.005						997.0449
0.7198		25	0.0404	1025.70	(135)	0.000309	0.000314	1025.5	0.2078	-0.000005	0.043						997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.7244		25	0.0406	1025.90	(135)	0.000308	0.000314	1025.7	0.2310	-0.000005	0.053						997.0449
0.72467		25	0.0406	1025.78	(13)	0.000311	0.000314	1025.7	0.1055	-0.000002	0.011				28.74		997.0449
0.79957		25	0.0446	1028.62	(73)	0.000313	0.000315	1028.6	0.0723	-0.000002	0.005				31.578		997.0449
0.79957		25	0.0446	1028.62	(13)	0.000313	0.000315	1028.6	0.0723	-0.000002	0.005				31.578		997.0449
0.8		25	0.0447	1028.65	(80)	0.000313	0.000315	1028.6	0.0830	-0.000002	0.007						997.0449
0.85382		25	0.0475	1030.71	(31)	0.000314	0.000315	1030.6	0.0900	-0.000002	0.008						997.0449
0.8636		25	0.0480	1031.20	(135)	0.000312	0.000316	1031.0	0.2078	-0.000004	0.043						997.0449
0.90125		25	0.0500	1032.48	(73)	0.000315	0.000316	1032.4	0.0575	-0.000001	0.003				35.435		997.0449
0.90125		25	0.0500	1032.48	(13)	0.000315	0.000316	1032.4	0.0575	-0.000001	0.003				35.435		997.0449
0.9208		25	0.0511	1033.31	(79)	0.000314	0.000316	1033.2	0.1477	-0.000003	0.022					18.33	997.0449
0.9807		25	0.0542	1035.50	(135)	0.000316	0.000317	1035.4	0.0729	-0.000001	0.005						997.0449
0.9865		25	0.0545	1035.70	(62)	0.000316	0.000317	1035.6	0.0543	-0.000001	0.003						997.0449
0.9992		25	0.0552	1036.17	(13)	0.000317	0.000317	1036.1	0.0468	-0.000001	0.002				39.126		997.0449
1		25	0.0552	1036.10	(27)	0.000318	0.000317	1036.2	-0.0542	0.000001	0.003						997.0449
1		25	0.0552	1036.07	(44)	0.000319	0.000317	1036.2	-0.0842	0.000001	0.007						997.0449
1		25	0.0552	1036.14	(67)	0.000318	0.000317	1036.2	-0.0163	0.000000	0.000				39.093		997.0449
1.0001		25	0.0552	1036.20	(73)	0.000317	0.000317	1036.2	0.0429	-0.000001	0.002				39.156		997.0449
1.0001		25	0.0552	1036.20	(13)	0.000317	0.000317	1036.2	0.0429	-0.000001	0.002				39.156		997.0449
1.0012		25	0.0553	1036.26	(13)	0.000316	0.000317	1036.2	0.0605	-0.000001	0.004				39.215		997.0449
1.0034		25	0.0554	1036.40	(135)	0.000315	0.000317	1036.3	0.1178	-0.000002	0.014						997.0449
	0.997147	25	0.0562	1036.97	(32)	0.000316	0.000318	1036.9	0.1043	-0.000002	0.011						997.0449
1.021		25	0.0563	1037.12	(28)	0.000315	0.000318	1036.9	0.1786	-0.000003	0.032				40.078		997.0449
1.1888		25	0.0650	1043.38	(79)	0.000317	0.000320	1043.2	0.1633	-0.000002	0.027					18.55	997.0449
1.2		25	0.0655	1043.65	(80)	0.000320	0.000320	1043.6	0.0222	0.000000	0.000						997.0449
1.3174		25	0.0715	1048.00	(135)	0.000321	0.000321	1048.0	0.0374	0.000000	0.001						997.0449
1.4138		25	0.0763	1051.40	(52)	0.000324	0.000322	1051.5	-0.0935	0.000001	0.009						997.0449
1.47458		25	0.0793	1053.53	(31)	0.000325	0.000323	1053.7	-0.1765	0.000002	0.031						997.0449
		25	0.0800	1054.12	(90)	0.000324	0.000323	1054.2	-0.0698	0.000001	0.005						997.0449
1.49986		25	0.0806	1054.56	(13)	0.000324	0.000324	1054.6	-0.0591	0.000001	0.003				57.52		997.0449
1.5088		25	0.0810	1054.97	(79)	0.000323	0.000324	1054.9	0.0199	0.000000	0.000					18.9	997.0449
	1.522627	25	0.0842	1057.28	(32)	0.000324	0.000324	1057.2	0.0331	0.000000	0.001						997.0449
1.5854		25	0.0848	1057.80	(135)	0.000324	0.000325	1057.7	0.0844	-0.000001	0.007						997.0449
1.6654		25	0.0887	1060.70	(135)	0.000324	0.000325	1060.6	0.1110	-0.000001	0.012						997.0449
1.6728		25	0.0891	1060.90	(135)	0.000325	0.000326	1060.9	0.0461	0.000000	0.002						997.0449
1.8995		25	0.0999	1068.90	(135)	0.000328	0.000328	1068.9	0.0013	0.000000	0.000						997.0449
1.9384		25	0.1018	1070.20	(79)	0.000329	0.000329	1070.3	-0.0648	0.000001	0.004					19.24	997.0449
1.95		25	0.1023	1070.17	(20)	0.000333	0.000329	1070.7	-0.5023	0.000004	0.252				73.125		997.0449
1.961		25	0.1028	1070.90	(135)	0.000330	0.000329	1071.1	-0.1576	0.000001	0.025						997.0449
1.993		25	0.1043	1072.00	(62)	0.000331	0.000329	1072.2	-0.1770	0.000001	0.031						997.0449
1.994		25	0.1044	1072.08	(28)	0.000330	0.000329	1072.2	-0.1291	0.000001	0.017				75.038		997.0449
2		25	0.1047	1072.10	(27)	0.000332	0.000329	1072.4	-0.3215	0.000003	0.103						997.0449
2		25	0.1047	1072.11	(44)	0.000332	0.000329	1072.4	-0.3115	0.000003	0.097						997.0449
2.001		25	0.1047	1072.30	(135)	0.000331	0.000329	1072.5	-0.1564	0.000001	0.024						997.0449
2.0889		25	0.1088	1075.40	(79)	0.000331	0.000330	1075.5	-0.1123	0.000001	0.013					19.36	997.0449
2.3156		25	0.1192	1083.10	(135)	0.000334	0.000333	1083.3	-0.2133	0.000002	0.045						997.0449
		25	0.1200	1083.65	(90)	0.000335	0.000333	1083.9	-0.2660	0.000002	0.071						997.0449
2.3666		25	0.1215	1084.85	(79)	0.000335	0.000333	1085.0	-0.1981	0.000001	0.039					19.57	997.0449
2.5		25	0.1275	1089.20	(27)	0.000337	0.000335	1089.6	-0.3591	0.000002	0.129						997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
2.5		25	0.1275	1089.36	(67)	0.000336	0.000335	1089.6	-0.2022	0.000001	0.041				92.312		997.0449
2.51393		25	0.1281	1089.63	(31)	0.000338	0.000335	1090.0	-0.3974	0.000003	0.158						997.0449
2.7186		25	0.1371	1096.60	(135)	0.000339	0.000337	1096.9	-0.2527	0.000002	0.064						997.0449
2.8116		25	0.1411	1099.74	(79)	0.000339	0.000338	1099.9	-0.1766	0.000001	0.031					19.83	997.0449
2.9296		25	0.1462	1103.40	(62)	0.000342	0.000340	1103.8	-0.3810	0.000002	0.145						997.0449
2.9405		25	0.1466	1103.80	(135)	0.000342	0.000340	1104.1	-0.3359	0.000002	0.113						997.0449
3		25	0.1492	1105.44	(44)	0.000344	0.000340	1106.1	-0.6285	0.000003	0.395						997.0449
3.023		25	0.1501	1106.65	(28)	0.000341	0.000340	1106.8	-0.1623	0.000001	0.026				109.606		997.0449
	2.866916	25	0.1513	1107.55	(32)	0.000342	0.000341	1107.7	-0.1386	0.000001	0.019						997.0449
3.09392		25	0.1531	1108.49	(31)	0.000344	0.000341	1109.1	-0.6116	0.000003	0.374						997.0449
3.2249		25	0.1586	1113.00	(135)	0.000344	0.000343	1113.3	-0.2965	0.000002	0.088						997.0449
3.2579		25	0.1599	1114.10	(135)	0.000344	0.000343	1114.3	-0.2470	0.000001	0.061						997.0449
		25	0.1600	1114.01	(90)	0.000345	0.000343	1114.4	-0.3780	0.000002	0.143						997.0449
3.4321		25	0.1671	1119.60	(135)	0.000346	0.000345	1119.8	-0.2499	0.000001	0.062						997.0449
3.4865		25	0.1693	1121.20	(62)	0.000347	0.000345	1121.6	-0.3539	0.000002	0.125						997.0449
3.5345		25	0.1712	1122.60	(52)	0.000348	0.000346	1123.1	-0.4517	0.000002	0.204						997.0449
	3.293967	25	0.1714	1123.08	(32)	0.000346	0.000346	1123.2	-0.1390	0.000001	0.019						997.0449
3.6736		25	0.1767	1127.10	(135)	0.000348	0.000347	1127.4	-0.2625	0.000001	0.069						997.0449
3.6813		25	0.1771	1127.50	(135)	0.000348	0.000347	1127.6	-0.0998	0.000000	0.010						997.0449
3.9873		25	0.1890	1136.60	(62)	0.000351	0.000350	1136.9	-0.3235	0.000001	0.105						997.0449
4		25	0.1895	1136.98	(44)	0.000351	0.000350	1137.3	-0.3260	0.000001	0.106						997.0449
	3.729894	25	0.1914	1138.82	(32)	0.000351	0.000351	1138.8	-0.0072	0.000000	0.000						997.0449
4.2179		25	0.1978	1143.70	(135)	0.000353	0.000352	1143.8	-0.1126	0.000000	0.013						997.0449
		25	0.2000	1145.33	(90)	0.000354	0.000353	1145.6	-0.2497	0.000001	0.062						997.0449
4.3397		25	0.2023	1147.30	(135)	0.000354	0.000353	1147.4	-0.1046	0.000000	0.011						997.0449
4.5		25	0.2082	1152.00	(67)	0.000355	0.000355	1152.1	-0.0856	0.000000	0.007				154.953		997.0449
	4.171523	25	0.2111	1154.66	(32)	0.000355	0.000355	1154.4	0.2704	-0.000001	0.073						997.0449
4.6368		25	0.2132	1156.20	(135)	0.000355	0.000356	1156.0	0.1665	-0.000001	0.028						997.0449
4.9288		25	0.2236	1164.70	(135)	0.000357	0.000359	1164.3	0.3657	-0.000001	0.134						997.0449
4.991		25	0.2258	1166.26	(28)	0.000359	0.000359	1166.1	0.1850	-0.000001	0.034				169.22		997.0449
5		25	0.2261	1166.07	(44)	0.000360	0.000359	1166.3	-0.2618	0.000001	0.069						997.0449
	4.534427	25	0.2270	1167.43	(32)	0.000358	0.000359	1167.0	0.4039	-0.000001	0.163						997.0449
5.116		25	0.2302	1169.80	(135)	0.000359	0.000360	1169.6	0.2358	-0.000001	0.056						997.0449
5.24324		25	0.2346	1172.90	(31)	0.000362	0.000361	1173.1	-0.1787	0.000001	0.032						997.0449
5.2593		25	0.2351	1173.90	(135)	0.000360	0.000361	1173.5	0.3800	-0.000001	0.144						997.0449
5.346		25	0.2381	1176.20	(135)	0.000361	0.000362	1175.9	0.3064	-0.000001	0.094						997.0449
		25	0.2400	1177.76	(90)	0.000362	0.000363	1177.5	0.3032	-0.000001	0.092						997.0449
5.4952		25	0.2431	1180.30	(62)	0.000362	0.000363	1179.9	0.3563	-0.000001	0.127						997.0449
5.5426		25	0.2447	1181.60	(135)	0.000363	0.000364	1181.2	0.3786	-0.000001	0.143						997.0449
5.8023		25	0.2532	1188.80	(62)	0.000364	0.000366	1188.1	0.6552	-0.000002	0.429						997.0449
5.82267		25	0.2539	1188.88	(31)	0.000366	0.000366	1188.7	0.1976	-0.000001	0.039						997.0449
5.8345		25	0.2543	1189.70	(135)	0.000364	0.000366	1189.0	0.7057	-0.000002	0.498						997.0449
		25	0.2600	1194.43	(90)	0.000365	0.000368	1193.6	0.7910	-0.000002	0.626						997.0449
6.0216		25	0.2603	1194.90	(135)	0.000365	0.000368	1193.9	1.0082	-0.000003	1.017						997.0449
0.00784		30	0.0005	995.94	(31)	0.000360	0.000310	996.0	-0.0227	0.000050	0.001						995.6473
0.01285		30	0.0008	996.15	(31)	0.000329	0.000310	996.2	-0.0142	0.000019	0.000						995.6473
0.01598		30	0.0009	996.28	(31)	0.000321	0.000310	996.3	-0.0101	0.000011	0.000						995.6473
0.02027		30	0.0012	996.46	(31)	0.000312	0.000310	996.5	-0.0025	0.000002	0.000						995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.05		30	0.0029	997.65	(44)	0.000312	0.000310	997.7	-0.0061	0.000002	0.000						995.6473
0.06177		30	0.0036	998.14	(31)	0.000307	0.000310	998.1	0.0121	-0.000003	0.000						995.6473
0.0986		30	0.0057	999.60	(62)	0.000311	0.000311	999.6	-0.0014	0.000000	0.000						995.6473
0.1		30	0.0058	999.68	(44)	0.000307	0.000311	999.7	0.0227	-0.000004	0.001						995.6473
0.11094		30	0.0064	1000.13	(31)	0.000306	0.000311	1000.1	0.0358	-0.000006	0.001						995.6473
0.23631		30	0.0136	1005.13	(31)	0.000309	0.000313	1005.1	0.0549	-0.000004	0.003						995.6473
0.4971		30	0.0282	1015.30	(62)	0.000316	0.000316	1015.3	0.0132	0.000000	0.000						995.6473
0.5		30	0.0284	1015.43	(44)	0.000315	0.000316	1015.4	0.0308	-0.000001	0.001						995.6473
0.56874		30	0.0322	1018.08	(31)	0.000316	0.000317	1018.1	0.0230	-0.000001	0.001						995.6473
0.85382		30	0.0475	1028.97	(31)	0.000320	0.000321	1028.9	0.0357	-0.000001	0.001						995.6473
0.9865		30	0.0545	1033.90	(62)	0.000323	0.000322	1033.9	-0.0178	0.000000	0.000						995.6473
1		30	0.0552	1034.32	(44)	0.000324	0.000323	1034.4	-0.1021	0.000002	0.010						995.6473
1.47458		30	0.0793	1051.67	(31)	0.000330	0.000328	1051.8	-0.1592	0.000002	0.025						995.6473
1.993		30	0.1043	1069.90	(62)	0.000336	0.000334	1070.2	-0.2510	0.000002	0.063						995.6473
2		30	0.1047	1070.09	(44)	0.000337	0.000334	1070.4	-0.3036	0.000003	0.092						995.6473
2.51393		30	0.1281	1087.47	(31)	0.000342	0.000340	1087.9	-0.3920	0.000003	0.154						995.6473
2.9296		30	0.1462	1101.20	(62)	0.000346	0.000344	1101.5	-0.3114	0.000002	0.097						995.6473
3		30	0.1492	1103.22	(44)	0.000348	0.000345	1103.8	-0.5619	0.000003	0.316						995.6473
3.09392		30	0.1531	1106.23	(31)	0.000349	0.000346	1106.8	-0.5626	0.000003	0.317						995.6473
3.4865		30	0.1693	1118.80	(62)	0.000351	0.000350	1119.2	-0.3543	0.000002	0.126						995.6473
3.9873		30	0.1890	1134.20	(62)	0.000355	0.000354	1134.4	-0.2159	0.000001	0.047						995.6473
4		30	0.1895	1134.60	(44)	0.000355	0.000354	1134.8	-0.1958	0.000001	0.038						995.6473
5		30	0.2261	1163.51	(44)	0.000364	0.000363	1163.6	-0.1205	0.000000	0.015						995.6473
5.24324		30	0.2346	1170.30	(31)	0.000365	0.000365	1170.3	-0.0355	0.000000	0.001						995.6473
5.4952		30	0.2431	1177.70	(62)	0.000366	0.000367	1177.2	0.5410	-0.000002	0.293						995.6473
5.8023		30	0.2532	1186.10	(62)	0.000368	0.000370	1185.3	0.7882	-0.000002	0.621						995.6473
5.82267		30	0.2539	1186.16	(31)	0.000369	0.000370	1185.8	0.3137	-0.000001	0.098						995.6473
		35	0.0001	994.07	(48)	0.000302	0.000314	994.1	0.0007	-0.000012	0.000			0.41			994.0319
		35	0.0001	994.11	(48)	0.000294	0.000314	994.1	0.0024	-0.000021	0.000			0.83			994.0319
		35	0.0003	994.24	(48)	0.000295	0.000315	994.2	0.0055	-0.000019	0.000			2.07			994.0319
		35	0.0006	994.44	(48)	0.000302	0.000315	994.4	0.0071	-0.000012	0.000			4.1			994.0319
		35	0.0012	994.85	(48)	0.000298	0.000315	994.8	0.0193	-0.000017	0.000			8.25			994.0319
0.02677		35	0.0016	995.12	(89)	0.000301	0.000315	995.1	0.0210	-0.000014	0.000				1.089		994.0319
0.0412		35	0.0024	995.70	(13)	0.000304	0.000315	995.7	0.0272	-0.000011	0.001				1.67		994.0319
0.05		35	0.0029	996.03	(44)	0.000313	0.000315	996.0	0.0051	-0.000002	0.000						994.0319
0.0625		35	0.0036	996.60	(74)	0.000294	0.000315	996.5	0.0758	-0.000021	0.006					17.2	994.0319
0.06845		35	0.0040	996.80	(89)	0.000304	0.000315	996.8	0.0444	-0.000011	0.002				2.771		994.0319
0.0934		35	0.0054	997.80	(89)	0.000306	0.000316	997.7	0.0510	-0.000009	0.003				3.768		994.0319
0.09485		35	0.0055	997.85	(13)	0.000308	0.000316	997.8	0.0425	-0.000008	0.002				3.817		994.0319
0.1		35	0.0058	998.02	(44)	0.000314	0.000316	998.0	0.0095	-0.000002	0.000						994.0319
0.1		35	0.0058	998.07	(80)	0.000305	0.000316	998.0	0.0595	-0.000010	0.004						994.0319
0.12426		35	0.0072	999.03	(89)	0.000308	0.000316	999.0	0.0586	-0.000008	0.003				4.998		994.0319
0.125		35	0.0073	999.10	(74)	0.000303	0.000316	999.0	0.0958	-0.000013	0.009					17.7	994.0319
0.1663		35	0.0096	1000.70	(13)	0.000309	0.000317	1000.6	0.0728	-0.000008	0.005				6.673		994.0319
0.19656		35	0.0114	1001.92	(89)	0.000309	0.000317	1001.8	0.0937	-0.000008	0.009				7.886		994.0319
0.2		35	0.0116	1002.02	(80)	0.000312	0.000317	1002.0	0.0605	-0.000005	0.004						994.0319
		35	0.0116	1002.11	(48)	0.000308	0.000317	1002.0	0.1031	-0.000009	0.011			81.3			994.0319
0.25		35	0.0144	1003.99	(74)	0.000313	0.000318	1003.9	0.0665	-0.000005	0.004					18.3	994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.25724		35	0.0148	1004.29	(89)	0.000312	0.000318	1004.2	0.0812	-0.000005	0.007				10.256		994.0319
0.32		35	0.0184	1006.73	(80)	0.000315	0.000319	1006.7	0.0705	-0.000004	0.005						994.0319
0.33312		35	0.0191	1007.26	(89)	0.000314	0.000319	1007.2	0.0851	-0.000004	0.007				13.224		994.0319
		35	0.0231	1010.06	(48)	0.000314	0.000320	1009.9	0.1305	-0.000006	0.017			161.21			994.0319
0.48319		35	0.0275	1013.07	(89)	0.000318	0.000321	1013.0	0.0831	-0.000003	0.007				19.035		994.0319
0.5		35	0.0284	1013.66	(44)	0.000320	0.000321	1013.6	0.0292	-0.000001	0.001						994.0319
0.5		35	0.0284	1013.73	(67)	0.000317	0.000321	1013.6	0.1000	-0.000003	0.010				19.699		994.0319
0.5		35	0.0284	1013.51	(74)	0.000325	0.000321	1013.6	-0.1228	0.000004	0.015					19	994.0319
0.5		35	0.0284	1013.69	(80)	0.000319	0.000321	1013.6	0.0592	-0.000002	0.004						994.0319
0.5019		35	0.0285	1013.77	(13)	0.000319	0.000321	1013.7	0.0680	-0.000002	0.005				19.74		994.0319
		35	0.0287	1014.00	(48)	0.000316	0.000321	1013.9	0.1405	-0.000005	0.020			200.9			994.0319
0.50786		35	0.0288	1014.01	(89)	0.000318	0.000321	1013.9	0.0758	-0.000003	0.006				19.977		994.0319
0.65563		35	0.0369	1019.64	(89)	0.000321	0.000323	1019.6	0.0587	-0.000002	0.003				25.61		994.0319
0.8		35	0.0447	1025.07	(80)	0.000324	0.000325	1025.0	0.0267	-0.000001	0.001						994.0319
0.84115		35	0.0469	1026.61	(89)	0.000325	0.000325	1026.6	0.0210	0.000000	0.000				32.578		994.0319
0.9471		35	0.0524	1030.57	(89)	0.000326	0.000326	1030.5	0.0223	0.000000	0.000				36.537		994.0319
0.9992		35	0.0552	1032.44	(13)	0.000328	0.000327	1032.5	-0.0364	0.000001	0.001				38.413		994.0319
1		35	0.0552	1032.40	(44)	0.000329	0.000327	1032.5	-0.1109	0.000002	0.012						994.0319
1		35	0.0552	1032.56	(67)	0.000326	0.000327	1032.5	0.0490	-0.000001	0.002				38.528		994.0319
1.2		35	0.0655	1039.82	(80)	0.000330	0.000329	1039.9	-0.0480	0.000001	0.002						994.0319
1.4309		35	0.0772	1048.12	(89)	0.000333	0.000332	1048.2	-0.1068	0.000001	0.011				54.088		994.0319
1.8001		35	0.0952	1061.12	(89)	0.000338	0.000336	1061.3	-0.1815	0.000002	0.033				67.084		994.0319
2		35	0.1047	1067.93	(44)	0.000341	0.000338	1068.2	-0.2966	0.000002	0.088						994.0319
2.5		35	0.1275	1085.03	(67)	0.000344	0.000344	1085.1	-0.0838	0.000001	0.007				91.001		994.0319
2.5333		35	0.1290	1085.85	(89)	0.000346	0.000344	1086.2	-0.3737	0.000002	0.140				91.814		994.0319
3		35	0.1492	1100.92	(44)	0.000351	0.000349	1101.4	-0.4768	0.000003	0.227						994.0319
3.0142		35	0.1498	1101.57	(89)	0.000350	0.000349	1101.9	-0.2796	0.000002	0.078				107.539		994.0319
4		35	0.1895	1132.31	(44)	0.000358	0.000358	1132.2	0.0824	0.000000	0.007						994.0319
4.5		35	0.2082	1147.12	(67)	0.000361	0.000362	1146.8	0.2954	-0.000001	0.087				153.09		994.0319
5		35	0.2261	1160.92	(44)	0.000366	0.000367	1160.9	0.0085	0.000000	0.000						994.0319
0.01719		40	0.0010	992.88	(31)	0.000336	0.000319	992.9	-0.0170	0.000017	0.000						992.2158
0.05351		40	0.0031	994.37	(31)	0.000307	0.000319	994.3	0.0365	-0.000012	0.001						992.2158
0.0625		40	0.0036	994.74	(74)	0.000305	0.000319	994.7	0.0535	-0.000015	0.003					17.8	992.2158
0.0986		40	0.0057	996.10	(62)	0.000322	0.000320	996.1	-0.0115	0.000002	0.000						992.2158
0.0999		40	0.0058	996.10	(52)	0.000331	0.000320	996.2	-0.0627	0.000011	0.004						992.2158
0.125		40	0.0073	997.23	(74)	0.000310	0.000320	997.1	0.0758	-0.000011	0.006					18.1	992.2158
0.1723		40	0.0100	999.04	(31)	0.000317	0.000321	999.0	0.0351	-0.000004	0.001						992.2158
		40	0.0100	999.08	(90)	0.000315	0.000321	999.0	0.0542	-0.000005	0.003						992.2158
0.25		40	0.0144	1002.06	(74)	0.000320	0.000322	1002.0	0.0264	-0.000002	0.001					18.7	992.2158
		40	0.0200	1005.93	(90)	0.000321	0.000323	1005.9	0.0446	-0.000002	0.002						992.2158
0.4971		40	0.0282	1011.60	(62)	0.000324	0.000325	1011.6	0.0309	-0.000001	0.001						992.2158
0.5		40	0.0284	1011.43	(74)	0.000334	0.000325	1011.7	-0.2549	0.000009	0.065					19.5	992.2158
0.55893		40	0.0316	1013.96	(31)	0.000325	0.000326	1013.9	0.0332	-0.000001	0.001						992.2158
0.7069		40	0.0397	1019.70	(52)	0.000323	0.000327	1019.5	0.1746	-0.000004	0.030						992.2158
		40	0.0400	1019.77	(90)	0.000327	0.000327	1019.8	0.0171	0.000000	0.000						992.2158
0.9865		40	0.0545	1029.90	(62)	0.000331	0.000331	1029.9	-0.0384	0.000001	0.001						992.2158
1.13947		40	0.0624	1035.43	(31)	0.000334	0.000332	1035.5	-0.1149	0.000002	0.013						992.2158
1.4138		40	0.0763	1045.30	(52)	0.000337	0.000336	1045.4	-0.1422	0.000002	0.020						992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
		40	0.0800	1047.98	(90)	0.000337	0.000336	1048.1	-0.1012	0.000001	0.010						992.2158
1.993		40	0.1043	1065.50	(62)	0.000343	0.000342	1065.7	-0.1936	0.000002	0.037						992.2158
		40	0.1200	1076.99	(90)	0.000347	0.000345	1077.2	-0.2065	0.000001	0.043						992.2158
2.35546		40	0.1210	1077.57	(31)	0.000348	0.000345	1077.9	-0.3662	0.000003	0.134						992.2158
2.9296		40	0.1462	1096.40	(62)	0.000353	0.000351	1096.7	-0.2784	0.000002	0.077						992.2158
		40	0.1600	1106.88	(90)	0.000355	0.000354	1107.1	-0.2100	0.000001	0.044						992.2158
3.4865		40	0.1693	1113.90	(62)	0.000357	0.000356	1114.1	-0.2275	0.000001	0.052						992.2158
3.5345		40	0.1712	1115.40	(52)	0.000358	0.000357	1115.6	-0.1990	0.000001	0.040						992.2158
3.87979		40	0.1848	1125.59	(31)	0.000362	0.000360	1126.0	-0.4455	0.000002	0.199						992.2158
3.9873		40	0.1890	1129.10	(62)	0.000361	0.000361	1129.2	-0.1328	0.000001	0.018						992.2158
		40	0.2000	1137.74	(90)	0.000363	0.000363	1137.7	-0.0069	0.000000	0.000						992.2158
		40	0.2400	1169.71	(90)	0.000371	0.000372	1169.1	0.5640	-0.000002	0.318						992.2158
5.45241		40	0.2417	1170.69	(31)	0.000372	0.000373	1170.5	0.2325	-0.000001	0.054						992.2158
5.4952		40	0.2431	1172.20	(62)	0.000371	0.000373	1171.6	0.6011	-0.000002	0.361						992.2158
5.8023		40	0.2532	1179.90	(62)	0.000375	0.000375	1179.7	0.2091	-0.000001	0.044						992.2158
		40	0.2600	1186.14	(90)	0.000374	0.000377	1185.1	1.0248	-0.000003	1.050						992.2158
		42.5	0.0001	991.28	(48)	0.000303	0.000320	991.3	0.0010	-0.000017	0.000			0.41			991.237
		42.5	0.0001	991.32	(48)	0.000303	0.000320	991.3	0.0020	-0.000017	0.000			0.82			991.237
		42.5	0.0003	991.44	(48)	0.000300	0.000321	991.4	0.0060	-0.000021	0.000			2.06			991.237
		42.5	0.0006	991.64	(48)	0.000303	0.000321	991.6	0.0100	-0.000017	0.000			4.1			991.237
		42.5	0.0012	992.05	(48)	0.000300	0.000321	992.0	0.0242	-0.000021	0.001			8.24			991.237
		42.5	0.0116	999.29	(48)	0.000310	0.000323	999.1	0.1532	-0.000013	0.023			81.22			991.237
		42.5	0.0231	1007.20	(48)	0.000316	0.000325	1007.0	0.2270	-0.000010	0.052			161.03			991.237
		42.5	0.0287	1011.12	(48)	0.000318	0.000327	1010.9	0.2506	-0.000009	0.063			200.58			991.237
0.02677		45	0.0016	991.28	(89)	0.000316	0.000322	991.3	0.0101	-0.000007	0.000				1.064		990.2132
0.05		45	0.0029	992.15	(44)	0.000333	0.000323	992.2	-0.0301	0.000010	0.001						990.2132
0.06845		45	0.0040	992.95	(89)	0.000312	0.000323	992.9	0.0432	-0.000011	0.002				2.734		990.2132
0.0934		45	0.0054	993.92	(89)	0.000315	0.000323	993.9	0.0428	-0.000008	0.002				3.711		990.2132
0.1		45	0.0058	994.10	(27)	0.000330	0.000323	994.1	-0.0397	0.000007	0.002						990.2132
0.1		45	0.0058	994.14	(44)	0.000323	0.000323	994.1	0.0003	0.000000	0.000						990.2132
0.1		45	0.0058	994.18	(80)	0.000316	0.000323	994.1	0.0403	-0.000007	0.002						990.2132
0.12426		45	0.0072	995.15	(89)	0.000315	0.000324	995.1	0.0643	-0.000009	0.004				4.939		990.2132
0.19656		45	0.0114	998.01	(89)	0.000316	0.000325	997.9	0.1015	-0.000009	0.010				7.792		990.2132
0.2		45	0.0116	998.09	(80)	0.000320	0.000325	998.0	0.0527	-0.000005	0.003						990.2132
0.25724		45	0.0148	1000.35	(89)	0.000319	0.000325	1000.3	0.0957	-0.000006	0.009				10.138		990.2132
0.32		45	0.0184	1002.73	(80)	0.000323	0.000326	1002.7	0.0532	-0.000003	0.003						990.2132
0.33312		45	0.0191	1003.29	(89)	0.000321	0.000326	1003.2	0.1096	-0.000006	0.012				13.078		990.2132
0.48319		45	0.0275	1009.03	(89)	0.000324	0.000328	1008.9	0.1134	-0.000004	0.013				18.821		990.2132
0.5		45	0.0284	1009.61	(44)	0.000327	0.000328	1009.6	0.0502	-0.000002	0.003						990.2132
0.5		45	0.0284	1009.63	(67)	0.000326	0.000328	1009.6	0.0655	-0.000002	0.004				19.412		990.2132
0.5		45	0.0284	1009.60	(80)	0.000327	0.000328	1009.6	0.0402	-0.000001	0.002						990.2132
0.50786		45	0.0288	1009.96	(89)	0.000325	0.000328	1009.9	0.1010	-0.000003	0.010				19.746		990.2132
0.65563		45	0.0369	1015.53	(89)	0.000328	0.000330	1015.4	0.0933	-0.000002	0.009				25.318		990.2132
0.8		45	0.0447	1020.83	(80)	0.000332	0.000332	1020.8	-0.0011	0.000000	0.000						990.2132
0.84115		45	0.0469	1022.52	(89)	0.000329	0.000332	1022.4	0.1634	-0.000003	0.027				32.308		990.2132
0.9471		45	0.0524	1026.43	(89)	0.000331	0.000333	1026.3	0.1594	-0.000003	0.025				36.214		990.2132
1		45	0.0552	1028.00	(27)	0.000338	0.000334	1028.2	-0.2087	0.000004	0.044						990.2132
1		45	0.0552	1028.14	(44)	0.000335	0.000334	1028.2	-0.0687	0.000001	0.005						990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
1		45	0.0552	1028.18	(67)	0.000335	0.000334	1028.2	-0.0315	0.000001	0.001				37.964		990.2132
1.2		45	0.0655	1035.42	(80)	0.000337	0.000336	1035.5	-0.0591	0.000001	0.003						990.2132
1.4309		45	0.0772	1043.77	(89)	0.000338	0.000339	1043.7	0.0265	0.000000	0.001				53.555		990.2132
1.8001		45	0.0952	1056.70	(89)	0.000342	0.000343	1056.7	0.0345	0.000000	0.001				66.489		990.2132
2		45	0.1047	1063.20	(27)	0.000347	0.000345	1063.5	-0.3230	0.000003	0.104						990.2132
2		45	0.1047	1063.32	(44)	0.000346	0.000345	1063.5	-0.2030	0.000002	0.041						990.2132
2.5		45	0.1275	1079.90	(27)	0.000352	0.000350	1080.2	-0.3415	0.000002	0.117						990.2132
2.5		45	0.1275	1079.92	(67)	0.000352	0.000350	1080.2	-0.3223	0.000002	0.104				89.706		990.2132
2.5333		45	0.1290	1081.10	(89)	0.000352	0.000350	1081.3	-0.2334	0.000002	0.054				90.887		990.2132
3		45	0.1492	1095.99	(44)	0.000357	0.000354	1096.4	-0.3783	0.000002	0.143						990.2132
4		45	0.1895	1126.98	(44)	0.000363	0.000363	1126.9	0.0360	0.000000	0.001						990.2132
4.5		45	0.2082	1141.33	(67)	0.000368	0.000367	1141.4	-0.1122	0.000000	0.013				151.114		990.2132
5		45	0.2261	1155.52	(44)	0.000371	0.000371	1155.4	0.0840	0.000000	0.007						990.2132
0.01719		50	0.0010	988.68	(31)	0.000356	0.000325	988.7	-0.0296	0.000030	0.001						988.0363
0.05351		50	0.0031	990.16	(31)	0.000316	0.000326	990.1	0.0305	-0.000010	0.001						988.0363
0.0625		50	0.0036	990.52	(74)	0.000315	0.000326	990.5	0.0394	-0.000011	0.002					18.4	988.0363
0.125		50	0.0073	992.96	(74)	0.000320	0.000327	992.9	0.0475	-0.000007	0.002					18.7	988.0363
0.1723		50	0.0100	994.81	(31)	0.000321	0.000327	994.7	0.0626	-0.000006	0.004						988.0363
0.25		50	0.0144	997.69	(74)	0.000332	0.000328	997.7	-0.0551	0.000004	0.003					19.4	988.0363
0.5		50	0.0284	1006.86	(74)	0.000346	0.000331	1007.3	-0.4208	0.000015	0.177					20.2	988.0363
0.55893		50	0.0316	1009.57	(31)	0.000330	0.000332	1009.5	0.0663	-0.000002	0.004						988.0363
1.13947		50	0.0624	1030.84	(31)	0.000339	0.000338	1030.9	-0.0575	0.000001	0.003						988.0363
2.35546		50	0.1210	1072.58	(31)	0.000353	0.000350	1072.9	-0.3272	0.000002	0.107						988.0363
3.87979		50	0.1848	1120.30	(31)	0.000366	0.000364	1120.7	-0.3815	0.000002	0.146						988.0363
5.45241		50	0.2417	1165.12	(31)	0.000376	0.000376	1164.9	0.1980	-0.000001	0.039						988.0363
0.05		55	0.0029	987.63	(44)	0.000332	0.000328	987.6	-0.0123	0.000004	0.000						985.6952
0.1		55	0.0058	989.57	(44)	0.000331	0.000329	989.6	-0.0123	0.000002	0.000						985.6952
0.1		55	0.0058	989.61	(80)	0.000324	0.000329	989.6	0.0277	-0.000005	0.001						985.6952
0.2		55	0.0116	993.48	(80)	0.000326	0.000330	993.4	0.0385	-0.000003	0.001						985.6952
0.32		55	0.0184	998.09	(80)	0.000328	0.000331	998.0	0.0541	-0.000003	0.003						985.6952
0.5		55	0.0284	1004.95	(44)	0.000330	0.000333	1004.9	0.0962	-0.000003	0.009						985.6952
0.5		55	0.0284	1004.96	(67)	0.000329	0.000333	1004.9	0.1095	-0.000004	0.012				19.268		985.6952
0.5		55	0.0284	1004.90	(80)	0.000332	0.000333	1004.9	0.0462	-0.000002	0.002						985.6952
0.8		55	0.0447	1016.05	(80)	0.000336	0.000337	1016.0	0.0271	-0.000001	0.001						985.6952
1		55	0.0552	1023.33	(44)	0.000339	0.000339	1023.3	-0.0066	0.000000	0.000						985.6952
1		55	0.0552	1023.34	(67)	0.000339	0.000339	1023.3	0.0006	0.000000	0.000				37.642		985.6952
1.2		55	0.0655	1030.52	(80)	0.000341	0.000341	1030.5	-0.0266	0.000000	0.001						985.6952
1.95		55	0.1023	1056.63	(20)	0.000349	0.000348	1056.7	-0.0582	0.000001	0.003				70.934		985.6952
2		55	0.1047	1058.25	(44)	0.000350	0.000349	1058.4	-0.1312	0.000001	0.017						985.6952
2.5		55	0.1275	1074.85	(67)	0.000354	0.000353	1075.0	-0.1428	0.000001	0.020				89.156		985.6952
3		55	0.1492	1090.78	(44)	0.000359	0.000358	1091.0	-0.2534	0.000001	0.064						985.6952
4		55	0.1895	1121.55	(44)	0.000366	0.000366	1121.5	0.0649	0.000000	0.004						985.6952
4.5		55	0.2082	1135.93	(67)	0.000370	0.000370	1135.9	-0.0128	0.000000	0.000				150.234		985.6952
5		55	0.2261	1149.90	(44)	0.000374	0.000374	1149.9	-0.0146	0.000000	0.000						985.6952
0.0999		60	0.0058	987.10	(52)	0.000325	0.000330	987.1	0.0333	-0.000006	0.001						983.1989
		60	0.0100	990.00	(90)	0.000318	0.000331	989.9	0.1268	-0.000013	0.016						983.1989
		60	0.0200	996.70	(90)	0.000328	0.000333	996.6	0.1003	-0.000005	0.010						983.1989
0.7069		60	0.0397	1010.40	(52)	0.000327	0.000337	1010.0	0.4131	-0.000010	0.171						983.1989

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10 ⁴	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
1.4138		60	0.0400	1010.30	(90)	0.000335	0.000337	1010.2	0.0897	-0.000002	0.008						983.1989
		60	0.0763	1035.60	(52)	0.000343	0.000344	1035.5	0.1317	-0.000002	0.017						983.1989
		60	0.0800	1038.10	(90)	0.000345	0.000345	1038.1	0.0336	0.000000	0.001						983.1989
		60	0.1200	1066.70	(90)	0.000354	0.000353	1066.8	-0.0767	0.000001	0.006						983.1989
3.5345		60	0.1600	1096.20	(90)	0.000362	0.000361	1096.3	-0.1478	0.000001	0.022						983.1989
		60	0.1712	1104.70	(52)	0.000364	0.000363	1104.8	-0.0836	0.000000	0.007						983.1989
		60	0.2000	1126.80	(90)	0.000369	0.000369	1126.8	0.0177	0.000000	0.000						983.1989
		60	0.2400	1158.40	(90)	0.000376	0.000377	1158.1	0.3213	-0.000001	0.103						983.1989
		60	0.2600	1174.70	(90)	0.000379	0.000381	1174.0	0.6518	-0.000002	0.425						983.1989
0.1		65	0.0058	984.50	(27)	0.000316	0.000332	984.4	0.0864	-0.000015	0.007						980.5548
0.1		65	0.0058	984.45	(80)	0.000325	0.000332	984.4	0.0364	-0.000006	0.001						980.5548
0.2		65	0.0116	988.30	(80)	0.000328	0.000333	988.2	0.0545	-0.000005	0.003						980.5548
0.32		65	0.0184	992.88	(80)	0.000330	0.000334	992.8	0.0716	-0.000004	0.005						980.5548
0.5		65	0.0284	999.67	(80)	0.000333	0.000336	999.6	0.0886	-0.000003	0.008						980.5548
0.8		65	0.0447	1010.77	(80)	0.000337	0.000339	1010.7	0.0879	-0.000002	0.008						980.5548
1		65	0.0552	1017.80	(27)	0.000344	0.000341	1018.0	-0.1547	0.000003	0.024						980.5548
1.2		65	0.0655	1025.17	(80)	0.000343	0.000343	1025.1	0.0431	-0.000001	0.002						980.5548
2		65	0.1047	1052.60	(27)	0.000353	0.000351	1052.8	-0.2431	0.000002	0.059						980.5548
2.5		65	0.1275	1069.20	(27)	0.000357	0.000355	1069.4	-0.2070	0.000001	0.043						980.5548
0.0999		75	0.0058	978.60	(52)	0.000348	0.000333	978.7	-0.0853	0.000015	0.007						974.849
0.1		75	0.0058	978.90	(27)	0.000295	0.000333	978.7	0.2109	-0.000038	0.044						974.849
0.1		75	0.0058	978.76	(80)	0.000320	0.000333	978.7	0.0709	-0.000013	0.005						974.849
0.2		75	0.0116	982.60	(80)	0.000325	0.000334	982.5	0.0967	-0.000009	0.009						974.849
0.32		75	0.0184	987.18	(80)	0.000328	0.000335	987.0	0.1338	-0.000007	0.018						974.849
0.5		75	0.0284	993.95	(80)	0.000331	0.000337	993.8	0.1584	-0.000006	0.025						974.849
0.7069		75	0.0397	1001.60	(52)	0.000335	0.000339	1001.4	0.1558	-0.000004	0.024						974.849
0.8		75	0.0447	1005.03	(80)	0.000336	0.000340	1004.9	0.1771	-0.000004	0.031						974.849
1		75	0.0552	1012.30	(27)	0.000338	0.000342	1012.1	0.1964	-0.000003	0.039						974.849
1.2		75	0.0655	1019.40	(80)	0.000342	0.000344	1019.3	0.1428	-0.000002	0.020						974.849
1.4138		75	0.0763	1027.20	(52)	0.000341	0.000346	1026.8	0.4010	-0.000005	0.161						974.849
2		75	0.1047	1047.00	(27)	0.000350	0.000351	1046.9	0.0679	-0.000001	0.005						974.849
2.5		75	0.1275	1063.30	(27)	0.000356	0.000355	1063.5	-0.1953	0.000001	0.038						974.849
3.5345		75	0.1712	1096.90	(52)	0.000359	0.000363	1096.1	0.8183	-0.000004	0.670						974.849
		80	0.0100	978.50	(90)	0.000324	0.000334	978.4	0.0919	-0.000010	0.008						971.7978
		80	0.0200	985.20	(90)	0.000329	0.000336	985.1	0.1249	-0.000006	0.016						971.7978
0.5		80	0.0284	990.92	(67)	0.000330	0.000337	990.7	0.2058	-0.000007	0.042				19.122		971.7978
		80	0.0400	998.80	(90)	0.000334	0.000339	998.6	0.2191	-0.000005	0.048						971.7978
1		80	0.0552	1009.07	(67)	0.000341	0.000342	1009.0	0.0609	-0.000001	0.004				37.274		971.7978
		80	0.0800	1026.40	(90)	0.000345	0.000346	1026.3	0.1097	-0.000001	0.012						971.7978
		80	0.1200	1054.90	(90)	0.000353	0.000353	1055.0	-0.0511	0.000000	0.003						971.7978
2.5		80	0.1275	1060.18	(67)	0.000356	0.000354	1060.4	-0.2343	0.000002	0.055				88.387		971.7978
		80	0.1600	1084.20	(90)	0.000362	0.000360	1084.6	-0.3870	0.000002	0.150						971.7978
		80	0.2000	1114.60	(90)	0.000370	0.000367	1115.2	-0.6201	0.000002	0.385						971.7978
4.5		80	0.2082	1120.63	(67)	0.000373	0.000369	1121.6	-1.0224	0.000004	1.045				148.828		971.7978
		80	0.2400	1146.30	(90)	0.000376	0.000375	1146.9	-0.5705	0.000002	0.325						971.7978
		80	0.2600	1162.60	(90)	0.000379	0.000378	1163.1	-0.4828	0.000001	0.233						971.7978
0.1		85	0.0058	972.55	(80)	0.000314	0.000333	972.4	0.1002	-0.000018	0.010						968.6203
0.2		85	0.0116	976.40	(80)	0.000320	0.000334	976.3	0.1457	-0.000013	0.021						968.6203

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10^4	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.32		85	0.0184	980.98	(80)	0.000324	0.000335	980.8	0.1931	-0.000011	0.037						968.6203
0.5		85	0.0284	987.76	(80)	0.000328	0.000336	987.5	0.2407	-0.000009	0.058						968.6203
0.8		85	0.0447	998.86	(80)	0.000333	0.000339	998.6	0.2947	-0.000007	0.087						968.6203
1.2		85	0.0655	1013.24	(80)	0.000339	0.000343	1013.0	0.2784	-0.000004	0.077						968.6203
0.1		95	0.0058	965.84	(80)	0.000310	0.000331	965.7	0.1140	-0.000021	0.013						961.9004
0.2		95	0.0116	969.70	(80)	0.000316	0.000332	969.5	0.1726	-0.000016	0.030						961.9004
0.32		95	0.0184	974.29	(80)	0.000319	0.000333	974.1	0.2324	-0.000013	0.054						961.9004
0.5		95	0.0284	981.09	(80)	0.000323	0.000334	980.8	0.3011	-0.000011	0.091						961.9004
0.8		95	0.0447	992.23	(80)	0.000328	0.000337	991.8	0.3904	-0.000009	0.152						961.9004
1.2		95	0.0655	1006.67	(80)	0.000334	0.000340	1006.3	0.4157	-0.000006	0.173						961.9004
1.95		95	0.1023	1032.45	(20)	0.000345	0.000346	1032.3	0.1220	-0.000001	0.015				70.554		961.9004
0.0999		100	0.0058	962.30	(52)	0.000308	0.000329	962.2	0.1145	-0.000021	0.013						958.3637
0.1		100	0.0058	962.70	(27)	0.000235	0.000329	962.2	0.5107	-0.000095	0.261		!				958.3637
		100	0.0100	965.10	(90)	0.000315	0.000330	965.0	0.1392	-0.000015	0.019						958.3637
		100	0.0200	971.90	(90)	0.000317	0.000332	971.6	0.2797	-0.000015	0.078						958.3637
0.5		100	0.0284	977.65	(67)	0.000318	0.000333	977.3	0.3965	-0.000015	0.157				19.29		958.3637
0.7069		100	0.0397	985.50	(52)	0.000319	0.000335	984.9	0.5938	-0.000015	0.353						958.3637
		100	0.0400	985.50	(90)	0.000325	0.000335	985.1	0.3717	-0.000010	0.138						958.3637
1		100	0.0552	996.30	(27)	0.000324	0.000337	995.6	0.7233	-0.000013	0.523						958.3637
1		100	0.0552	995.97	(67)	0.000330	0.000337	995.6	0.3900	-0.000007	0.152				37.603		958.3637
1.4138		100	0.0763	1011.30	(52)	0.000328	0.000340	1010.3	0.9813	-0.000013	0.963						958.3637
		100	0.0800	1013.40	(90)	0.000335	0.000341	1012.9	0.4808	-0.000006	0.231						958.3637
2		100	0.1047	1031.30	(27)	0.000338	0.000345	1030.6	0.7232	-0.000007	0.523						958.3637
		100	0.1200	1042.00	(90)	0.000346	0.000347	1041.8	0.2219	-0.000002	0.049						958.3637
2.5		100	0.1275	1047.70	(27)	0.000346	0.000348	1047.3	0.4025	-0.000003	0.162						958.3637
2.5		100	0.1275	1047.14	(67)	0.000350	0.000348	1047.3	-0.1568	0.000001	0.025				88.777		958.3637
		100	0.1600	1071.30	(90)	0.000356	0.000354	1071.7	-0.4475	0.000002	0.200						958.3637
3.5345		100	0.1712	1081.30	(52)	0.000351	0.000355	1080.3	0.9549	-0.000005	0.912						958.3637
		100	0.2000	1101.70	(90)	0.000365	0.000360	1102.9	-1.1709	0.000005	1.371						958.3637
4.5		100	0.2082	1108.22	(67)	0.000366	0.000361	1109.4	-1.2008	0.000005	1.442				149.857		958.3637
0.5		120	0.0284	962.67	(67)	0.000300	0.000324	962.0	0.6237	-0.000024	0.389				19.588		943.0825
1		120	0.0552	981.20	(67)	0.000314	0.000328	980.5	0.7185	-0.000014	0.516				38.118		943.0825
2.5		120	0.1275	1032.98	(67)	0.000336	0.000338	1032.8	0.1913	-0.000001	0.037				89.901		943.0825
4.5		120	0.2082	1094.25	(67)	0.000357	0.000349	1096.2	-1.9276	0.000008	3.715	!			151.163		943.0825
0.0999		125	0.0058	943.40	(52)	0.000206	0.000318	942.8	0.5792	-0.000112	0.335		!				938.9841
0.7069		125	0.0397	967.10	(52)	0.000285	0.000323	965.7	1.4188	-0.000038	2.013	!					938.9841
1		125	0.0552	978.10	(27)	0.000294	0.000325	976.4	1.6516	-0.000031	2.728	!					938.9841
1.4138		125	0.0763	993.50	(52)	0.000299	0.000328	991.4	2.1425	-0.000029	4.590	!					938.9841
2		125	0.1047	1013.30	(27)	0.000319	0.000332	1011.9	1.3897	-0.000013	1.931						938.9841
2.5		125	0.1275	1029.90	(27)	0.000328	0.000335	1028.9	0.9675	-0.000007	0.936						938.9841
3.5345		125	0.1712	1064.40	(52)	0.000332	0.000341	1062.7	1.6632	-0.000009	2.766	!					938.9841
0.5		140	0.0284	946.16	(67)	0.000270	0.000312	945.1	1.0553	-0.000042	1.114				20.138		926.026
1		140	0.0552	965.09	(67)	0.000288	0.000315	963.7	1.3862	-0.000027	1.922				39.067		926.026
2.5		140	0.1275	1017.76	(67)	0.000316	0.000324	1016.7	1.0177	-0.000008	1.036				91.737		926.026
4.5		140	0.2082	1079.91	(67)	0.000341	0.000334	1081.6	-1.6559	0.000007	2.742	!			153.884		926.026
Average Res									0.0713	-0.000006	73.159	Sum Chi sqr					
Std dev Res									0.3335	0.000011							
Avg - 4std									-1.2626	-0.000051							

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	(rho-1)*10^4	Delta density / kg/m³	Apparent molal volume / cm³/mol	Density of water / kg/m³
								Avg + 4std	1.4053	0.000039							
Curve fit for the model App vol=(w+c2+c3*t °C)/(c0*w + c1)/e^(0.000001*(t °C+c4)^2)																	
c0		-0.004329															
c1		0.064714															
c2		1.016611															
c3		0.014624															
c4		3315.634															
Min T		0															
Max T		140															
Min w		0.0001															
Max w		0.2603															
Avg dens res		0.0713															
Std dens res		0.3335															
Avg app vol res *10^3	-0.00568																
Std app vol res *10^3	0.01129																
No of points in corr		630															
No of inconsistent poin		7															
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)																	
	1.965444	25	0.1097	1047.07	(32)	0.000566	0.000331	1076.2	-29.1232	0.000236	848.162	!	!				997.0449
1		35	0.0552	1030.91	(74)	0.000354	0.000327	1032.5	-1.5976	0.000027	2.552	!				20.7	994.0319
1		40	0.0552	1028.47	(74)	0.000364	0.000331	1030.4	-1.9680	0.000034	3.873	!				21.3	992.2158
1		50	0.0552	1023.73	(74)	0.000373	0.000337	1025.8	-2.1100	0.000036	4.452	!				21.8	988.0363
		100	0.2400	1133.1	(90)	0.000373	0.000366	1135.2	-2.0922	0.000007	4.377	!					958.3637
		100	0.2600	1149.2	(90)	0.000377	0.000369	1151.8	-2.6159	0.000008	6.843	!					958.3637
0.1		125	0.0058	943.60	(27)	0.000168	0.000318	942.8	0.7754	-0.000150	0.601		!				938.9841

Data from Lyle, T. R., Hosking, R., "The temperature variations ...", *Phil Mag Ser* **1902**, 6, 487
was excluded because many data points are inconsistent

Density of aqueous solutions of **NaClO3**

- References (11) Campbell, A. N.; Kartzmark, E. M.; Oliver, B. G. The Electrolytic Conductances of Sodium Chlorate and of Lithium Chlorate in Water and in Water-Dioxane. *Can. J. Chem.* **1966**, *44*, 925-934.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.
- (108) Roux, A.; Musbally, G. M.; Perron, G.; Singh, P. P.; Woolley, E. M.; Hepler, L. G. Apparent Molal Heat Capacities and Volumes of Aqueous Electrolytes at 25°C: NaClO3, NaClO4, NaNO3, NaBrO3, NaIO3, KClO3, KBrO3, KIO3, NH4NO3, NH4Cl, and NH4ClO4. *Can. J. Chem.* **1978**, *56*, 24-28.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
		18	0.0100	1005.30	(90)	0.000334	0.000346	1005.2	0.1271	-0.000013	0.016				998.5956
		18	0.0200	1012.10	(90)	0.000333	0.000347	1011.8	0.2815	-0.000014	0.079				998.5956
		18	0.0400	1025.80	(90)	0.000337	0.000349	1025.3	0.4802	-0.000011	0.231				998.5956
		18	0.0600	1039.70	(90)	0.000342	0.000351	1039.1	0.5897	-0.000009	0.348				998.5956
		18	0.0800	1053.80	(90)	0.000346	0.000352	1053.2	0.5984	-0.000007	0.358				998.5956
		18	0.1000	1068.10	(90)	0.000350	0.000354	1067.6	0.4946	-0.000004	0.245				998.5956
		18	0.1200	1082.70	(90)	0.000353	0.000356	1082.3	0.3656	-0.000003	0.134				998.5956
		18	0.1400	1097.70	(90)	0.000356	0.000357	1097.4	0.2984	-0.000002	0.089				998.5956
		18	0.1600	1113.10	(90)	0.000358	0.000359	1112.8	0.2793	-0.000001	0.078				998.5956
		18	0.1800	1128.80	(90)	0.000360	0.000361	1128.6	0.1939	-0.000001	0.038				998.5956
		18	0.2000	1144.90	(90)	0.000362	0.000362	1144.8	0.1271	0.000000	0.016				998.5956
		18	0.2200	1161.40	(90)	0.000363	0.000364	1161.3	0.0632	0.000000	0.004				998.5956
		18	0.2400	1178.20	(90)	0.000365	0.000365	1178.3	-0.1146	0.000000	0.013				998.5956
		18	0.2600	1195.30	(90)	0.000368	0.000366	1195.7	-0.4239	0.000001	0.180				998.5956
		18	0.2800	1212.80	(90)	0.000370	0.000368	1213.6	-0.7830	0.000002	0.613				998.5956
		18	0.3000	1230.70	(90)	0.000372	0.000369	1231.9	-1.2116	0.000003	1.468				998.5956
		18	0.3200	1249.10	(90)	0.000374	0.000371	1250.7	-1.6300	0.000003	2.657				998.5956
		18	0.3400	1268.00	(90)	0.000376	0.000372	1270.1	-2.0600	0.000004	4.244				998.5956
		18	0.4000	1333.00	(90)	0.000373	0.000376	1331.4	1.6443	-0.000002	2.704				998.5956
		18	0.4100	1344.00	(90)	0.000374	0.000376	1342.1	1.9128	-0.000003	3.659				998.5956
		18	0.4200	1354.00	(90)	0.000376	0.000377	1353.0	1.0248	-0.000001	1.050				998.5956
		18	0.4300	1365.00	(90)	0.000376	0.000377	1364.0	0.9768	-0.000001	0.954				998.5956
		18	0.4400	1376.00	(90)	0.000377	0.000378	1375.2	0.7648	-0.000001	0.585				998.5956
		18	0.4500	1387.00	(90)	0.000378	0.000379	1386.6	0.3852	0.000000	0.148				998.5956
		18	0.4600	1399.00	(90)	0.000378	0.000379	1398.2	0.8337	-0.000001	0.695				998.5956
		18	0.4700	1410.00	(90)	0.000380	0.000380	1409.9	0.1064	0.000000	0.011				998.5956
		18	0.4800	1422.00	(90)	0.000380	0.000380	1421.8	0.1988	0.000000	0.040				998.5956
		18	0.4900	1434.00	(90)	0.000381	0.000381	1433.9	0.1068	0.000000	0.011				998.5956
		18	0.5000	1446.00	(90)	0.000382	0.000382	1446.2	-0.1744	0.000000	0.030				998.5956
	0.005	25	0.0005	997.60	(11)	-0.000043	0.000346	997.4	0.2063	-0.000389	0.043		!		997.0449
	0.01	25	0.0011	997.90	(11)	0.000197	0.000346	997.7	0.1576	-0.000148	0.025				997.0449
	0.02433	25	0.0026	999.00	(11)	0.000246	0.000346	998.7	0.2586	-0.000100	0.067				997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.050379		25	0.0053	1000.59	(108)	0.000337	0.000346	1000.5	0.0489	-0.000009	0.002			35.86	997.0449
	0.0503	25	0.0054	1000.70	(11)	0.000318	0.000346	1000.6	0.1490	-0.000028	0.022				997.0449
	0.1007	25	0.0107	1004.30	(11)	0.000324	0.000347	1004.1	0.2426	-0.000023	0.059				997.0449
0.12012		25	0.0126	1005.40	(108)	0.000343	0.000347	1005.3	0.0513	-0.000004	0.003			36.49	997.0449
0.20006		25	0.0209	1010.95	(108)	0.000342	0.000348	1010.8	0.1325	-0.000006	0.018			36.35	997.0449
0.3004		25	0.0310	1017.80	(108)	0.000343	0.000349	1017.6	0.1856	-0.000006	0.034			36.51	997.0449
	0.3027	25	0.0316	1018.30	(11)	0.000341	0.000349	1018.1	0.2474	-0.000008	0.061				997.0449
0.42522		25	0.0433	1026.16	(108)	0.000346	0.000350	1026.0	0.1979	-0.000004	0.039			36.8	997.0449
0.46567		25	0.0472	1028.86	(108)	0.000346	0.000350	1028.6	0.2090	-0.000004	0.044			36.86	997.0449
0.50573		25	0.0511	1031.54	(108)	0.000346	0.000351	1031.3	0.2488	-0.000005	0.062			36.86	997.0449
	0.5045	25	0.0521	1031.20	(11)	0.000365	0.000351	1032.0	-0.7793	0.000014	0.607				997.0449
	0.7015	25	0.0714	1045.80	(11)	0.000348	0.000353	1045.4	0.3793	-0.000005	0.144				997.0449
0.7371		25	0.0727	1046.64	(108)	0.000350	0.000353	1046.4	0.2701	-0.000003	0.073			37.22	997.0449
0.88968		25	0.0865	1056.43	(108)	0.000351	0.000354	1056.1	0.3138	-0.000003	0.098			37.38	997.0449
	0.905	25	0.0909	1059.60	(11)	0.000352	0.000355	1059.3	0.3280	-0.000003	0.108				997.0449
1.16574		25	0.1104	1073.72	(108)	0.000354	0.000357	1073.4	0.3382	-0.000003	0.114			37.69	997.0449
	1.5818	25	0.1523	1105.80	(11)	0.000355	0.000361	1104.8	1.0341	-0.000006	1.069				997.0449
2.0202		25	0.1770	1124.34	(108)	0.000361	0.000363	1124.0	0.3530	-0.000002	0.125			38.46	997.0449
	2.5246	25	0.2301	1167.90	(11)	0.000365	0.000368	1167.2	0.7016	-0.000002	0.492				997.0449
2.9217		25	0.2372	1173.49	(108)	0.000367	0.000368	1173.2	0.2809	-0.000001	0.079			39.09	997.0449
3.5062		25	0.2718	1203.32	(108)	0.000370	0.000371	1203.1	0.2356	-0.000001	0.056			39.42	997.0449
	3.5329	25	0.3049	1233.40	(11)	0.000373	0.000374	1232.9	0.4634	-0.000001	0.215				997.0449
4.3207		25	0.3150	1242.36	(108)	0.000374	0.000374	1242.3	0.0329	0.000000	0.001			39.84	997.0449
4.9154		25	0.3435	1269.31	(108)	0.000377	0.000377	1269.4	-0.0624	0.000000	0.004			40.09	997.0449
	4.4592	25	0.3671	1292.80	(11)	0.000378	0.000378	1292.6	0.1713	0.000000	0.029				997.0449
5.5812		25	0.3727	1297.81	(108)	0.000379	0.000379	1298.2	-0.3656	0.000001	0.134			40.37	997.0449
	5.2282	25	0.4149	1341.30	(11)	0.000383	0.000382	1341.9	-0.6039	0.000001	0.365				997.0449
7.2695		25	0.4362	1363.84	(108)	0.000385	0.000383	1365.0	-1.1672	0.000001	1.362			40.94	997.0449
	5.7954	25	0.4479	1377.30	(11)	0.000385	0.000384	1377.9	-0.6149	0.000001	0.378				997.0449
7.7911		25	0.4533	1380.39	(108)	0.000389	0.000384	1384.0	-3.6526	0.000004	13.342	!		41.36	997.0449
	6.7685	25	0.5010	1438.10	(11)	0.000389	0.000388	1439.6	-1.5015	0.000001	2.255				997.0449
	0.00499	35	0.0005	994.50	(11)	0.000119	0.000344	994.4	0.1189	-0.000225	0.014				994.0319
	0.00997	35	0.0011	995.00	(11)	0.000088	0.000345	994.7	0.2706	-0.000256	0.073				994.0319
	0.02426	35	0.0026	995.90	(11)	0.000278	0.000345	995.7	0.1711	-0.000067	0.029				994.0319
	0.0501	35	0.0053	997.50	(11)	0.000352	0.000345	997.5	-0.0354	0.000007	0.001				994.0319
	0.1003	35	0.0107	1001.10	(11)	0.000340	0.000346	1001.0	0.0622	-0.000006	0.004				994.0319
	0.3017	35	0.0316	1014.90	(11)	0.000352	0.000348	1015.0	-0.1235	0.000004	0.015				994.0319
	0.5033	35	0.0521	1028.60	(11)	0.000357	0.000351	1028.9	-0.3205	0.000006	0.103				994.0319
	0.6987	35	0.0714	1041.80	(11)	0.000360	0.000353	1042.3	-0.4988	0.000006	0.249				994.0319
	0.9014	35	0.0909	1055.40	(11)	0.000363	0.000356	1056.1	-0.6890	0.000007	0.475				994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
	1.5758	35	0.1523	1101.60	(11)	0.000361	0.000363	1101.2	0.3596	-0.000002	0.129				994.0319
	2.5114	35	0.2301	1161.80	(11)	0.000375	0.000371	1162.9	-1.1131	0.000004	1.239				994.0319
	3.5137	35	0.3049	1226.70	(11)	0.000380	0.000378	1227.5	-0.8136	0.000002	0.662				994.0319
	4.4335	35	0.3669	1286.30	(11)	0.000383	0.000384	1285.6	0.6794	-0.000001	0.462				994.0319
	5.1998	35	0.4149	1334.00	(11)	0.000388	0.000388	1333.9	0.1249	0.000000	0.016				994.0319
	5.7647	35	0.4479	1370.00	(11)	0.000390	0.000391	1368.8	1.1701	-0.000001	1.369				994.0319
	6.7303	35	0.5010	1430.00	(11)	0.000394	0.000395	1428.5	1.5075	-0.000001	2.273				994.0319
									Average Res	0.0610	-0.000017	49.337	Sum chi sqr		
									Std dev Res	0.7929	0.000060				
									Avg - 4std	-3.1108	-0.000258				
									Avg + 4std	3.2327	0.000225				
Curve fit for the model App vol=(w+c2+c3*t °C)/(c0*w + c1)/e^(0.000001*(t °C+c4)^2)															
c0		0.014762													
c1		0.024913													
c2		1.292409													
c3		-0.007617													
c4		-3454.295													
Min T		18													
Max T		35													
Min w		0.000533													
Max w		0.500971													
Avg dens res		0.060966													
Std dens res		0.792944													
Avg app vol res *10^3		-0.016792													
Std app vol res *10^3		0.060387													
No of points in corr		79													
No of inconsistent poir		1													
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)															
	6.2211	25	0.4712	1405.20	(11)	0.000385	0.000386	1404.5	0.7423	-0.000001	0.551				997.0449

Density of aqueous solutions of **Na2CO3**

- References (38) Hershey, J. P.; Sotolongo, S.; Millero, F. J. Densities and Compressibilities of Aqueous Sodium Carbonate and Bicarbonate from 0 to 45°C. *J. Sol. Chem.* **1983**, 12, 233-254.
- (41) Hitchcock, L. B.; McIlhenny, J. S. Viscosity and Density of Pure Alkaline Solutions and their Mixtures. *Ind. Engng. Chem.* **1935**, 27, 461-466
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, 61, 1492-1498.
- (88) Perron, G., Desnoyers, J. E., Millero, F. J., Apparent molal volumes and heat capacities of some sulfates and carbonates in water at 25 °C, *Can. J. Chem.*, **1975**, 53, 1134-1138

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
0.00974		0	0.0010	1001.02	(38)	-0.000144	-0.000089	1001.0	0.0565	-0.000055	0.003			1.181	999.8395
0.01938		0	0.0020	1002.17	(38)	-0.000134	-0.000088	1002.1	0.0935	-0.000045	0.009			2.329	999.8395
0.02221		0	0.0023	1002.51	(38)	-0.000135	-0.000088	1002.4	0.1107	-0.000047	0.012			2.672	999.8395
0.04425		0	0.0047	1005.12	(38)	-0.000126	-0.000086	1004.9	0.1917	-0.000041	0.037			5.284	999.8395
0.04798		0	0.0051	1005.57	(38)	-0.000126	-0.000085	1005.4	0.2113	-0.000041	0.045			5.731	999.8395
0.06729		0	0.0071	1007.82	(38)	-0.000119	-0.000083	1007.6	0.2579	-0.000036	0.067			7.985	999.8395
0.06737		0	0.0071	1007.83	(38)	-0.000119	-0.000083	1007.6	0.2578	-0.000036	0.066			7.994	999.8395
0.0906		0	0.0095	1010.53	(38)	-0.000112	-0.000080	1010.2	0.3050	-0.000031	0.093			10.686	999.8395
0.12763		0	0.0133	1014.80	(38)	-0.000104	-0.000076	1014.4	0.3827	-0.000028	0.146			14.956	999.8395
0.13143		0	0.0137	1015.20	(38)	-0.000102	-0.000076	1014.8	0.3621	-0.000026	0.131			15.364	999.8395
0.13197		0	0.0138	1015.29	(38)	-0.000103	-0.000076	1014.9	0.3872	-0.000027	0.150			15.45	999.8395
0.18106		0	0.0188	1020.86	(38)	-0.000094	-0.000071	1020.4	0.4517	-0.000023	0.204			21.023	999.8395
0.24773		0	0.0256	1028.30	(38)	-0.000082	-0.000064	1027.8	0.4869	-0.000018	0.237			28.459	999.8395
0.37697		0	0.0384	1042.42	(38)	-0.000063	-0.000051	1041.9	0.5187	-0.000012	0.269			42.579	999.8395
0.49229		0	0.0496	1054.70	(38)	-0.000049	-0.000040	1054.2	0.5073	-0.000009	0.257			54.858	999.8395
0.62869		0	0.0625	1068.86	(38)	-0.000034	-0.000027	1068.4	0.4679	-0.000007	0.219			69.025	999.8395
0.05519		5	0.0058	1006.41	(38)	-0.000101	-0.000071	1006.2	0.1745	-0.000030	0.030			6.444	999.9638
0.05527		5	0.0058	1006.41	(38)	-0.000100	-0.000071	1006.2	0.1705	-0.000029	0.029			6.449	999.9638
0.11524		5	0.0121	1013.29	(38)	-0.000090	-0.000065	1013.0	0.3112	-0.000025	0.097			13.33	999.9638
0.11534		5	0.0121	1013.28	(38)	-0.000088	-0.000065	1013.0	0.2890	-0.000023	0.084			13.319	999.9638
0.22457		5	0.0232	1025.50	(38)	-0.000071	-0.000054	1025.1	0.4227	-0.000017	0.179			25.54	999.9638
0.22529		5	0.0233	1025.59	(38)	-0.000071	-0.000054	1025.2	0.4268	-0.000017	0.182			25.623	999.9638
0.30377		5	0.0312	1034.19	(38)	-0.000061	-0.000046	1033.7	0.4921	-0.000015	0.242			34.224	999.9638
0.30384		5	0.0312	1034.14	(38)	-0.000059	-0.000046	1033.7	0.4366	-0.000013	0.191			34.176	999.9638
0.41673		5	0.0423	1046.33	(38)	-0.000048	-0.000035	1045.8	0.5606	-0.000012	0.314			46.367	999.9638
0.4174		5	0.0424	1046.39	(38)	-0.000047	-0.000035	1045.8	0.5527	-0.000012	0.305			46.43	999.9638
0.56892		5	0.0569	1062.23	(38)	-0.000031	-0.000022	1061.7	0.5787	-0.000009	0.335			62.27	999.9638
0.57107		5	0.0571	1062.45	(38)	-0.000031	-0.000022	1061.9	0.5754	-0.000009	0.331			62.488	999.9638
0.68423		5	0.0676	1073.96	(38)	-0.000019	-0.000012	1073.4	0.5518	-0.000007	0.304			73.995	999.9638
0.68476		5	0.0677	1074.01	(38)	-0.000019	-0.000012	1073.5	0.5533	-0.000007	0.306			74.05	999.9638

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
0.83972		5	0.0817	1089.40	(38)	-0.000005	0.000001	1088.9	0.5225	-0.000005	0.273			89.439	999.9638
0.84138		5	0.0819	1089.48	(38)	-0.000004	0.000001	1089.0	0.4416	-0.000005	0.195			89.521	999.9638
0.95454		5	0.0919	1100.31	(38)	0.000007	0.000010	1100.0	0.2663	-0.000002	0.071			100.342	999.9638
0.06234		15	0.0066	1006.13	(38)	-0.000065	-0.000047	1006.0	0.1211	-0.000018	0.015			7.035	999.0996
0.11948		15	0.0125	1012.44	(38)	-0.000054	-0.000042	1012.3	0.1587	-0.000012	0.025			13.343	999.0996
0.23971		15	0.0248	1025.41	(38)	-0.000036	-0.000030	1025.3	0.1413	-0.000005	0.020			26.315	999.0996
0.32078		15	0.0329	1033.98	(38)	-0.000026	-0.000023	1033.9	0.0984	-0.000003	0.010			34.878	999.0996
0.43994		15	0.0446	1046.34	(38)	-0.000013	-0.000013	1046.3	0.0294	-0.000001	0.001			47.241	999.0996
0.60125		15	0.0599	1062.70	(38)	0.000001	0.000000	1062.7	-0.0378	0.000001	0.001			63.604	999.0996
0.72112		15	0.0710	1074.55	(38)	0.000011	0.000010	1074.7	-0.1106	0.000001	0.012			75.453	999.0996
0.8833		15	0.0856	1090.25	(38)	0.000023	0.000022	1090.4	-0.1647	0.000002	0.027			91.153	999.0996
	0.4822	20	0.0488	1048.10	(41)	0.000024	0.000000	1049.4	-1.2746	0.000024	1.625				998.2041
	0.9725	20	0.0941	1095.40	(41)	0.000057	0.000036	1097.8	-2.3714	0.000021	5.623				998.2041
	1.425	20	0.1328	1137.50	(41)	0.000078	0.000065	1139.7	-2.2190	0.000013	4.924				998.2041
	1.9225	20	0.1720	1184.80	(41)	0.000084	0.000092	1182.9	1.9233	-0.000008	3.699				998.2041
	2.412	20	0.2089	1224.00	(41)	0.000117	0.000117	1224.1	-0.0871	0.000000	0.008				998.2041
	2.842	20	0.2392	1259.10	(41)	0.000134	0.000136	1258.5	0.6092	-0.000002	0.371				998.2041
	3.31	20	0.2710	1294.60	(41)	0.000155	0.000155	1294.9	-0.3196	0.000001	0.102				998.2041
	3.809	20	0.3034	1330.80	(41)	0.000176	0.000173	1332.6	-1.7555	0.000003	3.082				998.2041
0.004		25	0.0004	997.49	(38)	-0.000065	-0.000032	997.5	0.0140	-0.000033	0.000			0.45	997.0449
0.00404		25	0.0004	997.49	(88)	-0.000054	-0.000032	997.5	0.0096	-0.000023	0.000			0.45	997.0449
0.00646		25	0.0007	997.77	(38)	-0.000061	-0.000031	997.7	0.0200	-0.000029	0.000			0.724	997.0449
0.00653		25	0.0007	997.77	(88)	-0.000049	-0.000031	997.8	0.0124	-0.000018	0.000			0.724	997.0449
0.00667		25	0.0007	997.79	(38)	-0.000056	-0.000031	997.8	0.0171	-0.000024	0.000			0.744	997.0449
0.00856		25	0.0009	998.00	(38)	-0.000055	-0.000031	998.0	0.0213	-0.000024	0.000			0.954	997.0449
0.00858		25	0.0009	998.00	(88)	-0.000053	-0.000031	998.0	0.0202	-0.000022	0.000			0.955	997.0449
0.01094		25	0.0012	998.26	(38)	-0.000055	-0.000031	998.2	0.0283	-0.000024	0.001			1.22	997.0449
0.01151		25	0.0012	998.33	(38)	-0.000057	-0.000031	998.3	0.0322	-0.000027	0.001			1.286	997.0449
0.0185		25	0.0020	999.10	(38)	-0.000052	-0.000030	999.1	0.0420	-0.000022	0.002			2.056	997.0449
0.01976		25	0.0021	999.24	(38)	-0.000051	-0.000030	999.2	0.0431	-0.000021	0.002			2.194	997.0449
0.02229		25	0.0024	999.52	(38)	-0.000051	-0.000030	999.5	0.0492	-0.000021	0.002			2.475	997.0449
0.02384		25	0.0025	999.69	(38)	-0.000049	-0.000030	999.6	0.0479	-0.000019	0.002			2.642	997.0449
0.02781		25	0.0029	1000.13	(38)	-0.000049	-0.000029	1000.1	0.0569	-0.000019	0.003			3.082	997.0449
0.03965		25	0.0042	1001.41	(38)	-0.000041	-0.000028	1001.4	0.0553	-0.000013	0.003			4.364	997.0449
0.03972		25	0.0042	1001.41	(88)	-0.000040	-0.000028	1001.4	0.0477	-0.000011	0.002			4.364	997.0449
0.04332		25	0.0046	1001.82	(38)	-0.000042	-0.000028	1001.8	0.0650	-0.000014	0.004			4.771	997.0449
0.04881		25	0.0051	1002.42	(38)	-0.000042	-0.000027	1002.3	0.0740	-0.000014	0.005			5.374	997.0449
0.05626		25	0.0059	1003.22	(38)	-0.000038	-0.000027	1003.1	0.0689	-0.000012	0.005			6.174	997.0449
0.06512		25	0.0069	1004.17	(38)	-0.000035	-0.000026	1004.1	0.0648	-0.000009	0.004			7.126	997.0449
0.06523		25	0.0069	1004.17	(88)	-0.000034	-0.000026	1004.1	0.0529	-0.000008	0.003			7.126	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
0.09175		25	0.0096	1007.04	(38)	-0.000031	-0.000024	1007.0	0.0676	-0.000007	0.005			9.994	997.0449
0.09705		25	0.0102	1007.62	(38)	-0.000031	-0.000023	1007.5	0.0769	-0.000007	0.006			10.572	997.0449
0.12738		25	0.0133	1010.86	(38)	-0.000026	-0.000020	1010.8	0.0742	-0.000005	0.006			13.814	997.0449
0.15489		25	0.0162	1013.76	(38)	-0.000021	-0.000018	1013.7	0.0494	-0.000003	0.002			16.718	997.0449
0.15515		25	0.0162	1013.22	(88)	0.000013	-0.000018	1013.7	-0.5182	0.000031	0.269			16.178	997.0449
0.17942		25	0.0187	1016.34	(38)	-0.000017	-0.000016	1016.3	0.0283	-0.000001	0.001			19.297	997.0449
0.19736		25	0.0205	1018.24	(38)	-0.000016	-0.000014	1018.2	0.0355	-0.000002	0.001			21.199	997.0449
0.2001		25	0.0208	1018.22	(73)	-0.000001	-0.000014	1018.5	-0.2773	0.000013	0.077				997.0449
0.24096		25	0.0249	1022.78	(38)	-0.000010	-0.000011	1022.8	-0.0110	0.000000	0.000			25.734	997.0449
0.24137		25	0.0249	1022.78	(88)	-0.000009	-0.000011	1022.8	-0.0529	0.000002	0.003			25.735	997.0449
0.24814		25	0.0256	1023.52	(38)	-0.000009	-0.000010	1023.5	-0.0253	0.000001	0.001			26.471	997.0449
0.29549		25	0.0304	1028.42	(38)	-0.000005	-0.000006	1028.5	-0.0555	0.000002	0.003			31.373	997.0449
0.29598		25	0.0304	1028.42	(88)	-0.000003	-0.000006	1028.5	-0.1083	0.000003	0.012			31.371	997.0449
0.29998		25	0.0308	1028.42	(73)	0.000010	-0.000006	1028.9	-0.5191	0.000016	0.269				997.0449
0.37363		25	0.0381	1036.36	(38)	0.000004	0.000000	1036.5	-0.1639	0.000004	0.027			39.32	997.0449
0.39969		25	0.0406	1038.43	(73)	0.000019	0.000002	1039.2	-0.7624	0.000017	0.581				997.0449
0.43177		25	0.0438	1042.28	(38)	0.000008	0.000005	1042.5	-0.1729	0.000004	0.030			45.238	997.0449
0.43249		25	0.0438	1042.28	(88)	0.000010	0.000005	1042.5	-0.2489	0.000005	0.062			45.235	997.0449
0.48684		25	0.0491	1047.80	(38)	0.000013	0.000009	1048.0	-0.2192	0.000004	0.048			50.754	997.0449
0.49011		25	0.0494	1048.12	(38)	0.000013	0.000009	1048.3	-0.2219	0.000004	0.049			51.08	997.0449
0.49927		25	0.0503	1048.28	(73)	0.000028	0.000010	1049.3	-0.9867	0.000018	0.974				997.0449
0.58212		25	0.0581	1057.22	(38)	0.000021	0.000016	1057.5	-0.3045	0.000005	0.093			60.176	997.0449
0.58309		25	0.0582	1057.22	(88)	0.000022	0.000016	1057.6	-0.4015	0.000006	0.161			60.175	997.0449
0.59974		25	0.0598	1058.06	(73)	0.000035	0.000017	1059.3	-1.2076	0.000018	1.458				997.0449
0.63524		25	0.0631	1062.42	(38)	0.000025	0.000020	1062.8	-0.3429	0.000005	0.118			65.375	997.0449
0.69957		25	0.0690	1067.63	(73)	0.000042	0.000024	1069.0	-1.4162	0.000018	2.006				997.0449
0.71082		25	0.0701	1069.72	(38)	0.000030	0.000025	1070.1	-0.4136	0.000005	0.171			72.68	997.0449
0.78884		25	0.0772	1077.18	(38)	0.000036	0.000031	1077.7	-0.4841	0.000005	0.234			80.131	997.0449
0.79952		25	0.0781	1077.08	(73)	0.000049	0.000031	1078.7	-1.6024	0.000018	2.568				997.0449
0.87488		25	0.0849	1085.36	(38)	0.000041	0.000036	1085.8	-0.4882	0.000005	0.238			88.315	997.0449
0.89963		25	0.0871	1086.39	(73)	0.000055	0.000038	1088.2	-1.7931	0.000017	3.215				997.0449
0.98336		25	0.0944	1095.46	(38)	0.000048	0.000043	1096.0	-0.5571	0.000005	0.310			98.414	997.0449
0.98394		25	0.0944	1095.45	(88)	0.000049	0.000043	1096.1	-0.6170	0.000005	0.381			98.408	997.0449
0.98578		25	0.0946	1095.67	(38)	0.000049	0.000044	1096.2	-0.5680	0.000005	0.323			98.628	997.0449
1.00387		25	0.0962	1099.66	(38)	0.000030	0.000045	1097.9	1.7456	-0.000015	3.047			102.62	997.0449
	0.4995	30	0.0506	1047.20	(41)	0.000026	0.000018	1047.7	-0.4685	0.000008	0.219				995.6473
	1.475	30	0.1375	1137.30	(41)	0.000094	0.000079	1140.0	-2.6843	0.000015	7.205				995.6473
	1.9685	30	0.1764	1182.60	(41)	0.000104	0.000104	1182.7	-0.0773	0.000000	0.006				995.6473
	2.615	30	0.2241	1236.70	(41)	0.000131	0.000133	1236.1	0.5670	-0.000002	0.321				995.6473
	2.987	30	0.2498	1267.30	(41)	0.000143	0.000147	1265.5	1.7775	-0.000004	3.160				995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
	3.4945	30	0.2836	1306.20	(41)	0.000162	0.000165	1304.8	1.4405	-0.000003	2.075				995.6473
	3.886	30	0.3082	1336.20	(41)	0.000174	0.000178	1334.0	2.2399	-0.000004	5.017				995.6473
0.04367		35	0.0046	998.77	(38)	-0.000029	-0.000009	998.7	0.0896	-0.000019	0.008			4.734	994.0319
0.15058		35	0.0157	1010.02	(38)	-0.000008	-0.000001	1009.9	0.1105	-0.000007	0.012			15.988	994.0319
0.26374		35	0.0272	1021.65	(38)	0.000006	0.000008	1021.6	0.0625	-0.000002	0.004			27.623	994.0319
0.33415		35	0.0342	1028.79	(38)	0.000012	0.000013	1028.8	0.0317	-0.000001	0.001			34.757	994.0319
0.59236		35	0.0591	1054.30	(38)	0.000033	0.000031	1054.4	-0.0763	0.000001	0.006			60.264	994.0319
0.76027		35	0.0746	1070.38	(38)	0.000044	0.000042	1070.5	-0.1165	0.000001	0.014			76.348	994.0319
0.88907		35	0.0861	1082.44	(38)	0.000052	0.000050	1082.6	-0.1507	0.000001	0.023			88.411	994.0319
0.97945		35	0.0940	1090.76	(38)	0.000057	0.000056	1090.9	-0.1853	0.000002	0.034			96.729	994.0319
1.00752		35	0.0965	1093.27	(38)	0.000060	0.000057	1093.5	-0.2510	0.000002	0.063			99.235	994.0319
	0.47915	40	0.0488	1040.70	(41)	0.000046	0.000031	1041.5	-0.7778	0.000015	0.605				992.2158
	0.965	40	0.0941	1087.20	(41)	0.000072	0.000061	1088.4	-1.1710	0.000011	1.371				992.2158
	1.414	40	0.1329	1128.10	(41)	0.000094	0.000086	1129.5	-1.4188	0.000008	2.013				992.2158
	1.907	40	0.1725	1171.70	(41)	0.000113	0.000109	1172.6	-0.9204	0.000004	0.847				992.2158
	2.393	40	0.2090	1213.70	(41)	0.000128	0.000129	1213.2	0.4535	-0.000001	0.206				992.2158
	2.8195	40	0.2394	1248.30	(41)	0.000144	0.000145	1247.9	0.3988	-0.000001	0.159				992.2158
	3.285	40	0.2712	1283.80	(41)	0.000164	0.000161	1284.9	-1.1359	0.000003	1.290				992.2158
	3.7665	40	0.3025	1319.90	(41)	0.000181	0.000176	1322.2	-2.2526	0.000004	5.074				992.2158
0.04369		45	0.0046	994.86	(38)	-0.000014	0.000007	994.8	0.0962	-0.000021	0.009			4.651	990.2132
0.15064		45	0.0157	1005.98	(38)	0.000003	0.000015	1005.8	0.1868	-0.000012	0.035			15.764	990.2132
0.19707		45	0.0205	1011.36	(38)	-0.000022	0.000018	1010.5	0.8410	-0.000040	0.707			21.148	990.2132
0.26384		45	0.0272	1017.47	(38)	0.000015	0.000023	1017.3	0.2086	-0.000007	0.044			27.26	990.2132
0.29544		45	0.0304	1021.56	(38)	-0.000011	0.000025	1020.4	1.1291	-0.000036	1.275			31.349	990.2132
0.33428		45	0.0342	1024.50	(38)	0.000022	0.000028	1024.3	0.1908	-0.000005	0.036			34.285	990.2132
0.39365		45	0.0401	1031.58	(38)	-0.000001	0.000032	1030.2	1.3885	-0.000033	1.928			41.362	990.2132
0.49172		45	0.0495	1041.42	(38)	0.000007	0.000038	1039.8	1.6330	-0.000030	2.667			51.207	990.2132
0.59067		45	0.0589	1051.20	(38)	0.000015	0.000044	1049.3	1.8626	-0.000029	3.469			60.986	990.2132
0.59258		45	0.0591	1049.68	(38)	0.000042	0.000044	1049.5	0.1646	-0.000003	0.027			59.471	990.2132
0.68899		45	0.0681	1060.78	(38)	0.000023	0.000050	1058.7	2.0841	-0.000027	4.343			70.563	990.2132
0.76056		45	0.0746	1065.59	(38)	0.000052	0.000054	1065.4	0.1664	-0.000002	0.028			75.374	990.2132
0.78743		45	0.0770	1070.22	(38)	0.000030	0.000056	1067.9	2.2887	-0.000026	5.238			80.005	990.2132
0.88603		45	0.0858	1079.53	(38)	0.000037	0.000061	1077.1	2.4751	-0.000025	6.126			89.317	990.2132
0.88973		45	0.0862	1077.58	(38)	0.000060	0.000062	1077.4	0.1831	-0.000002	0.034			87.365	990.2132
0.97926		45	0.0940	1085.75	(38)	0.000065	0.000066	1085.6	0.1773	-0.000002	0.031			95.534	990.2132
1.00771		45	0.0965	1090.88	(38)	0.000044	0.000068	1088.1	2.7286	-0.000024	7.445			100.662	990.2132
1.0079		45	0.0965	1088.32	(38)	0.000067	0.000068	1088.2	0.1515	-0.000001	0.023			98.102	990.2132
Average Res									0.0608	-0.000008	104.949	Sum chi sqr			
Std dev Res									0.8456	0.000016					
Avg - 4std									-3.3218	-0.000072					

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
Avg + 4std									3.4434	0.000055					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	0.012755
c1	0.014217
c2	-0.091456
c3	0.002134
c4	3342.364
Min T	0
Max T	45
Min w	0.0004
Max w	0.3082
Avg dens res	0.060811
Std dens res	0.84564
Avg app vol res *10 ³	-0.008186
Std app vol res *10 ³	0.0159
No of points in corr	147
No of inconsistent pair	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Perry's data not used

Density of aqueous solutions of NaF

- References (55) Krishnamurty, B. Ultrasonic Studies in Electrolytes: Part I - Alkali Halides. *Ind. Research (India)* **1950**, 9B, 215-219.
- (72) Millero, F. J.; Knox, J. H. Apparent Molal Volumes of Aqueous NaF, Na₂SO₄, KCl, K₂SO₄, MgCl₂, and MgSO₄ Solutions at 0° and 50°C. *J. Chem. Eng. Data* **1973**, 18, 407-411.
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, 61, 1492-1498.
- (86) Pedersen, T. G.; Dethlefsen, C.; Hvidt, A. Volumetric Properties of Aqueous Solutions of Alkali Halides *Carlsberg Res. Commun.* **1984**, 49, 445-455.
- (114) Saluja, P. P. S.; Lemire, R. J.; LeBlanc, J. C.; High-Temperature Thermodynamics of Aqueous Alkali-Metal Salts; *J. Chem. Thermodynamics*, **1992**, 24, 181-203

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m ³	Density of water / kg/m ³
0.00972		0	0.0004	1000.31	(72)	-0.000152	-0.000137	1000.3	0.0064	-0.000016	0.000			0.47000	999.8395
0.029258		0	0.0012	1001.25	(72)	-0.000148	-0.000133	1001.2	0.0195	-0.000016	0.000			1.4109	999.8395
0.090096		0	0.0038	1004.15	(72)	-0.000138	-0.000120	1004.1	0.0669	-0.000018	0.004			4.3064	999.8395
0.153786		0	0.0064	1007.14	(72)	-0.000129	-0.000108	1007.0	0.1355	-0.000021	0.018			7.2963	999.8395
0.243098		0	0.0101	1011.30	(72)	-0.000122	-0.000093	1011.0	0.2988	-0.000029	0.089			11.4628	999.8395
0.268629		0	0.0112	1012.47	(72)	-0.000119	-0.000089	1012.1	0.3410	-0.000030	0.116			12.631	999.8395
0.360255		0	0.0149	1016.67	(72)	-0.000111	-0.000075	1016.1	0.5583	-0.000036	0.312			16.8286	999.8395
0.360703		0	0.0149	1016.70	(72)	-0.000112	-0.000075	1016.1	0.5715	-0.000037	0.327			16.861	999.8395
0.497018		0	0.0204	1022.86	(72)	-0.000101	-0.000056	1021.9	0.9717	-0.000045	0.944			23.0247	999.8395
0.01		24.04	0.0004	997.97	(114)	-0.000631	-0.000096	997.7	0.2236	-0.000535	0.050		!		997.2867
0.03299		24.04	0.0014	998.98	(114)	-0.000223	-0.000092	998.8	0.1811	-0.000131	0.033				997.2867
0.11127		24.04	0.0047	1002.40	(114)	-0.000097	-0.000080	1002.3	0.0815	-0.000017	0.007				997.2867
0.19158		24.04	0.0080	1005.88	(114)	-0.000071	-0.000069	1005.9	0.0143	-0.000002	0.000				997.2867
0.30593		24.04	0.0127	1010.77	(114)	-0.000052	-0.000054	1010.8	-0.0317	0.000002	0.001				997.2867
0.43944		24.04	0.0181	1016.41	(114)	-0.000039	-0.000039	1016.4	-0.0111	0.000001	0.000				997.2867
		25	0.0010	998.11	(86)	-0.000060	-0.000092	998.1	-0.0324	0.000032	0.001			1.066	997.0449
		25	0.0011	998.23	(86)	-0.000057	-0.000092	998.3	-0.0382	0.000034	0.001			1.183	997.0449
		25	0.0012	998.35	(86)	-0.000056	-0.000091	998.4	-0.0429	0.000035	0.002			1.301	997.0449
		25	0.0013	998.47	(86)	-0.000058	-0.000091	998.5	-0.0438	0.000033	0.002			1.425	997.0449
		25	0.0023	999.49	(86)	-0.000052	-0.000087	999.6	-0.0820	0.000035	0.007			2.448	997.0449
		25	0.0030	1000.18	(86)	-0.000049	-0.000085	1000.3	-0.1064	0.000036	0.011			3.139	997.0449
		25	0.0034	1000.66	(86)	-0.000049	-0.000083	1000.8	-0.1188	0.000034	0.014			3.612	997.0449
		25	0.0040	1001.28	(86)	-0.000047	-0.000081	1001.4	-0.1384	0.000034	0.019			4.24	997.0449
0.10084		25	0.0042	1001.47	(73)	-0.000048	-0.000080	1001.6	-0.1358	0.000032	0.018				997.0449
		25	0.0066	1003.95	(86)	-0.000042	-0.000072	1004.2	-0.2036	0.000031	0.041			6.91	997.0449
		25	0.0076	1005.01	(86)	-0.000039	-0.000069	1005.2	-0.2288	0.000030	0.052			7.966	997.0449
0.20120		25	0.0084	1005.78	(73)	-0.000037	-0.000066	1006.0	-0.2504	0.000030	0.063				997.0449
		25	0.0086	1006.03	(86)	-0.000039	-0.000066	1006.3	-0.2315	0.000027	0.054			8.988	997.0449
		25	0.0096	1007.09	(86)	-0.000037	-0.000062	1007.3	-0.2462	0.000025	0.061			10.045	997.0449
		25	0.0111	1008.67	(86)	-0.000034	-0.000058	1008.9	-0.2654	0.000023	0.070			11.629	997.0449
		25	0.0122	1009.73	(86)	-0.000033	-0.000055	1010.0	-0.2705	0.000022	0.073			12.682	997.0449
0.29634		25	0.0123	1009.84	(73)	-0.000031	-0.000054	1010.1	-0.2939	0.000023	0.086				997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m ³	Density of water / kg/m ³
		25	0.0137	1011.31	(86)	-0.000031	-0.000051	1011.6	-0.2787	0.000020	0.078			14.261	997.0449
		25	0.0147	1012.35	(86)	-0.000029	-0.000048	1012.6	-0.2803	0.000019	0.079			15.308	997.0449
		25	0.0158	1013.53	(86)	-0.000029	-0.000045	1013.8	-0.2484	0.000015	0.062			16.481	997.0449
		25	0.0167	1014.43	(86)	-0.000026	-0.000042	1014.7	-0.2867	0.000017	0.082			17.389	997.0449
		25	0.0181	1015.92	(86)	-0.000027	-0.000039	1016.2	-0.2263	0.000012	0.051			18.879	997.0449
		25	0.0203	1018.15	(86)	-0.000023	-0.000033	1018.4	-0.2121	0.000010	0.045			21.108	997.0449
0.49991		25	0.0206	1018.40	(73)	-0.000020	-0.000033	1018.7	-0.2665	0.000012	0.071				997.0449
		25	0.0215	1019.49	(86)	-0.000022	-0.000030	1019.7	-0.1812	0.000008	0.033			22.449	997.0449
		25	0.0227	1020.69	(86)	-0.000021	-0.000027	1020.8	-0.1619	0.000007	0.026			23.641	997.0449
		25	0.0238	1021.87	(86)	-0.000019	-0.000025	1022.0	-0.1422	0.000006	0.020			24.823	997.0449
0.59012		25	0.0242	1022.15	(73)	-0.000016	-0.000024	1022.4	-0.2067	0.000008	0.043				997.0449
		25	0.0250	1023.05	(86)	-0.000018	-0.000022	1023.2	-0.1123	0.000004	0.013			26.01	997.0449
		25	0.0261	1024.23	(86)	-0.000017	-0.000020	1024.3	-0.0884	0.000003	0.008			27.189	997.0449
		25	0.0272	1025.37	(86)	-0.000015	-0.000017	1025.4	-0.0733	0.000003	0.005			28.326	997.0449
		25	0.0273	1025.42	(86)	-0.000015	-0.000017	1025.5	-0.0618	0.000002	0.004			28.372	997.0449
		25	0.0281	1026.26	(86)	-0.000014	-0.000016	1026.3	-0.0530	0.000002	0.003			29.213	997.0449
		25	0.0284	1026.60	(86)	-0.000014	-0.000015	1026.6	-0.0324	0.000001	0.001			29.557	997.0449
0.70804		25	0.0289	1027.02	(73)	-0.000011	-0.000014	1027.1	-0.0890	0.000003	0.008				997.0449
		25	0.0289	1027.14	(86)	-0.000012	-0.000014	1027.2	-0.0479	0.000002	0.002			30.095	997.0449
		25	0.0295	1027.78	(86)	-0.000012	-0.000013	1027.8	-0.0034	0.000000	0.000			30.731	997.0449
		25	0.0307	1028.95	(86)	-0.000011	-0.000010	1028.9	0.0292	-0.000001	0.001			31.907	997.0449
		25	0.0318	1030.11	(86)	-0.000010	-0.000008	1030.1	0.0561	-0.000002	0.003			33.068	997.0449
0.79744		25	0.0324	1030.69	(73)	-0.000008	-0.000007	1030.7	0.0261	-0.000001	0.001				997.0449
		25	0.0329	1031.28	(86)	-0.000008	-0.000006	1031.2	0.0862	-0.000002	0.007			34.239	997.0449
		25	0.0341	1032.46	(86)	-0.000007	-0.000004	1032.3	0.1224	-0.000003	0.015			35.418	997.0449
		25	0.0352	1033.63	(86)	-0.000006	-0.000002	1033.5	0.1578	-0.000004	0.025			36.588	997.0449
		25	0.0363	1034.79	(86)	-0.000005	0.000000	1034.6	0.1951	-0.000005	0.038			37.744	997.0449
		25	0.0374	1035.94	(86)	-0.000003	0.000003	1035.7	0.2133	-0.000005	0.045			38.894	997.0449
0.03299		48.75	0.0014	990.27	(114)	-0.000221	-0.000062	990.0	0.2155	-0.000159	0.046				988.5963
0.11127		48.75	0.0047	993.55	(114)	-0.000073	-0.000053	993.5	0.0946	-0.000021	0.009				988.5963
0.19158		48.75	0.0080	996.88	(114)	-0.000042	-0.000044	996.9	-0.0179	0.000002	0.000				988.5963
0.30593		48.75	0.0127	1001.70	(114)	-0.000032	-0.000033	1001.7	-0.0226	0.000002	0.001				988.5963
0.43944		48.75	0.0181	1007.22	(114)	-0.000021	-0.000022	1007.2	-0.0245	0.000001	0.001				988.5963
0.010102		50	0.0004	988.47	(72)	-0.000036	-0.000063	988.5	-0.0115	0.000028	0.000			0.4338	988.0363
0.0196		50	0.0008	988.88	(72)	-0.000034	-0.000062	988.9	-0.0225	0.000028	0.001			0.8406	988.0363
0.039394		50	0.0017	989.72	(72)	-0.000031	-0.000060	989.8	-0.0471	0.000029	0.002			1.684	988.0363
0.079954		50	0.0033	991.44	(72)	-0.000027	-0.000055	991.5	-0.0913	0.000028	0.008			3.407	988.0363
0.143533		50	0.0060	994.12	(72)	-0.000022	-0.000048	994.3	-0.1558	0.000026	0.024			6.0842	988.0363
0.24328		50	0.0101	998.26	(72)	-0.000013	-0.000038	998.5	-0.2513	0.000025	0.063			10.2267	988.0363
0.337712		50	0.0140	1002.18	(72)	-0.000010	-0.000030	1002.5	-0.2830	0.000020	0.080			14.1444	988.0363
0.430678		50	0.0178	1005.99	(72)	-0.000005	-0.000022	1006.3	-0.3086	0.000017	0.095			17.9545	988.0363
0.571046		50	0.0234	1011.71	(72)	0.000001	-0.000012	1012.0	-0.2950	0.000012	0.087			23.6743	988.0363
0.803873		50	0.0327	1021.03	(72)	0.000010	0.000003	1021.3	-0.2523	0.000007	0.064			32.9935	988.0363

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
0.03299		73.77	0.0014	977.19	(114)	-0.000194	-0.000040	977.0	0.2031	-0.000154	0.041				975.5797
0.11127		73.77	0.0047	980.47	(114)	-0.000073	-0.000033	980.3	0.1792	-0.000040	0.032				975.5797
0.19158		73.77	0.0080	983.94	(114)	-0.000067	-0.000027	983.6	0.3091	-0.000040	0.096				975.5797
0.30593		73.77	0.0127	988.66	(114)	-0.000045	-0.000019	988.3	0.3231	-0.000026	0.104				975.5797
0.43944		73.77	0.0181	994.10	(114)	-0.000029	-0.000010	993.8	0.3433	-0.000019	0.118				975.5797
0.03299		98.67	0.0014	961.05	(114)	-0.000317	-0.000025	960.7	0.3731	-0.000292	0.139				959.3157
0.11127		98.67	0.0047	964.44	(114)	-0.000150	-0.000019	963.9	0.5624	-0.000130	0.316				959.3157
0.19158		98.67	0.0080	967.77	(114)	-0.000098	-0.000015	967.1	0.6244	-0.000084	0.390				959.3157
0.30593		98.67	0.0127	972.62	(114)	-0.000082	-0.000008	971.7	0.8774	-0.000073	0.770				959.3157
0.43944		98.67	0.0181	978.31	(114)	-0.000075	-0.000002	977.1	1.2621	-0.000073	1.593	!			959.3157
Average Res									0.0249	-0.000014	7.328	Sum chi sqr			
Std dev Res									0.2943	0.000077					
Avg - 4std									-1.1523	-0.000320					
Avg + 4std									1.2021	0.000293					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	2.82E-06
c1	2.18E-07
c2	-0.04148
c3	0.000218
c4	4586.88
Min T	0
Max T	98.67
Min w	0.000408
Max w	0.03744
Avg dens res	0.024891
Std dens res	0.294304
Avg app vol res *10 ³	-0.01375
Std app vol res *10 ³	0.07657
No of points in corr	85
No of inconsistent pair	6

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

0.1	28	0.0042	1003.00	(55)	-0.000614	-0.000077	1000.7	2.2575	-0.000537	5.097	!	!		996.2335
0.2	28	0.0083	1008.00	(55)	-0.000403	-0.000063	1005.1	2.8656	-0.000339	8.212	!	!		996.2335
0.3	28	0.0124	1013.00	(55)	-0.000332	-0.000051	1009.4	3.5749	-0.000281	12.780	!			996.2335
0.4	28	0.0165	1015.00	(55)	-0.000118	-0.000040	1013.7	1.3223	-0.000078	1.748	!			996.2335
0.5	28	0.0206	1021.00	(55)	-0.000180	-0.000030	1017.8	3.2068	-0.000150	10.283	!			996.2335
1	28	0.0405	1036.00	(55)	0.000053	0.000009	1037.9	-1.9346	0.000044	3.743	!			996.2335

Density of aqueous solutions of **NaHCO3**

- References (38) Hershey, J. P.; Sotolongo, S.; Millero, F. J. Densities and Compressibilities of Aqueous Sodium Carbonate and Bicarbonate from 0 to 45°C. *J. Sol. Chem.* **1983**, *12*, 233-254.
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, *61*, 1492-1498.
- (88) Perron, G.; Desnoyers, J. E.; Millero, F. J., Apparent molal volumes and heat capacities of some sulfates and carbonates in water at 25 °C, *Can. J. Chem.*, **1975**, *53*, 1134-1138
- (106) Rashkovskaya, E. A.; Chernen'kaya, E. I. Densities of Solutions of NH4HCO3, NaHCO3, NH4Cl and Ammonia in the 20-100° Range. *J. Appl. Chem. USSR* **1967**, *40*, 301-308.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
0.00434		0	0.0004	1000.1	(38)	0.000207	0.000236	1000.1	0.0106	-0.000029	0.000			0.289	999.8395
0.0167		0	0.0014	1000.9	(38)	0.000210	0.000237	1000.9	0.0375	-0.000027	0.001			1.108	999.8395
0.03491		0	0.0029	1002.1	(38)	0.000212	0.000237	1002.1	0.0726	-0.000025	0.005			2.308	999.8395
0.06027		0	0.0050	1003.8	(38)	0.000215	0.000238	1003.7	0.1168	-0.000023	0.014			3.97	999.8395
0.09949		0	0.0083	1006.3	(38)	0.000220	0.000239	1006.2	0.1649	-0.000020	0.027			6.51	999.8395
0.1333		0	0.0111	1008.5	(38)	0.000223	0.000240	1008.3	0.1975	-0.000018	0.039			8.681	999.8395
0.18649		0	0.0154	1011.9	(38)	0.000227	0.000242	1011.7	0.2347	-0.000015	0.055			12.064	999.8395
0.26204		0	0.0215	1016.7	(38)	0.000232	0.000244	1016.4	0.2678	-0.000012	0.072			16.811	999.8395
0.36248		0	0.0296	1022.9	(38)	0.000238	0.000248	1022.6	0.2950	-0.000010	0.087			23.035	999.8395
0.47636		0	0.0385	1029.8	(38)	0.000244	0.000251	1029.5	0.2846	-0.000007	0.081			29.954	999.8395
0.59586		0	0.0477	1036.9	(38)	0.000250	0.000255	1036.7	0.2533	-0.000005	0.064			37.084	999.8395
0.74565		0	0.0589	1045.7	(38)	0.000256	0.000259	1045.5	0.2079	-0.000003	0.043			45.856	999.8395
0.05186		5	0.0043	1003.3	(38)	0.000233	0.000252	1003.2	0.0842	-0.000019	0.007			3.339	999.9638
0.18933		5	0.0157	1011.9	(38)	0.000248	0.000256	1011.7	0.1375	-0.000009	0.019			11.916	999.9638
0.29355		5	0.0241	1018.2	(38)	0.000257	0.000260	1018.1	0.0609	-0.000002	0.004			18.201	999.9638
0.39653		5	0.0322	1024.3	(38)	0.000262	0.000263	1024.3	0.0180	-0.000001	0.000			24.359	999.9638
0.5958		5	0.0477	1036.0	(38)	0.000271	0.000269	1036.1	-0.0804	0.000002	0.006			36.02	999.9638
0.70303		5	0.0558	1042.1	(38)	0.000274	0.000272	1042.3	-0.1171	0.000002	0.014			42.181	999.9638
0.79821		5	0.0628	1047.5	(38)	0.000277	0.000275	1047.7	-0.1532	0.000002	0.023			47.57	999.9638
0.8976		5	0.0701	1053.0	(38)	0.000281	0.000278	1053.3	-0.2551	0.000003	0.065			53.057	999.9638
1.0003		5	0.0775	1058.7	(38)	0.000284	0.000281	1059.0	-0.2797	0.000003	0.078			58.726	999.9638
1.00034		5	0.0775	1058.7	(38)	0.000284	0.000281	1059.0	-0.2319	0.000003	0.054			58.776	999.9638
0.05528		15	0.0046	1002.5	(38)	0.000268	0.000275	1002.5	0.0336	-0.000007	0.001			3.393	999.0996
0.1202		15	0.0100	1006.4	(38)	0.000275	0.000277	1006.4	0.0187	-0.000002	0.000			7.292	999.0996
0.23922		15	0.0197	1013.4	(38)	0.000284	0.000281	1013.5	-0.0571	0.000003	0.003			14.304	999.0996
0.31752		15	0.0260	1018.0	(38)	0.000287	0.000283	1018.1	-0.1002	0.000004	0.010			18.862	999.0996
0.4566		15	0.0369	1025.9	(38)	0.000292	0.000288	1026.1	-0.1853	0.000005	0.034			26.829	999.0996
0.60394		15	0.0483	1034.3	(38)	0.000296	0.000292	1034.5	-0.2209	0.000004	0.049			35.156	999.0996
0.72429		15	0.0574	1041.0	(38)	0.000299	0.000296	1041.2	-0.2022	0.000003	0.041			41.878	999.0996
0.88532		15	0.0692	1049.9	(38)	0.000302	0.000300	1050.0	-0.1000	0.000001	0.010			50.771	999.0996
1.00844		15	0.0781	1056.6	(38)	0.000304	0.000304	1056.6	0.0067	0.000000	0.000			57.462	999.0996
0.00298		25	0.0003	997.2	(38)	0.000276	0.000290	997.2	0.0036	-0.000015	0.000			0.181	997.0449
0.00468		25	0.0004	997.3	(38)	0.000276	0.000290	997.3	0.0055	-0.000014	0.000			0.284	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
0.00811		25	0.0007	997.5	(88)	0.000279	0.000290	997.5	0.0075	-0.000011	0.000			0.49	997.0449
0.01405		25	0.0012	997.9	(88)	0.000289	0.000291	997.9	0.0024	-0.000002	0.000			0.838	997.0449
0.01769		25	0.0015	998.1	(38)	0.000280	0.000291	998.1	0.0161	-0.000011	0.000			1.068	997.0449
0.02314		25	0.0019	998.4	(88)	0.000281	0.000291	998.4	0.0196	-0.000010	0.000			1.395	997.0449
0.03495		25	0.0029	999.1	(88)	0.000281	0.000291	999.1	0.0292	-0.000010	0.001			2.105	997.0449
0.03688		25	0.0031	999.3	(38)	0.000283	0.000291	999.2	0.0269	-0.000009	0.001			2.217	997.0449
0.04072		25	0.0034	999.5	(38)	0.000282	0.000291	999.5	0.0315	-0.000009	0.001			2.449	997.0449
0.06435		25	0.0054	1000.9	(88)	0.000285	0.000292	1000.9	0.0386	-0.000007	0.001			3.853	997.0449
0.08565		25	0.0071	1002.2	(38)	0.000287	0.000293	1002.1	0.0433	-0.000006	0.002			5.113	997.0449
0.10029		25	0.0084	1003.0	(38)	0.000288	0.000293	1003.0	0.0406	-0.000005	0.002			5.971	997.0449
0.10029		25	0.0084	1003.04	(73)	0.000285	0.000293	1003.0	0.0647	-0.000008	0.004				997.0449
0.12723		25	0.0106	1004.6	(88)	0.000289	0.000294	1004.6	0.0552	-0.000005	0.003			7.565	997.0449
0.17697		25	0.0146	1007.5	(38)	0.000294	0.000295	1007.5	0.0273	-0.000002	0.001			10.438	997.0449
0.188		25	0.0155	1008.2	(88)	0.000292	0.000296	1008.1	0.0596	-0.000004	0.004			11.111	997.0449
0.19854		25	0.0164	1008.7	(38)	0.000294	0.000296	1008.7	0.0284	-0.000002	0.001			11.691	997.0449
0.19854		25	0.0164	1008.76	(73)	0.000293	0.000296	1008.7	0.0525	-0.000003	0.003				997.0449
0.24972		25	0.0205	1011.7	(38)	0.000297	0.000298	1011.7	0.0107	-0.000001	0.000			14.629	997.0449
0.27007		25	0.0222	1012.9	(88)	0.000295	0.000298	1012.8	0.0713	-0.000003	0.005			15.859	997.0449
0.29909		25	0.0245	1014.5	(38)	0.000299	0.000299	1014.5	0.0022	0.000000	0.000			17.452	997.0449
0.29909		25	0.0245	1014.52	(73)	0.000298	0.000299	1014.5	0.0253	-0.000001	0.001				997.0449
0.3189		25	0.0261	1015.7	(88)	0.000296	0.000300	1015.6	0.0874	-0.000003	0.008			18.665	997.0449
0.37438		25	0.0305	1018.8	(38)	0.000302	0.000301	1018.8	-0.0237	0.000001	0.001			21.707	997.0449
0.39916		25	0.0324	1020.2	(38)	0.000303	0.000302	1020.2	-0.0189	0.000001	0.000			23.111	997.0449
0.39916		25	0.0324	1020.28	(73)	0.000299	0.000302	1020.2	0.1052	-0.000003	0.011				997.0449
0.48897		25	0.0395	1025.2	(38)	0.000305	0.000305	1025.2	0.0026	0.000000	0.000			28.163	997.0449
0.5285		25	0.0425	1027.5	(88)	0.000304	0.000306	1027.4	0.0958	-0.000002	0.009			30.452	997.0449
0.60053		25	0.0480	1031.4	(38)	0.000308	0.000308	1031.4	-0.0111	0.000000	0.000			34.31	997.0449
0.60053		25	0.0480	1031.38	(73)	0.000308	0.000308	1031.4	0.0140	0.000000	0.000				997.0449
0.63853		25	0.0509	1033.5	(38)	0.000309	0.000309	1033.4	0.0157	0.000000	0.000			36.413	997.0449
0.69427		25	0.0551	1036.5	(38)	0.000310	0.000311	1036.5	0.0296	0.000000	0.001			39.452	997.0449
0.69427		25	0.0551	1036.52	(73)	0.000310	0.000311	1036.5	0.0527	-0.000001	0.003				997.0449
0.7740		25	0.0611	1040.9	(88)	0.000311	0.000313	1040.8	0.1470	-0.000002	0.022			43.856	997.0449
0.79985		25	0.0630	1042.2	(38)	0.000312	0.000314	1042.1	0.1109	-0.000002	0.012			45.197	997.0449
0.79985		25	0.0630	1042.27	(73)	0.000312	0.000314	1042.1	0.1390	-0.000002	0.019				997.0449
0.8074		25	0.0635	1042.6	(38)	0.000313	0.000314	1042.5	0.1032	-0.000001	0.011			45.591	997.0449
0.97909		25	0.0760	1051.9	(38)	0.000315	0.000319	1051.5	0.3673	-0.000004	0.135			54.871	997.0449
0.05817		35	0.0049	997.5	(38)	0.000295	0.000303	997.4	0.0385	-0.000008	0.001			3.429	994.0319
0.1178		35	0.0098	1000.9	(38)	0.000301	0.000305	1000.9	0.0314	-0.000003	0.001			6.87	994.0319
0.23556		35	0.0194	1007.6	(38)	0.000309	0.000308	1007.6	-0.0224	0.000001	0.001			13.544	994.0319
0.31109		35	0.0255	1011.8	(38)	0.000311	0.000310	1011.9	-0.0288	0.000001	0.001			17.796	994.0319
0.43769		35	0.0355	1018.8	(38)	0.000316	0.000314	1018.9	-0.0792	0.000002	0.006			24.784	994.0319
0.60204		35	0.0481	1027.7	(38)	0.000321	0.000319	1027.8	-0.1148	0.000002	0.013			33.701	994.0319
0.71868		35	0.0569	1034.0	(38)	0.000323	0.000322	1034.1	-0.0878	0.000001	0.008			39.956	994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
0.88105		35	0.0689	1042.6	(38)	0.000326	0.000326	1042.6	0.0460	-0.000001	0.002			48.587	994.0319
1.00324		35	0.0777	1049.0	(38)	0.000327	0.000330	1048.8	0.1980	-0.000002	0.039			55.002	994.0319
0.05837		45	0.0049	993.6	(38)	0.000296	0.000309	993.6	0.0624	-0.000013	0.004			3.427	990.2132
0.11598		45	0.0096	996.9	(38)	0.000307	0.000311	996.9	0.0402	-0.000004	0.002			6.7	990.2132
0.23638		45	0.0195	1003.6	(38)	0.000318	0.000314	1003.7	-0.0780	0.000004	0.006			13.387	990.2132
0.23823		45	0.0196	1003.7	(38)	0.000317	0.000314	1003.8	-0.0567	0.000003	0.003			13.512	990.2132
0.31888		45	0.0261	1008.1	(38)	0.000322	0.000316	1008.3	-0.1474	0.000006	0.022			17.917	990.2132
0.4355		45	0.0353	1014.5	(38)	0.000326	0.000320	1014.7	-0.2253	0.000006	0.051			24.253	990.2132
0.4373		45	0.0354	1014.6	(38)	0.000326	0.000320	1014.8	-0.2234	0.000006	0.050			24.353	990.2132
0.60109		45	0.0481	1023.4	(38)	0.000329	0.000324	1023.6	-0.2275	0.000005	0.052			33.182	990.2132
0.71888		45	0.0570	1029.6	(38)	0.000331	0.000327	1029.9	-0.2089	0.000003	0.044			39.429	990.2132
0.87795		45	0.0687	1038.1	(38)	0.000332	0.000332	1038.1	-0.0235	0.000000	0.001			47.862	990.2132
0.88221		45	0.0690	1038.3	(38)	0.000332	0.000332	1038.3	-0.0228	0.000000	0.001			48.081	990.2132
1.00082		45	0.0776	1044.5	(38)	0.000334	0.000335	1044.3	0.1125	-0.000001	0.013			54.241	990.2132
1.00182		45	0.0776	1044.5	(38)	0.000334	0.000335	1044.4	0.1142	-0.000001	0.013			54.293	990.2132
Average Res									0.0164	-0.000004	1.501	Sum chi sqr			
Std dev Res									0.1281	0.000007					
Avg - 4std									-0.4960	-0.000034					
Avg + 4std									0.5288	0.000026					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	-9.5E-08
c1	1.57E-07
c2	0.991146
c3	0.022644
c4	4900.228
Min T	0
Max T	45
Min w	0.0003
Max w	0.0781
Avg dens res	0.0164
Std dens res	0.128095
Avg app vol res *10 ³	-0.00381
Std app vol res *10 ³	0.007446
No of points in corr	91
No of inconsistent poin	176

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

20	0.0100	1006.7	(106)	0.000156	0.000286	1005.4	1.3152	-0.000130	1.730	!	!			998.2041
20	0.0200	1014.3	(106)	0.000207	0.000290	1012.6	1.7072	-0.000083	2.914	!	!			998.2041
20	0.0300	1022.1	(106)	0.000221	0.000294	1019.8	2.2742	-0.000073	5.172	!	!			998.2041
20	0.0400	1028.7	(106)	0.000259	0.000298	1027.1	1.6188	-0.000038	2.621	!	!			998.2041
20	0.0500	1035.9	(106)	0.000273	0.000302	1034.4	1.5440	-0.000029	2.384	!				998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
		20	0.0600	1042.8	(106)	0.000288	0.000305	1041.6	1.1527	-0.000018	1.329	!			998.2041
		20	0.0700	1050.1	(106)	0.000295	0.000309	1049.0	1.1481	-0.000015	1.318	!			998.2041
		20	0.0800	1056.7	(106)	0.000309	0.000313	1056.3	0.4335	-0.000005	0.188				998.2041
		20	0.0880	1062.8	(106)	0.000310	0.000317	1062.1	0.6771	-0.000007	0.458	!			998.2041
		25	0.0100	1005.6	(106)	0.000150	0.000294	1004.1	1.4548	-0.000144	2.116	!	!		997.0449
		25	0.0200	1013.3	(106)	0.000198	0.000297	1011.3	2.0280	-0.000099	4.113	!	!		997.0449
		25	0.0300	1021.1	(106)	0.000215	0.000301	1018.4	2.6772	-0.000086	7.168	!	!		997.0449
		25	0.0400	1027.8	(106)	0.000253	0.000305	1025.6	2.2051	-0.000052	4.862	!	!		997.0449
		25	0.0500	1035.1	(106)	0.000265	0.000309	1032.8	2.3143	-0.000043	5.356	!	!		997.0449
		25	0.0600	1042.0	(106)	0.000282	0.000313	1040.0	2.0079	-0.000031	4.032	!			997.0449
		25	0.0700	1049.3	(106)	0.000289	0.000317	1047.2	2.0889	-0.000027	4.363	!			997.0449
		25	0.0800	1056.0	(106)	0.000303	0.000321	1054.4	1.5606	-0.000018	2.435	!			997.0449
		25	0.0900	1062.4	(106)	0.000317	0.000325	1061.7	0.7266	-0.000007	0.528	!			997.0449
		25	0.0955	1065.6	(106)	0.000327	0.000327	1065.7	-0.0533	0.000000	0.003				997.0449
		30	0.0100	1004.3	(106)	0.000139	0.000300	1002.7	1.6193	-0.000161	2.622	!	!		995.6473
		30	0.0200	1012.2	(106)	0.000183	0.000303	1009.7	2.4599	-0.000120	6.051	!	!		995.6473
		30	0.0300	1020.1	(106)	0.000202	0.000307	1016.8	3.2769	-0.000105	10.738	!	!		995.6473
		30	0.0400	1027.0	(106)	0.000238	0.000311	1023.9	3.0729	-0.000073	9.442	!	!		995.6473
		30	0.0500	1034.2	(106)	0.000256	0.000315	1031.0	3.1505	-0.000059	9.926	!	!		995.6473
		30	0.0600	1041.2	(106)	0.000272	0.000318	1038.2	3.0127	-0.000046	9.076	!	!		995.6473
		30	0.0700	1048.5	(106)	0.000281	0.000322	1045.3	3.1625	-0.000041	10.001	!	!		995.6473
		30	0.0800	1055.2	(106)	0.000296	0.000326	1052.5	2.7031	-0.000030	7.307	!			995.6473
		30	0.0900	1061.7	(106)	0.000310	0.000330	1059.7	2.0380	-0.000020	4.153	!			995.6473
		30	0.1000	1068.1	(106)	0.000323	0.000334	1066.8	1.2707	-0.000011	1.615	!			995.6473
		30	0.1020	1068.5	(106)	0.000333	0.000335	1068.3	0.2373	-0.000002	0.056				995.6473
		35	0.0100	1003.0	(106)	0.000107	0.000305	1001.0	1.9893	-0.000198	3.957	!	!		994.0319
		35	0.0200	1011.1	(106)	0.000157	0.000308	1008.0	3.0845	-0.000151	9.514	!	!		994.0319
		35	0.0300	1019.1	(106)	0.000181	0.000312	1015.0	4.0560	-0.000131	16.451	!	!		994.0319
		35	0.0400	1026.1	(106)	0.000220	0.000316	1022.1	4.0063	-0.000095	16.050	!	!		994.0319
		35	0.0500	1033.4	(106)	0.000240	0.000319	1029.2	4.2381	-0.000080	17.961	!	!		994.0319
		35	0.0600	1040.4	(106)	0.000259	0.000323	1036.2	4.1541	-0.000064	17.256	!	!		994.0319
		35	0.0700	1047.8	(106)	0.000269	0.000327	1043.3	4.4573	-0.000058	19.868	!	!		994.0319
		35	0.0800	1054.5	(106)	0.000285	0.000331	1050.4	4.0510	-0.000046	16.410	!	!		994.0319
		35	0.0900	1061.0	(106)	0.000300	0.000335	1057.6	3.4383	-0.000034	11.822	!	!		994.0319
		35	0.1000	1067.4	(106)	0.000315	0.000338	1064.7	2.7228	-0.000024	7.414	!			994.0319
		35	0.1075	1071.2	(106)	0.000332	0.000341	1070.0	1.1866	-0.000010	1.408	!			994.0319
		40	0.0100	1001.7	(106)	0.000054	0.000308	999.2	2.5488	-0.000255	6.496	!	!		992.2158
		40	0.0200	1010.0	(106)	0.000121	0.000312	1006.1	3.8869	-0.000191	15.108	!	!		992.2158
		40	0.0300	1018.0	(106)	0.000157	0.000315	1013.1	4.9008	-0.000158	24.018	!	!		992.2158
		40	0.0400	1025.2	(106)	0.000197	0.000319	1020.1	5.0930	-0.000122	25.938	!	!		992.2158
		40	0.0500	1032.6	(106)	0.000220	0.000323	1027.1	5.4659	-0.000103	29.876	!	!		992.2158
		40	0.0600	1039.6	(106)	0.000242	0.000326	1034.2	5.4223	-0.000084	29.401	!	!		992.2158
		40	0.0700	1046.9	(106)	0.000256	0.000330	1041.2	5.6651	-0.000074	32.093	!	!		992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
		40	0.0800	1053.8	(106)	0.000272	0.000334	1048.3	5.4973	-0.000062	30.221	!	!		992.2158
		40	0.0900	1060.3	(106)	0.000289	0.000338	1055.4	4.9222	-0.000049	24.228	!	!		992.2158
		40	0.1000	1066.8	(106)	0.000303	0.000342	1062.5	4.3432	-0.000038	18.863	!	!		992.2158
		40	0.1130	1074.0	(106)	0.000329	0.000347	1071.7	2.3405	-0.000018	5.478	!	!		992.2158
		45	0.0100	1000.3	(106)	-0.000008	0.000311	997.1	3.1845	-0.000319	10.141	!	!		990.2132
		45	0.0200	1008.9	(106)	0.000075	0.000314	1004.0	4.8550	-0.000240	23.571	!	!		990.2132
		45	0.0300	1017.1	(106)	0.000120	0.000318	1011.0	6.1004	-0.000198	37.215	!	!		990.2132
		45	0.0400	1024.4	(106)	0.000167	0.000321	1018.0	6.4230	-0.000154	41.255	!	!		990.2132
		45	0.0500	1031.7	(106)	0.000198	0.000325	1025.0	6.7253	-0.000127	45.230	!	!		990.2132
		45	0.0600	1038.8	(106)	0.000223	0.000329	1032.0	6.8100	-0.000106	46.376	!	!		990.2132
		45	0.0700	1046.2	(106)	0.000238	0.000332	1039.0	7.1798	-0.000094	51.549	!	!		990.2132
		45	0.0800	1053.1	(106)	0.000256	0.000336	1046.1	7.0376	-0.000080	49.528	!	!		990.2132
		45	0.0900	1059.7	(106)	0.000274	0.000340	1053.1	6.5866	-0.000066	43.384	!	!		990.2132
		45	0.1000	1066.1	(106)	0.000291	0.000343	1060.2	5.9301	-0.000052	35.166	!	!		990.2132
		45	0.1200	1077.0	(106)	0.000332	0.000351	1074.3	2.7147	-0.000020	7.369	!	!		990.2132
		50	0.0100	998.7	(106)	-0.000069	0.000312	994.9	3.7854	-0.000381	14.330	!	!		988.0363
		50	0.0200	1007.8	(106)	0.000020	0.000316	1001.8	5.9788	-0.000296	35.745	!	!		988.0363
		50	0.0300	1016.1	(106)	0.000080	0.000319	1008.8	7.3457	-0.000239	53.960	!	!		988.0363
		50	0.0400	1023.5	(106)	0.000135	0.000323	1015.7	7.7886	-0.000187	60.662	!	!		988.0363
		50	0.0500	1030.9	(106)	0.000170	0.000326	1022.7	8.2097	-0.000156	67.400	!	!		988.0363
		50	0.0600	1037.9	(106)	0.000202	0.000330	1029.7	8.2117	-0.000128	67.432	!	!		988.0363
		50	0.0700	1045.4	(106)	0.000219	0.000333	1036.7	8.6971	-0.000115	75.640	!	!		988.0363
		50	0.0800	1052.4	(106)	0.000238	0.000337	1043.7	8.6689	-0.000099	75.149	!	!		988.0363
		50	0.0900	1059.0	(106)	0.000259	0.000341	1050.8	8.2299	-0.000082	67.732	!	!		988.0363
		50	0.1000	1065.5	(106)	0.000276	0.000344	1057.8	7.6835	-0.000068	59.036	!	!		988.0363
		50	0.1270	1080.0	(106)	0.000334	0.000355	1076.9	3.1475	-0.000021	9.907	!	!		988.0363
		55	0.0100	997.2	(106)	-0.000156	0.000313	992.6	4.6422	-0.000469	21.550	!	!		985.6952
		55	0.0200	1006.7	(106)	-0.000044	0.000316	999.5	7.2498	-0.000360	52.559	!	!		985.6952
		55	0.0300	1015.1	(106)	0.000035	0.000320	1006.4	8.7295	-0.000285	76.204	!	!		985.6952
		55	0.0400	1022.7	(106)	0.000097	0.000323	1013.3	9.3834	-0.000226	88.049	!	!		985.6952
		55	0.0500	1030.0	(106)	0.000142	0.000327	1020.3	9.7139	-0.000185	94.360	!	!		985.6952
		55	0.0600	1037.2	(106)	0.000175	0.000330	1027.3	9.9233	-0.000155	98.473	!	!		985.6952
		55	0.0700	1044.6	(106)	0.000197	0.000334	1034.3	10.3143	-0.000136	106.384	!	!		985.6952
		55	0.0800	1051.7	(106)	0.000219	0.000337	1041.3	10.3894	-0.000119	107.940	!	!		985.6952
		55	0.0900	1058.4	(106)	0.000240	0.000341	1048.3	10.0517	-0.000101	101.037	!	!		985.6952
		55	0.1000	1064.8	(106)	0.000261	0.000345	1055.4	9.4042	-0.000084	88.439	!	!		985.6952
		55	0.1340	1082.9	(106)	0.000335	0.000357	1079.4	3.5140	-0.000022	12.348	!	!		985.6952
		60	0.0100	995.6	(106)	-0.000250	0.000313	990.1	5.5469	-0.000563	30.768	!	!		983.1989
		60	0.0200	1005.6	(106)	-0.000116	0.000316	996.9	8.6611	-0.000432	75.015	!	!		983.1989
		60	0.0300	1014.1	(106)	-0.000016	0.000319	1003.9	10.2456	-0.000335	104.972	!	!		983.1989
		60	0.0400	1021.8	(106)	0.000057	0.000323	1010.8	11.0025	-0.000266	121.054	!	!		983.1989
		60	0.0500	1029.2	(106)	0.000108	0.000326	1017.8	11.4338	-0.000218	130.732	!	!		983.1989
		60	0.0600	1036.4	(106)	0.000147	0.000330	1024.8	11.6420	-0.000183	135.535	!	!		983.1989

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
		60	0.0700	1043.8	(106)	0.000174	0.000333	1031.8	12.0294	-0.000160	144.706	!	!		983.1989
		60	0.0800	1051.0	(106)	0.000197	0.000337	1038.8	12.1986	-0.000140	148.807	!	!		983.1989
		60	0.0900	1057.7	(106)	0.000221	0.000340	1045.8	11.8525	-0.000119	140.482	!	!		983.1989
		60	0.1000	1064.2	(106)	0.000243	0.000344	1052.9	11.2939	-0.000101	127.553	!	!		983.1989
		60	0.1410	1085.9	(106)	0.000335	0.000359	1081.9	3.9921	-0.000024	15.937	!	!		983.1989
		65	0.0100	993.9	(106)	-0.000350	0.000312	987.4	6.4927	-0.000662	42.156	!	!		980.5548
		65	0.0200	1004.5	(106)	-0.000196	0.000315	994.3	10.2068	-0.000511	104.179	!	!		980.5548
		65	0.0300	1013.1	(106)	-0.000072	0.000318	1001.2	11.8891	-0.000391	141.351	!	!		980.5548
		65	0.0400	1020.9	(106)	0.000012	0.000322	1008.2	12.7416	-0.000309	162.349	!	!		980.5548
		65	0.0500	1028.4	(106)	0.000071	0.000325	1015.1	13.2663	-0.000254	175.996	!	!		980.5548
		65	0.0600	1035.6	(106)	0.000116	0.000328	1022.1	13.4655	-0.000212	181.319	!	!		980.5548
		65	0.0700	1043.1	(106)	0.000146	0.000332	1029.2	13.9414	-0.000186	194.362	!	!		980.5548
		65	0.0800	1050.3	(106)	0.000173	0.000335	1036.2	14.0965	-0.000162	198.711	!	!		980.5548
		65	0.0900	1057.1	(106)	0.000199	0.000339	1043.3	13.8334	-0.000139	191.363	!	!		980.5548
		65	0.1000	1063.6	(106)	0.000224	0.000342	1050.3	13.2550	-0.000119	175.695	!	!		980.5548
		70	0.0100	992.2	(106)	-0.000465	0.000311	984.6	7.5740	-0.000775	57.365	!	!		977.7696
		70	0.0200	1003.4	(106)	-0.000283	0.000314	991.5	11.8819	-0.000597	141.179	!	!		977.7696
		70	0.0300	1012.1	(106)	-0.000134	0.000317	998.4	13.6558	-0.000450	186.482	!	!		977.7696
		70	0.0400	1020.0	(106)	-0.000036	0.000320	1005.4	14.5976	-0.000356	213.091	!	!		977.7696
		70	0.0500	1027.5	(106)	0.000033	0.000323	1012.4	15.1091	-0.000290	228.286	!	!		977.7696
		70	0.0600	1034.7	(106)	0.000085	0.000327	1019.4	15.2925	-0.000242	233.860	!	!		977.7696
		70	0.0700	1047.3	(106)	0.000053	0.000330	1026.5	20.8498	-0.000277	434.715	!	!		977.7696
		70	0.0800	1049.6	(106)	0.000148	0.000333	1033.5	16.0835	-0.000185	258.679	!	!		977.7696
		70	0.0900	1056.4	(106)	0.000177	0.000337	1040.6	15.7960	-0.000160	249.514	!	!		977.7696
		70	0.1000	1063.0	(106)	0.000203	0.000340	1047.7	15.2900	-0.000137	233.784	!	!		977.7696
		75	0.0100	990.5	(106)	-0.000595	0.000308	981.7	8.7856	-0.000904	77.187	!	!		974.849
		75	0.0200	1002.2	(106)	-0.000374	0.000311	988.6	13.5822	-0.000685	184.477	!	!		974.849
		75	0.0300	1011.1	(106)	-0.000200	0.000315	995.6	15.5424	-0.000515	241.567	!	!		974.849
		75	0.0400	1019.2	(106)	-0.000090	0.000318	1002.5	16.6679	-0.000408	277.820	!	!		974.849
		75	0.0500	1026.7	(106)	-0.000010	0.000321	1009.5	17.1605	-0.000331	294.483	!	!		974.849
		75	0.0600	1033.9	(106)	0.000049	0.000324	1016.6	17.3221	-0.000275	300.054	!	!		974.849
		75	0.0700	1046.5	(106)	0.000022	0.000327	1023.6	22.8547	-0.000305	522.339	!	!		974.849
		75	0.0800	1049.0	(106)	0.000119	0.000331	1030.7	18.2607	-0.000211	333.452	!	!		974.849
		75	0.0900	1055.8	(106)	0.000152	0.000334	1037.9	17.9422	-0.000182	321.923	!	!		974.849
		75	0.1000	1062.4	(106)	0.000180	0.000337	1045.0	17.4019	-0.000157	302.826	!	!		974.849
		80	0.0100	988.9	(106)	-0.000751	0.000306	978.7	10.2234	-0.001056	104.519	!	!		971.7978
		80	0.0200	1001.1	(106)	-0.000477	0.000309	985.6	15.5043	-0.000786	240.382	!	!		971.7978
		80	0.0300	1010.1	(106)	-0.000272	0.000312	992.6	17.5461	-0.000583	307.865	!	!		971.7978
		80	0.0400	1018.3	(106)	-0.000146	0.000315	999.5	18.7505	-0.000461	351.581	!	!		971.7978
		80	0.0500	1025.8	(106)	-0.000054	0.000318	1006.6	19.2192	-0.000372	369.376	!	!		971.7978
		80	0.0600	1033.1	(106)	0.000011	0.000321	1013.6	19.4539	-0.000310	378.453	!	!		971.7978
		80	0.0700	1045.7	(106)	-0.000010	0.000324	1020.7	24.9565	-0.000334	622.829	!	!		971.7978
		80	0.0800	1048.3	(106)	0.000090	0.000327	1027.9	20.4293	-0.000237	417.355	!	!		971.7978

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
		80	0.0900	1055.2	(106)	0.000125	0.000331	1035.0	20.1742	-0.000205	406.999	!	!		971.7978
		80	0.1000	1061.9	(106)	0.000156	0.000334	1042.2	19.6937	-0.000178	387.844	!	!		971.7978
		85	0.0100	987.1	(106)	-0.000900	0.000303	975.5	11.5839	-0.001203	134.186	!	!		968.6203
		85	0.0200	999.9	(106)	-0.000582	0.000306	982.5	17.4451	-0.000888	304.330	!	!		968.6203
		85	0.0300	999.1	(106)	-0.000017	0.000308	989.4	9.6646	-0.000326	93.404	!	!		968.6203
		85	0.0400	1017.4	(106)	-0.000205	0.000311	996.5	20.9438	-0.000516	438.643	!	!		968.6203
		85	0.0500	1025.0	(106)	-0.000103	0.000314	1003.5	21.4843	-0.000418	461.576	!	!		968.6203
		85	0.0600	1032.3	(106)	-0.000029	0.000317	1010.6	21.6878	-0.000346	470.361	!	!		968.6203
		85	0.0700	1039.9	(106)	0.000021	0.000321	1017.7	22.1560	-0.000299	490.888	!	!		968.6203
		85	0.0800	1047.6	(106)	0.000059	0.000324	1024.9	22.6908	-0.000264	514.875	!	!		968.6203
		85	0.0900	1054.7	(106)	0.000096	0.000327	1032.1	22.5944	-0.000231	510.506	!	!		968.6203
		85	0.1000	1061.3	(106)	0.000131	0.000330	1039.3	21.9688	-0.000199	482.629	!	!		968.6203
		90	0.0100	985.4	(106)	-0.001075	0.000299	972.2	13.1639	-0.001374	173.288	!	!		965.3201
		90	0.0200	998.8	(106)	-0.000700	0.000302	979.2	19.6022	-0.001002	384.247	!	!		965.3201
		90	0.0300	998.0	(106)	-0.000095	0.000305	986.2	11.7961	-0.000400	139.147	!	!		965.3201
		90	0.0400	1016.5	(106)	-0.000268	0.000308	993.3	23.2467	-0.000576	540.410	!	!		965.3201
		90	0.0500	1024.2	(106)	-0.000155	0.000311	1000.3	23.8556	-0.000466	569.088	!	!		965.3201
		90	0.0600	1031.5	(106)	-0.000072	0.000313	1007.5	24.0242	-0.000385	577.160	!	!		965.3201
		90	0.0700	1039.2	(106)	-0.000016	0.000316	1014.6	24.5541	-0.000333	602.903	!	!		965.3201
		90	0.0800	1047.0	(106)	0.000026	0.000320	1021.9	25.1472	-0.000294	632.380	!	!		965.3201
		90	0.0900	1054.1	(106)	0.000066	0.000323	1029.1	25.0053	-0.000256	625.263	!	!		965.3201
		90	0.1000	1060.8	(106)	0.000104	0.000326	1036.4	24.4304	-0.000222	596.845	!	!		965.3201
		95	0.0100	988.7	(106)	-0.001778	0.000295	968.8	19.8609	-0.002073	394.456	!	!		961.9004
		95	0.0200	997.7	(106)	-0.000826	0.000298	975.8	21.8738	-0.001123	478.463	!	!		961.9004
		95	0.0300	997.0	(106)	-0.000180	0.000301	982.9	14.1393	-0.000481	199.919	!	!		961.9004
		95	0.0400	1015.6	(106)	-0.000335	0.000303	989.9	25.6585	-0.000638	658.359	!	!		961.9004
		95	0.0500	1023.4	(106)	-0.000210	0.000306	997.1	26.3328	-0.000516	693.416	!	!		961.9004
		95	0.0600	1030.7	(106)	-0.000117	0.000309	1004.2	26.4635	-0.000426	700.315	!	!		961.9004
		95	0.0700	1038.4	(106)	-0.000055	0.000312	1011.4	26.9520	-0.000367	726.412	!	!		961.9004
		95	0.0800	1046.3	(106)	-0.000009	0.000315	1018.7	27.6001	-0.000324	761.766	!	!		961.9004
		95	0.0900	1053.6	(106)	0.000034	0.000318	1026.0	27.6094	-0.000284	762.281	!	!		961.9004
		95	0.1000	1060.2	(106)	0.000076	0.000321	1033.3	26.8819	-0.000245	722.635	!	!		961.9004
		100	0.0100	981.9	(106)	-0.001458	0.000291	965.3	16.5729	-0.001748	274.662	!	!		958.3637
		100	0.0200	996.5	(106)	-0.000953	0.000293	972.3	24.1582	-0.001247	583.621	!	!		958.3637
		100	0.0300	996.0	(106)	-0.000271	0.000296	979.4	16.5932	-0.000567	275.334	!	!		958.3637
		100	0.0400	1014.7	(106)	-0.000405	0.000299	986.5	28.1788	-0.000704	794.043	!	!		958.3637
		100	0.0500	1022.5	(106)	-0.000266	0.000302	993.7	28.8161	-0.000567	830.370	!	!		958.3637
		100	0.0600	1029.1	(106)	-0.000152	0.000304	1000.9	28.2065	-0.000456	795.607	!	!		958.3637
		100	0.0700	1037.6	(106)	-0.000095	0.000307	1008.1	29.4512	-0.000402	867.375	!	!		958.3637
		100	0.0800	1045.7	(106)	-0.000046	0.000310	1015.4	30.2517	-0.000356	915.168	!	!		958.3637
		100	0.0900	1053.1	(106)	0.000000	0.000313	1022.8	30.3096	-0.000313	918.674	!	!		958.3637
		100	0.1000	1059.7	(106)	0.000046	0.000316	1030.2	29.5266	-0.000270	871.821	!	!		958.3637

Density of aqueous solutions of **NaH2PO4**

- References (71) Mason, C. M., Culvern, J. B., Electrical conductivity of orthophosphoric acid and of sodium and potassium dihydrogen phosphates at 25 °C, *J Am Chem Soc*, **1949**, 71, 2387-2393
- (122) Sohnel, P.; Novotny, P.; Solc, Z.; Densities of aqueous solutions of 18 inorganic substances, *J Chem Eng Data*, **1984**, 29, 379-382

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		5	0.1000	1071.0	(122)	0.000337	0.000324	1072.5	-1.5020	0.000013	2.256			999.9638
		5	0.2000	1148.8	(122)	0.000352	0.000348	1149.9	-1.0665	0.000004	1.137			999.9638
		15	0.1000	1068.5	(122)	0.000351	0.000332	1070.7	-2.1841	0.000019	4.770			999.0996
		15	0.2000	1144.0	(122)	0.000367	0.000355	1147.1	-3.1128	0.000012	9.690			999.0996
0.00102		25	0.0001	997.2	(71)	0.000060	0.000315	997.1	0.0312	-0.000256	0.001			997.0449
0.006859		25	0.0008	997.9	(71)	0.000010	0.000315	997.6	0.2511	-0.000306	0.063			997.0449
0.008265		25	0.0010	998.0	(71)	0.000017	0.000315	997.7	0.2956	-0.000299	0.087			997.0449
0.0103		25	0.0012	998.4	(71)	-0.000064	0.000316	997.9	0.4685	-0.000380	0.220			997.0449
0.01372		25	0.0016	998.4	(71)	0.000177	0.000316	998.2	0.2273	-0.000138	0.052			997.0449
0.02		25	0.0024	999.0	(71)	0.000203	0.000316	998.7	0.2716	-0.000113	0.074			997.0449
0.02566		25	0.0031	999.7	(71)	0.000151	0.000316	999.2	0.5075	-0.000165	0.258			997.0449
0.02751		25	0.0033	999.8	(71)	0.000166	0.000316	999.3	0.4957	-0.000150	0.246			997.0449
0.03878		25	0.0046	1000.7	(71)	0.000215	0.000316	1000.2	0.4715	-0.000101	0.222			997.0449
0.05152		25	0.0062	1001.9	(71)	0.000215	0.000317	1001.3	0.6286	-0.000102	0.395			997.0449
0.06864		25	0.0082	1003.5	(71)	0.000217	0.000317	1002.7	0.8294	-0.000100	0.688			997.0449
0.07778		25	0.0093	1003.8	(71)	0.000277	0.000318	1003.4	0.3799	-0.000041	0.144			997.0449
0.09274		25	0.0111	1006.0	(71)	0.000196	0.000318	1004.6	1.3660	-0.000122	1.866			997.0449
0.103		25	0.0123	1006.5	(71)	0.000236	0.000318	1005.5	1.0272	-0.000083	1.055			997.0449
0.1374		25	0.0163	1009.3	(71)	0.000257	0.000319	1008.3	1.0287	-0.000062	1.058			997.0449
0.1935		25	0.0229	1014.0	(71)	0.000270	0.000321	1012.8	1.1842	-0.000050	1.402			997.0449
0.2754		25	0.0323	1021.5	(71)	0.000261	0.000323	1019.4	2.1044	-0.000062	4.429			997.0449
0.3091		25	0.0362	1024.7	(71)	0.000255	0.000324	1022.1	2.6160	-0.000069	6.844			997.0449
0.4128		25	0.0479	1033.3	(71)	0.000269	0.000327	1030.3	2.9650	-0.000058	8.791			997.0449
0.5152		25	0.0593	1042.3	(71)	0.000269	0.000330	1038.4	3.9100	-0.000061	15.288			997.0449
0.6183		25	0.0706	1050.9	(71)	0.000275	0.000332	1046.4	4.4571	-0.000057	19.866			997.0449
0.7783		25	0.0877	1064.2	(71)	0.000282	0.000336	1058.8	5.3985	-0.000055	29.143			997.0449
0.9274		25	0.1033	1076.7	(71)	0.000285	0.000340	1070.2	6.5405	-0.000055	42.779			997.0449
		40	0.1000	1058.6	(122)	0.000376	0.000349	1061.6	-3.0061	0.000027	9.036			992.2158
		40	0.2000	1132.9	(122)	0.000382	0.000370	1136.0	-3.1055	0.000012	9.644			992.2158
		40	0.5000	1396.2	(122)	0.000425	0.000426	1395.1	1.1013	-0.000001	1.213			992.2158
		60	0.1000	1048.6	(122)	0.000383	0.000360	1051.1	-2.4715	0.000022	6.108			983.1989
		60	0.2000	1122.3	(122)	0.000387	0.000379	1124.2	-1.8763	0.000007	3.521			983.1989
		60	0.5000	1383.2	(122)	0.000429	0.000430	1382.0	1.1837	-0.000001	1.401			983.1989
		60	0.6000	1482.8	(122)	0.000446	0.000445	1483.9	-1.0593	0.000001	1.122			983.1989
		80	0.1000	1035.8	(122)	0.000393	0.000369	1038.4	-2.5677	0.000024	6.593			971.7978

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		80	0.2000	1108.7	(122)	0.000394	0.000387	1110.5	-1.7509	0.000007	3.066			971.7978
		80	0.5000	1372.2	(122)	0.000428	0.000433	1368.3	3.8770	-0.000004	15.031			971.7978
		80	0.6000	1469.9	(122)	0.000448	0.000446	1471.9	-2.0205	0.000002	4.082			971.7978
Average Res									0.4709	-0.000072	213.641	Sum chi sqr		
Std dev Res									2.3551	0.000099				
Avg - 4std									-8.9494	-0.000469				
Avg + 4std									9.8912	0.000325				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	208.7729
c1	641.0473
c2	0.788927
c3	0.004552
c4	1198.407
Min T	5
Max T	80
Min w	0.0001
Max w	0.6000
Avg dens res	0.4709
Std dens res	2.3551
Avg app vol res *10 ³	-0.072159
Std app vol res *10 ³	0.099282
No of points in corr	38
No of inconsistent pair	3

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Data at high concentration for Mason seems inconsistent with Sohnel

1.367	25	0.1474	1112.9	(71)	0.000294	0.000350	1102.9	10.0254	-0.000055	100.508	!		997.0449
2.061	25	0.2118	1167.6	(71)	0.000311	0.000364	1152.5	15.0758	-0.000053	227.279	!		997.0449
3.885	25	0.3571	1305.3	(71)	0.000340	0.000394	1273.0	32.2962	-0.000054	1043.047	!		997.0449

Density of aqueous solutions of **Na2HPO4**References (122) Sohnel, P.; Novotny, P.; Solc, Z.; Densities of aqueous solutions of 18 inorganic substances, *J Chem Eng Data*, **1984**, 29, 379-382

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		40	0.0500	1043.1	(122)	0.000025	0.000022	1043.3	-0.1650	0.000003	0.027			992.2158
		40	0.1000	1097.6	(122)	0.000040	0.000045	1097.0	0.5517	-0.000005	0.304			992.2158
		40	0.2000	1215.4	(122)	0.000082	0.000085	1214.8	0.6312	-0.000002	0.398			992.2158
		40	0.3000	1350.4	(122)	0.000117	0.000118	1349.9	0.4517	-0.000001	0.204			992.2158
		60	0.0500	1033.7	(122)	0.000023	0.000016	1034.1	-0.3745	0.000007	0.140			983.1989
		60	0.1000	1087.1	(122)	0.000045	0.000041	1087.6	-0.5188	0.000004	0.269			983.1989
		60	0.2000	1203.6	(122)	0.000086	0.000082	1204.6	-1.0246	0.000004	1.050			983.1989
		60	0.3000	1337.6	(122)	0.000119	0.000117	1338.7	-1.0807	0.000002	1.168			983.1989
		80	0.0500	1022.5	(122)	0.000009	0.000011	1022.4	0.1133	-0.000002	0.013			971.7978
		80	0.1000	1076.0	(122)	0.000032	0.000036	1075.6	0.4167	-0.000004	0.174			971.7978
		80	0.2000	1191.9	(122)	0.000079	0.000080	1191.7	0.2270	-0.000001	0.052			971.7978
		80	0.3000	1325.1	(122)	0.000114	0.000116	1324.4	0.6672	-0.000001	0.445			971.7978
Average Res									-0.0087	0.000000	4.245	Sum chi sqr		
Std dev Res									0.6211	0.000004				
Avg - 4std									-2.4932	-0.000014				
Avg + 4std									2.4757	0.000015				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	1096.726
c1	937.567
c2	0.014236
c3	-5.59E-04
c4	-860.197
Min T	40
Max T	80
Min w	0.0500
Max w	0.3000
Avg dens res	-0.008746
Std dens res	0.621119
Avg app vol res *10 ³	0.000383
Std app vol res *10 ³	0.003548
No of points in corr	12
No of inconsistent pair	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **NaHSO3**

References (16) Choudary, N. V.; Jasra, R. V. Densities of Aqueous Solutions of Sodium Bisulfite and Sodium 2-Methalallyl Sulfate. *J. Chem. Eng. Data* 1994, 39, 181-183.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
0.0099		10	0.0010	1000.8	(16)	-0.000070	0.000211	1000.5	0.2896	-0.000281	0.084		!	999.6996
0.0483		10	0.0050	1004.0	(16)	0.000147	0.000214	1003.6	0.3337	-0.000066	0.111			999.6996
0.0985		10	0.0101	1008.2	(16)	0.000168	0.000217	1007.7	0.5091	-0.000049	0.259			999.6996
0.1179		10	0.0121	1009.3	(16)	0.000212	0.000218	1009.3	0.0768	-0.000006	0.006			999.6996
0.4536		10	0.0451	1034.3	(16)	0.000258	0.000237	1035.3	-1.0188	0.000021	1.038			999.6996
0.8981		10	0.0855	1068.2	(16)	0.000250	0.000255	1067.7	0.5061	-0.000005	0.256			999.6996
1.3988		10	0.1271	1105.3	(16)	0.000248	0.000268	1102.2	3.1656	-0.000020	10.021			999.6996
1.9151		10	0.1662	1136.7	(16)	0.000275	0.000279	1135.9	0.7883	-0.000004	0.621			999.6996
2.1883		10	0.1855	1153.0	(16)	0.000283	0.000283	1153.1	-0.1337	0.000001	0.018			999.6996
2.4717		10	0.2046	1168.6	(16)	0.000294	0.000287	1170.6	-1.9397	0.000007	3.762			999.6996
2.5478		10	0.2096	1173.8	(16)	0.000292	0.000288	1175.2	-1.3583	0.000005	1.845			999.6996
2.6895		10	0.2187	1182.1	(16)	0.000294	0.000289	1183.7	-1.6144	0.000005	2.606			999.6996
2.7636		10	0.2233	1186.9	(16)	0.000294	0.000290	1188.1	-1.2034	0.000004	1.448			999.6996
2.8919		10	0.2313	1195.4	(16)	0.000292	0.000291	1195.7	-0.2888	0.000001	0.083			999.6996
2.9155		10	0.2328	1196.6	(16)	0.000293	0.000292	1197.1	-0.5365	0.000002	0.288			999.6996
3.0844		10	0.2430	1209.9	(16)	0.000285	0.000293	1207.0	2.9212	-0.000008	8.534			999.6996
0.0099		15	0.0010	1000.1	(16)	0.000000	0.000207	999.9	0.2134	-0.000207	0.046			999.0996
0.0483		15	0.0050	1003.3	(16)	0.000164	0.000210	1003.1	0.2356	-0.000047	0.056			999.0996
0.0985		15	0.0101	1007.3	(16)	0.000196	0.000214	1007.1	0.1859	-0.000018	0.035			999.0996
0.1179		15	0.0121	1008.6	(16)	0.000227	0.000216	1008.7	-0.1351	0.000011	0.018			999.0996
0.4536		15	0.0451	1033.2	(16)	0.000267	0.000237	1034.7	-1.4529	0.000030	2.111			999.0996
0.8981		15	0.0855	1066.5	(16)	0.000261	0.000257	1066.9	-0.4140	0.000004	0.171			999.0996
1.3988		15	0.1271	1103.0	(16)	0.000259	0.000272	1100.9	2.0867	-0.000014	4.354			999.0996
1.9151		15	0.1662	1134.9	(16)	0.000280	0.000284	1134.1	0.7485	-0.000003	0.560			999.0996
2.1883		15	0.1855	1150.4	(16)	0.000291	0.000289	1151.0	-0.6498	0.000003	0.422			999.0996
2.4717		15	0.2046	1166.7	(16)	0.000298	0.000293	1168.1	-1.4142	0.000005	2.000			999.0996
2.5478		15	0.2096	1171.5	(16)	0.000298	0.000294	1172.7	-1.1540	0.000004	1.332			999.0996
2.6895		15	0.2187	1179.7	(16)	0.000300	0.000296	1181.0	-1.3119	0.000004	1.721			999.0996
2.7636		15	0.2233	1184.5	(16)	0.000300	0.000297	1185.3	-0.8639	0.000003	0.746			999.0996
2.8919		15	0.2313	1192.3	(16)	0.000300	0.000298	1192.8	-0.4376	0.000001	0.192			999.0996
2.9155		15	0.2328	1194.0	(16)	0.000299	0.000299	1194.1	-0.1527	0.000000	0.023			999.0996
3.0844		15	0.2430	1205.8	(16)	0.000295	0.000301	1203.8	2.0308	-0.000006	4.124			999.0996
0.0099		20	0.0010	999.2	(16)	0.000076	0.000203	999.0	0.1300	-0.000127	0.017			998.2041
0.0483		20	0.0050	1002.1	(16)	0.000214	0.000207	1002.2	-0.0388	0.000008	0.002			998.2041
0.0985		20	0.0101	1006.3	(16)	0.000210	0.000211	1006.3	0.0058	-0.000001	0.000			998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
0.1179		20	0.0121	1007.5	(16)	0.000240	0.000213	1007.8	-0.3329	0.000027	0.111			998.2041
0.4536		20	0.0451	1032.2	(16)	0.000271	0.000237	1033.8	-1.6280	0.000034	2.650			998.2041
0.8981		20	0.0855	1065.0	(16)	0.000267	0.000259	1065.8	-0.7739	0.000008	0.599			998.2041
1.3988		20	0.1271	1099.9	(16)	0.000273	0.000276	1099.4	0.5125	-0.000003	0.263			998.2041
1.9151		20	0.1662	1132.1	(16)	0.000289	0.000289	1132.0	0.0494	0.000000	0.002			998.2041
2.1883		20	0.1855	1147.7	(16)	0.000298	0.000294	1148.6	-0.9128	0.000004	0.833			998.2041
2.4717		20	0.2046	1164.5	(16)	0.000303	0.000299	1165.4	-0.9283	0.000003	0.862			998.2041
2.5478		20	0.2096	1168.7	(16)	0.000304	0.000300	1169.8	-1.1434	0.000004	1.307			998.2041
2.6895		20	0.2187	1177.6	(16)	0.000304	0.000303	1178.0	-0.4142	0.000001	0.172			998.2041
2.7636		20	0.2233	1182.1	(16)	0.000304	0.000304	1182.2	-0.1542	0.000000	0.024			998.2041
2.8919		20	0.2313	1190.2	(16)	0.000303	0.000305	1189.5	0.7422	-0.000002	0.551			998.2041
2.9155		20	0.2328	1191.8	(16)	0.000303	0.000306	1190.8	0.9453	-0.000003	0.894			998.2041
3.0844		20	0.2430	1203.6	(16)	0.000298	0.000308	1200.2	3.3233	-0.000009	11.044			998.2041
0.0099		25	0.0010	997.8	(16)	0.000248	0.000198	997.9	-0.0513	0.000050	0.003			997.0449
0.0483		25	0.0050	1000.9	(16)	0.000237	0.000202	1001.0	-0.1766	0.000035	0.031			997.0449
0.0985		25	0.0101	1004.7	(16)	0.000254	0.000207	1005.1	-0.4848	0.000047	0.235			997.0449
0.1179		25	0.0121	1006.1	(16)	0.000259	0.000209	1006.7	-0.6232	0.000051	0.388			997.0449
0.4536		25	0.0451	1031.1	(16)	0.000268	0.000236	1032.7	-1.5745	0.000033	2.479			997.0449
0.8981		25	0.0855	1062.6	(16)	0.000279	0.000260	1064.4	-1.7648	0.000018	3.115			997.0449
1.3988		25	0.1271	1096.2	(16)	0.000289	0.000280	1097.6	-1.3731	0.000009	1.885			997.0449
1.9151		25	0.1662	1129.8	(16)	0.000294	0.000294	1129.7	0.0901	0.000000	0.008			997.0449
2.1883		25	0.1855	1145.6	(16)	0.000302	0.000300	1146.0	-0.3562	0.000001	0.127			997.0449
2.4717		25	0.2046	1163.1	(16)	0.000303	0.000306	1162.4	0.7136	-0.000003	0.509			997.0449
2.5478		25	0.2096	1167.5	(16)	0.000304	0.000307	1166.7	0.7512	-0.000003	0.564			997.0449
2.6895		25	0.2187	1175.8	(16)	0.000306	0.000309	1174.7	1.0819	-0.000004	1.171			997.0449
2.7636		25	0.2233	1179.9	(16)	0.000307	0.000310	1178.8	1.0757	-0.000003	1.157			997.0449
2.8919		25	0.2313	1187.1	(16)	0.000309	0.000312	1185.9	1.1655	-0.000004	1.358			997.0449
2.9155		25	0.2328	1188.3	(16)	0.000309	0.000313	1187.2	1.1104	-0.000003	1.233			997.0449
3.0844		25	0.2430	1197.8	(16)	0.000311	0.000315	1196.4	1.3881	-0.000004	1.927			997.0449
0.0099		30	0.0010	996.8	(16)	-0.000111	0.000192	996.5	0.3091	-0.000302	0.096		!	995.6473
0.0985		30	0.0101	1003.6	(16)	0.000218	0.000202	1003.8	-0.1677	0.000016	0.028			995.6473
0.1179		30	0.0121	1004.9	(16)	0.000241	0.000204	1005.4	-0.4550	0.000037	0.207			995.6473
0.4536		30	0.0451	1031.5	(16)	0.000230	0.000234	1031.3	0.1735	-0.000004	0.030			995.6473
0.8981		30	0.0855	1063.7	(16)	0.000252	0.000261	1062.8	0.8982	-0.000009	0.807			995.6473
1.9151		30	0.1662	1127.9	(16)	0.000296	0.000299	1127.2	0.7309	-0.000003	0.534			995.6473
2.1883		30	0.1855	1143.6	(16)	0.000304	0.000306	1143.1	0.4635	-0.000002	0.215			995.6473
2.4717		30	0.2046	1159.1	(16)	0.000312	0.000312	1159.2	-0.0935	0.000000	0.009			995.6473
2.5478		30	0.2096	1163.1	(16)	0.000314	0.000313	1163.4	-0.3026	0.000001	0.092			995.6473
2.6895		30	0.2187	1171.1	(16)	0.000316	0.000316	1171.2	-0.0962	0.000000	0.009			995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
2.7636		30	0.2233	1175.3	(16)	0.000317	0.000317	1175.2	0.0721	0.000000	0.005			995.6473
2.8919		30	0.2313	1181.5	(16)	0.000321	0.000319	1182.2	-0.6867	0.000002	0.472			995.6473
2.9155		30	0.2328	1182.5	(16)	0.000322	0.000320	1183.4	-0.8715	0.000003	0.760			995.6473
3.0844		30	0.2430	1191.2	(16)	0.000326	0.000322	1192.4	-1.1312	0.000003	1.280			995.6473
0.0099		40	0.0010	993.3	(16)	-0.000068	0.000177	993.1	0.2485	-0.000245	0.062			992.2158
0.0483		40	0.0050	996.4	(16)	0.000161	0.000182	996.3	0.1051	-0.000021	0.011			992.2158
0.1179		40	0.0121	1003.6	(16)	0.000068	0.000192	1002.1	1.5135	-0.000124	2.291			992.2158
0.4536		40	0.0451	1028.1	(16)	0.000228	0.000228	1028.1	0.0220	0.000000	0.000			992.2158
0.8981		40	0.0855	1059.7	(16)	0.000256	0.000262	1059.2	0.5586	-0.000006	0.312			992.2158
1.9151		40	0.1662	1123.9	(16)	0.000297	0.000308	1121.6	2.3548	-0.000011	5.545			992.2158
2.4717		40	0.2046	1153.8	(16)	0.000318	0.000324	1152.2	1.6395	-0.000006	2.688			992.2158
2.5478		40	0.2096	1157.4	(16)	0.000321	0.000326	1156.2	1.2284	-0.000004	1.509			992.2158
2.6895		40	0.2187	1164.7	(16)	0.000325	0.000329	1163.6	1.0677	-0.000004	1.140			992.2158
2.7636		40	0.2233	1167.3	(16)	0.000331	0.000331	1167.4	-0.1594	0.000001	0.025			992.2158
2.8919		40	0.2313	1172.3	(16)	0.000339	0.000333	1174.0	-1.7136	0.000005	2.936			992.2158
2.9155		40	0.2328	1173.6	(16)	0.000339	0.000334	1175.2	-1.5913	0.000005	2.532			992.2158
3.0844		40	0.2430	1180.4	(16)	0.000347	0.000337	1183.7	-3.2559	0.000010	10.601			992.2158
Average Res									-0.0085	-0.000012	118.524	Sum chi sqr		
Std dev Res									1.1480	0.000059				
Avg - 4std									-4.6003	-0.000250				
Avg + 4std									4.5833	0.000225				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	6.14E-06
c1	1.3E-06
c2	0.136346
c3	-0.001462
c4	-4472.457
Min T	10
Max T	40
Min w	0.0010
Max w	0.2430
Avg dens res	-0.0085
Std dens res	1.1480
Avg app vol res *10^3	-0.012283
Std app vol res *10^3	0.059418
No of points in corr	91
No of inconsistent poin	1

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
0.0483		30	0.0050	998.1	(16)	#DIV/0!	0.000196	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Density of aqueous solutions of **Nal**

- References (62) Lengyel, S.; Tamás, J.; Giber, J.; Holderith, J. Study of Viscosity of Aqueous Alkali Halide Solutions. *Acta Chim. Acad. Sci. Hung.* **1964**, *40*, 125-143.
- (65) MacInnes, D. A.; Dayhoff, M. O. The Partial Molal Volumes of Potassium Chloride, Potassium and Sodium Iodides and Iodine in Aqueous Solution at 25°C. *J. Am. Chem. Soc.* **1952**, *74*, 1017-1020.
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, *61*, 1492-1498.
- (112) Saluja, P. P. S., LeBlanc, J. C., Hume, H. B., Apparent molar heat capacities and volumes of aqueous solutions of several 1:1 electrolytes at elevated temperatures, *Can. J. Chem.*, **1986**, *64*, 926-931
- (118) Scott, A. F.; Durham, E. J.; Studies in the solubilities of the soluble electrolytes, *J. Phys. Chem.*, **1930**, *34*, 1424-1438
- (119) Scott, A. F.; Obenaus, V. M.; Wilson, R. W. The Compressibility Coefficients of Solutions of Eight Alkali Halides. *J. Phys. Chem.* **1934**, *38*, 931-940.
- (130) Vaslow, F. The Apparent Molal Volumes of the Lithium and Sodium Halides. Critical Type Transitions in Aqueous Solution. *J. Phys. Chem.* **1969**, *73*, 3745-3750.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
2.507		10	0.2732	1263.80	(62)	0.000235	0.000239	1261.9	1.8597	-0.000004	3.459				999.6996
2.968		10	0.3079	1306.70	(62)	0.000237	0.000241	1304.8	1.8855	-0.000004	3.555				999.6996
5.107		10	0.4336	1487.20	(62)	0.000244	0.000245	1486.0	1.1671	-0.000001	1.362				999.6996
8.095		10	0.5482	1698.60	(62)	0.000250	0.000249	1699.0	-0.4331	0.000000	0.188				999.6996
8.473		10	0.5595	1722.00	(62)	0.000250	0.000250	1723.2	-1.2138	0.000001	1.473				999.6996
11.286		10	0.6285	1889.90	(62)	0.000251	0.000252	1887.1	2.8350	-0.000001	8.037				999.6996
2.507		20	0.2732	1258.20	(62)	0.000244	0.000245	1257.7	0.5141	-0.000001	0.264				998.2041
2.968		20	0.3079	1300.50	(62)	0.000246	0.000246	1300.1	0.4067	-0.000001	0.165				998.2041
5.107		20	0.4336	1479.50	(62)	0.000250	0.000250	1479.3	0.2270	0.000000	0.052				998.2041
8.095		20	0.5482	1688.80	(62)	0.000255	0.000254	1689.7	-0.9244	0.000001	0.855				998.2041
8.473		20	0.5595	1712.20	(62)	0.000255	0.000254	1713.6	-1.4046	0.000001	1.973				998.2041
11.286		20	0.6285	1875.80	(62)	0.000256	0.000256	1875.4	0.4429	0.000000	0.196				998.2041
2.507		25	0.2732	1255.10	(62)	0.000248	0.000248	1255.2	-0.0698	0.000000	0.005				997.0449
2.968		25	0.3079	1297.30	(62)	0.000249	0.000249	1297.4	-0.0519	0.000000	0.003				997.0449
5.107		25	0.4336	1474.90	(62)	0.000254	0.000253	1475.6	-0.6603	0.000001	0.436				997.0449
8.095		25	0.5482	1684.20	(62)	0.000257	0.000256	1684.8	-0.6226	0.000000	0.388				997.0449
8.473		25	0.5595	1707.50	(62)	0.000257	0.000256	1708.6	-1.0642	0.000001	1.132				997.0449
11.286		25	0.6285	1871.00	(62)	0.000258	0.000258	1869.4	1.6434	-0.000001	2.701				997.0449
1.1472		30	0.1467	1119.50	(62)	0.000247	0.000247	1119.6	-0.1177	0.000001	0.014				995.6473
1.1472		30	0.1467	1119.50	(62)	0.000247	0.000247	1119.6	-0.1177	0.000001	0.014				995.6473
2.507		30	0.2732	1252.30	(62)	0.000251	0.000251	1252.4	-0.1359	0.000000	0.018				995.6473
2.968		30	0.3079	1294.20	(62)	0.000252	0.000252	1294.4	-0.1988	0.000000	0.040				995.6473
5.107		30	0.4336	1470.90	(62)	0.000256	0.000255	1471.7	-0.7698	0.000001	0.593				995.6473
8.095		30	0.5482	1679.70	(62)	0.000258	0.000258	1679.8	-0.0997	0.000000	0.010				995.6473
8.473		30	0.5595	1702.70	(62)	0.000259	0.000259	1703.4	-0.7102	0.000000	0.504				995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
11.286		30	0.6285	1866.10	(62)	0.000259	0.000260	1863.3	2.7997	-0.000001	7.838				995.6473
1.1472		40	0.1467	1114.80	(62)	0.000253	0.000252	1114.9	-0.1204	0.000001	0.015				992.2158
2.507		40	0.2732	1246.10	(62)	0.000256	0.000255	1246.4	-0.3051	0.000001	0.093				992.2158
2.968		40	0.3079	1287.40	(62)	0.000257	0.000256	1287.9	-0.5486	0.000001	0.301				992.2158
5.107		40	0.4336	1463.00	(62)	0.000260	0.000259	1463.4	-0.4482	0.000000	0.201				992.2158
8.095		40	0.5482	1669.80	(62)	0.000262	0.000262	1669.5	0.3191	0.000000	0.102				992.2158
8.473		40	0.5595	1692.70	(62)	0.000262	0.000262	1692.9	-0.1516	0.000000	0.023				992.2158
		25	0.0066	1002.09	(65)	0.000233	0.000238	1002.1	0.0376	-0.000006	0.001				997.0449
		25	0.0103	1004.97	(65)	0.000234	0.000239	1004.9	0.0443	-0.000004	0.002				997.0449
		25	0.0131	1007.13	(65)	0.000235	0.000239	1007.1	0.0437	-0.000003	0.002				997.0449
		25	0.0183	1011.21	(65)	0.000236	0.000239	1011.2	0.0558	-0.000003	0.003				997.0449
		25	0.0221	1014.20	(65)	0.000237	0.000239	1014.1	0.0480	-0.000002	0.002				997.0449
		25	0.0288	1019.44	(65)	0.000237	0.000239	1019.4	0.0568	-0.000002	0.003				997.0449
		25	0.0295	1020.06	(65)	0.000237	0.000239	1020.0	0.0651	-0.000002	0.004				997.0449
0.100677		25	0.0149	1008.52	(73)	0.000235	0.000239	1008.5	0.0503	-0.000003	0.003				997.0449
0.200029		25	0.0291	1019.70	(73)	0.000238	0.000239	1019.6	0.0523	-0.000002	0.003				997.0449
0.300304		25	0.0431	1030.88	(73)	0.000239	0.000240	1030.8	0.0461	-0.000001	0.002				997.0449
0.399862		25	0.0566	1041.89	(73)	0.000240	0.000240	1041.8	0.0436	-0.000001	0.002				997.0449
0.499648		25	0.0697	1052.82	(73)	0.000241	0.000241	1052.8	0.0282	0.000000	0.001				997.0449
0.599737		25	0.0825	1063.70	(73)	0.000241	0.000241	1063.7	0.0211	0.000000	0.000				997.0449
0.698274		25	0.0948	1074.31	(73)	0.000242	0.000242	1074.3	0.0012	0.000000	0.000				997.0449
0.799093		25	0.1070	1085.08	(73)	0.000242	0.000242	1085.1	-0.0155	0.000000	0.000				997.0449
0.899269		25	0.1188	1095.69	(73)	0.000243	0.000243	1095.7	-0.0349	0.000000	0.001				997.0449
0.99457		25	0.1298	1105.70	(73)	0.000243	0.000243	1105.8	-0.0564	0.000000	0.003				997.0449
0.04911		48.93	0.0073	993.97	(112)	0.000252	0.000253	994.0	0.0078	-0.000001	0.000			37.75	988.5163
0.09791		48.93	0.0145	999.39	(112)	0.000251	0.000253	999.4	0.0309	-0.000002	0.001			37.62	988.5163
0.20015		48.93	0.0291	1010.64	(112)	0.000251	0.000253	1010.6	0.0594	-0.000002	0.004			37.7	988.5163
0.49648		48.93	0.0693	1042.59	(112)	0.000254	0.000255	1042.6	0.0185	0.000000	0.000			38.12	988.5163
0.99059		48.93	0.1293	1094.13	(112)	0.000256	0.000256	1094.2	-0.0675	0.000000	0.005			38.45	988.5163
2.01		48.93	0.2316	1194.34	(112)	0.000259	0.000258	1194.4	-0.0814	0.000000	0.007			38.79	988.5163
0.09847		74.08	0.0145	986.11	(112)	0.000259	0.000265	986.0	0.0821	-0.000006	0.007			38.88	975.3963
0.20365		74.08	0.0296	997.42	(112)	0.000261	0.000265	997.3	0.1288	-0.000004	0.017			39.13	975.3963
0.51703		74.08	0.0719	1030.61	(112)	0.000262	0.000266	1030.3	0.3278	-0.000004	0.107			39.24	975.3963
0.05266		74.98	0.0078	980.61	(112)	0.000257	0.000265	980.6	0.0603	-0.000008	0.004			38.59	974.8609
0.09723		74.98	0.0144	985.45	(112)	0.000259	0.000266	985.4	0.0964	-0.000007	0.009			38.77	974.8609
0.20453		74.98	0.0298	997.02	(112)	0.000260	0.000266	996.8	0.1817	-0.000006	0.033			38.92	974.8609
1.02118		74.98	0.1328	1081.35	(112)	0.000265	0.000267	1081.0	0.3627	-0.000002	0.132			39.72	974.8609
0.0485		99.96	0.0072	963.67	(112)	0.000251	0.000275	963.5	0.1555	-0.000023	0.024		!	37.69	958.3924
0.1051		99.96	0.0155	969.76	(112)	0.000255	0.000275	969.5	0.2825	-0.000019	0.080		!	38.27	958.3924
0.2136		99.96	0.0310	981.26	(112)	0.000260	0.000275	980.8	0.4498	-0.000015	0.202			38.93	958.3924

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.5267		99.96	0.0732	1013.86	(112)	0.000263	0.000275	1013.0	0.8695	-0.000012	0.756			39.49	958.3924
1.003		99.96	0.1307	1061.48	(112)	0.000268	0.000275	1060.4	1.0426	-0.000007	1.087			40.21	958.3924
10.67		0	0.6153	1861.20	(118)	0.000248	0.000247	1863.9	-2.7275	0.000001	7.439				999.8395
13.15		35	0.6635	1951.20	(118)	0.000262	0.000263	1949.4	1.8090	-0.000001	3.272				994.0319
15.12		50.02	0.6939	2016.90	(118)	0.000268	0.000268	2016.5	0.4422	0.000000	0.196				988.0272
17.98		63.13	0.7294	2106.80	(118)	0.000273	0.000272	2109.2	-2.4498	0.000001	6.001				981.5606
19.81		75.4	0.7481	2154.40	(118)	0.000275	0.000275	2155.3	-0.9292	0.000000	0.863				974.6096
20.05		92.23	0.7504	2142.50	(118)	0.000277	0.000277	2141.1	1.3828	0.000000	1.912				963.8096
1.077		35	0.1390	1109.98	(119)	0.000250	0.000249	1110.1	-0.1687	0.000001	0.028				994.0319
1.96		35	0.2271	1197.58	(119)	0.000253	0.000252	1198.0	-0.4529	0.000001	0.205				994.0319
4.525		35	0.4042	1421.73	(119)	0.000257	0.000257	1422.3	-0.5294	0.000001	0.280				994.0319
10.348		35	0.6081	1806.44	(119)	0.000262	0.000262	1807.1	-0.6189	0.000000	0.383				994.0319
0.05		25	0.0074	1002.75	(130)	0.000236	0.000239	1002.7	0.0204	-0.000003	0.000			35.35	997.0449
0.1		25	0.0148	1008.42	(130)	0.000237	0.000239	1008.4	0.0251	-0.000002	0.001			35.55	997.0449
0.2		25	0.0291	1019.69	(130)	0.000238	0.000239	1019.6	0.0409	-0.000001	0.002			35.68	997.0449
0.3		25	0.0430	1030.84	(130)	0.000239	0.000240	1030.8	0.0431	-0.000001	0.002			35.82	997.0449
0.4		25	0.0566	1041.91	(130)	0.000240	0.000240	1041.9	0.0441	-0.000001	0.002			35.93	997.0449
0.5		25	0.0697	1052.87	(130)	0.000240	0.000241	1052.8	0.0417	-0.000001	0.002			36.03	997.0449
0.6		25	0.0825	1063.75	(130)	0.000241	0.000241	1063.7	0.0383	0.000000	0.001			36.12	997.0449
0.7		25	0.0950	1074.53	(130)	0.000241	0.000242	1074.5	0.0364	0.000000	0.001			36.2	997.0449
0.8		25	0.1071	1085.22	(130)	0.000242	0.000242	1085.2	0.0300	0.000000	0.001			36.28	997.0449
0.9		25	0.1189	1095.83	(130)	0.000242	0.000243	1095.8	0.0279	0.000000	0.001			36.35	997.0449
1		25	0.1304	1106.35	(130)	0.000243	0.000243	1106.3	0.0221	0.000000	0.000			36.42	997.0449
1.2		25	0.1525	1127.14	(130)	0.000244	0.000244	1127.1	0.0230	0.000000	0.001			36.54	997.0449
1.4		25	0.1735	1147.60	(130)	0.000244	0.000245	1147.6	0.0266	0.000000	0.001			36.65	997.0449
1.6		25	0.1935	1167.75	(130)	0.000245	0.000245	1167.7	0.0361	0.000000	0.001			36.75	997.0449
1.8		25	0.2125	1187.57	(130)	0.000246	0.000246	1187.5	0.0350	0.000000	0.001			36.85	997.0449
Average Res									0.0508	-0.000002	59.114	Sum chi sqr			
Std dev Res									0.8044	0.000004					
Avg - 4std									-3.1666	-0.000018					
Avg + 4std									3.2682	0.000014					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	626.1478
c1	1858.178
c2	1.738657
c3	0.0105
c4	1203.275
Min T	0
Max T	99.96

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
Min w		0.0066													
Max w		0.7504													
Avg dens res		0.0508													
Std dens res		0.8044													
Avg app vol res *10 ³	-0.001712														
Std app vol res *10 ³	0.004														
No of points in corr		92													
No of inconsistent pair		3													
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)															
11.286		40	0.6285	1856.50	(62)	0.000261	0.000264	1851.1	5.3956	-0.000002	29.113	!			992.2158
19		67.93	0.7402	2155.30	(118)	0.000268	0.000273	2138.4	16.9084	-0.000005	285.894	!			978.9394
20.03		70.87	0.7502	2157.70	(118)	0.000277	0.000274	2168.7	-11.0345	0.000003	121.760	!			977.271

Density of aqueous solutions of **Na2MoO4**

References (78) Olofsson, I. V.; Spitzer, J. J.; Hepler, L. G.; Apparent molar heat capacities and volumes of aqueous electrolytes at 25 °C: Na₂SO₄, K₂SO₄, Na₂S₂O₃, Na₂S₂O₈, K₂S₂O₈, K₂CrO₄, Na₂MoO₄, and Na₂WO₄, *Can. J. Chem.*, **1978**, *56*, 1871-1873

(122) Sohnel, P.; Novotny, P.; Solc, Z.; Densities of aqueous solutions of 18 inorganic substances, *J Chem Eng Data*, **1984**, *29*, 379-382

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
0.02986		25	0.0061	1002.3	(78)	0.000145	0.000163	1002.2	0.1144	-0.000019	0.013			29.8	997.0449
0.04337		25	0.0089	1004.7	(78)	0.000145	0.000164	1004.5	0.1701	-0.000019	0.029			29.78	997.0449
0.04812		25	0.0098	1005.5	(78)	0.000145	0.000164	1005.3	0.1817	-0.000018	0.033			29.95	997.0449
0.06478		25	0.0132	1008.4	(78)	0.000148	0.000164	1008.1	0.2100	-0.000016	0.044			30.57	997.0449
0.07729		25	0.0157	1010.5	(78)	0.000149	0.000164	1010.3	0.2516	-0.000016	0.063			30.62	997.0449
0.09278		25	0.0187	1013.2	(78)	0.000151	0.000165	1012.9	0.2683	-0.000014	0.072			31.06	997.0449
0.11		25	0.0221	1016.2	(78)	0.000151	0.000165	1015.8	0.3154	-0.000014	0.099			31.17	997.0449
0.12477		25	0.0250	1018.7	(78)	0.000152	0.000165	1018.3	0.3431	-0.000013	0.118			31.36	997.0449
0.14357		25	0.0287	1021.9	(78)	0.000153	0.000166	1021.5	0.3894	-0.000013	0.152			31.49	997.0449
0.16223		25	0.0323	1025.1	(78)	0.000155	0.000166	1024.7	0.3957	-0.000012	0.157			31.85	997.0449
		25	0.0500	1040.6	(122)	0.000163	0.000168	1040.3	0.2706	-0.000005	0.073				997.0449
		25	0.1000	1087.1	(122)	0.000172	0.000174	1086.8	0.2607	-0.000002	0.068				997.0449
		25	0.2000	1191.3	(122)	0.000185	0.000187	1190.8	0.5155	-0.000002	0.266				997.0449
		25	0.3000	1311.5	(122)	0.000201	0.000201	1311.7	-0.1632	0.000000	0.027				997.0449
		25	0.3500	1379.3	(122)	0.000209	0.000209	1379.4	-0.1426	0.000000	0.020				997.0449
		40	0.0500	1035.4	(122)	0.000167	0.000169	1035.3	0.1130	-0.000002	0.013				992.2158
		40	0.1000	1080.9	(122)	0.000181	0.000175	1081.5	-0.6454	0.000006	0.416				992.2158
		40	0.2000	1184.6	(122)	0.000189	0.000189	1184.8	-0.2315	0.000001	0.054				992.2158
		40	0.3000	1304.7	(122)	0.000203	0.000203	1304.7	-0.0457	0.000000	0.002				992.2158
		40	0.3500	1372.0	(122)	0.000211	0.000211	1371.9	0.1246	0.000000	0.016				992.2158
		60	0.0500	1026.3	(122)	0.000163	0.000168	1026.0	0.2920	-0.000006	0.085				983.1989
		60	0.1000	1071.9	(122)	0.000175	0.000175	1072.0	-0.0743	0.000001	0.006				983.1989
		60	0.2000	1174.4	(122)	0.000189	0.000189	1174.6	-0.1563	0.000001	0.024				983.1989
		60	0.3000	1292.9	(122)	0.000205	0.000204	1293.5	-0.6316	0.000001	0.399				983.1989
		60	0.3500	1360.6	(122)	0.000211	0.000212	1360.1	0.5375	-0.000001	0.289				983.1989
		80	0.0500	1014.3	(122)	0.000167	0.000165	1014.4	-0.1077	0.000002	0.012				971.7978
		80	0.1000	1060.5	(122)	0.000168	0.000171	1060.2	0.3256	-0.000003	0.106				971.7978
		80	0.2000	1162.3	(122)	0.000186	0.000186	1162.4	-0.0575	0.000000	0.003				971.7978
		80	0.3000	1281.0	(122)	0.000201	0.000201	1280.9	0.0692	0.000000	0.005				971.7978
		80	0.3500	1347.2	(122)	0.000210	0.000210	1347.3	-0.0557	0.000000	0.003				971.7978
Average Res									0.0946	-0.000005	2.666	Sum chi sqr			
Std dev Res									0.2875	0.000008					
Avg - 4std									-1.0556	-0.000036					
Avg + 4std									1.2447	0.000025					

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
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Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	-2.08132
c1	4.844613
c2	4.43423
c3	-0.020815
c4	-2942.264
Min T	25
Max T	80
Min w	0.006111
Max w	0.35
Avg dens res	0.094561
Std dens res	0.287539
Avg app vol res *10 ³	-0.005397
Std app vol res *10 ³	0.007531
No of points in corr	30
No of inconsistent pair	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **NaNO2**

References (33) Gunther, P.; Perschke, W.; Comparison of some physical constants of thiocyanate, azide and nitrite solutions, *J. Chem. Soc.*, **1930**, 100-104

(90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		15	0.0100	1005.8	(90)	0.000334	0.000339	1005.8	0.0494	-0.000005	0.002			999.0996
		15	0.0200	1012.5	(90)	0.000339	0.000341	1012.4	0.0599	-0.000003	0.004			999.0996
		15	0.0400	1026.0	(90)	0.000345	0.000346	1025.9	0.0653	-0.000002	0.004			999.0996
		15	0.0800	1053.5	(90)	0.000355	0.000356	1053.4	0.1085	-0.000001	0.012			999.0996
		15	0.1200	1081.6	(90)	0.000365	0.000366	1081.5	0.1199	-0.000001	0.014			999.0996
		15	0.1600	1110.3	(90)	0.000374	0.000375	1110.2	0.0898	0.000000	0.008			999.0996
		15	0.2000	1139.4	(90)	0.000385	0.000384	1139.6	-0.1911	0.000001	0.037			999.0996
	0.5	20	0.0338	1021.0	(33)	0.000340	0.000343	1020.9	0.1215	-0.000003	0.015			998.2041
	1	20	0.0662	1042.7	(33)	0.000356	0.000351	1043.0	-0.3409	0.000005	0.116			998.2041
	2	20	0.1271	1085.7	(33)	0.000367	0.000365	1085.9	-0.2107	0.000001	0.044			998.2041
	3	20	0.1836	1127.3	(33)	0.000377	0.000378	1127.1	0.2267	-0.000001	0.051			998.2041
Average Res									0.0089	-0.000001	0.308	Sum chi sqr		
Std dev Res									0.1752	0.000003				
Avg - 4std									-0.6918	-0.000011				
Avg + 4std									0.7097	0.000009				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0 78.36507
 c1 297.9973
 c2 0.962457
 c3 0.0022
 c4 1500
 Min T 15
 Max T 20
 Min w 0.0100
 Max w 0.2000
 Avg dens res 0.0089
 Std dens res 0.1752
 Avg app vol res $\cdot 10^3$ -0.000857
 Std app vol res $\cdot 10^3$ 0.002587
 No of points in corr 11
 No of inconsistent pair 0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **NaNO3**

- References (8) Berchiesi, M. A.; Berchiesi, G.; Lobbia, G. G. Apparent Molal Volumes of Alkali Metal Nitrates at 30°C. *J. Chem. Eng. Data* **1974**, *19*, 326-328.
- (22) Doan, T. H.; Sangster, J. Viscosities of Concentrated Aqueous Solutions of some 1:1, 2:1, and 3:1 Nitrates at 25°C. *J. Chem. Eng. Data* **1981**, *26*, 141-144.
- (45) Isono, T. Densities, Viscosities, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions at Several Temperatures. Alkaline-Earth Chlorides, LaCl_3 , Na_2SO_4 , NaNO_3 , NaBr , KNO_3 , KBr , and $\text{Cd}(\text{NO}_3)_2$. *J. Chem. Eng. Data* **1984**, *29*, 45-52.
- (50) Kartzmark, E. M. Conductances, Densities, and Viscosities of Solutions of Sodium Nitrate in Water and in Dioxane-Water at 25°C. *Can. J. Chem.* **1972**, *50*, 2845-2850.
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, *61*, 1492-1498.
- (82) Patterson, B. A.; Woolley, E. M.; Thermodynamics for Ionization of Water at Temperatures from 278.15 K to 393.15 K and at the Pressure 0.35 MPa: Apparent Molar Volumes and Apparent Molar Heat Capacities of Aqueous Solutions of Potassium and Sodium Nitrates and Nitric Acid, *J. Chem. Thermodynamics*, **2002**, *34*, 535 - 556
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (102) Puchkov, L. V.; Matashkin, V. G. Densities of $\text{LiNO}_3\text{-H}_2\text{O}$ and $\text{NaNO}_3\text{-H}_2\text{O}$ Solutions at Temperatures in the Range 25-300°C. *J. Appl. Chem. USSR* **1970**, *43*, 1848-1851.
- (110) Roy, Mahendra Nath; Jha, Anupam; Choudhury, Ankan, Densities, Viscosities and Adiabatic Compressibilities of Some Mineral Salts in Water at Different Temperatures, *J. Chem. Eng. Data* **2004**, *49*, 291-296.

molality	molarity	t / °C	mass frac	Density exp kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
		0	0.0100	1007.10	(90)	0.000279	0.000303	1006.9	0.2403	-0.000024	0.058				999.8395
		0	0.0200	1014.40	(90)	0.000282	0.000305	1013.9	0.4673	-0.000023	0.218				999.8395
		0	0.0400	1029.00	(90)	0.000292	0.000310	1028.2	0.7593	-0.000018	0.577				999.8395
		0	0.0499	1036.30	(102)	0.000295	0.000312	1035.4	0.8953	-0.000017	0.802				999.8395
		0	0.0800	1058.70	(90)	0.000305	0.000318	1057.5	1.1708	-0.000013	1.371				999.8395
		0	0.0993	1073.30	(102)	0.000311	0.000322	1072.0	1.3041	-0.000011	1.701				999.8395
		0	0.1200	1089.10	(90)	0.000317	0.000326	1087.8	1.3348	-0.000009	1.782				999.8395
		0	0.1600	1120.30	(90)	0.000328	0.000334	1119.0	1.2871	-0.000006	1.657				999.8395
		0	0.2000	1152.60	(90)	0.000337	0.000342	1151.3	1.2581	-0.000005	1.583				999.8395
		0	0.2007	1153.20	(102)	0.000337	0.000342	1151.9	1.2823	-0.000005	1.644				999.8395
		0	0.2400	1186.00	(90)	0.000346	0.000350	1184.8	1.1730	-0.000003	1.376				999.8395
		0	0.2800	1220.40	(90)	0.000355	0.000357	1219.5	0.8505	-0.000002	0.723				999.8395
		0	0.2974	1235.70	(102)	0.000358	0.000360	1235.1	0.6380	-0.000001	0.407				999.8395
		0	0.3000	1238.00	(90)	0.000359	0.000360	1237.4	0.5980	-0.000001	0.358				999.8395
		0	0.3500	1283.40	(90)	0.000369	0.000369	1283.6	-0.1601	0.000000	0.026				999.8395
		0	0.3970	1328.70	(102)	0.000377	0.000376	1329.1	-0.3798	0.000001	0.144				999.8395
		0	0.4000	1331.60	(90)	0.000377	0.000377	1332.1	-0.4597	0.000001	0.211				999.8395
0.01509		5	0.0013	1000.89	(82)	0.000279	0.000310	1000.8	0.0393	-0.000031	0.002			23.72	999.9638
0.03017		5	0.0026	1001.80	(82)	0.000283	0.000310	1001.7	0.0702	-0.000027	0.005			24.02	999.9638
0.06039		5	0.0051	1003.61	(82)	0.000288	0.000310	1003.5	0.1156	-0.000022	0.013			24.48	999.9638
0.12079		5	0.0102	1007.17	(82)	0.000296	0.000312	1007.0	0.1581	-0.000015	0.025			25.18	999.9638
0.2514		5	0.0209	1014.88	(82)	0.000297	0.000314	1014.5	0.3568	-0.000017	0.127			25.272	999.9638

molality	molarity	t / °C	mass frac	Density exp kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
0.501		5	0.0408	1029.08	(82)	0.000307	0.000318	1028.6	0.4671	-0.000011	0.218			26.119	999.9638
0.01509		15	0.0013	999.99	(82)	0.000308	0.000326	1000.0	0.0233	-0.000018	0.001			26.17	999.0996
0.03017		15	0.0026	1000.86	(82)	0.000313	0.000326	1000.8	0.0330	-0.000013	0.001			26.64	999.0996
0.05		15	0.0042	1002.09	(45)	0.000295	0.000327	1002.0	0.1341	-0.000032	0.018				999.0996
0.06039		15	0.0051	1002.59	(82)	0.000318	0.000327	1002.5	0.0470	-0.000009	0.002			27	999.0996
0.1		15	0.0084	1004.99	(45)	0.000305	0.000327	1004.8	0.1927	-0.000023	0.037				999.0996
0.12079		15	0.0102	1006.04	(82)	0.000321	0.000328	1006.0	0.0667	-0.000006	0.004			27.31	999.0996
0.2514		15	0.0209	1013.45	(82)	0.000324	0.000330	1013.3	0.1333	-0.000006	0.018			27.51	999.0996
0.5		15	0.0408	1027.47	(45)	0.000323	0.000334	1027.0	0.4599	-0.000011	0.212				999.0996
0.501		15	0.0408	1027.15	(82)	0.000332	0.000334	1027.1	0.0866	-0.000002	0.007			28.188	999.0996
1		15	0.0783	1054.28	(45)	0.000332	0.000341	1053.5	0.7308	-0.000008	0.534				999.0996
2		15	0.1453	1103.85	(45)	0.000347	0.000352	1102.9	0.9031	-0.000005	0.816				999.0996
3		15	0.2032	1148.94	(45)	0.000358	0.000362	1148.0	0.9045	-0.000003	0.818				999.0996
3.959		15	0.2518	1188.07	(45)	0.000369	0.000369	1187.8	0.2983	-0.000001	0.089				999.0996
6		15	0.3377	1261.22	(45)	0.000385	0.000382	1262.8	-1.5522	0.000003	2.409				999.0996
0.05		20	0.0042	1001.09	(45)	0.000319	0.000334	1001.0	0.0629	-0.000015	0.004				998.2041
0.1		20	0.0084	1003.96	(45)	0.000320	0.000335	1003.8	0.1245	-0.000015	0.015				998.2041
		20	0.0100	1004.90	(90)	0.000334	0.000335	1004.9	0.0099	-0.000001	0.000				998.2041
		20	0.0200	1011.70	(90)	0.000334	0.000337	1011.6	0.0710	-0.000003	0.005				998.2041
		20	0.0400	1025.40	(90)	0.000338	0.000341	1025.3	0.1313	-0.000003	0.017				998.2041
0.5		20	0.0408	1026.10	(45)	0.000334	0.000341	1025.8	0.3052	-0.000007	0.093				998.2041
1		20	0.0783	1052.46	(45)	0.000343	0.000347	1052.0	0.4181	-0.000005	0.175				998.2041
		20	0.0800	1053.20	(90)	0.000348	0.000348	1053.2	-0.0230	0.000000	0.001				998.2041
		20	0.1200	1081.90	(90)	0.000356	0.000354	1082.1	-0.2293	0.000002	0.053				998.2041
2		20	0.1453	1101.47	(45)	0.000355	0.000358	1100.9	0.5421	-0.000003	0.294				998.2041
		20	0.1600	1111.80	(90)	0.000362	0.000361	1112.1	-0.2550	0.000001	0.065				998.2041
		20	0.2000	1142.90	(90)	0.000368	0.000367	1143.1	-0.1728	0.000001	0.030				998.2041
3		20	0.2032	1146.29	(45)	0.000365	0.000367	1145.6	0.7044	-0.000003	0.496				998.2041
		20	0.2400	1175.20	(90)	0.000373	0.000373	1175.3	-0.0613	0.000000	0.004				998.2041
3.959		20	0.2518	1185.15	(45)	0.000374	0.000375	1185.0	0.1791	-0.000001	0.032				998.2041
		20	0.2800	1208.50	(90)	0.000379	0.000379	1208.7	-0.2057	0.000001	0.042				998.2041
		20	0.3000	1225.60	(90)	0.000382	0.000381	1225.9	-0.3276	0.000001	0.107				998.2041
6		20	0.3377	1257.87	(45)	0.000389	0.000387	1259.4	-1.5124	0.000003	2.287				998.2041
		20	0.3500	1270.10	(90)	0.000389	0.000388	1270.5	-0.4394	0.000001	0.193				998.2041
		20	0.4000	1317.50	(90)	0.000395	0.000395	1317.5	-0.0453	0.000000	0.002				998.2041
		20	0.4500	1368.30	(90)	0.000400	0.000401	1367.2	1.1209	-0.000001	1.257				998.2041
0.01509		25	0.0013	997.90	(82)	0.000329	0.000341	997.9	0.0145	-0.000011	0.000			28	997.0449
0.03017		25	0.0026	998.75	(82)	0.000335	0.000341	998.7	0.0158	-0.000006	0.000			28.46	997.0449
0.05		25	0.0042	999.87	(45)	0.000333	0.000341	999.8	0.0340	-0.000008	0.001				997.0449
0.05176		25	0.0044	999.99	(73)	0.000329	0.000341	999.9	0.0560	-0.000013	0.003				997.0449
0.06039		25	0.0051	1000.43	(82)	0.000338	0.000341	1000.4	0.0166	-0.000003	0.000			28.75	997.0449
	0.09617	25	0.0082	1002.50	(50)	0.000334	0.000342	1002.4	0.0690	-0.000008	0.005				997.0449

molality	molarity	t / °C	mass frac	Density exp kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
0.1		25	0.0084	1002.72	(45)	0.000329	0.000342	1002.6	0.1072	-0.000013	0.011				997.0449
0.101107		25	0.0085	1002.75	(73)	0.000333	0.000342	1002.7	0.0759	-0.000009	0.006				997.0449
0.12079		25	0.0102	1003.76	(82)	0.000342	0.000342	1003.8	-0.0012	0.000000	0.000			29.11	997.0449
0.200333		25	0.0167	1008.23	(73)	0.000338	0.000344	1008.1	0.0874	-0.000005	0.008				997.0449
0.2514		25	0.0209	1010.93	(82)	0.000345	0.000344	1010.9	-0.0064	0.000000	0.000			29.283	997.0449
0.298821		25	0.0248	1013.61	(73)	0.000341	0.000345	1013.5	0.0935	-0.000004	0.009				997.0449
	0.3315	25	0.0277	1015.50	(50)	0.000346	0.000345	1015.5	-0.0181	0.000001	0.000				997.0449
0.400891		25	0.0330	1018.94	(73)	0.000349	0.000346	1019.0	-0.0900	0.000003	0.008				997.0449
0.498377		25	0.0406	1024.32	(73)	0.000346	0.000348	1024.2	0.0761	-0.000002	0.006				997.0449
0.5		25	0.0408	1023.90	(22)	0.000358	0.000348	1024.3	-0.4303	0.000010	0.185				997.0449
0.5		25	0.0408	1024.54	(45)	0.000343	0.000348	1024.3	0.2097	-0.000005	0.044				997.0449
0.501		25	0.0408	1024.28	(82)	0.000350	0.000348	1024.4	-0.1062	0.000002	0.011			29.755	997.0449
0.598955		25	0.0484	1029.64	(73)	0.000348	0.000349	1029.6	0.0691	-0.000001	0.005				997.0449
		25	0.0499	1031.00	(102)	0.000341	0.000349	1030.6	0.4300	-0.000008	0.185				997.0449
0.699736		25	0.0561	1034.89	(73)	0.000350	0.000350	1034.9	0.0339	-0.000001	0.001				997.0449
0.798943		25	0.0636	1040.06	(73)	0.000351	0.000351	1040.0	0.0516	-0.000001	0.003				997.0449
0.896968		25	0.0708	1045.02	(73)	0.000353	0.000353	1045.1	-0.0309	0.000000	0.001				997.0449
1		25	0.0783	1050.00	(22)	0.000357	0.000354	1050.3	-0.3002	0.000003	0.090				997.0449
1		25	0.0783	1050.60	(45)	0.000350	0.000354	1050.3	0.2998	-0.000003	0.090				997.0449
1.000043		25	0.0783	1050.26	(73)	0.000354	0.000354	1050.3	-0.0423	0.000000	0.002				997.0449
	0.9782	25	0.0791	1050.80	(50)	0.000355	0.000354	1050.9	-0.0522	0.000001	0.003				997.0449
		25	0.0993	1065.00	(102)	0.000358	0.000357	1065.2	-0.1529	0.000001	0.023				997.0449
1.5		25	0.1131	1073.70	(22)	0.000370	0.000359	1075.1	-1.3604	0.000010	1.851				997.0449
2		25	0.1453	1098.00	(22)	0.000368	0.000364	1098.7	-0.7038	0.000004	0.495				997.0449
2		25	0.1453	1099.06	(45)	0.000362	0.000364	1098.7	0.3562	-0.000002	0.127				997.0449
	1.9511	25	0.1504	1102.40	(50)	0.000366	0.000365	1102.5	-0.1378	0.000001	0.019				997.0449
2.5		25	0.1752	1120.10	(22)	0.000374	0.000369	1121.3	-1.2126	0.000006	1.470				997.0449
		25	0.2007	1140.00	(102)	0.000376	0.000372	1141.0	-1.0167	0.000004	1.034				997.0449
3		25	0.2032	1140.90	(22)	0.000381	0.000373	1143.0	-2.0597	0.000008	4.242				997.0449
3		25	0.2032	1143.62	(45)	0.000370	0.000373	1143.0	0.6603	-0.000002	0.436				997.0449
	2.8509	25	0.2109	1149.00	(50)	0.000374	0.000374	1149.0	-0.0376	0.000000	0.001				997.0449
3.5		25	0.2293	1162.10	(22)	0.000382	0.000376	1163.7	-1.6104	0.000005	2.593				997.0449
3.959		25	0.2518	1182.10	(45)	0.000379	0.000380	1182.0	0.0789	0.000000	0.006				997.0449
4		25	0.2537	1182.00	(22)	0.000384	0.000380	1183.6	-1.6238	0.000005	2.637				997.0449
	3.7502	25	0.2670	1193.90	(50)	0.000384	0.000382	1194.6	-0.7277	0.000002	0.530				997.0449
		25	0.2974	1219.00	(102)	0.000389	0.000386	1220.4	-1.4289	0.000003	2.042				997.0449
5		25	0.2982	1219.10	(22)	0.000390	0.000386	1221.1	-2.0463	0.000005	4.187				997.0449
6		25	0.3377	1254.40	(45)	0.000394	0.000391	1255.9	-1.4981	0.000003	2.244				997.0449
	5.1299	25	0.3454	1262.50	(50)	0.000392	0.000392	1262.8	-0.2712	0.000000	0.074				997.0449
	6.0413	25	0.3930	1306.40	(50)	0.000399	0.000398	1307.1	-0.6630	0.000001	0.440				997.0449
		25	0.3970	1312.00	(102)	0.000396	0.000398	1310.8	1.1631	-0.000002	1.353				997.0449
	6.9868	25	0.4395	1351.30	(50)	0.000405	0.000403	1352.5	-1.1527	0.000001	1.329				997.0449

molality	molarity	t / °C	mass frac	Density exp kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
		25	0.4682	1383.00	(102)	0.000405	0.000407	1381.8	1.2157	-0.000001	1.478				997.0449
	0.16869	29.85	0.0143	1004.74	(110)	0.000371	0.000350	1005.0	-0.3029	0.000021	0.092				995.6924
	0.22894	29.85	0.0193	1008.31	(110)	0.000353	0.000350	1008.4	-0.0535	0.000003	0.003				995.6924
0.05		30	0.0042	998.42	(45)	0.000345	0.000348	998.4	0.0121	-0.000003	0.000				995.6473
0.1		30	0.0084	1001.23	(45)	0.000340	0.000349	1001.2	0.0753	-0.000009	0.006				995.6473
	0.19705	30	0.0166	1006.57	(8)	0.000349	0.000350	1006.6	0.0132	-0.000001	0.000				995.6473
	0.34304	30	0.0287	1014.61	(8)	0.000351	0.000352	1014.6	0.0274	-0.000001	0.001				995.6473
0.5		30	0.0408	1022.80	(45)	0.000350	0.000354	1022.6	0.1578	-0.000004	0.025				995.6473
	0.57912	30	0.0479	1027.44	(8)	0.000356	0.000355	1027.5	-0.0266	0.000001	0.001				995.6473
	0.90402	30	0.0735	1044.95	(8)	0.000360	0.000359	1045.0	-0.0658	0.000001	0.004				995.6473
1		30	0.0783	1048.54	(45)	0.000358	0.000360	1048.3	0.1905	-0.000002	0.036				995.6473
	1.83007	30	0.1422	1093.68	(8)	0.000371	0.000369	1094.0	-0.3589	0.000002	0.129				995.6473
2		30	0.1453	1096.56	(45)	0.000368	0.000370	1096.3	0.2600	-0.000001	0.068				995.6473
3		30	0.2032	1140.76	(45)	0.000376	0.000378	1140.2	0.5777	-0.000002	0.334				995.6473
	2.84293	30	0.2109	1145.70	(8)	0.000381	0.000379	1146.2	-0.5246	0.000002	0.275				995.6473
3.959		30	0.2518	1178.97	(45)	0.000384	0.000384	1178.9	0.0240	0.000000	0.001				995.6473
6		30	0.3377	1250.95	(45)	0.000397	0.000395	1252.3	-1.3911	0.000003	1.935				995.6473
0.01509		35	0.0013	994.87	(82)	0.000343	0.000354	994.9	0.0145	-0.000011	0.000			29.12	994.0319
0.03017		35	0.0026	995.67	(82)	0.000358	0.000354	995.7	-0.0105	0.000004	0.000			30.46	994.0319
0.05		35	0.0042	996.77	(45)	0.000353	0.000354	996.8	0.0064	-0.000002	0.000				994.0319
0.06039		35	0.0051	997.32	(82)	0.000357	0.000355	997.3	-0.0137	0.000003	0.000			30.37	994.0319
0.1		35	0.0084	999.55	(45)	0.000347	0.000355	999.5	0.0682	-0.000008	0.005				994.0319
0.12079		35	0.0102	1000.56	(82)	0.000360	0.000355	1000.6	-0.0471	0.000005	0.002			30.6	994.0319
0.2514		35	0.0209	1007.55	(82)	0.000361	0.000357	1007.6	-0.0853	0.000004	0.007			30.688	994.0319
0.5		35	0.0408	1020.87	(45)	0.000357	0.000360	1020.8	0.1189	-0.000003	0.014				994.0319
0.501		35	0.0408	1020.62	(82)	0.000364	0.000360	1020.8	-0.1841	0.000004	0.034			30.969	994.0319
1		35	0.0783	1046.34	(45)	0.000364	0.000366	1046.2	0.1294	-0.000002	0.017				994.0319
2		35	0.1453	1093.94	(45)	0.000374	0.000375	1093.7	0.2036	-0.000001	0.041				994.0319
3		35	0.2032	1137.87	(45)	0.000380	0.000382	1137.3	0.5973	-0.000002	0.357				994.0319
3.959		35	0.2518	1175.85	(45)	0.000388	0.000388	1175.8	0.0858	0.000000	0.007				994.0319
6		35	0.3377	1247.49	(45)	0.000401	0.000398	1248.7	-1.2378	0.000002	1.532				994.0319
		40	0.0100	998.60	(90)	0.000364	0.000361	998.6	-0.0218	0.000002	0.000				992.2158
		40	0.0200	1005.00	(90)	0.000367	0.000363	1005.1	-0.0820	0.000004	0.007				992.2158
		40	0.0400	1018.00	(90)	0.000370	0.000366	1018.2	-0.1690	0.000004	0.029				992.2158
		40	0.0800	1044.70	(90)	0.000375	0.000371	1045.0	-0.3363	0.000004	0.113				992.2158
		40	0.1200	1072.40	(90)	0.000380	0.000376	1072.9	-0.4839	0.000004	0.234				992.2158
		40	0.1600	1101.30	(90)	0.000384	0.000381	1101.8	-0.4829	0.000002	0.233				992.2158
		40	0.2000	1131.40	(90)	0.000388	0.000386	1131.8	-0.4106	0.000002	0.169				992.2158
		40	0.2400	1162.90	(90)	0.000391	0.000391	1163.1	-0.1508	0.000000	0.023				992.2158
		40	0.2800	1195.50	(90)	0.000396	0.000396	1195.6	-0.0948	0.000000	0.009				992.2158
		40	0.3000	1212.20	(90)	0.000398	0.000398	1212.4	-0.1866	0.000000	0.035				992.2158
		40	0.3500	1256.00	(90)	0.000403	0.000403	1256.0	0.0106	0.000000	0.000				992.2158

molality	molarity	t / °C	mass frac	Density exp kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
		40	0.4000	1302.70	(90)	0.000407	0.000408	1302.1	0.6049	-0.000001	0.366				992.2158
		40	0.4500	1352.80	(90)	0.000411	0.000413	1351.0	1.8421	-0.000002	3.393				992.2158
0.01509		45	0.0013	991.04	(82)	0.000348	0.000366	991.0	0.0220	-0.000017	0.000			29.6	990.2132
0.03017		45	0.0026	991.81	(82)	0.000375	0.000366	991.8	-0.0237	0.000009	0.001			31.9	990.2132
0.05		45	0.0042	992.89	(45)	0.000367	0.000366	992.9	-0.0015	0.000000	0.000				990.2132
0.06039		45	0.0051	993.38	(82)	0.000380	0.000366	993.4	-0.0694	0.000014	0.005			32.3	990.2132
0.1		45	0.0084	995.61	(45)	0.000360	0.000367	995.6	0.0531	-0.000006	0.003				990.2132
0.12079		45	0.0102	996.59	(82)	0.000374	0.000367	996.7	-0.0667	0.000007	0.004			31.75	990.2132
0.2514		45	0.0209	1003.42	(82)	0.000375	0.000368	1003.5	-0.1292	0.000006	0.017			31.833	990.2132
0.5		45	0.0408	1016.52	(45)	0.000369	0.000371	1016.4	0.0951	-0.000002	0.009				990.2132
0.501		45	0.0408	1016.27	(82)	0.000376	0.000371	1016.5	-0.2019	0.000005	0.041			31.943	990.2132
1		45	0.0783	1041.56	(45)	0.000374	0.000376	1041.4	0.1285	-0.000002	0.017				990.2132
2		45	0.1453	1088.49	(45)	0.000382	0.000384	1088.2	0.2983	-0.000002	0.089				990.2132
3		45	0.2032	1131.81	(45)	0.000388	0.000391	1131.1	0.6944	-0.000003	0.482				990.2132
3.959		45	0.2518	1169.37	(45)	0.000395	0.000396	1169.1	0.2349	-0.000001	0.055				990.2132
6		45	0.3377	1240.38	(45)	0.000407	0.000405	1241.4	-0.9988	0.000002	0.998				990.2132
		50	0.0499	1020.00	(102)	0.000377	0.000377	1020.0	0.0322	-0.000001	0.001				988.0363
		50	0.0993	1052.00	(102)	0.000392	0.000383	1053.0	-1.0335	0.000009	1.068				988.0363
		50	0.2007	1126.00	(102)	0.000394	0.000394	1126.0	-0.0129	0.000000	0.000				988.0363
		50	0.2974	1202.00	(102)	0.000406	0.000404	1203.0	-1.0456	0.000002	1.093				988.0363
		50	0.3970	1292.00	(102)	0.000412	0.000413	1291.5	0.4789	-0.000001	0.229				988.0363
		50	0.4682	1363.00	(102)	0.000417	0.000419	1361.5	1.4817	-0.000002	2.196				988.0363
0.01509		55	0.0013	986.50	(82)	0.000368	0.000376	986.5	0.0096	-0.000008	0.000			31.31	985.6952
0.03017		55	0.0026	987.30	(82)	0.000371	0.000376	987.3	0.0128	-0.000005	0.000			31.54	985.6952
0.05		55	0.0042	988.32	(45)	0.000378	0.000376	988.3	-0.0059	0.000001	0.000				985.6952
0.06039		55	0.0051	988.89	(82)	0.000374	0.000377	988.9	0.0142	-0.000003	0.000			31.76	985.6952
0.1		55	0.0084	991.00	(45)	0.000370	0.000377	990.9	0.0559	-0.000007	0.003				985.6952
0.12079		55	0.0102	992.02	(82)	0.000378	0.000377	992.0	-0.0103	0.000001	0.000			32.14	985.6952
0.2514		55	0.0209	998.75	(82)	0.000381	0.000378	998.8	-0.0458	0.000002	0.002			32.346	985.6952
0.5		55	0.0408	1011.60	(45)	0.000377	0.000381	1011.5	0.1440	-0.000003	0.021				985.6952
0.501		55	0.0408	1011.38	(82)	0.000384	0.000381	1011.5	-0.1300	0.000003	0.017			32.62	985.6952
1		55	0.0783	1036.28	(45)	0.000382	0.000385	1036.1	0.2148	-0.000003	0.046				985.6952
2		55	0.1453	1082.65	(45)	0.000389	0.000392	1082.2	0.4844	-0.000003	0.235				985.6952
3		55	0.2032	1125.46	(45)	0.000394	0.000398	1124.6	0.8827	-0.000003	0.779				985.6952
3.959		55	0.2518	1162.67	(45)	0.000401	0.000403	1162.2	0.4544	-0.000001	0.206				985.6952
6		55	0.3377	1233.13	(45)	0.000412	0.000410	1233.9	-0.7867	0.000002	0.619				985.6952
		60	0.0100	989.40	(90)	0.000380	0.000382	989.4	0.0200	-0.000002	0.000				983.1989
		60	0.0200	995.60	(90)	0.000384	0.000383	995.6	-0.0175	0.000001	0.000				983.1989
		60	0.0400	1008.20	(90)	0.000387	0.000385	1008.3	-0.0662	0.000002	0.004				983.1989
		60	0.0800	1034.00	(90)	0.000392	0.000389	1034.3	-0.2869	0.000003	0.082				983.1989
		60	0.1200	1060.90	(90)	0.000396	0.000393	1061.3	-0.4312	0.000003	0.186				983.1989
		60	0.1600	1089.20	(90)	0.000398	0.000397	1089.5	-0.2750	0.000001	0.076				983.1989

molality	molarity	t / °C	mass frac	Density exp kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
		60	0.2000	1118.70	(90)	0.000401	0.000401	1118.8	-0.1013	0.000000	0.010				983.1989
		60	0.2400	1149.60	(90)	0.000404	0.000404	1149.4	0.1998	-0.000001	0.040				983.1989
		60	0.2800	1181.60	(90)	0.000407	0.000408	1181.4	0.2296	-0.000001	0.053				983.1989
		60	0.3000	1198.00	(90)	0.000409	0.000409	1197.9	0.0967	0.000000	0.009				983.1989
		60	0.3500	1241.30	(90)	0.000413	0.000414	1240.9	0.3500	-0.000001	0.123				983.1989
		60	0.4000	1287.50	(90)	0.000416	0.000417	1286.6	0.8526	-0.000001	0.727				983.1989
		60	0.4500	1337.10	(90)	0.000419	0.000421	1335.3	1.8243	-0.000002	3.328				983.1989
0.01509		65	0.0013	981.35	(82)	0.000378	0.000385	981.3	0.0091	-0.000007	0.000			32.1	980.5548
0.03017		65	0.0026	982.13	(82)	0.000379	0.000385	982.1	0.0159	-0.000006	0.000			32.19	980.5548
0.06039		65	0.0051	983.71	(82)	0.000380	0.000385	983.7	0.0290	-0.000006	0.001			32.26	980.5548
0.12079		65	0.0102	986.79	(82)	0.000386	0.000386	986.8	0.0028	0.000000	0.000			32.78	980.5548
0.2514		65	0.0209	993.46	(82)	0.000387	0.000387	993.5	0.0060	0.000000	0.000			32.872	980.5548
0.501		65	0.0408	1005.91	(82)	0.000390	0.000389	1006.0	-0.0555	0.000001	0.003			33.18	980.5548
0.01509		75	0.0013	975.63	(82)	0.000384	0.000393	975.6	0.0112	-0.000009	0.000			32.6	974.849
0.03017		75	0.0026	976.42	(82)	0.000382	0.000393	976.4	0.0259	-0.000011	0.001			32.49	974.849
0.06039		75	0.0051	977.97	(82)	0.000385	0.000393	977.9	0.0409	-0.000008	0.002			32.7	974.849
0.12079		75	0.0102	981.02	(82)	0.000390	0.000394	981.0	0.0299	-0.000003	0.001			33.19	974.849
0.2514		75	0.0209	987.61	(82)	0.000392	0.000394	987.6	0.0491	-0.000002	0.002			33.324	974.849
0.501		75	0.0408	999.97	(82)	0.000395	0.000396	999.9	0.0576	-0.000001	0.003			33.553	974.849
		80	0.0100	977.90	(90)	0.000387	0.000397	977.8	0.0955	-0.000010	0.009				971.7978
		80	0.0200	984.00	(90)	0.000391	0.000398	983.9	0.1295	-0.000007	0.017				971.7978
		80	0.0400	996.40	(90)	0.000394	0.000399	996.2	0.2152	-0.000005	0.046				971.7978
		80	0.0800	1021.80	(90)	0.000400	0.000402	1021.6	0.2261	-0.000003	0.051				971.7978
		80	0.1200	1048.10	(90)	0.000405	0.000405	1048.0	0.0602	0.000000	0.004				971.7978
		80	0.1600	1075.70	(90)	0.000408	0.000408	1075.7	0.0359	0.000000	0.001				971.7978
		80	0.2000	1104.80	(90)	0.000410	0.000411	1104.5	0.2640	-0.000001	0.070				971.7978
		80	0.2400	1135.10	(90)	0.000412	0.000413	1134.8	0.3467	-0.000001	0.120				971.7978
		80	0.2800	1166.70	(90)	0.000415	0.000416	1166.4	0.2766	-0.000001	0.077				971.7978
		80	0.3000	1183.00	(90)	0.000417	0.000417	1182.8	0.1603	0.000000	0.026				971.7978
		80	0.3500	1225.80	(90)	0.000420	0.000420	1225.7	0.0953	0.000000	0.009				971.7978
		80	0.4000	1271.50	(90)	0.000423	0.000423	1271.4	0.1021	0.000000	0.010				971.7978
		80	0.4500	1320.60	(90)	0.000425	0.000426	1320.2	0.3696	0.000000	0.137				971.7978
0.01509		85	0.0013	969.41	(82)	0.000376	0.000399	969.4	0.0275	-0.000023	0.001			32	968.6203
0.03017		85	0.0026	970.18	(82)	0.000384	0.000399	970.1	0.0365	-0.000015	0.001			32.66	968.6203
0.06039		85	0.0051	971.72	(82)	0.000387	0.000400	971.7	0.0604	-0.000013	0.004			32.9	968.6203
0.12079		85	0.0102	974.75	(82)	0.000393	0.000400	974.7	0.0631	-0.000007	0.004			33.44	968.6203
0.2514		85	0.0209	981.30	(82)	0.000395	0.000401	981.2	0.1170	-0.000006	0.014			33.568	968.6203
0.501		85	0.0408	993.54	(82)	0.000398	0.000402	993.4	0.1539	-0.000004	0.024			33.858	968.6203
0.01509		95	0.0013	962.67	(82)	0.000392	0.000405	962.7	0.0154	-0.000013	0.000			33.3	961.9004
0.03017		95	0.0026	963.46	(82)	0.000381	0.000405	963.4	0.0567	-0.000024	0.003			32.38	961.9004
0.06039		95	0.0051	964.99	(82)	0.000388	0.000405	964.9	0.0829	-0.000017	0.007			32.94	961.9004
0.12079		95	0.0102	968.01	(82)	0.000394	0.000405	967.9	0.1117	-0.000012	0.012			33.45	961.9004

molality	molarity	t / °C	mass frac	Density exp kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
0.2514		95	0.0209	974.54	(82)	0.000395	0.000406	974.3	0.2121	-0.000011	0.045			33.594	961.9004
0.501		95	0.0408	986.74	(82)	0.000399	0.000407	986.4	0.3225	-0.000008	0.104			33.911	961.9004
		100	0.0100	964.40	(90)	0.000390	0.000408	964.2	0.1600	-0.000017	0.026				958.3637
		100	0.0200	970.40	(90)	0.000396	0.000408	970.2	0.2212	-0.000012	0.049				958.3637
		100	0.0400	982.60	(90)	0.000400	0.000409	982.2	0.3515	-0.000009	0.124				958.3637
		100	0.0499	989.00	(102)	0.000396	0.000410	988.3	0.6800	-0.000014	0.462				958.3637
		100	0.0800	1007.80	(90)	0.000404	0.000411	1007.2	0.6105	-0.000008	0.373				958.3637
		100	0.1200	1034.00	(90)	0.000407	0.000413	1033.3	0.7331	-0.000006	0.537				958.3637
		100	0.1600	1061.40	(90)	0.000410	0.000415	1060.6	0.8315	-0.000005	0.691				958.3637
		100	0.2000	1090.10	(90)	0.000413	0.000417	1089.2	0.9093	-0.000004	0.827				958.3637
		100	0.2007	1091.00	(102)	0.000411	0.000417	1089.7	1.2960	-0.000005	1.680				958.3637
		100	0.2400	1120.00	(90)	0.000416	0.000419	1119.2	0.7602	-0.000003	0.578				958.3637
		100	0.2800	1151.30	(90)	0.000419	0.000420	1150.8	0.4669	-0.000001	0.218				958.3637
		100	0.2974	1167.00	(102)	0.000416	0.000421	1165.1	1.9094	-0.000005	3.646				958.3637
		100	0.3000	1167.40	(90)	0.000421	0.000421	1167.2	0.1511	0.000000	0.023				958.3637
		100	0.3500	1210.00	(90)	0.000423	0.000423	1210.2	-0.2364	0.000000	0.056				958.3637
		100	0.3970	1252.00	(102)	0.000427	0.000425	1253.4	-1.4006	0.000002	1.962				958.3637
		100	0.4000	1255.50	(90)	0.000426	0.000425	1256.3	-0.7531	0.000001	0.567				958.3637
		100	0.4500	1304.40	(90)	0.000428	0.000427	1305.6	-1.2463	0.000002	1.553				958.3637
		100	0.4682	1323.00	(102)	0.000429	0.000427	1324.5	-1.5402	0.000002	2.372				958.3637
								Average Res	0.0494	-0.000003	93.4162	Sum Chi sq			
								Std dev Res	0.6081	0.000007					
								Avg - 4std	-2.3828	-0.000032					
								Avg + 4std	2.4816	0.000026					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	49.20868
c1	94.73699
c2	0.779268
c3	0.007545
c4	1819.194
Min T	0
Max T	100
Min w	0.0013
Max w	0.4682
Avg dens res	0.049383
Std dens res	0.608053
Avg app vol res *10 ³	-0.003057
Std app vol res *10 ³	0.007157
No of points in corr	252
No of inconsistent pair	29

molality	molarity	t / °C	mass frac	Density exp kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)															
8		15	0.4047	1318.96	(45)	0.000401	0.000391	1326.0	-6.9926	0.000010	48.896	!			999.0996
8		20	0.4047	1315.32	(45)	0.000405	0.000395	1322.1	-6.8207	0.000010	46.521	!			998.2041
	0.07171	25	0.0061	1000.80	(50)	0.000385	0.000342	1001.1	-0.2646	0.000043	0.070		!		997.0449
4.5		25	0.2767	1200.10	(22)	0.000390	0.000383	1202.8	-2.6529	0.000007	7.038	!			997.0449
8		25	0.4047	1311.74	(45)	0.000408	0.000399	1318.3	-6.5435	0.000009	42.817	!			997.0449
	7.79	25	0.4776	1386.40	(50)	0.000413	0.000408	1391.6	-5.1646	0.000006	26.673	!			997.0449
	0.01205	29.85	0.0010	996.18	(110)	0.000526	0.000347	996.4	-0.1825	0.000179	0.033		!		995.6924
	0.06025	29.85	0.0051	998.54	(110)	0.000446	0.000348	999.0	-0.5004	0.000098	0.250		!		995.6924
	0.10845	29.85	0.0092	1001.23	(110)	0.000401	0.000349	1001.7	-0.4825	0.000052	0.233		!		995.6924
8		30	0.4047	1308.08	(45)	0.000412	0.000403	1314.4	-6.3207	0.000009	39.951	!			995.6473
	0.01203	34.85	0.0010	994.44	(110)	0.000655	0.000354	994.7	-0.3064	0.000301	0.094		!		994.0833
	0.06016	34.85	0.0051	996.37	(110)	0.000556	0.000354	997.4	-1.0284	0.000202	1.058		!		994.0833
	0.10807	34.85	0.0092	998.79	(110)	0.000490	0.000355	1000.0	-1.2440	0.000135	1.548		!		994.0833
	0.16813	34.85	0.0143	1001.99	(110)	0.000449	0.000356	1003.3	-1.3409	0.000094	1.798		!		994.0833
	0.22825	34.85	0.0193	1005.74	(110)	0.000402	0.000357	1006.6	-0.8770	0.000045	0.769		!		994.0833
8		35	0.4047	1304.42	(45)	0.000415	0.000406	1310.5	-6.0865	0.000009	37.046	!			994.0319
	0.01202	39.85	0.0010	992.59	(110)	0.000695	0.000360	992.9	-0.3401	0.000335	0.116		!		992.273
	0.06012	39.85	0.0051	994.35	(110)	0.000598	0.000360	995.6	-1.2093	0.000238	1.462		!		992.273
	0.10791	39.85	0.0092	996.89	(110)	0.000500	0.000361	998.2	-1.2766	0.000139	1.630		!		992.273
	0.16772	39.85	0.0143	999.73	(110)	0.000481	0.000362	1001.4	-1.6966	0.000119	2.878		!		992.273
	0.22779	39.85	0.0193	1003.27	(110)	0.000435	0.000362	1004.7	-1.4175	0.000073	2.009		!		992.273
	0.012	44.85	0.0010	990.57	(110)	0.000719	0.000366	990.9	-0.3569	0.000353	0.127		!		990.2759
	0.06	44.85	0.0051	992.21	(110)	0.000627	0.000366	993.5	-1.3211	0.000261	1.745		!		990.2759
	0.10777	44.85	0.0092	994.46	(110)	0.000549	0.000367	996.1	-1.6597	0.000182	2.754		!		990.2759
	0.16729	44.85	0.0143	997.22	(110)	0.000517	0.000367	999.3	-2.1216	0.000149	4.501		!		990.2759
	0.22731	44.85	0.0193	1001.15	(110)	0.000441	0.000368	1002.6	-1.4225	0.000073	2.023		!		990.2759
8		45	0.4047	1296.85	(45)	0.000420	0.000411	1302.7	-5.8724	0.000009	34.485	!			990.2132
8		55	0.4047	1289.21	(45)	0.000424	0.000416	1295.0	-5.7712	0.000009	33.306	!			985.6952
		100	0.0993	1023.00	(102)	0.000380	0.000412	1019.6	3.3752	-0.000033	11.392	!	!		958.3637

Density of aqueous solutions of **NaOH**

- References
- (3) Akerlof, G.; Kegeles, G.; The density of aqueous solutions of sodium hydroxide, *J. Am. Chem.*, **1939**, 61, 1027-1032
- (39) Hershey, J. P.; Sotolongo, S.; Millero, F. J. Densities and Compressibilities of Aqueous HCl and NaOH from 0 to 45°C. The Effect of Pressure on the Ionization of Water. *J. Sol. Chem.* **1984**, 13, 825-848.
- (41) Hitchcock, L. B.; McIlhenny, J. S. Viscosity and Density of Pure Alkaline Solutions and their Mixtures. *Ind. Engng. Chem.* **1935**, 27, 461-466
- (54) Krey, J.; Vapour Pressure and Density of the System Water-Sodium Hydroxide. *Z. Physik. Chem. N. F.* **1972**, 81, 252-273.
- (66) Maksimova, I. N.; Yushkevich, V. F. Electrical Conductivity of Sodium Hydroxide Solutions at High Temperatures. *Z. Fiz. Khim.* **1963**, 37, 903-907.
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, 61, 1492-1498.
- (81) Patterson, B. A.; Call, T. G.; Jardine, J. J.; Origlia-Luster, M. L.; Woolley, E. M.; Thermodynamics for Ionization of Water at Temperatures from 278.15 K to 393.15 K and at the Pressure 0.35 MPa: Apparent Molar Volumes of Aqueous KCl, KOH, and NaOH and Apparent Molar Heat Capacities of Aqueous HCl, KCl, KOH, and NaOH, *J. Chem. Thermodynamics*, **2001**, 33, 1237-1262
- (88) Perron, G.; Desnoyers, J. E.; Millero, F. J., Apparent molal volumes and heat capacities of some sulfates and carbonates in water at 25 °C, *Can. J. Chem.*, **1975**, 53, 1134-1138
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.
- (109) Roux, A. H.; Perron, G.; Desnoyers, J. E. Capacités calorifiques, volumes, expansibilités et compressibilités des solutions aqueuses concentrées de LiOH, NaOH et KOH. *Can. J. Chem.* **1984**, 62, 878-885

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
		0	0.0100	1012.40	(90)	-0.000241	-0.000098	1010.94	1.4633	-0.000143	2.14		!			999.8395
		0	0.0200	1023.76	(3)	-0.000168	-0.000087	1022.07	1.6918	-0.000081	2.86					999.8395
		0	0.0200	1024.40	(90)	-0.000199	-0.000087	1022.07	2.3318	-0.000111	5.44					999.8395
		0	0.0400	1047.08	(3)	-0.000128	-0.000067	1044.42	2.6565	-0.000061	7.06					999.8395
		0	0.0400	1048.20	(90)	-0.000153	-0.000067	1044.42	3.7765	-0.000086	14.26					999.8395
		0	0.0600	1070.19	(3)	-0.000096	-0.000047	1066.88	3.3066	-0.000048	10.93					999.8395
		0	0.0800	1093.21	(3)	-0.000068	-0.000028	1089.42	3.7854	-0.000040	14.33					999.8395
		0	0.0800	1094.30	(90)	-0.000079	-0.000028	1089.42	4.8754	-0.000051	23.77					999.8395
		0	0.1000	1116.14	(3)	-0.000042	-0.000009	1112.02	4.1174	-0.000033	16.95					999.8395
		0	0.1000	1117.44	(54)	-0.000052	-0.000009	1112.02	5.4169	-0.000044	29.34				117.60	999.8395
		0	0.1200	1139.00	(3)	-0.000018	0.000010	1134.65	4.3485	-0.000028	18.91					999.8395
		0	0.1200	1139.90	(90)	-0.000024	0.000010	1134.65	5.2485	-0.000034	27.55					999.8395
		0	0.1400	1161.73	(3)	0.000005	0.000028	1157.28	4.4455	-0.000024	19.76					999.8395
		0	0.1600	1184.33	(3)	0.000026	0.000046	1179.89	4.4366	-0.000020	19.68					999.8395
		0	0.1600	1184.90	(90)	0.000024	0.000046	1179.89	5.0066	-0.000022	25.07					999.8395
		0	0.1800	1206.61	(3)	0.000048	0.000064	1202.45	4.1609	-0.000016	17.31					999.8395
		0	0.2000	1228.63	(3)	0.000069	0.000081	1224.92	3.7088	-0.000012	13.76					999.8395
		0	0.2000	1229.64	(54)	0.000066	0.000081	1224.92	4.7183	-0.000016	22.26				229.80	999.8395
		0	0.2000	1229.60	(90)	0.000066	0.000081	1224.92	4.6788	-0.000016	21.89					999.8395
		0	0.2200	1250.23	(3)	0.000090	0.000098	1247.28	2.9513	-0.000009	8.71					999.8395
		0	0.2400	1271.33	(3)	0.000110	0.000115	1269.49	1.8405	-0.000005	3.39					999.8395
		0	0.2400	1274.10	(90)	0.000103	0.000115	1269.49	4.6105	-0.000012	21.26					999.8395
		0	0.2600	1291.80	(3)	0.000131	0.000131	1291.52	0.2790	-0.000001	0.08					999.8395
		0	0.2800	1311.50	(3)	0.000151	0.000148	1313.34	-1.8397	0.000004	3.38					999.8395

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
		0	0.2800	1318.20	(90)	0.000137	0.000148	1313.34	4.8603	-0.000010	23.62					999.8395
		0	0.3000	1333.83	(3)	0.000165	0.000163	1334.91	-1.0817	0.000002	1.17					999.8395
		0	0.3200	1356.83	(3)	0.000178	0.000179	1356.20	0.6272	-0.000001	0.39					999.8395
		0	0.3200	1361.40	(90)	0.000170	0.000179	1356.20	5.1972	-0.000009	27.01					999.8395
		0	0.3400	1379.58	(3)	0.000190	0.000194	1377.18	2.4016	-0.000004	5.77					999.8395
		0	0.3600	1401.98	(3)	0.000203	0.000209	1397.80	4.1761	-0.000006	17.44					999.8395
		0	0.3600	1403.00	(90)	0.000202	0.000209	1397.80	5.1961	-0.000007	27.00					999.8395
		0	0.3800	1423.88	(3)	0.000216	0.000224	1418.04	5.8352	-0.000008	34.05					999.8395
		0	0.4000	1445.15	(3)	0.000230	0.000238	1437.87	7.2833	-0.000009	53.05					999.8395
		0	0.4000	1443.50	(90)	0.000232	0.000238	1437.87	5.6333	-0.000007	31.73					999.8395
		0	0.4200	1465.61	(3)	0.000243	0.000253	1457.24	8.3744	-0.000009	70.13					999.8395
		0	0.4400	1485.05	(3)	0.000257	0.000267	1476.12	8.9318	-0.000009	79.78					999.8395
		0	0.4400	1482.50	(90)	0.000260	0.000267	1476.12	6.3818	-0.000007	40.73					999.8395
		0	0.4600	1503.30	(3)	0.000272	0.000281	1494.48	8.8184	-0.000009	77.76					999.8395
		0	0.4800	1520.08	(3)	0.000287	0.000294	1512.29	7.7860	-0.000007	60.62					999.8395
		0	0.4800	1521.00	(90)	0.000286	0.000294	1512.29	8.7060	-0.000008	75.79					999.8395
		0	0.5000	1538.11	(3)	0.000300	0.000307	1529.52	8.5853	-0.000007	73.71					999.8395
		0	0.5000	1540.00	(90)	0.000299	0.000307	1529.52	10.4753	-0.000009	109.73					999.8395
		0	0.5200	1548.27	(3)	0.000319	0.000321	1546.14	2.1259	-0.000002	4.52					999.8395
0.02035		4	0.0008	1000.96	(109)	-0.000219	-0.000104	1000.87	0.0933	-0.000115	0.01				0.992	999.972
0.03045		4	0.0012	1001.46	(109)	-0.000219	-0.000104	1001.32	0.1407	-0.000115	0.02				1.485	999.972
0.04054		4	0.0016	1001.94	(109)	-0.000215	-0.000103	1001.76	0.1809	-0.000111	0.03				1.97	999.972
0.05078		4	0.0020	1002.43	(109)	-0.000211	-0.000103	1002.21	0.2207	-0.000108	0.05				2.461	999.972
0.06058		4	0.0024	1002.91	(109)	-0.000211	-0.000102	1002.64	0.2633	-0.000108	0.07				2.935	999.972
0.08075		4	0.0032	1003.87	(109)	-0.000207	-0.000102	1003.53	0.3421	-0.000105	0.12				3.901	999.972
0.10144		4	0.0040	1004.86	(109)	-0.000204	-0.000101	1004.44	0.4213	-0.000103	0.18				4.889	999.972
0.3042		4	0.0120	1014.36	(109)	-0.000180	-0.000093	1013.28	1.0827	-0.000088	1.17				14.39	999.972
0.5067		4	0.0199	1023.60	(109)	-0.000162	-0.000084	1021.99	1.6139	-0.000078	2.60				23.63	999.972
1.0126		4	0.0389	1045.79	(109)	-0.000126	-0.000065	1043.23	2.5610	-0.000060	6.56				45.82	999.972
1.0158		4	0.0390	1045.92	(109)	-0.000125	-0.000065	1043.36	2.5559	-0.000060	6.53				45.947	999.972
2.02		4	0.0748	1086.87	(109)	-0.000070	-0.000030	1083.41	3.4668	-0.000039	12.02				86.901	999.972
3.026		4	0.1080	1124.51	(109)	-0.000026	0.000001	1120.83	3.6844	-0.000027	13.57				124.54	999.972
5.027		4	0.1674	1191.18	(109)	0.000041	0.000055	1187.87	3.3118	-0.000014	10.97				191.208	999.972
7.532		4	0.2315	1262.49	(109)	0.000102	0.000110	1259.52	2.9682	-0.000008	8.81				262.516	999.972
10.88		4	0.3032	1340.75	(109)	0.000162	0.000168	1337.63	3.1177	-0.000006	9.72				340.774	999.972
0.07496		5	0.0030	1003.43	(81)	-0.000155	-0.000101	1003.27	0.1625	-0.000054	0.03			-6.2		999.9638
0.09996		5	0.0040	1004.67	(39)	-0.000178	-0.000100	1004.36	0.3115	-0.000078	0.10				4.711	999.9638
0.10003		5	0.0040	1004.80	(81)	-0.000208	-0.000100	1004.37	0.4324	-0.000108	0.19			-8.3		999.9638
0.15009		5	0.0060	1007.10	(81)	-0.000188	-0.000098	1006.56	0.5464	-0.000090	0.30			-7.53		999.9638
0.20096		5	0.0080	1009.35	(39)	-0.000166	-0.000096	1008.78	0.5721	-0.000070	0.33				9.387	999.9638
0.30021		5	0.0119	1013.89	(39)	-0.000158	-0.000092	1013.09	0.8051	-0.000066	0.65				13.93	999.9638
0.30073		5	0.0119	1014.12	(81)	-0.000175	-0.000092	1013.11	1.0123	-0.000083	1.02			-6.99		999.9638
0.49443		5	0.0194	1022.67	(39)	-0.000145	-0.000084	1021.44	1.2269	-0.000061	1.51				22.703	999.9638
0.50002		5	0.0196	1023.21	(81)	-0.000159	-0.000084	1021.68	1.5310	-0.000075	2.34			-6.347		999.9638

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
0.6		5	0.0234	1027.38	(39)	-0.000139	-0.000080	1025.93	1.4473	-0.000059	2.09				27.417	999.9638
0.71076		5	0.0276	1031.89	(39)	-0.000119	-0.000076	1030.61	1.2780	-0.000043	1.63				31.928	999.9638
0.78379		5	0.0304	1035.51	(39)	-0.000129	-0.000073	1033.68	1.8283	-0.000056	3.34				35.545	999.9638
0.87099		5	0.0337	1039.33	(39)	-0.000125	-0.000070	1037.32	2.0103	-0.000055	4.04				39.369	999.9638
0.99676		5	0.0383	1044.81	(39)	-0.000120	-0.000065	1042.54	2.2774	-0.000055	5.19				44.851	999.9638
0.02035		10	0.0008	1000.66	(109)	-0.000175	-0.000099	1000.59	0.0615	-0.000075	0.00				0.956	999.6996
0.03045		10	0.0012	1001.13	(109)	-0.000175	-0.000099	1001.04	0.0929	-0.000076	0.01				1.431	999.6996
0.04054		10	0.0016	1001.60	(109)	-0.000175	-0.000098	1001.48	0.1241	-0.000076	0.02				1.905	999.6996
0.05078		10	0.0020	1002.08	(109)	-0.000173	-0.000098	1001.93	0.1531	-0.000075	0.02				2.383	999.6996
0.06058		10	0.0024	1002.54	(109)	-0.000172	-0.000098	1002.36	0.1796	-0.000074	0.03				2.839	999.6996
0.08075		10	0.0032	1003.47	(109)	-0.000167	-0.000097	1003.24	0.2275	-0.000070	0.05				3.77	999.6996
0.10144		10	0.0040	1004.43	(109)	-0.000165	-0.000096	1004.15	0.2809	-0.000069	0.08				4.728	999.6996
0.3042		10	0.0120	1013.67	(109)	-0.000146	-0.000088	1012.95	0.7232	-0.000059	0.52				13.969	999.6996
0.5067		10	0.0199	1022.68	(109)	-0.000131	-0.000080	1021.61	1.0616	-0.000051	1.13				22.976	999.6996
		10	0.0200	1022.42	(3)	-0.000111	-0.000080	1021.76	0.6554	-0.000031	0.43					999.6996
1.0126		10	0.0389	1044.37	(109)	-0.000099	-0.000061	1042.76	1.6100	-0.000038	2.59				44.669	999.6996
1.0158		10	0.0390	1044.49	(109)	-0.000098	-0.000061	1042.89	1.6035	-0.000038	2.57				44.794	999.6996
		10	0.0400	1044.89	(3)	-0.000081	-0.000060	1043.95	0.9354	-0.000021	0.88					999.6996
		10	0.0600	1067.26	(3)	-0.000055	-0.000040	1066.25	1.0116	-0.000015	1.02					999.6996
2.02		10	0.0748	1084.73	(109)	-0.000049	-0.000026	1082.75	1.9860	-0.000023	3.94				85.035	999.6996
		10	0.0800	1089.63	(3)	-0.000032	-0.000021	1088.62	1.0065	-0.000011	1.01					999.6996
		10	0.1000	1111.20	(3)	-0.000003	-0.000002	1111.06	0.1438	-0.000001	0.02					999.6996
		10	0.1000	1113.00	(54)	-0.000018	-0.000002	1111.06	1.9435	-0.000016	3.78				113.30	999.6996
3.026		10	0.1080	1121.90	(109)	-0.000009	0.000005	1120.00	1.8988	-0.000014	3.61				122.199	999.6996
		10	0.1200	1134.45	(3)	0.000010	0.000016	1133.52	0.9286	-0.000006	0.86					999.6996
		10	0.1400	1156.86	(3)	0.000030	0.000034	1155.99	0.8668	-0.000005	0.75					999.6996
		10	0.1600	1179.25	(3)	0.000048	0.000052	1178.44	0.8056	-0.000004	0.65					999.6996
5.027		10	0.1674	1188.11	(109)	0.000053	0.000059	1186.75	1.3602	-0.000006	1.85				188.408	999.6996
		10	0.1800	1201.55	(3)	0.000067	0.000069	1200.85	0.7033	-0.000003	0.49					999.6996
		10	0.2000	1223.71	(3)	0.000085	0.000087	1223.17	0.5389	-0.000002	0.29					999.6996
		10	0.2000	1223.70	(54)	0.000085	0.000087	1223.17	0.5285	-0.000002	0.28				224.00	999.6996
		10	0.2200	1245.67	(3)	0.000102	0.000103	1245.39	0.2827	-0.000001	0.08					999.6996
7.532		10	0.2315	1259.09	(109)	0.000110	0.000113	1258.12	0.9711	-0.000003	0.94				259.387	999.6996
		10	0.2400	1267.31	(3)	0.000120	0.000120	1267.46	-0.1546	0.000000	0.02					999.6996
		10	0.2600	1288.55	(3)	0.000138	0.000136	1289.37	-0.8211	0.000002	0.67					999.6996
		10	0.2800	1309.29	(3)	0.000156	0.000152	1311.07	-1.7848	0.000004	3.19					999.6996
		10	0.3000	1329.40	(3)	0.000173	0.000167	1332.54	-3.1428	0.000006	9.88					999.6996
		10	0.3000	1332.20	(54)	0.000168	0.000167	1332.54	-0.3432	0.000001	0.12				332.50	999.6996
10.88		10	0.3032	1337.02	(109)	0.000168	0.000170	1335.97	1.0467	-0.000002	1.10				337.32	999.6996
		10	0.3200	1349.96	(3)	0.000189	0.000183	1353.74	-3.7819	0.000006	14.30					999.6996
		10	0.3400	1372.43	(3)	0.000201	0.000198	1374.64	-2.2088	0.000003	4.88					999.6996
		10	0.3600	1396.54	(3)	0.000211	0.000213	1395.20	1.3400	-0.000002	1.80					999.6996
		10	0.3800	1416.29	(3)	0.000226	0.000227	1415.39	0.8982	-0.000001	0.81					999.6996
		10	0.4000	1437.44	(3)	0.000239	0.000241	1435.18	2.2589	-0.000003	5.10					999.6996

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
		10	0.4200	1457.83	(3)	0.000252	0.000256	1454.53	3.2953	-0.000004	10.86					999.6996
		10	0.4400	1477.32	(3)	0.000265	0.000269	1473.42	3.8998	-0.000004	15.21					999.6996
		10	0.4600	1495.68	(3)	0.000279	0.000283	1491.81	3.8743	-0.000004	15.01					999.6996
		10	0.4800	1512.72	(3)	0.000294	0.000296	1509.66	3.0598	-0.000003	9.36					999.6996
		10	0.5000	1528.14	(3)	0.000308	0.000309	1526.95	1.1866	-0.000001	1.41					999.6996
		10	0.5200	1541.74	(3)	0.000324	0.000322	1543.66	-1.9165	0.000002	3.67					999.6996
0.07496		15	0.0030	1002.51	(81)	-0.000137	-0.000093	1002.37	0.1302	-0.000043	0.02			-5.46		999.0996
0.0998		15	0.0040	1003.59	(39)	-0.000126	-0.000092	1003.46	0.1371	-0.000034	0.02				4.494	999.0996
0.10003		15	0.0040	1003.74	(81)	-0.000161	-0.000092	1003.47	0.2754	-0.000069	0.08			-6.43		999.0996
0.15009		15	0.0060	1005.93	(81)	-0.000139	-0.000090	1005.64	0.2936	-0.000049	0.09			-5.55		999.0996
0.2022		15	0.0080	1008.16	(39)	-0.000121	-0.000088	1007.90	0.2658	-0.000033	0.07				9.063	999.0996
		15	0.0100	1010.65	(90)	-0.000143	-0.000086	1010.07	0.5814	-0.000057	0.34					999.0996
0.2941		15	0.0116	1012.23	(39)	-0.000116	-0.000084	1011.86	0.3747	-0.000031	0.14				13.131	999.0996
0.30073		15	0.0119	1012.72	(81)	-0.000131	-0.000084	1012.14	0.5765	-0.000047	0.33			-5.258		999.0996
0.39		15	0.0154	1016.45	(39)	-0.000111	-0.000081	1015.96	0.4843	-0.000031	0.23				17.346	999.0996
0.4842		15	0.0190	1020.56	(39)	-0.000107	-0.000077	1019.97	0.5874	-0.000030	0.35				21.456	999.0996
0.50002		15	0.0196	1021.46	(81)	-0.000117	-0.000076	1020.64	0.8234	-0.000040	0.68			-4.666		999.0996
		15	0.0200	1021.98	(90)	-0.000120	-0.000076	1021.07	0.9087	-0.000044	0.83					999.0996
0.5875		15	0.0230	1025.03	(39)	-0.000102	-0.000073	1024.33	0.6967	-0.000029	0.49				25.93	999.0996
0.7021		15	0.0273	1029.96	(39)	-0.000097	-0.000069	1029.14	0.8159	-0.000028	0.67				30.856	999.0996
0.7829		15	0.0304	1033.41	(39)	-0.000093	-0.000066	1032.51	0.8993	-0.000028	0.81				34.306	999.0996
0.8704		15	0.0336	1037.12	(39)	-0.000090	-0.000062	1036.13	0.9892	-0.000027	0.98				38.021	999.0996
1.0036		15	0.0386	1042.74	(39)	-0.000085	-0.000058	1041.61	1.1340	-0.000027	1.29				43.643	999.0996
		15	0.0400	1044.41	(90)	-0.000085	-0.000056	1043.17	1.2422	-0.000029	1.54					999.0996
		15	0.0800	1088.87	(90)	-0.000031	-0.000018	1087.65	1.2195	-0.000013	1.49					999.0996
		15	0.1200	1133.27	(90)	0.000013	0.000019	1132.37	0.9038	-0.000006	0.82					999.0996
		15	0.1600	1177.61	(90)	0.000053	0.000055	1177.11	0.4950	-0.000002	0.25					999.0996
		15	0.2000	1221.83	(90)	0.000089	0.000089	1221.68	0.1501	-0.000001	0.02					999.0996
		15	0.2400	1265.82	(90)	0.000122	0.000122	1265.83	-0.0085	0.000000	0.00					999.0996
		15	0.2800	1309.40	(90)	0.000154	0.000154	1309.32	0.0844	0.000000	0.01					999.0996
		15	0.3200	1352.00	(90)	0.000184	0.000185	1351.89	0.1136	0.000000	0.01					999.0996
		15	0.3600	1393.30	(90)	0.000214	0.000214	1393.28	0.0205	0.000000	0.00					999.0996
		15	0.4000	1433.40	(90)	0.000243	0.000243	1433.23	0.1682	0.000000	0.03					999.0996
		15	0.4400	1472.00	(90)	0.000270	0.000271	1471.48	0.5176	-0.000001	0.27					999.0996
		15	0.4800	1510.20	(90)	0.000295	0.000297	1507.78	2.4222	-0.000002	5.87					999.0996
		15	0.5000	1529.00	(90)	0.000307	0.000310	1525.12	3.8837	-0.000003	15.08					999.0996
		20	0.0005	998.70	(66)	0.000007	-0.000092	998.75	-0.0493	0.000099	0.00		!			998.2041
		20	0.0099	1008.60	(66)	-0.000041	-0.000082	1009.01	-0.4142	0.000041	0.17					998.2041
		20	0.0100	1009.50	(90)	-0.000119	-0.000082	1009.12	0.3764	-0.000037	0.14					998.2041
		20	0.0200	1020.22	(3)	-0.000079	-0.000072	1020.08	0.1434	-0.000007	0.02					998.2041
		20	0.0200	1020.70	(90)	-0.000102	-0.000072	1020.08	0.6234	-0.000030	0.39					998.2041
		20	0.0400	1042.07	(3)	-0.000052	-0.000053	1042.07	-0.0040	0.000000	0.00					998.2041
		20	0.0400	1042.80	(90)	-0.000069	-0.000053	1042.07	0.7260	-0.000017	0.53					998.2041
	1.109	20	0.0424	1045.40	(41)	-0.000064	-0.000050	1044.75	0.6452	-0.000014	0.42					998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
		20	0.0476	1048.20	(66)	-0.000002	-0.000045	1050.46	-2.2614	0.000043	5.11					998.2041
		20	0.0600	1063.90	(3)	-0.000029	-0.000033	1064.18	-0.2756	0.000004	0.08					998.2041
	1.888	20	0.0702	1075.80	(41)	-0.000028	-0.000024	1075.47	0.3260	-0.000004	0.11					998.2041
		20	0.0800	1085.77	(3)	-0.000008	-0.000014	1086.36	-0.5899	0.000006	0.35					998.2041
		20	0.0800	1086.90	(90)	-0.000020	-0.000014	1086.36	0.5401	-0.000006	0.29					998.2041
		20	0.0910	1093.80	(66)	0.000040	-0.000004	1098.59	-4.7883	0.000044	22.93					998.2041
		20	0.1000	1107.73	(3)	0.000011	0.000004	1108.60	-0.8741	0.000007	0.76					998.2041
		20	0.1000	1108.10	(54)	0.000008	0.000004	1108.60	-0.5000	0.000004	0.25				109.90	998.2041
	2.99	20	0.1071	1116.50	(41)	0.000011	0.000011	1116.53	-0.0252	0.000000	0.00					998.2041
		20	0.1200	1129.79	(3)	0.000029	0.000022	1130.88	-1.0943	0.000007	1.20					998.2041
		20	0.1200	1130.90	(90)	0.000022	0.000022	1130.88	0.0157	0.000000	0.00					998.2041
		20	0.1400	1151.92	(3)	0.000047	0.000040	1153.18	-1.2555	0.000007	1.58					998.2041
	4.677	20	0.1594	1173.80	(41)	0.000061	0.000057	1174.75	-0.9488	0.000004	0.90					998.2041
		20	0.1600	1174.09	(3)	0.000064	0.000058	1175.45	-1.3615	0.000006	1.85					998.2041
		20	0.1600	1175.10	(90)	0.000059	0.000058	1175.45	-0.3515	0.000002	0.12					998.2041
		20	0.1800	1196.28	(3)	0.000080	0.000075	1197.69	-1.4054	0.000005	1.98					998.2041
	5.8	20	0.1919	1209.00	(41)	0.000091	0.000085	1210.86	-1.8617	0.000007	3.47					998.2041
	6.032	20	0.1984	1216.20	(41)	0.000097	0.000090	1218.05	-1.8511	0.000006	3.43					998.2041
		20	0.2000	1218.84	(3)	0.000095	0.000092	1219.85	-1.0091	0.000003	1.02					998.2041
		20	0.2000	1217.80	(54)	0.000099	0.000092	1219.85	-2.0450	0.000007	4.18				219.60	998.2041
		20	0.2000	1219.10	(90)	0.000094	0.000092	1219.85	-0.7491	0.000003	0.56					998.2041
		20	0.2200	1240.49	(3)	0.000112	0.000108	1241.91	-1.4237	0.000004	2.03					998.2041
		20	0.2400	1262.37	(3)	0.000128	0.000124	1263.85	-1.4795	0.000004	2.19					998.2041
		20	0.2400	1262.90	(90)	0.000127	0.000124	1263.85	-0.9495	0.000002	0.90					998.2041
	8.309	20	0.2592	1282.40	(41)	0.000145	0.000140	1284.71	-2.3067	0.000005	5.32					998.2041
		20	0.2600	1284.02	(3)	0.000144	0.000140	1285.63	-1.6062	0.000004	2.58					998.2041
		20	0.2800	1305.30	(3)	0.000160	0.000156	1307.21	-1.9127	0.000004	3.66					998.2041
		20	0.2800	1306.40	(90)	0.000158	0.000156	1307.21	-0.8127	0.000002	0.66					998.2041
		20	0.3000	1326.12	(3)	0.000176	0.000171	1328.58	-2.4575	0.000005	6.04					998.2041
		20	0.3000	1325.70	(54)	0.000177	0.000171	1328.58	-2.8733	0.000005	8.26				327.50	998.2041
		20	0.3200	1346.37	(3)	0.000192	0.000187	1349.69	-3.3187	0.000006	11.01					998.2041
		20	0.3200	1349.00	(90)	0.000188	0.000187	1349.69	-0.6887	0.000001	0.47					998.2041
		20	0.3400	1365.90	(3)	0.000209	0.000201	1370.51	-4.6140	0.000007	21.29					998.2041
		20	0.3600	1387.48	(3)	0.000221	0.000216	1391.02	-3.5413	0.000005	12.54					998.2041
		20	0.3600	1390.00	(90)	0.000217	0.000216	1391.02	-1.0213	0.000001	1.04					998.2041
		20	0.3800	1409.06	(3)	0.000233	0.000230	1411.18	-2.1180	0.000003	4.49					998.2041
		20	0.4000	1432.15	(3)	0.000243	0.000244	1430.95	1.1980	-0.000001	1.44					998.2041
		20	0.4000	1429.20	(54)	0.000247	0.000244	1430.95	-1.7479	0.000002	3.06				431.00	998.2041
		20	0.4000	1430.00	(90)	0.000246	0.000244	1430.95	-0.9520	0.000001	0.91					998.2041
		20	0.4200	1450.47	(3)	0.000258	0.000258	1450.31	0.1586	0.000000	0.03					998.2041
		20	0.4400	1469.98	(3)	0.000271	0.000272	1469.22	0.7555	-0.000001	0.57					998.2041
		20	0.4400	1468.50	(90)	0.000273	0.000272	1469.22	-0.7245	0.000001	0.52					998.2041
		20	0.4600	1488.47	(3)	0.000284	0.000285	1487.66	0.8096	-0.000001	0.66					998.2041
		20	0.4800	1505.69	(3)	0.000298	0.000298	1505.59	0.1011	0.000000	0.01					998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
		20	0.4800	1506.50	(90)	0.000298	0.000298	1505.59	0.9111	-0.000001	0.83					998.2041
		20	0.4896	1512.00	(66)	0.000306	0.000305	1514.01	-2.0056	0.000002	4.02					998.2041
		20	0.5000	1521.42	(3)	0.000313	0.000311	1522.98	-1.5605	0.000001	2.44					998.2041
		20	0.5000	1524.00	(54)	0.000311	0.000311	1522.98	1.0237	-0.000001	1.05				525.80	998.2041
		20	0.5000	1525.30	(90)	0.000309	0.000311	1522.98	2.3195	-0.000002	5.38					998.2041
		20	0.5200	1535.41	(3)	0.000328	0.000324	1539.81	-4.3967	0.000004	19.33					998.2041
0.03855		25	0.0015	998.77	(88)	-0.000125	-0.000087	998.72	0.0592	-0.000039	0.00				1.73	997.0449
0.03855		25	0.0015	998.77	(109)	-0.000125	-0.000087	998.72	0.0592	-0.000039	0.00				1.73	997.0449
0.06815		25	0.0027	1000.10	(88)	-0.000126	-0.000086	1000.00	0.1083	-0.000040	0.01				3.059	997.0449
0.06815		25	0.0027	1000.10	(109)	-0.000126	-0.000086	1000.00	0.1083	-0.000040	0.01				3.059	997.0449
0.07496		25	0.0030	1000.35	(81)	-0.000107	-0.000085	1000.29	0.0645	-0.000022	0.00			-4.28		997.0449
0.09652		25	0.0038	1001.34	(88)	-0.000115	-0.000085	1001.22	0.1169	-0.000030	0.01				4.292	997.0449
0.09652		25	0.0038	1001.34	(109)	-0.000115	-0.000085	1001.22	0.1169	-0.000030	0.01				4.292	997.0449
0.10003		25	0.0040	1001.53	(81)	-0.000125	-0.000084	1001.37	0.1601	-0.000040	0.03			-4.98		997.0449
0.10018		25	0.0040	1001.49	(39)	-0.000112	-0.000084	1001.38	0.1111	-0.000028	0.01				4.444	997.0449
0.100181		25	0.0040	1001.51	(73)	-0.000117	-0.000084	1001.38	0.1322	-0.000033	0.02					997.0449
0.14477		25	0.0058	1003.45	(88)	-0.000109	-0.000083	1003.30	0.1549	-0.000027	0.02				6.407	997.0449
0.14477		25	0.0058	1003.45	(109)	-0.000109	-0.000083	1003.30	0.1549	-0.000027	0.02				6.407	997.0449
0.15009		25	0.0060	1003.69	(81)	-0.000110	-0.000082	1003.53	0.1656	-0.000028	0.03			-4.4		997.0449
0.19197		25	0.0076	1005.49	(88)	-0.000103	-0.000081	1005.32	0.1715	-0.000022	0.03				8.449	997.0449
0.19197		25	0.0076	1005.49	(109)	-0.000103	-0.000081	1005.32	0.1715	-0.000022	0.03				8.449	997.0449
0.20033		25	0.0079	1005.86	(39)	-0.000103	-0.000080	1005.68	0.1835	-0.000023	0.03				8.819	997.0449
0.200333		25	0.0079	1005.89	(73)	-0.000107	-0.000080	1005.68	0.2095	-0.000026	0.04					997.0449
0.30024		25	0.0119	1010.18	(39)	-0.000096	-0.000077	1009.94	0.2328	-0.000019	0.05				13.132	997.0449
0.300243		25	0.0119	1010.20	(73)	-0.000098	-0.000077	1009.94	0.2558	-0.000021	0.07					997.0449
0.30073		25	0.0119	1010.26	(81)	-0.000101	-0.000077	1009.96	0.2996	-0.000025	0.09			-4.05		997.0449
0.39445		25	0.0155	1014.21	(88)	-0.000090	-0.000073	1013.94	0.2695	-0.000017	0.07				17.163	997.0449
0.3945		25	0.0155	1014.21	(109)	-0.000090	-0.000073	1013.94	0.2674	-0.000017	0.07				17.163	997.0449
0.400185		25	0.0158	1014.47	(73)	-0.000091	-0.000073	1014.18	0.2893	-0.000018	0.08					997.0449
0.40019		25	0.0158	1014.44	(39)	-0.000089	-0.000073	1014.18	0.2639	-0.000016	0.07				17.4	997.0449
0.49336		25	0.0194	1018.39	(88)	-0.000083	-0.000069	1018.10	0.2820	-0.000014	0.08				21.342	997.0449
0.4934		25	0.0194	1018.39	(109)	-0.000083	-0.000069	1018.11	0.2804	-0.000014	0.08				21.342	997.0449
0.49942		25	0.0196	1018.64	(39)	-0.000083	-0.000069	1018.36	0.2817	-0.000014	0.08				21.596	997.0449
0.49942		25	0.0196	1018.67	(73)	-0.000084	-0.000069	1018.36	0.3108	-0.000015	0.10					997.0449
0.50002		25	0.0196	1018.72	(81)	-0.000086	-0.000069	1018.38	0.3377	-0.000017	0.11			-3.42		997.0449
0.5027		25	0.0197	1018.78	(109)	-0.000083	-0.000069	1018.50	0.2830	-0.000014	0.08				21.735	997.0449
0.59954		25	0.0234	1022.83	(39)	-0.000077	-0.000065	1022.55	0.2851	-0.000012	0.08				25.787	997.0449
0.599544		25	0.0234	1022.86	(73)	-0.000078	-0.000065	1022.55	0.3131	-0.000013	0.10					997.0449
0.70006		25	0.0272	1027.03	(73)	-0.000072	-0.000061	1026.72	0.3074	-0.000011	0.09					997.0449
0.70007		25	0.0272	1027.00	(39)	-0.000071	-0.000061	1026.72	0.2778	-0.000010	0.08				29.956	997.0449
0.800065		25	0.0310	1031.13	(73)	-0.000066	-0.000058	1030.85	0.2809	-0.000009	0.08					997.0449
0.80007		25	0.0310	1031.11	(39)	-0.000066	-0.000058	1030.85	0.2596	-0.000008	0.07				34.064	997.0449
0.90024		25	0.0348	1035.19	(39)	-0.000060	-0.000054	1034.95	0.2323	-0.000006	0.05				38.142	997.0449
0.900243		25	0.0348	1035.21	(73)	-0.000061	-0.000054	1034.95	0.2553	-0.000007	0.07					997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
0.9996		25	0.0384	1039.24	(109)	-0.000056	-0.000050	1039.00	0.2417	-0.000006	0.06				42.196	997.0449
1.0006		25	0.0385	1039.29	(88)	-0.000056	-0.000050	1039.04	0.2501	-0.000006	0.06				42.245	997.0449
1.0006		25	0.0385	1039.29	(109)	-0.000056	-0.000050	1039.04	0.2501	-0.000006	0.06				42.245	997.0449
2.032		25	0.0752	1079.30	(109)	-0.000014	-0.000016	1079.44	-0.1444	0.000002	0.02				82.253	997.0449
3.098		25	0.1103	1117.65	(109)	0.000021	0.000017	1118.30	-0.6407	0.000005	0.41				120.61	997.0449
5.256		25	0.1737	1187.23	(109)	0.000078	0.000072	1188.68	-1.4430	0.000006	2.08				190.188	997.0449
7.422		25	0.2289	1247.70	(109)	0.000123	0.000118	1249.46	-1.7563	0.000005	3.08				250.656	997.0449
10.88		25	0.3032	1327.77	(109)	0.000179	0.000176	1329.53	-1.7562	0.000003	3.08				330.727	997.0449
		30	0.0200	1017.26	(3)	-0.000063	-0.000065	1017.31	-0.0468	0.000002	0.00				995.6473	
	0.9983	30	0.0385	1037.20	(41)	-0.000041	-0.000047	1037.45	-0.2509	0.000006	0.06				995.6473	
		30	0.0400	1038.68	(3)	-0.000036	-0.000045	1039.09	-0.4119	0.000010	0.17				995.6473	
	1.085	30	0.0417	1040.70	(41)	-0.000038	-0.000044	1040.95	-0.2485	0.000006	0.06				995.6473	
		30	0.0600	1060.10	(3)	-0.000013	-0.000026	1060.98	-0.8829	0.000013	0.78				995.6473	
		30	0.0800	1081.61	(3)	0.000007	-0.000008	1082.96	-1.3492	0.000014	1.82				995.6473	
		30	0.1000	1103.24	(3)	0.000025	0.000010	1105.00	-1.7590	0.000014	3.09				995.6473	
		30	0.1000	1103.25	(54)	0.000025	0.000010	1105.00	-1.7518	0.000014	3.07				107.60	995.6473
	3.018	30	0.1085	1112.80	(41)	0.000030	0.000018	1114.35	-1.5526	0.000012	2.41				995.6473	
		30	0.1200	1124.99	(3)	0.000042	0.000028	1127.08	-2.0896	0.000014	4.37				995.6473	
		30	0.1400	1146.86	(3)	0.000058	0.000046	1149.18	-2.3171	0.000013	5.37				995.6473	
	4.585	30	0.1573	1166.10	(41)	0.000071	0.000061	1168.25	-2.1477	0.000010	4.61				995.6473	
		30	0.1600	1168.82	(3)	0.000074	0.000063	1171.27	-2.4466	0.000011	5.99				995.6473	
		30	0.1800	1190.84	(3)	0.000090	0.000080	1193.32	-2.4822	0.000010	6.16				995.6473	
	5.977	30	0.1975	1210.20	(41)	0.000103	0.000095	1212.62	-2.4165	0.000008	5.84				995.6473	
	6.023	30	0.1988	1211.60	(41)	0.000104	0.000096	1214.03	-2.4334	0.000008	5.92				995.6473	
		30	0.2000	1212.88	(3)	0.000105	0.000097	1215.32	-2.4373	0.000008	5.94				995.6473	
		30	0.2000	1212.05	(54)	0.000108	0.000097	1215.32	-3.2701	0.000011	10.69				216.40	995.6473
		30	0.2200	1234.88	(3)	0.000120	0.000113	1237.22	-2.3443	0.000007	5.50				995.6473	
		30	0.2400	1256.79	(3)	0.000135	0.000129	1259.01	-2.2247	0.000006	4.95				995.6473	
	8.274	30	0.2591	1277.10	(41)	0.000150	0.000144	1279.72	-2.6230	0.000006	6.88				995.6473	
		30	0.2600	1278.52	(3)	0.000150	0.000145	1280.66	-2.1396	0.000005	4.58				995.6473	
		30	0.2800	1300.00	(3)	0.000165	0.000160	1302.13	-2.1292	0.000004	4.53				995.6473	
		30	0.3000	1321.12	(3)	0.000180	0.000175	1323.39	-2.2733	0.000004	5.17				995.6473	
		30	0.3000	1319.55	(54)	0.000183	0.000175	1323.39	-3.8461	0.000007	14.79				323.90	995.6473
		30	0.3200	1341.77	(3)	0.000195	0.000190	1344.42	-2.6515	0.000005	7.03				995.6473	
		30	0.3400	1361.82	(3)	0.000210	0.000205	1365.18	-3.3627	0.000005	11.31				995.6473	
		30	0.3600	1380.50	(3)	0.000227	0.000219	1385.65	-5.1459	0.000007	26.48				995.6473	
		30	0.3800	1401.98	(3)	0.000238	0.000233	1405.78	-3.8001	0.000005	14.44				995.6473	
		30	0.4000	1422.98	(3)	0.000250	0.000247	1425.55	-2.5740	0.000003	6.63				995.6473	
		30	0.4000	1422.35	(54)	0.000251	0.000247	1425.55	-3.2067	0.000004	10.28				426.70	995.6473
		30	0.4200	1443.34	(3)	0.000263	0.000261	1444.94	-1.5968	0.000002	2.55				995.6473	
		30	0.4400	1462.92	(3)	0.000275	0.000274	1463.90	-0.9781	0.000001	0.96				995.6473	
		30	0.4600	1481.53	(3)	0.000288	0.000287	1482.41	-0.8777	0.000001	0.77				995.6473	
		30	0.4800	1498.93	(3)	0.000302	0.000300	1500.44	-1.5063	0.000001	2.27				995.6473	
		30	0.5000	1514.95	(3)	0.000316	0.000313	1517.96	-3.0051	0.000003	9.03				995.6473	

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
		30	0.5000	1516.75	(54)	0.000314	0.000313	1517.96	-1.2078	0.000001	1.46				521.10	995.6473
		30	0.5200	1529.31	(3)	0.000330	0.000326	1534.94	-5.6263	0.000005	31.66					995.6473
0.07496		35	0.0030	997.28	(81)	-0.000089	-0.000078	997.24	0.0331	-0.000011	0.00			-3.56		994.0319
0.09934		35	0.0040	998.36	(39)	-0.000096	-0.000077	998.28	0.0771	-0.000020	0.01				4.33	994.0319
0.10003		35	0.0040	998.43	(81)	-0.000107	-0.000077	998.31	0.1196	-0.000030	0.01			-4.28		994.0319
0.15009		35	0.0060	1000.55	(81)	-0.000093	-0.000075	1000.45	0.1050	-0.000018	0.01			-3.7		994.0319
0.19896		35	0.0079	1002.62	(39)	-0.000086	-0.000073	1002.52	0.0995	-0.000013	0.01				8.589	994.0319
0.29978		35	0.0118	1006.88	(39)	-0.000077	-0.000069	1006.78	0.0954	-0.000008	0.01				12.844	994.0319
0.30073		35	0.0119	1006.96	(81)	-0.000080	-0.000069	1006.82	0.1355	-0.000011	0.02			-3.214		994.0319
0.38521		35	0.0152	1010.44	(39)	-0.000071	-0.000066	1010.37	0.0779	-0.000005	0.01				16.413	994.0319
0.49461		35	0.0194	1014.97	(39)	-0.000064	-0.000062	1014.93	0.0440	-0.000002	0.00				20.942	994.0319
0.50002		35	0.0196	1015.22	(81)	-0.000065	-0.000062	1015.15	0.0607	-0.000003	0.00			-2.583		994.0319
0.5804		35	0.0227	1018.50	(39)	-0.000059	-0.000059	1018.48	0.0133	-0.000001	0.00				24.466	994.0319
0.68698		35	0.0267	1022.84	(39)	-0.000054	-0.000055	1022.87	-0.0305	0.000001	0.00				28.81	994.0319
0.78077		35	0.0303	1026.64	(39)	-0.000049	-0.000051	1026.71	-0.0698	0.000002	0.00				32.606	994.0319
0.87904		35	0.0340	1030.59	(39)	-0.000045	-0.000048	1030.70	-0.1123	0.000003	0.01				36.556	994.0319
0.99742		35	0.0384	1035.32	(39)	-0.000040	-0.000044	1035.47	-0.1587	0.000004	0.03				41.284	994.0319
0.03727		40	0.0015	993.83	(109)	-0.000094	-0.000076	993.81	0.0278	-0.000019	0.00				1.618	992.2158
0.06069		40	0.0024	994.84	(109)	-0.000091	-0.000075	994.80	0.0385	-0.000016	0.00				2.626	992.2158
0.08169		40	0.0033	995.74	(109)	-0.000086	-0.000074	995.70	0.0406	-0.000013	0.00				3.521	992.2158
0.09978		40	0.0040	996.51	(109)	-0.000084	-0.000073	996.46	0.0424	-0.000011	0.00				4.291	992.2158
0.1		40	0.0040	996.53	(109)	-0.000087	-0.000073	996.47	0.0561	-0.000014	0.00				4.314	992.2158
0.10144		40	0.0040	996.58	(109)	-0.000086	-0.000073	996.53	0.0500	-0.000012	0.00				4.369	992.2158
		40	0.0099	1002.60	(66)	-0.000047	-0.000067	1002.81	-0.2073	0.000021	0.04					992.2158
		40	0.0100	1003.30	(90)	-0.000106	-0.000067	1002.91	0.3855	-0.000038	0.15					992.2158
0.3042		40	0.0120	1005.12	(109)	-0.000069	-0.000065	1005.08	0.0410	-0.000003	0.00				12.906	992.2158
0.5067		40	0.0199	1013.47	(109)	-0.000056	-0.000058	1013.50	-0.0352	0.000002	0.00				21.25	992.2158
		40	0.0200	1013.60	(3)	-0.000055	-0.000058	1013.65	-0.0471	0.000002	0.00					992.2158
		40	0.0200	1013.90	(90)	-0.000070	-0.000058	1013.65	0.2529	-0.000012	0.06					992.2158
	0.9751	40	0.0378	1031.80	(41)	-0.000015	-0.000041	1032.83	-1.0276	0.000026	1.06					992.2158
1.0094		40	0.0388	1033.62	(109)	-0.000033	-0.000040	1033.92	-0.2949	0.000007	0.09				41.405	992.2158
1.0126		40	0.0389	1033.81	(109)	-0.000034	-0.000040	1034.04	-0.2377	0.000006	0.06				41.59	992.2158
1.0158		40	0.0390	1033.88	(109)	-0.000032	-0.000039	1034.17	-0.2904	0.000007	0.08				41.665	992.2158
		40	0.0400	1034.73	(3)	-0.000027	-0.000038	1035.21	-0.4755	0.000011	0.23					992.2158
		40	0.0400	1035.20	(90)	-0.000038	-0.000038	1035.21	-0.0055	0.000000	0.00					992.2158
		40	0.0476	1042.20	(66)	-0.000008	-0.000031	1043.43	-1.2272	0.000024	1.51					992.2158
		40	0.0600	1055.87	(3)	-0.000005	-0.000020	1056.87	-1.0024	0.000015	1.00					992.2158
2.02		40	0.0748	1072.09	(109)	0.000003	-0.000006	1072.91	-0.8230	0.000010	0.68				79.876	992.2158
	2.01	40	0.0751	1071.10	(41)	0.000019	-0.000006	1073.24	-2.1449	0.000025	4.60					992.2158
		40	0.0800	1077.11	(3)	0.000015	-0.000001	1078.63	-1.5181	0.000016	2.30					992.2158
		40	0.0800	1078.00	(90)	0.000005	-0.000001	1078.63	-0.6281	0.000007	0.39					992.2158
		40	0.0910	1087.80	(66)	0.000035	0.000009	1090.62	-2.8243	0.000026	7.98					992.2158
		40	0.1000	1098.49	(3)	0.000033	0.000017	1100.45	-1.9622	0.000016	3.85					992.2158
		40	0.1000	1098.12	(54)	0.000036	0.000017	1100.45	-2.3365	0.000019	5.46				105.90	992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
3.026	3.063	40	0.1080	1107.99	(109)	0.000032	0.000024	1109.16	-1.1685	0.000009	1.37				115.773	992.2158
		40	0.1105	1108.40	(41)	0.000052	0.000026	1111.96	-3.5628	0.000026	12.69					992.2158
		40	0.1200	1120.00	(3)	0.000050	0.000034	1122.32	-2.3230	0.000015	5.40					992.2158
		40	0.1200	1121.00	(90)	0.000043	0.000034	1122.32	-1.3230	0.000009	1.75					992.2158
	3.949	40	0.1387	1138.70	(41)	0.000073	0.000050	1142.81	-4.1052	0.000023	16.85					992.2158
		40	0.1400	1141.64	(3)	0.000066	0.000052	1144.22	-2.5778	0.000014	6.64					992.2158
		40	0.1600	1163.40	(3)	0.000081	0.000068	1166.11	-2.7130	0.000012	7.36					992.2158
		40	0.1600	1164.50	(90)	0.000076	0.000068	1166.11	-1.6130	0.000007	2.60					992.2158
5.027	40	0.1674	1172.13	(109)	0.000084	0.000075	1174.22	-2.0845	0.000009	4.35				179.916	992.2158	
	40	0.1800	1185.23	(3)	0.000096	0.000085	1187.98	-2.7542	0.000011	7.59					992.2158	
	40	0.2000	1207.11	(3)	0.000111	0.000102	1209.81	-2.6958	0.000009	7.27					992.2158	
	40	0.2000	1206.32	(54)	0.000113	0.000102	1209.81	-3.4901	0.000012	12.18				214.10	992.2158	
	40	0.2000	1207.90	(90)	0.000108	0.000102	1209.81	-1.9058	0.000007	3.63					992.2158	
	40	0.2026	1205.10	(66)	0.000129	0.000104	1212.64	-7.5377	0.000025	56.82					992.2158	
	6.161	40	0.2036	1210.50	(41)	0.000115	0.000104	1213.69	-3.1949	0.000011	10.21					992.2158
	6.376	40	0.2095	1217.50	(41)	0.000118	0.000109	1220.11	-2.6068	0.000008	6.80					992.2158
7.532	40	0.2200	1228.98	(3)	0.000125	0.000118	1231.55	-2.5718	0.000008	6.61					992.2158	
	40	0.2315	1241.67	(109)	0.000133	0.000127	1244.03	-2.3598	0.000007	5.57				249.45	992.2158	
	40	0.2400	1250.78	(3)	0.000140	0.000133	1253.20	-2.4151	0.000006	5.83					992.2158	
	40	0.2400	1251.20	(90)	0.000139	0.000133	1253.20	-1.9951	0.000005	3.98					992.2158	
	40	0.2497	1262.60	(41)	0.000144	0.000141	1263.67	-1.0697	0.000003	1.14					992.2158	
	40	0.2600	1272.44	(3)	0.000154	0.000149	1274.71	-2.2681	0.000005	5.14					992.2158	
	40	0.2800	1293.89	(3)	0.000169	0.000164	1296.06	-2.1725	0.000005	4.72					992.2158	
	40	0.2800	1294.20	(90)	0.000168	0.000164	1296.06	-1.8625	0.000004	3.47					992.2158	
10.88	40	0.3000	1315.03	(3)	0.000183	0.000179	1317.23	-2.1995	0.000004	4.84					992.2158	
	40	0.3000	1313.32	(54)	0.000186	0.000179	1317.23	-3.9138	0.000008	15.32				321.10	992.2158	
	40	0.3032	1318.25	(109)	0.000186	0.000181	1320.62	-2.3643	0.000004	5.59				326.036	992.2158	
	40	0.3200	1335.76	(3)	0.000198	0.000194	1338.18	-2.4200	0.000004	5.86					992.2158	
	40	0.3200	1336.20	(90)	0.000197	0.000194	1338.18	-1.9800	0.000003	3.92					992.2158	
	40	0.3298	1338.50	(66)	0.000217	0.000201	1348.36	-9.8577	0.000017	97.17					992.2158	
	40	0.3400	1355.95	(3)	0.000213	0.000208	1358.88	-2.9343	0.000005	8.61					992.2158	
	40	0.3600	1375.47	(3)	0.000228	0.000222	1379.31	-3.8428	0.000006	14.77					992.2158	
	40	0.3600	1376.80	(90)	0.000226	0.000222	1379.31	-2.5128	0.000004	6.31					992.2158	
	40	0.3800	1394.85	(3)	0.000242	0.000236	1399.44	-4.5855	0.000006	21.03					992.2158	
	40	0.4000	1415.85	(3)	0.000254	0.000250	1419.22	-3.3726	0.000004	11.37					992.2158	
	40	0.4000	1415.52	(54)	0.000254	0.000250	1419.22	-3.7069	0.000005	13.74				423.30	992.2158	
	40	0.4000	1416.40	(90)	0.000253	0.000250	1419.22	-2.8226	0.000004	7.97					992.2158	
	40	0.4200	1436.25	(3)	0.000266	0.000263	1438.64	-2.3944	0.000003	5.73					992.2158	
	40	0.4400	1455.91	(3)	0.000278	0.000276	1457.67	-1.7614	0.000002	3.10					992.2158	
	40	0.4400	1454.50	(90)	0.000280	0.000276	1457.67	-3.1714	0.000003	10.06					992.2158	
	40	0.4600	1474.65	(3)	0.000291	0.000289	1476.27	-1.6246	0.000002	2.64					992.2158	
	40	0.4800	1492.26	(3)	0.000304	0.000302	1494.43	-2.1653	0.000002	4.69					992.2158	
40	0.4800	1492.20	(90)	0.000304	0.000302	1494.43	-2.2253	0.000002	4.95					992.2158		
40	0.4896	1506.30	(66)	0.000305	0.000308	1502.97	3.3313	-0.000003	11.10					992.2158		

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
		40	0.5000	1508.55	(3)	0.000318	0.000315	1512.10	-3.5456	0.000003	12.57					992.2158
		40	0.5000	1509.42	(54)	0.000317	0.000315	1512.10	-2.6798	0.000002	7.18				517.20	992.2158
		40	0.5000	1510.90	(90)	0.000316	0.000315	1512.10	-1.1956	0.000001	1.43					992.2158
		40	0.5200	1523.26	(3)	0.000332	0.000327	1529.26	-5.9984	0.000005	35.98					992.2158
0.05109		45	0.0020	992.46	(39)	-0.000113	-0.000071	992.38	0.0832	-0.000041	0.01				2.25	990.2132
0.07496		45	0.0030	993.40	(81)	-0.000075	-0.000070	993.39	0.0135	-0.000005	0.00			-3		990.2132
0.10003		45	0.0040	994.55	(81)	-0.000096	-0.000069	994.45	0.1026	-0.000026	0.01			-3.82		990.2132
0.1033		45	0.0041	994.72	(39)	-0.000102	-0.000069	994.59	0.1325	-0.000033	0.02				4.506	990.2132
0.15009		45	0.0060	996.66	(81)	-0.000084	-0.000068	996.56	0.0990	-0.000017	0.01			-3.37		990.2132
0.2004		45	0.0080	998.58	(39)	-0.000054	-0.000066	998.67	-0.0932	0.000012	0.01				8.364	990.2132
0.2991		45	0.0118	1002.97	(39)	-0.000077	-0.000062	1002.79	0.1798	-0.000015	0.03				12.761	990.2132
0.30073		45	0.0119	1002.93	(81)	-0.000067	-0.000062	1002.86	0.0650	-0.000005	0.00			-2.69		990.2132
0.3933		45	0.0155	1006.87	(39)	-0.000069	-0.000058	1006.71	0.1670	-0.000011	0.03				16.659	990.2132
0.4988		45	0.0196	1011.19	(39)	-0.000061	-0.000054	1011.06	0.1322	-0.000007	0.02				20.975	990.2132
0.50002		45	0.0196	1011.05	(81)	-0.000052	-0.000054	1011.11	-0.0530	0.000003	0.00			-2.07		990.2132
0.5979		45	0.0234	1015.21	(39)	-0.000055	-0.000051	1015.11	0.0902	-0.000004	0.01				24.992	990.2132
0.7045		45	0.0274	1019.49	(39)	-0.000048	-0.000047	1019.45	0.0400	-0.000001	0.00				29.278	990.2132
0.8159		45	0.0316	1023.93	(39)	-0.000043	-0.000043	1023.95	-0.0154	0.000000	0.00				33.721	990.2132
0.907		45	0.0350	1027.54	(39)	-0.000038	-0.000040	1027.60	-0.0592	0.000002	0.00				37.331	990.2132
0.9839		45	0.0379	1030.58	(39)	-0.000035	-0.000037	1030.67	-0.0941	0.000002	0.01				40.363	990.2132
		50	0.0200	1009.29	(3)	-0.000054	-0.000050	1009.23	0.0622	-0.000003	0.00					988.0363
		50	0.0400	1030.21	(3)	-0.000024	-0.000032	1030.55	-0.3385	0.000008	0.11					988.0363
		50	0.0600	1051.16	(3)	-0.000001	-0.000013	1051.98	-0.8212	0.000012	0.67					988.0363
		50	0.0800	1072.21	(3)	0.000019	0.000005	1073.51	-1.2972	0.000014	1.68					988.0363
		50	0.1000	1093.40	(3)	0.000037	0.000023	1095.11	-1.7073	0.000014	2.91					988.0363
		50	0.1000	1092.84	(54)	0.000042	0.000023	1095.11	-2.2710	0.000019	5.16				104.80	988.0363
		50	0.1200	1114.72	(3)	0.000054	0.000040	1116.76	-2.0409	0.000014	4.17					988.0363
		50	0.1400	1136.18	(3)	0.000069	0.000057	1138.45	-2.2667	0.000013	5.14					988.0363
		50	0.1600	1157.74	(3)	0.000085	0.000074	1160.14	-2.4025	0.000011	5.77					988.0363
		50	0.1800	1179.42	(3)	0.000100	0.000090	1181.83	-2.4051	0.000010	5.78					988.0363
		50	0.2000	1201.14	(3)	0.000114	0.000106	1203.47	-2.3305	0.000008	5.43					988.0363
		50	0.2000	1200.54	(54)	0.000116	0.000106	1203.47	-2.9342	0.000010	8.61				212.50	988.0363
		50	0.2200	1222.86	(3)	0.000129	0.000122	1225.05	-2.1940	0.000007	4.81					988.0363
		50	0.2400	1244.52	(3)	0.000143	0.000138	1246.55	-2.0299	0.000005	4.12					988.0363
		50	0.2600	1266.06	(3)	0.000157	0.000153	1267.93	-1.8721	0.000004	3.50					988.0363
		50	0.2800	1287.40	(3)	0.000172	0.000168	1289.17	-1.7737	0.000004	3.15					988.0363
		50	0.3000	1308.45	(3)	0.000186	0.000182	1310.25	-1.7975	0.000003	3.23					988.0363
		50	0.3000	1307.14	(54)	0.000189	0.000182	1310.25	-3.1112	0.000006	9.68				319.10	988.0363
		50	0.3200	1329.10	(3)	0.000200	0.000197	1331.13	-2.0257	0.000004	4.10					988.0363
		50	0.3400	1349.24	(3)	0.000215	0.000211	1351.78	-2.5401	0.000004	6.45					988.0363
		50	0.3600	1368.73	(3)	0.000230	0.000225	1372.18	-3.4523	0.000005	11.92					988.0363
		50	0.3800	1387.53	(3)	0.000245	0.000239	1392.30	-4.7739	0.000007	22.79					988.0363
		50	0.4000	1408.53	(3)	0.000257	0.000252	1412.12	-3.5861	0.000005	12.86					988.0363
		50	0.4000	1408.74	(54)	0.000256	0.000252	1412.12	-3.3798	0.000004	11.42				420.70	988.0363

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
		50	0.4200	1431.17	(3)	0.000266	0.000265	1431.59	-0.4204	0.000000	0.18					988.0363
		50	0.4400	1448.81	(3)	0.000281	0.000279	1450.70	-1.8885	0.000002	3.57					988.0363
		50	0.4600	1467.72	(3)	0.000293	0.000291	1469.41	-1.6923	0.000002	2.86					988.0363
		50	0.4800	1485.59	(3)	0.000306	0.000304	1487.70	-2.1142	0.000002	4.47					988.0363
		50	0.5000	1502.19	(3)	0.000319	0.000316	1505.55	-3.3569	0.000003	11.27					988.0363
		50	0.5000	1502.14	(54)	0.000319	0.000316	1505.55	-3.4106	0.000003	11.63				514.10	988.0363
		50	0.5200	1517.27	(3)	0.000333	0.000329	1522.91	-5.6440	0.000005	31.85					988.0363
0.07496		55	0.0030	988.85	(81)	-0.000068	-0.000063	988.84	0.0134	-0.000005	0.00			-2.71		985.6952
0.10003		55	0.0040	989.97	(81)	-0.000085	-0.000062	989.88	0.0870	-0.000022	0.01			-3.38		985.6952
0.1005		55	0.0040	989.91	(109)	-0.000065	-0.000062	989.90	0.0118	-0.000003	0.00				4.218	985.6952
0.15009		55	0.0060	992.10	(81)	-0.000082	-0.000060	991.97	0.1288	-0.000022	0.02			-3.29		985.6952
0.2028		55	0.0080	994.15	(109)	-0.000058	-0.000058	994.15	-0.0001	0.000000	0.00				8.459	985.6952
0.3007		55	0.0119	998.16	(109)	-0.000052	-0.000055	998.20	-0.0342	0.000003	0.00				12.468	985.6952
0.30073		55	0.0119	998.26	(81)	-0.000060	-0.000055	998.20	0.0631	-0.000005	0.00			-2.4		985.6952
0.50002		55	0.0196	1006.29	(81)	-0.000044	-0.000047	1006.35	-0.0598	0.000003	0.00			-1.774		985.6952
0.5063		55	0.0198	1006.47	(109)	-0.000041	-0.000047	1006.60	-0.1320	0.000007	0.02				20.776	985.6952
1.0146		55	0.0390	1026.45	(109)	-0.000018	-0.000029	1026.90	-0.4484	0.000011	0.20				40.754	985.6952
2.027		55	0.0750	1064.25	(109)	0.000016	0.000003	1065.32	-1.0694	0.000013	1.14				78.552	985.6952
3.026		55	0.1080	1099.16	(109)	0.000045	0.000032	1100.74	-1.5865	0.000012	2.52				113.46	985.6952
5.045		55	0.1679	1163.34	(109)	0.000092	0.000083	1165.42	-2.0842	0.000009	4.34				177.641	985.6952
7.494		55	0.2306	1230.75	(109)	0.000139	0.000132	1232.91	-2.1587	0.000006	4.66				245.059	985.6952
10.893		55	0.3035	1307.86	(109)	0.000191	0.000187	1310.12	-2.2605	0.000004	5.11				322.162	985.6952
		60	0.0099	993.60	(66)	-0.000058	-0.000053	993.55	0.0521	-0.000005	0.00					983.1989
		60	0.0100	994.10	(90)	-0.000098	-0.000053	993.65	0.4474	-0.000045	0.20					983.1989
		60	0.0200	1004.34	(3)	-0.000053	-0.000044	1004.14	0.1986	-0.000010	0.04					983.1989
		60	0.0200	1004.50	(90)	-0.000061	-0.000044	1004.14	0.3586	-0.000018	0.13					983.1989
		60	0.0400	1025.11	(3)	-0.000022	-0.000025	1025.22	-0.1062	0.000003	0.01					983.1989
		60	0.0400	1025.40	(90)	-0.000029	-0.000025	1025.22	0.1838	-0.000004	0.03					983.1989
		60	0.0476	1033.20	(66)	-0.000017	-0.000018	1033.26	-0.0560	0.000001	0.00					983.1989
		60	0.0600	1045.92	(3)	0.000001	-0.000007	1046.41	-0.4870	0.000007	0.24					983.1989
		60	0.0800	1066.82	(3)	0.000021	0.000011	1067.70	-0.8764	0.000010	0.77					983.1989
		60	0.0800	1067.60	(90)	0.000012	0.000011	1067.70	-0.0964	0.000001	0.01					983.1989
		60	0.0910	1078.80	(66)	0.000027	0.000021	1079.44	-0.6411	0.000006	0.41					983.1989
		60	0.1000	1087.87	(3)	0.000038	0.000028	1089.07	-1.1963	0.000010	1.43					983.1989
		60	0.1000	1087.50	(54)	0.000042	0.000028	1089.07	-1.5674	0.000013	2.46				104.30	983.1989
		60	0.1200	1109.06	(3)	0.000055	0.000045	1110.50	-1.4375	0.000010	2.07					983.1989
		60	0.1200	1110.10	(90)	0.000048	0.000045	1110.50	-0.3975	0.000003	0.16					983.1989
		60	0.1400	1130.40	(3)	0.000071	0.000062	1131.97	-1.5700	0.000009	2.47					983.1989
		60	0.1600	1151.85	(3)	0.000086	0.000079	1153.46	-1.6130	0.000008	2.60					983.1989
		60	0.1600	1153.10	(90)	0.000080	0.000079	1153.46	-0.3630	0.000002	0.13					983.1989
		60	0.1800	1173.40	(3)	0.000101	0.000095	1174.95	-1.5545	0.000006	2.42					983.1989
		60	0.2000	1195.01	(3)	0.000116	0.000111	1196.42	-1.4122	0.000005	1.99					983.1989
		60	0.2000	1195.00	(54)	0.000116	0.000111	1196.42	-1.4233	0.000005	2.03				211.80	983.1989
		60	0.2000	1196.00	(90)	0.000112	0.000111	1196.42	-0.4222	0.000001	0.18					983.1989

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
		60	0.2026	1195.90	(66)	0.000124	0.000113	1199.21	-3.3100	0.000011	10.96					983.1989
		60	0.2200	1216.62	(3)	0.000130	0.000126	1217.84	-1.2226	0.000004	1.49					983.1989
		60	0.2400	1238.20	(3)	0.000144	0.000142	1239.19	-0.9917	0.000003	0.98					983.1989
		60	0.2400	1238.80	(90)	0.000143	0.000142	1239.19	-0.3917	0.000001	0.15					983.1989
		60	0.2600	1259.65	(3)	0.000159	0.000157	1260.44	-0.7949	0.000002	0.63					983.1989
		60	0.2800	1280.93	(3)	0.000173	0.000171	1281.58	-0.6467	0.000001	0.42					983.1989
		60	0.2800	1281.40	(90)	0.000172	0.000171	1281.58	-0.1767	0.000000	0.03					983.1989
		60	0.3000	1301.92	(3)	0.000187	0.000186	1302.56	-0.6413	0.000001	0.41					983.1989
		60	0.3000	1301.10	(54)	0.000189	0.000186	1302.56	-1.4625	0.000003	2.14				317.90	983.1989
		60	0.3200	1322.53	(3)	0.000202	0.000200	1323.37	-0.8425	0.000002	0.71					983.1989
		60	0.3200	1323.20	(90)	0.000200	0.000200	1323.37	-0.1725	0.000000	0.03					983.1989
		60	0.3298	1329.50	(66)	0.000214	0.000207	1333.50	-3.9986	0.000007	15.99					983.1989
		60	0.3400	1342.26	(3)	0.000217	0.000214	1343.98	-1.7236	0.000003	2.97					983.1989
		60	0.3600	1362.16	(3)	0.000231	0.000228	1364.37	-2.2075	0.000003	4.87					983.1989
		60	0.3600	1363.40	(90)	0.000229	0.000228	1364.37	-0.9675	0.000001	0.94					983.1989
		60	0.3800	1380.89	(3)	0.000246	0.000241	1384.50	-3.6070	0.000005	13.01					983.1989
		60	0.4000	1400.78	(3)	0.000259	0.000255	1404.34	-3.5649	0.000005	12.71					983.1989
		60	0.4000	1402.10	(54)	0.000257	0.000255	1404.34	-2.2460	0.000003	5.04				418.90	983.1989
		60	0.4000	1402.70	(90)	0.000257	0.000255	1404.34	-1.6449	0.000002	2.71					983.1989
		60	0.4200	1421.38	(3)	0.000271	0.000268	1423.88	-2.5038	0.000003	6.27					983.1989
		60	0.4400	1441.32	(3)	0.000282	0.000280	1443.09	-1.7665	0.000002	3.12					983.1989
		60	0.4400	1440.50	(90)	0.000283	0.000280	1443.09	-2.5865	0.000003	6.69					983.1989
		60	0.4600	1460.70	(3)	0.000294	0.000293	1461.93	-1.2260	0.000001	1.50					983.1989
		60	0.4800	1478.64	(3)	0.000307	0.000305	1480.38	-1.7356	0.000002	3.01					983.1989
		60	0.4800	1478.10	(90)	0.000308	0.000305	1480.38	-2.2756	0.000002	5.18					983.1989
		60	0.4896	1497.30	(66)	0.000304	0.000311	1489.09	8.2149	-0.000008	67.48					983.1989
		60	0.5000	1495.61	(3)	0.000320	0.000318	1498.41	-2.7988	0.000002	7.83					983.1989
		60	0.5000	1495.20	(54)	0.000321	0.000318	1498.41	-3.2100	0.000003	10.30				512.00	983.1989
		60	0.5000	1496.70	(90)	0.000319	0.000318	1498.41	-1.7088	0.000002	2.92					983.1989
		60	0.5200	1511.16	(3)	0.000334	0.000330	1516.00	-4.8401	0.000004	23.43					983.1989
		60	0.6000	1578.60	(54)	0.000378	0.000376	1581.45	-2.8550	0.000002	8.15				595.40	983.1989
0.07496		65	0.0030	983.65	(81)	-0.000053	-0.000056	983.66	-0.0088	0.000003	0.00			-2.12		980.5548
0.10003		65	0.0040	984.75	(81)	-0.000070	-0.000055	984.69	0.0576	-0.000015	0.00			-2.8		980.5548
0.15009		65	0.0060	986.93	(81)	-0.000084	-0.000053	986.75	0.1773	-0.000031	0.03			-3.35		980.5548
0.30073		65	0.0119	993.09	(81)	-0.000063	-0.000048	992.91	0.1816	-0.000015	0.03			-2.527		980.5548
0.50002		65	0.0196	1001.05	(81)	-0.000045	-0.000040	1000.96	0.0883	-0.000004	0.01			-1.799		980.5548
		70	0.0200	998.76	(3)	-0.000052	-0.000037	998.46	0.3039	-0.000015	0.09					977.7696
		70	0.0400	1019.39	(3)	-0.000021	-0.000019	1019.28	0.1116	-0.000003	0.01					977.7696
		70	0.0600	1040.06	(3)	0.000002	-0.000001	1040.22	-0.1614	0.000002	0.03					977.7696
		70	0.0800	1060.85	(3)	0.000022	0.000017	1061.27	-0.4191	0.000005	0.18					977.7696
		70	0.1000	1081.79	(3)	0.000039	0.000034	1082.40	-0.6143	0.000005	0.38					977.7696
		70	0.1000	1081.87	(54)	0.000039	0.000034	1082.40	-0.5347	0.000005	0.29				104.10	977.7696
		70	0.1200	1102.89	(3)	0.000056	0.000051	1103.61	-0.7194	0.000005	0.52					977.7696
		70	0.1400	1124.16	(3)	0.000071	0.000067	1124.87	-0.7055	0.000004	0.50					977.7696

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
		70	0.1600	1145.55	(3)	0.000087	0.000084	1146.15	-0.6033	0.000003	0.36					977.7696
		70	0.1800	1167.06	(3)	0.000101	0.000100	1167.45	-0.3924	0.000002	0.15					977.7696
		70	0.2000	1188.66	(3)	0.000115	0.000115	1188.74	-0.0817	0.000000	0.01					977.7696
		70	0.2000	1189.27	(54)	0.000113	0.000115	1188.74	0.5279	-0.000002	0.28				211.50	977.7696
		70	0.2200	1210.29	(3)	0.000130	0.000131	1210.00	0.2906	-0.000001	0.08					977.7696
		70	0.2400	1231.89	(3)	0.000144	0.000146	1231.20	0.6871	-0.000002	0.47					977.7696
		70	0.2600	1253.42	(3)	0.000158	0.000160	1252.33	1.0909	-0.000003	1.19					977.7696
		70	0.2800	1274.79	(3)	0.000172	0.000175	1273.35	1.4359	-0.000003	2.06					977.7696
		70	0.3000	1295.92	(3)	0.000186	0.000189	1294.25	1.6663	-0.000003	2.78					977.7696
		70	0.3000	1294.97	(54)	0.000188	0.000189	1294.25	0.7159	-0.000001	0.51				317.20	977.7696
		70	0.3200	1316.72	(3)	0.000200	0.000203	1315.00	1.7170	-0.000003	2.95					977.7696
		70	0.3400	1337.05	(3)	0.000214	0.000217	1335.58	1.4732	-0.000002	2.17					977.7696
		70	0.3600	1356.82	(3)	0.000229	0.000230	1355.95	0.8705	-0.000001	0.76					977.7696
		70	0.3800	1375.87	(3)	0.000244	0.000244	1376.10	-0.2253	0.000000	0.05					977.7696
		70	0.4000	1394.03	(3)	0.000259	0.000257	1395.99	-1.9584	0.000003	3.84					977.7696
		70	0.4000	1395.37	(54)	0.000258	0.000257	1395.99	-0.6188	0.000001	0.38				417.60	977.7696
		70	0.4200	1413.18	(3)	0.000272	0.000270	1415.60	-2.4226	0.000003	5.87					977.7696
		70	0.4400	1433.36	(3)	0.000284	0.000282	1434.91	-1.5518	0.000002	2.41					977.7696
		70	0.4600	1452.84	(3)	0.000296	0.000295	1453.89	-1.0502	0.000001	1.10					977.7696
		70	0.4800	1471.37	(3)	0.000308	0.000307	1472.51	-1.1421	0.000001	1.30					977.7696
		70	0.5000	1488.82	(3)	0.000321	0.000319	1490.75	-1.9319	0.000002	3.73					977.7696
		70	0.5000	1488.17	(54)	0.000321	0.000319	1490.75	-2.5823	0.000002	6.67				510.40	977.7696
		70	0.5200	1504.92	(3)	0.000334	0.000331	1508.58	-3.6648	0.000003	13.43					977.7696
		70	0.6000	1572.17	(54)	0.000378	0.000376	1575.37	-3.1963	0.000002	10.22				594.40	977.7696
		70	0.7000	1647.57	(54)	0.000429	0.000429	1646.97	0.6007	0.000000	0.36				669.80	977.7696
0.07496		75	0.0030	977.93	(81)	-0.000054	-0.000049	977.91	0.0141	-0.000005	0.00			-2.16		974.849
0.10003		75	0.0040	979.06	(81)	-0.000081	-0.000048	978.93	0.1236	-0.000032	0.02			-3.22		974.849
0.15009		75	0.0060	981.21	(81)	-0.000089	-0.000046	980.97	0.2467	-0.000043	0.06			-3.57		974.849
0.30073		75	0.0119	987.34	(81)	-0.000066	-0.000041	987.05	0.2947	-0.000025	0.09			-2.651		974.849
0.50002		75	0.0196	995.28	(81)	-0.000048	-0.000034	995.00	0.2806	-0.000014	0.08			-1.928		974.849
		80	0.0005	972.30	(66)	-0.000034	-0.000048	972.31	-0.0066	0.000014	0.00					971.7978
		80	0.0099	982.20	(66)	-0.000072	-0.000039	981.89	0.3103	-0.000033	0.10					971.7978
		80	0.0100	982.40	(90)	-0.000082	-0.000039	981.99	0.4082	-0.000042	0.17					971.7978
		80	0.0200	992.90	(90)	-0.000064	-0.000030	992.22	0.6775	-0.000034	0.46					971.7978
		80	0.0400	1013.90	(90)	-0.000039	-0.000012	1012.79	1.1127	-0.000027	1.24					971.7978
		80	0.0476	1021.80	(66)	-0.000029	-0.000005	1020.64	1.1643	-0.000023	1.36					971.7978
		80	0.0800	1056.00	(90)	0.000003	0.000023	1054.28	1.7201	-0.000019	2.96					971.7978
		80	0.0910	1067.40	(66)	0.000016	0.000032	1065.76	1.6374	-0.000016	2.68					971.7978
		80	0.1000	1076.10	(54)	0.000032	0.000040	1075.18	0.9206	-0.000008	0.85				104.30	971.7978
		80	0.1200	1098.30	(90)	0.000041	0.000056	1096.15	2.1466	-0.000015	4.61					971.7978
		80	0.1600	1140.80	(90)	0.000076	0.000088	1138.27	2.5276	-0.000012	6.39					971.7978
		80	0.2000	1183.40	(54)	0.000109	0.000119	1180.49	2.9084	-0.000010	8.46				211.60	971.7978
		80	0.2000	1183.30	(90)	0.000109	0.000119	1180.49	2.8107	-0.000010	7.90					971.7978
		80	0.2026	1184.50	(66)	0.000117	0.000121	1183.23	1.2669	-0.000004	1.61					971.7978

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
		80	0.2400	1225.90	(90)	0.000140	0.000149	1222.64	3.2556	-0.000009	10.60					971.7978
		80	0.2800	1268.20	(90)	0.000170	0.000178	1264.57	3.6329	-0.000008	13.20					971.7978
		80	0.3000	1288.80	(54)	0.000185	0.000192	1285.39	3.4124	-0.000007	11.64				317.00	971.7978
		80	0.3200	1309.70	(90)	0.000199	0.000206	1306.08	3.6225	-0.000007	13.12					971.7978
		80	0.3298	1318.10	(66)	0.000209	0.000213	1316.16	1.9367	-0.000003	3.75					971.7978
		80	0.3600	1349.80	(90)	0.000229	0.000233	1346.99	2.8124	-0.000004	7.91					971.7978
		80	0.4000	1388.70	(54)	0.000257	0.000259	1387.10	1.5939	-0.000002	2.54				416.90	971.7978
		80	0.4000	1388.90	(90)	0.000256	0.000259	1387.10	1.7961	-0.000002	3.23					971.7978
		80	0.4400	1426.60	(90)	0.000283	0.000284	1426.23	0.3709	0.000000	0.14					971.7978
		80	0.4800	1464.10	(90)	0.000308	0.000308	1464.17	-0.0651	0.000000	0.00					971.7978
		80	0.5000	1481.30	(54)	0.000321	0.000320	1482.63	-1.3279	0.000001	1.76				509.50	971.7978
		80	0.5000	1482.70	(90)	0.000320	0.000320	1482.63	0.0744	0.000000	0.01					971.7978
		80	0.6000	1566.00	(54)	0.000378	0.000376	1568.90	-2.9025	0.000002	8.42				594.20	971.7978
		80	0.7000	1643.70	(54)	0.000428	0.000428	1643.12	0.5797	0.000000	0.34				671.90	971.7978
0.07496		85	0.0030	971.75	(81)	-0.000082	-0.000042	971.64	0.1108	-0.000039	0.01			-3.26		968.6203
0.10003		85	0.0040	972.83	(81)	-0.000088	-0.000041	972.65	0.1741	-0.000046	0.03			-3.5		968.6203
0.15009		85	0.0060	975.02	(81)	-0.000103	-0.000040	974.66	0.3585	-0.000063	0.13			-4.11		968.6203
0.30073		85	0.0119	981.14	(81)	-0.000076	-0.000034	980.66	0.4786	-0.000042	0.23			-3.04		968.6203
0.50002		85	0.0196	989.05	(81)	-0.000055	-0.000027	988.51	0.5339	-0.000028	0.29			-2.201		968.6203
		90	0.1000	1070.12	(54)	0.000021	0.000045	1067.43	2.6935	-0.000024	7.25				104.80	965.3201
		90	0.2000	1177.42	(54)	0.000103	0.000124	1171.71	5.7107	-0.000021	32.61				212.10	965.3201
		90	0.3000	1282.52	(54)	0.000182	0.000195	1276.00	6.5193	-0.000013	42.50				317.20	965.3201
		90	0.4000	1382.02	(54)	0.000255	0.000261	1377.73	4.2880	-0.000006	18.39				416.70	965.3201
		90	0.5000	1474.42	(54)	0.000321	0.000321	1474.06	0.3562	0.000000	0.13				509.10	965.3201
		90	0.6000	1559.82	(54)	0.000378	0.000376	1562.08	-2.2613	0.000002	5.11				594.50	965.3201
		90	0.7000	1639.72	(54)	0.000427	0.000428	1639.04	0.6829	0.000000	0.47				674.40	965.3201
0.07496		95	0.0030	965.04	(81)	-0.000093	-0.000036	964.88	0.1598	-0.000057	0.03			-3.72		961.9004
0.10003		95	0.0040	966.13	(81)	-0.000104	-0.000035	965.88	0.2568	-0.000069	0.07			-4.15		961.9004
0.15009		95	0.0060	968.33	(81)	-0.000118	-0.000033	967.86	0.4745	-0.000085	0.23			-4.71		961.9004
0.30073		95	0.0119	974.49	(81)	-0.000091	-0.000028	973.78	0.7121	-0.000063	0.51			-3.63		961.9004
0.50002		95	0.0196	982.41	(81)	-0.000067	-0.000021	981.53	0.8773	-0.000046	0.77			-2.686		961.9004
		100	0.0099	968.70	(66)	-0.000081	-0.000026	968.19	0.5109	-0.000055	0.26					958.3637
		100	0.0100	969.30	(90)	-0.000134	-0.000026	968.29	1.0115	-0.000108	1.02					958.3637
		100	0.0200	979.70	(90)	-0.000093	-0.000017	978.25	1.4478	-0.000076	2.10					958.3637
		100	0.0400	1000.90	(90)	-0.000065	0.000000	998.29	2.6095	-0.000065	6.81					958.3637
		100	0.0476	1008.40	(66)	-0.000044	0.000007	1005.94	2.4580	-0.000051	6.04					958.3637
		100	0.0800	1043.20	(90)	-0.000017	0.000034	1038.77	4.4312	-0.000051	19.64					958.3637
		100	0.0910	1053.90	(66)	0.000004	0.000043	1049.98	3.9163	-0.000039	15.34					958.3637
		100	0.1000	1063.76	(54)	0.000010	0.000050	1059.18	4.5804	-0.000041	20.98				105.40	958.3637
		100	0.1200	1085.50	(90)	0.000025	0.000066	1079.70	5.8036	-0.000041	33.68					958.3637
		100	0.1600	1127.70	(90)	0.000064	0.000097	1120.96	6.7402	-0.000033	45.43					958.3637
		100	0.2000	1171.16	(54)	0.000095	0.000128	1162.43	8.7292	-0.000032	76.20				212.80	958.3637
		100	0.2000	1170.00	(90)	0.000100	0.000128	1162.43	7.5656	-0.000028	57.24					958.3637
		100	0.2026	1171.10	(66)	0.000108	0.000129	1165.13	5.9656	-0.000022	35.59					958.3637

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
		100	0.2400	1212.40	(90)	0.000132	0.000156	1203.98	8.4152	-0.000024	70.82					958.3637
		100	0.2800	1254.60	(90)	0.000164	0.000184	1245.47	9.1345	-0.000021	83.44					958.3637
		100	0.3000	1275.96	(54)	0.000178	0.000198	1266.13	9.8321	-0.000020	96.67				317.60	958.3637
		100	0.3200	1296.00	(90)	0.000194	0.000211	1286.72	9.2785	-0.000017	86.09					958.3637
		100	0.3298	1304.50	(66)	0.000204	0.000218	1296.78	7.7235	-0.000014	59.65					958.3637
		100	0.3600	1336.00	(90)	0.000224	0.000237	1327.59	8.4101	-0.000013	70.73					958.3637
		100	0.4000	1375.16	(54)	0.000253	0.000262	1367.90	7.2624	-0.000010	52.74				416.80	958.3637
		100	0.4000	1375.00	(90)	0.000253	0.000262	1367.90	7.0988	-0.000009	50.39					958.3637
		100	0.4400	1412.70	(90)	0.000281	0.000287	1407.48	5.2193	-0.000006	27.24					958.3637
		100	0.4800	1450.30	(90)	0.000306	0.000310	1446.15	4.1495	-0.000004	17.22					958.3637
		100	0.5000	1467.56	(54)	0.000319	0.000322	1465.09	2.4753	-0.000002	6.13				509.20	958.3637
		100	0.5000	1469.00	(90)	0.000318	0.000322	1465.09	3.9116	-0.000004	15.30					958.3637
		100	0.6000	1553.56	(54)	0.000377	0.000376	1554.92	-1.3590	0.000001	1.85				595.20	958.3637
		100	0.7000	1635.46	(54)	0.000426	0.000427	1634.73	0.7321	0.000000	0.54				677.10	958.3637
		110	0.1000	1057.05	(54)	-0.000004	0.000055	1050.47	6.5788	-0.000059	43.28				106.10	950.9471
		110	0.4000	1368.25	(54)	0.000250	0.000264	1357.63	10.6189	-0.000014	112.76				417.30	950.9471
		110	0.5000	1460.55	(54)	0.000318	0.000322	1455.71	4.8368	-0.000005	23.39				509.60	950.9471
		110	0.6000	1547.25	(54)	0.000376	0.000376	1547.43	-0.1809	0.000000	0.03				596.30	950.9471
		110	0.7000	1630.95	(54)	0.000425	0.000426	1630.20	0.7494	0.000000	0.56				680.00	950.9471
		120	0.0099	953.80	(66)	-0.000143	-0.000014	952.64	1.1649	-0.000130	1.36		!			943.0825
		120	0.0476	993.40	(66)	-0.000068	0.000018	989.37	4.0261	-0.000086	16.21					943.0825
		120	0.0910	1039.00	(66)	-0.000015	0.000053	1032.31	6.6865	-0.000069	44.71					943.0825
		120	0.1000	1050.08	(54)	-0.000020	0.000060	1041.30	8.7870	-0.000080	77.21				107.00	943.0825
		120	0.2026	1156.10	(66)	0.000096	0.000137	1145.14	10.9644	-0.000041	120.22					943.0825
		120	0.5000	1453.68	(54)	0.000315	0.000323	1445.93	7.7504	-0.000007	60.07				510.60	943.0825
		120	0.6000	1540.98	(54)	0.000375	0.000376	1539.59	1.3891	-0.000001	1.93				597.90	943.0825
		120	0.7000	1626.28	(54)	0.000424	0.000424	1625.43	0.8567	0.000000	0.73				683.20	943.0825
							Average Res	0.1722	-0.000011		4606.511	Sum Chi	sqr			
							Std dev Res	2.7159	0.000027							
							Avg - 4std	-10.6915	-0.000117							
							Avg + 4std	11.0359	0.000095							

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	385.5529
c1	753.4695
c2	-0.10938
c3	0.000695
c4	542.8812
Min T	0
Max T	120
Min w	0.0005
Max w	0.7000
Avg dens res	0.172197
Std dens res	2.715928

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
Avg app vol res *10^3		-0.01094														
Std app vol res *10^3		0.026593														
No of points in corr		623														
No of inconsistent pair		12														
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)																
		20	0.2026	1210.90	(66)	0.000133	0.000094	1222.72	-11.8237	0.000039	139.80	!				998.2041
		20	0.3298	1344.50	(66)	0.000219	0.000194	1359.93	-15.4308	0.000026	238.11	!				998.2041
		40	0.0005	990.00	(66)	0.005519	-0.000077	992.75	-2.7499	0.005596	7.56		!			992.2158
		80	0.4896	1485.90	(66)	0.000302	0.000314	1473.07	12.8291	-0.000012	164.59	!				971.7978
		100	0.4896	1472.50	(66)	0.000299	0.000316	1455.28	17.2240	-0.000016	296.66	!				958.3637
		110	0.3000	1269.25	(54)	0.000173	0.000201	1255.80	13.4488	-0.000028	180.87	!			318.30	950.9471
		110	0.2000	1164.75	(54)	0.000086	0.000131	1152.69	12.0608	-0.000045	145.46	!			213.80	950.9471
		120	0.4896	1457.50	(66)	0.000296	0.000317	1435.84	21.6587	-0.000021	469.10	!				943.0825
		120	0.3298	1289.70	(66)	0.000196	0.000222	1275.55	14.1549	-0.000026	200.36	!				943.0825
		120	0.4000	1361.18	(54)	0.000246	0.000266	1346.92	14.2615	-0.000019	203.39	!			418.10	943.0825
		120	0.2000	1157.98	(54)	0.000076	0.000135	1142.48	15.5036	-0.000059	240.36	!			214.90	943.0825
		120	0.3000	1262.38	(54)	0.000166	0.000203	1245.01	17.3694	-0.000037	301.70	!			319.30	943.0825

Density of aqueous solutions of **Na3PO4**References (122) Sohnel, P.; Novotny, P.; Solc, Z.; Densities of aqueous solutions of 18 inorganic substances, *J Chem Eng Data*, **1984**, 29, 379-382

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		40	0.0500	1047.3	(122)	-0.000052	-0.000058	1047.6	-0.3156	0.000006	0.100			992.2158
		40	0.1000	1106.1	(122)	-0.000030	-0.000027	1105.8	0.3377	-0.000003	0.114			992.2158
		40	0.1500	1166.5	(122)	0.000004	0.000002	1166.9	-0.3890	0.000002	0.151			992.2158
		60	0.0500	1037.7	(122)	-0.000051	-0.000056	1038.0	-0.2507	0.000005	0.063			983.1989
		60	0.1000	1095.5	(122)	-0.000026	-0.000025	1095.5	0.0351	0.000000	0.001			983.1989
		60	0.1500	1155.4	(122)	0.000007	0.000004	1156.0	-0.5846	0.000003	0.342			983.1989
		60	0.2000	1221.5	(122)	0.000025	0.000031	1219.8	1.7187	-0.000006	2.954			983.1989
		60	0.2500	1286.5	(122)	0.000058	0.000056	1287.2	-0.6596	0.000002	0.435			983.1989
		80	0.0500	1025.5	(122)	-0.000049	-0.000054	1025.8	-0.2665	0.000005	0.071			971.7978
		80	0.1000	1083.1	(122)	-0.000028	-0.000023	1082.5	0.5850	-0.000005	0.342			971.7978
		80	0.1500	1141.6	(122)	0.000009	0.000005	1142.3	-0.6975	0.000004	0.487			971.7978
		80	0.2000	1206.5	(122)	0.000028	0.000032	1205.4	1.1004	-0.000004	1.211			971.7978
		80	0.2500	1270.6	(122)	0.000061	0.000057	1272.1	-1.5427	0.000004	2.380			971.7978
		80	0.3000	1343.5	(122)	0.000080	0.000081	1342.9	0.6100	-0.000001	0.372			971.7978
Average Res									-0.0228	0.000001	9.022	Sum chi sq		
Std dev Res									0.8328	0.000004				
Avg - 4std									-3.3538	-0.000015				
Avg + 4std									3.3082	0.000016				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	1015.629
c1	1533.695
c2	-0.151804
c3	0.000137
c4	173.7046
Min T	40
Max T	80
Min w	0.0500
Max w	0.3000
Avg dens res	-0.0228
Std dens res	0.8328
Avg app vol res *10 ³	0.000754
Std app vol res *10 ³	0.003882
No of points in corr	14
No of inconsistent pair	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **Na2SO3**

- References (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.
 (122) Sohnel, P.; Novotny, P.; Solc, Z.; Densities of aqueous solutions of 18 inorganic substances, *J Chem Eng Data*, **1984**, 29, 379-382
 (131) Vázquez, G.; Alvarez, E.; Cancela, A.; Navaza, J. M.; Density, Viscosity, and Surface Tension of Aqueous Solutions of Sodium Sulfite and Sodium Sulfite + Sucrose from 25 to 40 °C.; *J. Chem. Eng. Data*, **1995**, 40, 1101-1105

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		19	0.0100	1007.8	(90)	0.000068	0.000269	1005.8	2.0384	-0.000201	4.155			998.4052
		19	0.0200	1017.2	(90)	0.000076	0.000239	1013.8	3.3637	-0.000163	11.315			998.4052
		19	0.0400	1036.3	(90)	0.000086	0.000206	1031.2	5.1280	-0.000120	26.296			998.4052
		19	0.0800	1075.1	(90)	0.000108	0.000176	1068.9	6.2027	-0.000067	38.473			998.4052
		19	0.1200	1114.6	(90)	0.000131	0.000162	1110.1	4.5403	-0.000031	20.614			998.4052
		19	0.1600	1154.9	(90)	0.000153	0.000154	1154.7	0.1550	-0.000001	0.024			998.4052
		19	0.1800	1175.5	(90)	0.000163	0.000151	1178.5	-3.0104	0.000012	9.063			998.4052
	0.1	25	0.0125	1007.2	(131)	0.000195	0.000245	1006.6	0.6418	-0.000051	0.412			997.0449
	0.2	25	0.0248	1015.8	(131)	0.000257	0.000219	1016.8	-0.9612	0.000038	0.924			997.0449
	0.3	25	0.0369	1025.3	(131)	0.000254	0.000203	1027.3	-1.9588	0.000050	3.837			997.0449
	0.4	25	0.0487	1035.0	(131)	0.000248	0.000192	1037.9	-2.9198	0.000056	8.525			997.0449
		25	0.0500	1044.6	(122)	0.000090	0.000191	1039.1	5.4999	-0.000101	30.249			997.0449
	0.5	25	0.0603	1044.7	(131)	0.000245	0.000184	1048.7	-3.9900	0.000060	15.920			997.0449
		25	0.1000	1092.8	(122)	0.000124	0.000168	1087.6	5.1965	-0.000044	27.004			997.0449
		25	0.1500	1143.3	(122)	0.000148	0.000158	1141.3	1.9555	-0.000010	3.824			997.0449
		25	0.2000	1198.2	(122)	0.000161	0.000152	1200.9	-2.6585	0.000009	7.068			997.0449
	0.1	30	0.0125	1006.0	(131)	0.000179	0.000231	1005.3	0.6577	-0.000052	0.433			995.6473
	0.2	30	0.0248	1014.6	(131)	0.000249	0.000210	1015.6	-1.0122	0.000040	1.025			995.6473
	0.3	30	0.0369	1023.9	(131)	0.000254	0.000196	1026.1	-2.2330	0.000058	4.986			995.6473
	0.4	30	0.0488	1033.7	(131)	0.000246	0.000187	1036.8	-3.0823	0.000059	9.501			995.6473
	0.5	30	0.0604	1043.4	(131)	0.000243	0.000181	1047.5	-4.1277	0.000063	17.038			995.6473
	0.1	35	0.0125	1004.5	(131)	0.000170	0.000215	1003.9	0.5676	-0.000045	0.322			994.0319
	0.2	35	0.0249	1012.8	(131)	0.000257	0.000199	1014.3	-1.4879	0.000058	2.214			994.0319
	0.3	35	0.0370	1022.3	(131)	0.000254	0.000189	1024.8	-2.5300	0.000065	6.401			994.0319
	0.4	35	0.0489	1032.0	(131)	0.000248	0.000182	1035.5	-3.4798	0.000067	12.109			994.0319
	0.5	35	0.0605	1041.7	(131)	0.000245	0.000177	1046.2	-4.5050	0.000068	20.295			994.0319
	0.1	40	0.0126	1002.7	(131)	0.000170	0.000197	1002.3	0.3529	-0.000028	0.125			992.2158
	0.2	40	0.0249	1011.0	(131)	0.000257	0.000187	1012.8	-1.7951	0.000070	3.222			992.2158
	0.3	40	0.0371	1020.5	(131)	0.000254	0.000180	1023.4	-2.8694	0.000074	8.234			992.2158
	0.4	40	0.0489	1030.1	(131)	0.000251	0.000175	1034.0	-3.9241	0.000075	15.399			992.2158
		40	0.0500	1039.4	(122)	0.000093	0.000175	1035.0	4.4164	-0.000082	19.504			992.2158
	0.5	40	0.0606	1039.9	(131)	0.000245	0.000172	1044.7	-4.8263	0.000073	23.293			992.2158
		40	0.1000	1086.8	(122)	0.000131	0.000165	1082.7	4.0637	-0.000035	16.514			992.2158
		40	0.1500	1137.1	(122)	0.000152	0.000161	1135.3	1.7907	-0.000009	3.207			992.2158
		40	0.2000	1191.2	(122)	0.000166	0.000159	1193.3	-2.1246	0.000007	4.514			992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		60	0.0500	1029.9	(122)	0.000095	0.000140	1027.5	2.3726	-0.000045	5.629			983.1989
		60	0.1000	1077.4	(122)	0.000128	0.000155	1074.3	3.1409	-0.000027	9.866			983.1989
		60	0.1500	1126.9	(122)	0.000152	0.000162	1125.1	1.7706	-0.000009	3.135			983.1989
		60	0.2000	1179.6	(122)	0.000170	0.000166	1180.9	-1.3378	0.000005	1.790			983.1989
		80	0.0500	1017.4	(122)	0.000107	0.000084	1018.6	-1.1879	0.000023	1.411			971.7978
		80	0.1000	1065.3	(122)	0.000126	0.000134	1064.3	0.9530	-0.000008	0.908			971.7978
		80	0.1500	1113.7	(122)	0.000155	0.000157	1113.4	0.3006	-0.000002	0.090			971.7978
		80	0.2000	1166.6	(122)	0.000170	0.000169	1166.8	-0.2091	0.000001	0.044			971.7978
Average Res									-0.0261	-0.000002	398.910	Sum Chi sqr		
Std dev Res									3.0817	0.000065				
Avg - 4std									-12.35309	-0.000264				
Avg + 4std									12.30088	0.000260				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	1.52E-05
c1	4.38E-07
c2	0.102961
c3	-0.001527
c4	-4500.85
Min T	19
Max T	80
Min w	0.0100
Max w	0.2000
Avg dens res	-0.0261
Std dens res	3.0817
Avg app vol res *10 ³	-0.002302
Std app vol res *10 ³	0.065464
No of points in corr	43
No of inconsistent poir	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **Na2S2O3**

- References (78) Olofsson, I. V.; Spitzer, J. J.; Hepler, L. G. Apparent Molar Heat Capacities and Volumes of Aqueous Electrolytes at 25°C: Na₂SO₄, K₂SO₄, Na₂S₂O₃, Na₂S₂O₈, K₂S₂O₈, K₂CrO₄, Na₂MoO₄, and Na₂WO₄. *Can. J. Chem.* **1978**, *56*, 1871-1873
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (122) Sohnel, P.; Novotny, P.; Solc, Z.; Densities of aqueous solutions of 18 inorganic substances, *J Chem Eng Data*, **1984**, *29*, 379-382

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
		20	0.0100	1006.5	(90)	0.000176	0.000238	1005.9	0.6247	-0.000062	0.390				998.2041
		20	0.0200	1014.8	(90)	0.000183	0.000239	1013.6	1.1610	-0.000056	1.348				998.2041
		20	0.0400	1031.5	(90)	0.000193	0.000242	1029.4	2.0517	-0.000048	4.209				998.2041
		20	0.0800	1065.4	(90)	0.000212	0.000247	1062.2	3.1752	-0.000035	10.082				998.2041
		20	0.1200	1100.3	(90)	0.000227	0.000253	1096.6	3.6990	-0.000026	13.683				998.2041
		20	0.1600	1136.5	(90)	0.000240	0.000259	1132.6	3.8603	-0.000019	14.902				998.2041
		20	0.2000	1174.0	(90)	0.000252	0.000265	1170.4	3.6036	-0.000013	12.986				998.2041
		20	0.2400	1212.8	(90)	0.000263	0.000271	1209.9	2.8848	-0.000008	8.322				998.2041
		20	0.2800	1253.2	(90)	0.000274	0.000278	1251.2	1.9759	-0.000005	3.904				998.2041
		20	0.3000	1273.9	(90)	0.000279	0.000282	1272.6	1.3474	-0.000003	1.816				998.2041
		20	0.3500	1327.3	(90)	0.000292	0.000291	1327.8	-0.5215	0.000001	0.272				998.2041
		20	0.4000	1382.7	(90)	0.000305	0.000301	1385.8	-3.0837	0.000004	9.509				998.2041
0.02533		25	0.0040	1000.34	(78)	0.000175	0.000239	1000.1	0.2554	-0.000064	0.065			27.7	997.0449
0.03377		25	0.0053	1001.42	(78)	0.000178	0.000239	1001.1	0.3269	-0.000061	0.107			28.14	997.0449
0.04406		25	0.0069	1002.73	(78)	0.000182	0.000240	1002.3	0.4032	-0.000058	0.163			28.71	997.0449
0.05071		25	0.0080	1003.59	(78)	0.000181	0.000240	1003.1	0.4700	-0.000059	0.221			28.62	997.0449
0.05192		25	0.0081	1003.75	(78)	0.000180	0.000240	1003.3	0.4856	-0.000059	0.236			28.54	997.0449
0.06768		25	0.0106	1005.74	(78)	0.000184	0.000240	1005.1	0.6000	-0.000056	0.360			29.09	997.0449
0.06933		25	0.0108	1005.95	(78)	0.000185	0.000240	1005.3	0.6088	-0.000056	0.371			29.18	997.0449
0.07364		25	0.0115	1006.48	(78)	0.000186	0.000240	1005.9	0.6317	-0.000054	0.399			29.4	997.0449
0.08479		25	0.0132	1007.91	(78)	0.000186	0.000240	1007.2	0.7301	-0.000054	0.533			29.41	997.0449
0.08802		25	0.0137	1008.33	(78)	0.000185	0.000240	1007.6	0.7670	-0.000055	0.588			29.32	997.0449
0.10419		25	0.0162	1010.35	(78)	0.000188	0.000241	1009.5	0.8664	-0.000052	0.751			29.78	997.0449
0.1227		25	0.0190	1012.68	(78)	0.000190	0.000241	1011.7	1.0044	-0.000052	1.009			29.98	997.0449
0.13913		25	0.0215	1014.69	(78)	0.000193	0.000241	1013.6	1.0790	-0.000049	1.164			30.47	997.0449
0.14701		25	0.0227	1015.70	(78)	0.000192	0.000242	1014.5	1.1549	-0.000049	1.334			30.4	997.0449
0.14725		25	0.0228	1015.74	(78)	0.000192	0.000242	1014.6	1.1703	-0.000050	1.370			30.31	997.0449
0.17441		25	0.0268	1019.06	(78)	0.000196	0.000242	1017.8	1.2931	-0.000046	1.672			30.94	997.0449
0.24627		25	0.0375	1027.91	(78)	0.000199	0.000244	1026.2	1.7445	-0.000044	3.043			31.53	997.0449
		25	0.1000	1081.2	(122)	0.000222	0.000252	1077.7	3.4708	-0.000030	12.047				997.0449
		25	0.2000	1172.1	(122)	0.000254	0.000267	1168.5	3.6223	-0.000013	13.121				997.0449
		25	0.3000	1270.4	(122)	0.000284	0.000284	1270.0	0.3718	-0.000001	0.138				997.0449
		25	0.4000	1379.5	(122)	0.000308	0.000304	1382.4	-2.9215	0.000004	8.535				997.0449
		40	0.1000	1074.5	(122)	0.000236	0.000258	1072.0	2.5075	-0.000022	6.288				992.2158
		40	0.2000	1164.2	(122)	0.000263	0.000273	1161.5	2.6527	-0.000010	7.037				992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
		40	0.3000	1261.5	(122)	0.000291	0.000291	1261.5	-0.0125	0.000000	0.000				992.2158
		40	0.4000	1370.2	(122)	0.000313	0.000311	1371.8	-1.5887	0.000002	2.524				992.2158
		40	0.5000	1487.0	(122)	0.000337	0.000334	1490.8	-3.7745	0.000003	14.247				992.2158
		60	0.1000	1063.3	(122)	0.000251	0.000263	1062.0	1.3217	-0.000012	1.747				983.1989
		60	0.2000	1152.1	(122)	0.000272	0.000278	1150.3	1.7597	-0.000007	3.097				983.1989
		60	0.3000	1248.9	(122)	0.000296	0.000296	1248.9	0.0279	0.000000	0.001				983.1989
		60	0.4000	1355.9	(122)	0.000318	0.000316	1357.4	-1.5248	0.000002	2.325				983.1989
		60	0.5000	1473.5	(122)	0.000340	0.000339	1474.4	-0.8523	0.000001	0.726				983.1989
		60	0.6000	1599.2	(122)	0.000364	0.000367	1595.3	3.9414	-0.000003	15.535				983.1989
		80	0.1000	1051.7	(122)	0.000247	0.000263	1049.9	1.7585	-0.000016	3.092				971.7978
		80	0.2000	1138.7	(122)	0.000275	0.000279	1137.7	0.9754	-0.000004	0.951				971.7978
		80	0.3000	1235.3	(122)	0.000297	0.000296	1235.8	-0.5135	0.000001	0.264				971.7978
		80	0.4000	1341.8	(122)	0.000320	0.000316	1344.2	-2.3860	0.000003	5.693				971.7978
		80	0.5000	1458.8	(122)	0.000342	0.000340	1461.4	-2.5888	0.000002	6.702				971.7978
		80	0.6000	1584.8	(122)	0.000366	0.000367	1583.3	1.5029	-0.000001	2.259				971.7978
									Average Res	0.8424	-0.000026	201.14	Sum Chi sqr		
									Std dev Res	1.838677	0.000025				
									Avg - 4std	-6.512313	-0.000126				
									Avg + 4std	8.197105	0.000075				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	0.844616
c1	-1.514245
c2	-42.94899
c3	0.19335
c4	-3425.907
Min T	20
Max T	80
Min w	0.003989
Max w	0.6
Avg dens res	0.842396
Std dens res	1.838677
Avg app vol res *10 ³	-0.025726
Std app vol res *10 ³	0.025159
No of points in corr	50
No of inconsistent pair	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **Na2SO4**

- References
- (13) Chen, C.-T. A.; Chen, J. H.; Millero, F. J. Densities of NaCl, MgCl₂, Na₂SO₄, and MgSO₄ Aqueous Solutions at 1 atm. from 0 to 50°C and from 0.001 to 1.5 m. *J. Chem. Eng. Data* **1980**, *25*, 307-310.
 - (20) Dedick, Eugene A.; Hershey, J. Peter; Sotolongo, Sara; Stade, David J.; Millero, Frank J. The PVT Properties of Concentrated Aqueous Electrolytes IX. The Volume Properties of KCl and K₂SO₄ and their Mixtures with NaCl and Na₂SO₄ as a Function of Temperature, *J. Solution Chem.* **1990**, *19*, 353-374
 - (27) Fabuss, B. M.; Korosi, A.; Huq, A. K. M. S.; Densities of Binary and Ternary Aqueous Solutions of NaCl, Na₂SO₄, and MgSO₄, of Sea Waters, and Sea Water Concentrates, *J. Chem. Eng. Data* , **1966**, *3*, 325-331
 - (45) Isono, T. Densities, Viscosities, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions at Several Temperatures. Alkaline-Earth Chlorides, LaCl₃, Na₂SO₄, NaNO₃, NaBr, KNO₃, KBr, and Cd(NO₃)₂. *J. Chem. Eng. Data* **1984**, *29*, 45-52.
 - (47) Kaminsky, M. Experimental Investigations of the Concentration and Temperature Dependence of the Viscosity of Aqueous Solutions of Strong Electrolytes. I. Potassium Iodide, Ammonium Chloride, and Sodium Sulphate Solutions. *Z. Physik. Chem. N. F.* **1955**, *5*, 154-191.
 - (52) Korosi, A.; Fabuss, B. M. Viscosities of Binary Aqueous Solutions of NaCl, KCl, Na₂SO₄, and MgSO₄ at Concentrations and Temperatures of Interest in Desalination Processes. *J. Chem. Eng. Data* **1968**, *13*, 548-552.
 - (72) Millero, F. J.; Knox, J. H. Apparent Molal Volumes of Aqueous NaF, Na₂SO₄, KCl, K₂SO₄, MgCl₂, and MgSO₄ Solutions at 0° and 50°C. *J. Chem. Eng. Data* **1973**, *18*, 407-411.
 - (88) Perron, G.; Desnoyers, J. E.; Millero, F. J., "Apparent molal volumes and heat capacities of some sulfates and carbonates in water at 25 °C.", *Can. J. Chem.* , **1975**, *53*, 1134-1138
 - (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.
 - (114) Saluja, P. P. S.; Lemire, R. J.; LeBlanc, J. C.; High-Temperature Thermodynamics of Aqueous Alkali-Metal Salts; *J. Chem. Thermodynamics* , **1992**, *24*, 181-203
 - (134) Wirth, H. E.; Lo Surdo, A. Temperature Dependence of Volume Changes of Aqueous Solutions of Ammonium Chloride and Ammonium Nitrate at 25°C. *J. Chem. Eng. Data* **1968**, *13*, 226-231.

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Delta density / kg/m ³	Density of water at t°C kg/m ³
0.0034		0	0.0005	1000.32	(13)	0.000004	0.000067	1000.29	0.0305	-0.000063	0.001				0.481	999.8395
0.003567		0	0.0005	1000.34	(72)	0.000019	0.000067	1000.31	0.0245	-0.000048	0.001				0.4971	999.8395
0.008254		0	0.0012	1000.99	(72)	0.000022	0.000067	1000.93	0.0539	-0.000046	0.003				1.1471	999.8395
0.008351		0	0.0012	1001.00	(72)	0.000021	0.000067	1000.95	0.0550	-0.000046	0.003				1.1611	999.8395
0.01055		0	0.0015	1001.30	(13)	0.000023	0.000068	1001.24	0.0669	-0.000045	0.004				1.464	999.8395
0.011673		0	0.0017	1001.46	(72)	0.000022	0.000068	1001.39	0.0756	-0.000046	0.006				1.6213	999.8395
0.013831		0	0.0020	1001.76	(72)	0.000023	0.000068	1001.67	0.0883	-0.000045	0.008				1.9194	999.8395
0.01399		0	0.0020	1001.79	(13)	0.000017	0.000068	1001.69	0.1019	-0.000051	0.010				1.954	999.8395
0.014836		0	0.0021	1001.90	(72)	0.000022	0.000068	1001.80	0.0958	-0.000045	0.009				2.0598	999.8395
0.015569		0	0.0022	1002.00	(72)	0.000023	0.000068	1001.90	0.0988	-0.000045	0.010				2.1597	999.8395
0.017031		0	0.0024	1002.20	(72)	0.000023	0.000068	1002.09	0.1085	-0.000045	0.012				2.3627	999.8395
0.017661		0	0.0025	1002.29	(72)	0.000023	0.000068	1002.18	0.1123	-0.000045	0.013				2.4497	999.8395
0.017808		0	0.0025	1002.31	(72)	0.000024	0.000068	1002.20	0.1126	-0.000044	0.013				2.4695	999.8395
0.019987		0	0.0028	1002.61	(72)	0.000024	0.000068	1002.48	0.1258	-0.000044	0.016				2.7706	999.8395
0.020799		0	0.0029	1002.72	(72)	0.000025	0.000068	1002.59	0.1295	-0.000044	0.017				2.8816	999.8395
0.024185		0	0.0034	1003.19	(72)	0.000025	0.000068	1003.04	0.1485	-0.000043	0.022				3.3478	999.8395
0.024998		0	0.0035	1003.30	(72)	0.000026	0.000069	1003.15	0.1506	-0.000042	0.023				3.4572	999.8395
0.024998		0	0.0035	1003.30	(72)	0.000026	0.000069	1003.15	0.1515	-0.000043	0.023				3.4581	999.8395
0.026919		0	0.0038	1003.56	(72)	0.000026	0.000069	1003.40	0.1631	-0.000043	0.027				3.7232	999.8395

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water at t°C kg/m³
0.030351		0	0.0043	1004.03	(72)	0.000027	0.000069	1003.85	0.1818	-0.000042	0.033				4.1948	999.8395
0.03178		0	0.0045	1004.22	(13)	0.000029	0.000069	1004.04	0.1796	-0.000040	0.032				4.381	999.8395
0.034785		0	0.0049	1004.64	(72)	0.000028	0.000069	1004.44	0.2029	-0.000041	0.041				4.8005	999.8395
0.040737		0	0.0058	1005.45	(72)	0.000030	0.000070	1005.22	0.2273	-0.000039	0.052				5.6091	999.8395
0.049147		0	0.0069	1006.60	(72)	0.000032	0.000070	1006.33	0.2682	-0.000038	0.072				6.7567	999.8395
0.0505		0	0.0071	1006.76	(13)	0.000035	0.000070	1006.51	0.2516	-0.000035	0.063				6.918	999.8395
0.054676		0	0.0077	1007.34	(72)	0.000034	0.000070	1007.05	0.2832	-0.000036	0.080				7.4985	999.8395
0.05553		0	0.0078	1007.45	(13)	0.000035	0.000070	1007.17	0.2825	-0.000036	0.080				7.61	999.8395
0.061606		0	0.0087	1008.28	(72)	0.000035	0.000071	1007.96	0.3137	-0.000036	0.098				8.439	999.8395
0.070549		0	0.0099	1009.48	(72)	0.000038	0.000071	1009.14	0.3396	-0.000034	0.115				9.6379	999.8395
		0	0.0100	1009.40	(90)	0.000053	0.000071	1009.21	0.1895	-0.000019	0.036					999.8395
0.082529		0	0.0116	1011.07	(72)	0.000041	0.000072	1010.71	0.3683	-0.000031	0.136				11.2352	999.8395
0.09941		0	0.0139	1013.32	(72)	0.000045	0.000073	1012.91	0.4097	-0.000029	0.168				13.4818	999.8395
0.10019		0	0.0140	1013.42	(13)	0.000045	0.000073	1013.01	0.4101	-0.000028	0.168				13.584	999.8395
0.105998		0	0.0148	1014.18	(72)	0.000047	0.000074	1013.77	0.4046	-0.000027	0.164				14.3357	999.8395
0.126706		0	0.0177	1016.90	(72)	0.000051	0.000075	1016.46	0.4384	-0.000024	0.192				17.0637	999.8395
		0	0.0200	1018.90	(90)	0.000065	0.000076	1018.66	0.2362	-0.000011	0.056					999.8395
0.147918		0	0.0206	1019.69	(72)	0.000054	0.000076	1019.22	0.4735	-0.000022	0.224				19.8493	999.8395
0.16373		0	0.0227	1021.78	(13)	0.000055	0.000077	1021.26	0.5241	-0.000022	0.275				21.944	999.8395
0.1777		0	0.0246	1023.57	(72)	0.000058	0.000078	1023.06	0.5138	-0.000020	0.264				23.7353	999.8395
0.19951		0	0.0276	1026.42	(13)	0.000060	0.000080	1025.87	0.5570	-0.000019	0.310				26.583	999.8395
0.259374		0	0.0355	1034.07	(72)	0.000068	0.000083	1033.51	0.5588	-0.000015	0.312				34.2313	999.8395
		0	0.0400	1038.10	(90)	0.000079	0.000085	1037.81	0.2876	-0.000007	0.083					999.8395
0.34718		0	0.0470	1045.10	(72)	0.000079	0.000089	1044.59	0.5126	-0.000010	0.263				45.2643	999.8395
0.46965		0	0.0625	1060.17	(72)	0.000090	0.000096	1059.77	0.3922	-0.000006	0.154				60.3261	999.8395
0.50208		0	0.0666	1064.10	(13)	0.000093	0.000098	1063.74	0.3597	-0.000005	0.129				64.261	999.8395
0.557229		0	0.0734	1070.67	(72)	0.000098	0.000101	1070.44	0.2360	-0.000003	0.056				70.8333	999.8395
0.5676		0	0.0746	1071.95	(13)	0.000099	0.000102	1071.69	0.2566	-0.000003	0.066				72.106	999.8395
		0	0.0800	1077.30	(90)	0.000101	0.000104	1077.04	0.2629	-0.000003	0.069					999.8395
0.70189		0	0.0907	1087.73	(13)	0.000109	0.000109	1087.70	0.0288	0.000000	0.001				87.887	999.8395
0.705014		0	0.0910	1088.07	(72)	0.000109	0.000109	1088.07	0.0014	0.000000	0.000				88.2276	999.8395
0.921454		0	0.1157	1112.70	(72)	0.000124	0.000121	1113.06	-0.3592	0.000003	0.129				112.8616	999.8395
		0	0.1200	1117.40	(90)	0.000123	0.000123	1117.40	0.0016	0.000000	0.000					999.8395
1.3334		0	0.1593	1156.81	(134)	0.000148	0.000143	1157.96	-1.1543	0.000005	1.332					999.8395
		0	0.1600	1158.50	(90)	0.000144	0.000143	1158.74	-0.2379	0.000001	0.057					999.8395
		0	0.2000	1200.80	(90)	0.000163	0.000163	1200.85	-0.0463	0.000000	0.002					999.8395
		0	0.2400	1244.30	(90)	0.000181	0.000184	1243.46	0.8436	-0.000002	0.712					999.8395
0.0034		5	0.0005	1000.43	(13)	0.000031	0.000079	1000.41	0.0232	-0.000048	0.001				0.468	999.9638
0.01055		5	0.0015	1001.40	(13)	0.000040	0.000080	1001.34	0.0587	-0.000039	0.003				1.438	999.9638
0.01399		5	0.0020	1001.87	(13)	0.000041	0.000080	1001.79	0.0764	-0.000038	0.006				1.905	999.9638
0.03178		5	0.0045	1004.27	(13)	0.000047	0.000081	1004.11	0.1540	-0.000034	0.024				4.302	999.9638
0.0505		5	0.0071	1006.74	(13)	0.000055	0.000082	1006.55	0.1983	-0.000027	0.039				6.78	999.9638
0.05553		5	0.0078	1007.41	(13)	0.000056	0.000082	1007.20	0.2116	-0.000027	0.045				7.446	999.9638
0.16373		5	0.0227	1021.51	(13)	0.000072	0.000089	1021.11	0.3993	-0.000017	0.159				21.547	999.9638
0.19951		5	0.0276	1026.06	(13)	0.000077	0.000091	1025.66	0.4016	-0.000014	0.161				26.097	999.9638
0.30182		5	0.0411	1038.89	(13)	0.000089	0.000097	1038.52	0.3780	-0.000009	0.143				38.931	999.9638

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water at t°C kg/m³
0.50208		5	0.0666	1063.22	(13)	0.000106	0.000109	1063.06	0.1588	-0.000002	0.025				63.252	999.9638
0.5676		5	0.0746	1070.98	(13)	0.000111	0.000112	1070.91	0.0729	-0.000001	0.005				71.015	999.9638
0.65		5	0.0845	1082.39	(20)	0.000099	0.000117	1080.65	1.7366	-0.000018	3.016				82.424	999.9638
0.70189		5	0.0907	1086.60	(13)	0.000121	0.000120	1086.72	-0.1187	0.000001	0.014				86.634	999.9638
1.3334		5.12	0.1593	1155.02	(134)	0.000157	0.000152	1156.10	-1.0841	0.000005	1.175					999.9618
0.0034		15	0.0005	999.56	(13)	0.000051	0.000099	999.53	0.0233	-0.000048	0.001				0.458	999.0996
0.01055		15	0.0015	1000.49	(13)	0.000073	0.000100	1000.45	0.0400	-0.000027	0.002				1.388	999.0996
0.01399		15	0.0020	1000.95	(13)	0.000068	0.000100	1000.89	0.0630	-0.000032	0.004				1.85	999.0996
0.01399		15	0.0020	1000.96	(13)	0.000064	0.000100	1000.89	0.0720	-0.000036	0.005				1.859	999.0996
0.03178		15	0.0045	1003.27	(13)	0.000075	0.000101	1003.15	0.1172	-0.000026	0.014				4.171	999.0996
0.05		15	0.0071	1005.63	(45)	0.000079	0.000102	1005.47	0.1616	-0.000023	0.026					999.0996
0.0505		15	0.0071	1005.68	(13)	0.000081	0.000102	1005.53	0.1508	-0.000021	0.023				6.583	999.0996
0.05553		15	0.0078	1006.33	(13)	0.000082	0.000102	1006.17	0.1639	-0.000021	0.027				7.234	999.0996
0.1		15	0.0140	1012.01	(45)	0.000089	0.000105	1011.79	0.2227	-0.000016	0.050					999.0996
0.10019		15	0.0140	1012.04	(13)	0.000089	0.000105	1011.81	0.2294	-0.000016	0.053				12.941	999.0996
0.16373		15	0.0227	1020.02	(13)	0.000098	0.000108	1019.77	0.2526	-0.000011	0.064				20.922	999.0996
0.19951		15	0.0276	1024.49	(13)	0.000101	0.000110	1024.21	0.2719	-0.000009	0.074				25.387	999.0996
0.30182		15	0.0411	1037.01	(13)	0.000111	0.000116	1036.79	0.2219	-0.000005	0.049				37.908	999.0996
0.33307		15	0.0452	1040.78	(13)	0.000114	0.000118	1040.58	0.1958	-0.000004	0.038				41.68	999.0996
0.40356		15	0.0542	1049.19	(13)	0.000120	0.000121	1049.08	0.1149	-0.000002	0.013				50.095	999.0996
0.5		15	0.0663	1060.39	(45)	0.000129	0.000127	1060.54	-0.1530	0.000002	0.023					999.0996
0.50208		15	0.0666	1060.80	(13)	0.000126	0.000127	1060.79	0.0165	0.000000	0.000				61.705	999.0996
0.5676		15	0.0746	1068.41	(13)	0.000131	0.000130	1068.47	-0.0575	0.000001	0.003				69.311	999.0996
0.70189		15	0.0907	1083.74	(13)	0.000139	0.000137	1083.94	-0.2039	0.000002	0.042				84.64	999.0996
1.3334		15.08	0.1593	1151.16	(134)	0.000171	0.000167	1151.98	-0.8172	0.000004	0.668					999.0875
0.05		20	0.0071	1004.66	(45)	0.000089	0.000110	1004.51	0.1516	-0.000021	0.023					998.2041
		20	0.0100	1007.30	(90)	0.000097	0.000112	1007.15	0.1454	-0.000014	0.021					998.2041
0.1		20	0.0140	1010.96	(45)	0.000099	0.000113	1010.76	0.1963	-0.000014	0.039					998.2041
		20	0.0200	1016.40	(90)	0.000105	0.000115	1016.19	0.2143	-0.000010	0.046					998.2041
		20	0.0400	1034.80	(90)	0.000116	0.000123	1034.49	0.3128	-0.000007	0.098					998.2041
0.5		20	0.0663	1058.90	(45)	0.000136	0.000134	1059.05	-0.1472	0.000002	0.022					998.2041
		20	0.0800	1072.40	(90)	0.000135	0.000140	1072.02	0.3789	-0.000004	0.144					998.2041
0.7		20	0.0904	1081.54	(45)	0.000148	0.000144	1082.02	-0.4821	0.000005	0.232					998.2041
		20	0.1200	1110.90	(90)	0.000155	0.000156	1110.73	0.1695	-0.000001	0.029					998.2041
1		20	0.1244	1114.24	(45)	0.000163	0.000158	1115.05	-0.8054	0.000005	0.649					998.2041
1.2		20	0.1456	1135.22	(45)	0.000172	0.000167	1136.12	-0.8966	0.000005	0.804					998.2041
		20	0.1600	1150.60	(90)	0.000173	0.000173	1150.51	0.0931	0.000000	0.009					998.2041
		20	0.2000	1191.50	(90)	0.000189	0.000190	1191.20	0.2970	-0.000001	0.088					998.2041
		20	0.2400	1233.60	(90)	0.000205	0.000208	1232.63	0.9733	-0.000003	0.947					998.2041
0.01948		24.04	0.0028	999.80	(114)	0.000090	0.000115	999.73	0.0686	-0.000025	0.005			12.77		997.2867
0.05442		24.04	0.0077	1004.23	(114)	0.000099	0.000117	1004.09	0.1392	-0.000018	0.019			14.01		997.2867
0.09547		24.04	0.0134	1009.37	(114)	0.000106	0.000119	1009.19	0.1760	-0.000013	0.031			15.04		997.2867
0.20961		24.04	0.0289	1023.41	(114)	0.000118	0.000125	1023.19	0.2173	-0.000007	0.047			16.7		997.2867
0.31478		24.04	0.0428	1036.04	(114)	0.000126	0.000130	1035.87	0.1685	-0.000004	0.028			17.96		997.2867
0.39192		24.04	0.0527	1045.17	(114)	0.000132	0.000134	1045.04	0.1295	-0.000002	0.017			18.71		997.2867
0.49767		24.04	0.0660	1057.51	(114)	0.000138	0.000139	1057.42	0.0925	-0.000001	0.009			19.59		997.2867

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water at t°C kg/m³
1.3334		24.61	0.1593	1146.99	(134)	0.000180	0.000177	1147.60	-0.6080	0.000003	0.370					997.1442
0.00259		25	0.0004	997.38	(13)	0.000087	0.000115	997.37	0.0103	-0.000028	0.000				0.335	997.0449
0.0034		25	0.0005	997.48	(13)	0.000095	0.000115	997.47	0.0098	-0.000020	0.000				0.436	997.0449
0.00376		25	0.0005	997.53	(88)	0.000088	0.000115	997.52	0.0147	-0.000028	0.000				0.486	997.0449
0.00504		25	0.0007	997.70	(13)	0.000088	0.000115	997.68	0.0193	-0.000027	0.000				0.651	997.0449
0.01		25	0.0014	998.10	(27)	0.000256	0.000116	998.30	-0.1978	0.000140	0.039					997.0449
0.01055		25	0.0015	998.41	(13)	0.000089	0.000116	998.37	0.0392	-0.000026	0.002				1.361	997.0449
0.0127		25	0.0018	998.64	(13)	0.000116	0.000116	998.64	0.0001	0.000000	0.000				1.591	997.0449
0.01301		25	0.0018	998.73	(88)	0.000087	0.000116	998.67	0.0533	-0.000029	0.003				1.683	997.0449
0.01682		25	0.0024	999.21	(13)	0.000093	0.000116	999.15	0.0556	-0.000023	0.003				2.162	997.0449
0.02244		25	0.0032	999.93	(88)	0.000092	0.000116	999.85	0.0780	-0.000025	0.006				2.887	997.0449
0.03022		25	0.0043	1000.91	(13)	0.000096	0.000117	1000.83	0.0864	-0.000020	0.007				3.867	997.0449
0.03244		25	0.0046	1001.20	(88)	0.000095	0.000117	1001.10	0.1024	-0.000022	0.010				4.16	997.0449
0.0333		25	0.0047	1001.40	(52)	0.000077	0.000117	1001.21	0.1902	-0.000040	0.036					997.0449
0.03581		25	0.0051	1001.62	(13)	0.000098	0.000117	1001.52	0.0970	-0.000019	0.009				4.575	997.0449
0.04293		25	0.0061	1002.52	(13)	0.000099	0.000117	1002.41	0.1116	-0.000018	0.012				5.477	997.0449
0.05		25	0.0071	1003.40	(27)	0.000102	0.000118	1003.29	0.1095	-0.000015	0.012					997.0449
0.05		25	0.0071	1003.43	(45)	0.000098	0.000118	1003.29	0.1395	-0.000020	0.019					997.0449
0.0505		25	0.0071	1003.48	(13)	0.000100	0.000118	1003.35	0.1292	-0.000018	0.017				6.437	997.0449
0.05553		25	0.0078	1004.12	(13)	0.000100	0.000118	1003.98	0.1416	-0.000018	0.020				7.075	997.0449
0.05958		25	0.0084	1004.61	(13)	0.000103	0.000118	1004.48	0.1322	-0.000016	0.017				7.569	997.0449
0.06485		25	0.0091	1005.30	(88)	0.000101	0.000118	1005.14	0.1627	-0.000018	0.026				8.254	997.0449
0.07698		25	0.0108	1006.80	(13)	0.000105	0.000119	1006.64	0.1572	-0.000014	0.025				9.753	997.0449
0.08861		25	0.0124	1008.25	(13)	0.000106	0.000120	1008.08	0.1693	-0.000013	0.029				11.205	997.0449
0.0985		25	0.0138	1009.49	(13)	0.000107	0.000120	1009.30	0.1849	-0.000013	0.034				12.443	997.0449
0.1		25	0.0140	1009.60	(27)	0.000113	0.000120	1009.49	0.1118	-0.000008	0.012					997.0449
0.1		25	0.0140	1009.66	(45)	0.000108	0.000120	1009.49	0.1718	-0.000012	0.030					997.0449
0.10019		25	0.0140	1009.70	(13)	0.000107	0.000120	1009.51	0.1852	-0.000013	0.034				12.652	997.0449
0.11256		25	0.0157	1011.23	(13)	0.000109	0.000121	1011.04	0.1923	-0.000012	0.037				14.185	997.0449
0.13073		25	0.0182	1013.49	(88)	0.000110	0.000122	1013.27	0.2203	-0.000012	0.049				16.449	997.0449
0.13651		25	0.0190	1014.18	(13)	0.000112	0.000122	1013.98	0.1984	-0.000010	0.039				17.137	997.0449
0.15		25	0.0209	1015.80	(27)	0.000115	0.000123	1015.64	0.1620	-0.000008	0.026					997.0449
0.16801		25	0.0233	1018.04	(13)	0.000116	0.000124	1017.84	0.1964	-0.000008	0.039				20.993	997.0449
0.19572		25	0.0271	1021.45	(88)	0.000117	0.000125	1021.22	0.2324	-0.000008	0.054				24.407	997.0449
0.19951		25	0.0276	1021.89	(13)	0.000118	0.000125	1021.68	0.2055	-0.000007	0.042				24.841	997.0449
0.2356		25	0.0324	1026.20	(52)	0.000123	0.000127	1026.06	0.1446	-0.000004	0.021					997.0449
0.24072		25	0.0331	1026.84	(13)	0.000123	0.000128	1026.67	0.1698	-0.000005	0.029				29.799	997.0449
0.2623		25	0.0359	1029.50	(88)	0.000123	0.000129	1029.28	0.2198	-0.000006	0.048				32.451	997.0449
0.30182		25	0.0411	1034.18	(13)	0.000127	0.000131	1034.02	0.1578	-0.000004	0.025				37.131	997.0449
0.32785		25	0.0445	1037.31	(88)	0.000128	0.000132	1037.13	0.1857	-0.000004	0.034				40.266	997.0449
0.33307		25	0.0452	1037.89	(13)	0.000129	0.000132	1037.75	0.1402	-0.000003	0.020				40.842	997.0449
0.35894		25	0.0485	1040.93	(13)	0.000131	0.000134	1040.82	0.1156	-0.000002	0.013				43.89	997.0449
0.40356		25	0.0542	1046.17	(13)	0.000134	0.000136	1046.09	0.0780	-0.000001	0.006				49.122	997.0449
0.4712		25	0.0627	1054.00	(52)	0.000139	0.000139	1054.00	-0.0048	0.000000	0.000					997.0449
0.5		25	0.0663	1057.23	(45)	0.000142	0.000140	1057.35	-0.1189	0.000002	0.014					997.0449
0.50061		25	0.0664	1057.40	(13)	0.000141	0.000140	1057.42	-0.0147	0.000000	0.000				60.36	997.0449

molarity	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water at t°C kg/m³
0.50208		25	0.0666	1057.58	(13)	0.000141	0.000141	1057.59	-0.0079	0.000000	0.000				60.537	997.0449
0.5676		25	0.0746	1065.07	(13)	0.000144	0.000144	1065.14	-0.0646	0.000001	0.004				68.027	997.0449
0.65		25	0.0845	1074.06	(20)	0.000152	0.000148	1074.51	-0.4563	0.000005	0.208				77.011	997.0449
0.7		25	0.0904	1079.73	(45)	0.000154	0.000150	1080.14	-0.4090	0.000004	0.167					997.0449
0.70189		25	0.0907	1080.19	(13)	0.000152	0.000150	1080.35	-0.1649	0.000002	0.027				83.141	997.0449
0.72018		25	0.0928	1082.21	(13)	0.000153	0.000151	1082.40	-0.1858	0.000002	0.035				85.166	997.0449
0.94515		25	0.1184	1106.87	(88)	0.000162	0.000161	1107.05	-0.1850	0.000001	0.034				109.821	997.0449
1		25	0.1244	1112.20	(45)	0.000168	0.000163	1112.92	-0.7196	0.000005	0.518					997.0449
1.1779		25	0.1433	1131.30	(52)	0.000173	0.000171	1131.57	-0.2749	0.000001	0.076					997.0449
1.2		25	0.1456	1133.06	(45)	0.000176	0.000172	1133.85	-0.7923	0.000004	0.628					997.0449
1.5		25	0.1757	1161.60	(45)	0.000194	0.000184	1163.90	-2.3011	0.000010	5.295	!				997.0449
0.05		30	0.0071	1001.96	(45)	0.000107	0.000124	1001.84	0.1202	-0.000017	0.014					995.6473
		30	0.0100	1004.60	(90)	0.000109	0.000125	1004.44	0.1606	-0.000016	0.026					995.6473
0.1		30	0.0140	1008.15	(45)	0.000115	0.000127	1007.99	0.1646	-0.000012	0.027					995.6473
		30	0.0200	1013.50	(90)	0.000120	0.000129	1013.31	0.1866	-0.000009	0.035					995.6473
		30	0.0400	1031.50	(90)	0.000132	0.000136	1031.30	0.1950	-0.000005	0.038					995.6473
0.5		30	0.0663	1055.37	(45)	0.000147	0.000146	1055.47	-0.0994	0.000001	0.010					995.6473
		30	0.0800	1068.20	(90)	0.000152	0.000151	1068.24	-0.0449	0.000000	0.002					995.6473
0.7		30	0.0904	1077.76	(45)	0.000158	0.000155	1078.10	-0.3383	0.000003	0.114					995.6473
		30	0.1200	1106.20	(90)	0.000168	0.000166	1106.41	-0.2125	0.000001	0.045					995.6473
1		30	0.1244	1110.03	(45)	0.000172	0.000168	1110.67	-0.6422	0.000004	0.412					995.6473
1.2		30	0.1456	1130.80	(45)	0.000180	0.000176	1131.49	-0.6904	0.000004	0.477					995.6473
		30	0.1600	1145.60	(90)	0.000183	0.000182	1145.72	-0.1250	0.000001	0.016					995.6473
1.5		30	0.1757	1159.26	(45)	0.000197	0.000188	1161.40	-2.1424	0.000009	4.590	!				995.6473
		30	0.2000	1186.50	(90)	0.000197	0.000198	1186.07	0.4342	-0.000002	0.189					995.6473
		30	0.2400	1229.20	(90)	0.000209	0.000215	1227.28	1.9211	-0.000005	3.691					995.6473
1.3334		34.89	0.1593	1142.11	(134)	0.000187	0.000185	1142.54	-0.4263	0.000002	0.182					994.0696
0.0034		35	0.0005	994.47	(13)	0.000078	0.000127	994.45	0.0237	-0.000050	0.001				0.443	994.0319
0.01055		35	0.0015	995.37	(13)	0.000102	0.000128	995.33	0.0387	-0.000026	0.001				1.339	994.0319
0.05		35	0.0071	1000.29	(45)	0.000114	0.000130	1000.18	0.1136	-0.000016	0.013					994.0319
0.0505		35	0.0071	1000.36	(13)	0.000112	0.000130	1000.24	0.1252	-0.000018	0.016				6.331	994.0319
0.05553		35	0.0078	1000.99	(13)	0.000112	0.000130	1000.85	0.1396	-0.000018	0.020				6.961	994.0319
0.1		35	0.0140	1006.45	(45)	0.000120	0.000132	1006.28	0.1747	-0.000012	0.031					994.0319
0.10019		35	0.0140	1006.49	(13)	0.000118	0.000132	1006.30	0.1945	-0.000014	0.038				12.461	994.0319
0.16373		35	0.0227	1014.22	(13)	0.000125	0.000135	1013.98	0.2333	-0.000010	0.054				20.184	994.0319
0.30182		35	0.0411	1030.63	(13)	0.000137	0.000142	1030.43	0.2064	-0.000005	0.043				36.603	994.0319
0.33307		35	0.0452	1034.28	(13)	0.000139	0.000143	1034.10	0.1808	-0.000004	0.033				40.251	994.0319
0.40356		35	0.0542	1042.47	(13)	0.000144	0.000146	1042.32	0.1466	-0.000002	0.022				48.438	994.0319
0.5		35	0.0663	1053.37	(45)	0.000152	0.000151	1053.43	-0.0551	0.000001	0.003					994.0319
0.50208		35	0.0666	1053.72	(13)	0.000150	0.000151	1053.66	0.0561	-0.000001	0.003				59.687	994.0319
0.5676		35	0.0746	1061.13	(13)	0.000153	0.000154	1061.11	0.0229	0.000000	0.001				67.098	994.0319
0.7		35	0.0904	1075.66	(45)	0.000162	0.000160	1075.91	-0.2547	0.000002	0.065					994.0319
1		35	0.1244	1107.77	(45)	0.000176	0.000172	1108.31	-0.5447	0.000004	0.297					994.0319
1.2		35	0.1456	1128.46	(45)	0.000183	0.000180	1129.04	-0.5803	0.000003	0.337					994.0319
1.5		35	0.1757	1156.72	(45)	0.000201	0.000191	1158.85	-2.1282	0.000009	4.529	!				994.0319
0.0333		40	0.0047	996.40	(52)	0.000109	0.000134	996.28	0.1157	-0.000025	0.013					992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water at t°C kg/m³
		40	0.0100	1001.00	(90)	0.000123	0.000135	1000.88	0.1209	-0.000012	0.015					992.2158
		40	0.0200	1009.80	(90)	0.000130	0.000139	1009.63	0.1738	-0.000009	0.030					992.2158
0.2356		40	0.0324	1020.80	(52)	0.000136	0.000143	1020.58	0.2241	-0.000007	0.050					992.2158
		40	0.0400	1027.60	(90)	0.000140	0.000146	1027.37	0.2287	-0.000005	0.052					992.2158
0.4712		40	0.0627	1048.00	(52)	0.000153	0.000153	1047.95	0.0500	-0.000001	0.002					992.2158
		40	0.0800	1063.90	(90)	0.000159	0.000160	1063.85	0.0452	0.000000	0.002					992.2158
		40	0.1200	1101.50	(90)	0.000175	0.000174	1101.63	-0.1331	0.000001	0.018					992.2158
1.1779		40	0.1433	1124.20	(52)	0.000182	0.000182	1124.26	-0.0590	0.000000	0.003					992.2158
		40	0.1600	1140.60	(90)	0.000188	0.000188	1140.65	-0.0486	0.000000	0.002					992.2158
		40	0.2000	1181.30	(90)	0.000201	0.000203	1180.82	0.4848	-0.000002	0.235					992.2158
		40	0.2400	1223.70	(90)	0.000213	0.000218	1222.01	1.6875	-0.000005	2.848					992.2158
0.01		45	0.0014	991.30	(27)	0.000229	0.000137	991.43	-0.1292	0.000093	0.017					990.2132
0.05		45	0.0071	996.40	(27)	0.000121	0.000139	996.28	0.1241	-0.000018	0.015					990.2132
0.05		45	0.0071	996.39	(45)	0.000122	0.000139	996.28	0.1141	-0.000016	0.013					990.2132
0.1		45	0.0140	1002.30	(27)	0.000140	0.000141	1002.30	0.0048	0.000000	0.000					990.2132
0.1		45	0.0140	1002.48	(45)	0.000128	0.000141	1002.30	0.1848	-0.000013	0.034					990.2132
0.15		45	0.0209	1008.30	(27)	0.000142	0.000143	1008.27	0.0290	-0.000001	0.001					990.2132
0.5		45	0.0663	1048.96	(45)	0.000157	0.000158	1048.89	0.0687	-0.000001	0.005					990.2132
0.7		45	0.0904	1071.06	(45)	0.000167	0.000166	1071.16	-0.1002	0.000001	0.010					990.2132
1		45	0.1244	1102.94	(45)	0.000180	0.000178	1103.30	-0.3593	0.000002	0.129					990.2132
1.2		45	0.1456	1123.44	(45)	0.000188	0.000185	1123.90	-0.4576	0.000002	0.209					990.2132
1.5		45	0.1757	1151.68	(45)	0.000204	0.000196	1153.58	-1.9027	0.000008	3.620	!				990.2132
1.3334		45.25	0.1593	1136.79	(134)	0.000192	0.000190	1137.14	-0.3556	0.000002	0.126					990.1084
0.09898		48.79	0.0139	1000.70	(114)	0.000128	0.000143	1000.49	0.2136	-0.000015	0.046			18.17		988.5785
0.11341		48.79	0.0159	1002.45	(114)	0.000129	0.000144	1002.21	0.2439	-0.000015	0.059			18.27		988.5785
0.20351		48.79	0.0281	1013.19	(114)	0.000137	0.000148	1012.88	0.3075	-0.000011	0.095			19.48		988.5785
0.50228		48.79	0.0666	1047.54	(114)	0.000157	0.000160	1047.29	0.2521	-0.000003	0.064			22.26		988.5785
0.99188		48.79	0.1235	1100.37	(114)	0.000179	0.000179	1100.45	-0.0788	0.000001	0.006			25.49		988.5785
0.00969		49.17	0.0014	989.65	(114)	0.000087	0.000140	989.58	0.0703	-0.000052	0.005			12.42		988.4093
0.02305		49.17	0.0033	991.30	(114)	0.000108	0.000140	991.20	0.1031	-0.000032	0.011			15.35		988.4093
0.05339		49.17	0.0075	995.10	(114)	0.000108	0.000142	994.85	0.2464	-0.000033	0.061			15.41		988.4093
0.10154		49.17	0.0142	1000.83	(114)	0.000129	0.000144	1000.62	0.2130	-0.000015	0.045			18.28		988.4093
0.19785		49.17	0.0273	1012.29	(114)	0.000139	0.000148	1012.04	0.2528	-0.000009	0.064			19.71		988.4093
0.49852		49.17	0.0661	1046.86	(114)	0.000158	0.000160	1046.67	0.1862	-0.000003	0.035			22.39		988.4093
1.01884		49.17	0.1264	1102.82	(114)	0.000182	0.000180	1103.06	-0.2459	0.000002	0.060			25.8		988.4093
1.53238		49.17	0.1788	1154.56	(114)	0.000197	0.000198	1154.44	0.1162	0.000000	0.014			28.03		988.4093
0.002226		50	0.0003	988.32	(72)	0.000104	0.000140	988.31	0.0111	-0.000036	0.000				0.2804	988.0363
0.00622		50	0.0009	988.82	(72)	0.000105	0.000140	988.79	0.0302	-0.000035	0.001				0.7824	988.0363
0.006274		50	0.0009	988.82	(72)	0.000107	0.000140	988.80	0.0291	-0.000033	0.001				0.7878	988.0363
0.012695		50	0.0018	989.63	(72)	0.000109	0.000140	989.57	0.0560	-0.000032	0.003				1.5905	988.0363
0.014306		50	0.0020	989.83	(72)	0.000109	0.000140	989.77	0.0627	-0.000032	0.004				1.7918	988.0363
0.026513		50	0.0038	991.34	(72)	0.000112	0.000141	991.24	0.1059	-0.000029	0.011				3.3076	988.0363
0.044254		50	0.0062	993.53	(72)	0.000117	0.000142	993.37	0.1532	-0.000025	0.023				5.4907	988.0363
0.085346		50	0.0120	998.53	(72)	0.000124	0.000143	998.30	0.2310	-0.000019	0.053				10.4949	988.0363
0.15125		50	0.0210	1006.44	(72)	0.000132	0.000146	1006.14	0.2938	-0.000014	0.086				18.3991	988.0363
0.2266		50	0.0312	1015.33	(72)	0.000140	0.000149	1015.02	0.3167	-0.000010	0.100				27.2975	988.0363

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water at t°C kg/m³
0.28814		50	0.0393	1022.53	(72)	0.000144	0.000152	1022.19	0.3359	-0.000008	0.113				34.4945	988.0363
0.41164		50	0.0552	1036.68	(72)	0.000153	0.000157	1036.41	0.2683	-0.000005	0.072				48.6398	988.0363
0.53857		50	0.0711	1050.96	(72)	0.000159	0.000162	1050.75	0.2104	-0.000003	0.044				62.9239	988.0363
0.69983		50	0.0904	1068.69	(72)	0.000167	0.000168	1068.59	0.1019	-0.000001	0.010				80.651	988.0363
0.79824		50	0.1018	1079.30	(72)	0.000172	0.000172	1079.26	0.0439	0.000000	0.002				91.2671	988.0363
1.00476		50	0.1249	1101.08	(72)	0.000180	0.000180	1101.15	-0.0673	0.000000	0.005				113.0439	988.0363
1.00476		50	0.1249	1101.09	(72)	0.000180	0.000180	1101.15	-0.0624	0.000000	0.004				113.0488	988.0363
0.05		55	0.0071	991.84	(45)	0.000123	0.000145	991.69	0.1477	-0.000021	0.022					985.6952
0.1		55	0.0140	997.86	(45)	0.000132	0.000147	997.65	0.2118	-0.000015	0.045					985.6952
0.5		55	0.0663	1044.04	(45)	0.000160	0.000163	1043.82	0.2182	-0.000003	0.048					985.6952
0.65		55	0.0845	1060.56	(20)	0.000167	0.000168	1060.47	0.0969	-0.000001	0.009				74.869	985.6952
0.7		55	0.0904	1066.01	(45)	0.000169	0.000170	1065.94	0.0744	-0.000001	0.006					985.6952
1		55	0.1244	1097.67	(45)	0.000183	0.000181	1097.91	-0.2418	0.000002	0.058					985.6952
1.2		55	0.1456	1118.13	(45)	0.000189	0.000188	1118.45	-0.3172	0.000002	0.101					985.6952
1.5		55	0.1757	1146.17	(45)	0.000206	0.000198	1148.10	-1.9348	0.000008	3.744	!				985.6952
0.0333		60	0.0047	987.30	(52)	0.000120	0.000146	987.18	0.1210	-0.000026	0.015					983.1989
		60	0.0100	991.90	(90)	0.000125	0.000148	991.68	0.2241	-0.000023	0.050					983.1989
		60	0.0200	1000.70	(90)	0.000128	0.000151	1000.24	0.4575	-0.000023	0.209					983.1989
0.2356		60	0.0324	1011.30	(52)	0.000144	0.000154	1010.98	0.3224	-0.000010	0.104					983.1989
		60	0.0400	1018.40	(90)	0.000138	0.000156	1017.65	0.7537	-0.000018	0.568					983.1989
0.4712		60	0.0627	1038.30	(52)	0.000157	0.000163	1037.87	0.4262	-0.000006	0.182					983.1989
		60	0.0800	1054.40	(90)	0.000159	0.000168	1053.54	0.8574	-0.000010	0.735					983.1989
		60	0.1200	1091.50	(90)	0.000176	0.000180	1090.90	0.6037	-0.000004	0.364					983.1989
1.1779		60	0.1433	1113.40	(52)	0.000187	0.000188	1113.37	0.0308	0.000000	0.001					983.1989
		60	0.1600	1129.90	(90)	0.000192	0.000193	1129.70	0.1999	-0.000001	0.040					983.1989
		60	0.2000	1169.60	(90)	0.000207	0.000205	1169.93	-0.3272	0.000001	0.107					983.1989
0.01		65	0.0014	981.80	(27)	0.000108	0.000147	981.75	0.0531	-0.000039	0.003					980.5548
0.05		65	0.0071	986.70	(27)	0.000119	0.000148	986.50	0.2004	-0.000029	0.040					980.5548
0.1		65	0.0140	992.60	(27)	0.000136	0.000150	992.41	0.1944	-0.000014	0.038					980.5548
0.15		65	0.0209	998.50	(27)	0.000141	0.000152	998.27	0.2272	-0.000011	0.052					980.5548
0.05156		72.95	0.0073	982.45	(114)	0.000108	0.000150	982.16	0.2959	-0.000042	0.088			15.34		976.0625
0.06016		72.95	0.0085	983.39	(114)	0.000124	0.000150	983.17	0.2201	-0.000027	0.048			17.56		976.0625
0.0715		72.95	0.0101	984.76	(114)	0.000124	0.000151	984.50	0.2583	-0.000026	0.067			17.67		976.0625
0.20229		72.95	0.0279	1000.11	(114)	0.000143	0.000156	999.75	0.3554	-0.000013	0.126			20.29		976.0625
0.52286		72.95	0.0691	1036.37	(114)	0.000162	0.000166	1036.06	0.3147	-0.000004	0.099			23.05		976.0625
0.70028		72.95	0.0905	1055.69	(114)	0.000170	0.000172	1055.51	0.1858	-0.000002	0.035			24.21		976.0625
0.01948		74.8	0.0028	977.37	(114)	0.000111	0.000149	977.27	0.1013	-0.000038	0.010			15.74		974.9683
0.05442		74.8	0.0077	981.62	(114)	0.000119	0.000150	981.39	0.2324	-0.000031	0.054			16.91		974.9683
0.09547		74.8	0.0134	986.53	(114)	0.000128	0.000152	986.21	0.3166	-0.000024	0.100			18.13		974.9683
0.20961		74.8	0.0289	999.96	(114)	0.000139	0.000156	999.48	0.4829	-0.000017	0.233			19.78		974.9683
0.31478		74.8	0.0428	1012.05	(114)	0.000148	0.000160	1011.53	0.5203	-0.000012	0.271			20.98		974.9683
0.39192		74.8	0.0527	1020.76	(114)	0.000153	0.000162	1020.27	0.4933	-0.000009	0.243			21.76		974.9683
0.49767		74.8	0.0660	1032.66	(114)	0.000158	0.000166	1032.11	0.5465	-0.000008	0.299			22.43		974.9683
0.10641		74.96	0.0149	987.73	(114)	0.000129	0.000152	987.39	0.3386	-0.000023	0.115			18.33		974.8729
0.20393		74.96	0.0282	999.19	(114)	0.000139	0.000156	998.72	0.4682	-0.000017	0.219			19.76		974.8729
0.4941		74.96	0.0656	1032.09	(114)	0.000159	0.000166	1031.62	0.4749	-0.000007	0.226			22.55		974.8729

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water at t°C kg/m³
0.72002		74.96	0.0928	1056.59	(114)	0.000171	0.000173	1056.39	0.1998	-0.000002	0.040			24.27		974.8729
1.001		74.96	0.1245	1086.03	(114)	0.000182	0.000181	1086.19	-0.1630	0.000001	0.027			25.92		974.8729
1.5106		74.96	0.1767	1136.77	(114)	0.000199	0.000196	1137.48	-0.7129	0.000003	0.508			28.26		974.8729
0.01		75	0.0014	976.10	(27)	0.000099	0.000149	976.03	0.0674	-0.000050	0.005					974.849
0.0333		75	0.0047	979.20	(52)	0.000058	0.000150	978.78	0.4153	-0.000092	0.173					974.849
0.05		75	0.0071	981.10	(27)	0.000099	0.000150	980.75	0.3477	-0.000051	0.121					974.849
0.1		75	0.0140	987.00	(27)	0.000124	0.000152	986.62	0.3808	-0.000028	0.145					974.849
0.15		75	0.0209	992.90	(27)	0.000132	0.000154	992.45	0.4505	-0.000022	0.203					974.849
0.236		75	0.0324	1003.10	(52)	0.000135	0.000157	1002.39	0.7074	-0.000022	0.500					974.849
0.4721		75	0.0629	1030.30	(52)	0.000147	0.000165	1029.14	1.1608	-0.000017	1.347					974.849
1.1802		75	0.1436	1105.10	(52)	0.000184	0.000187	1104.61	0.4937	-0.000003	0.244					974.849
		80	0.0100	980.50	(90)	0.000116	0.000151	980.16	0.3426	-0.000036	0.117					971.7978
		80	0.0200	989.20	(90)	0.000124	0.000154	988.61	0.5861	-0.000030	0.343					971.7978
		80	0.0400	1006.80	(90)	0.000135	0.000159	1005.82	0.9789	-0.000024	0.958					971.7978
		80	0.0800	1042.60	(90)	0.000156	0.000169	1041.44	1.1648	-0.000013	1.357					971.7978
		80	0.1200	1079.50	(90)	0.000173	0.000179	1078.69	0.8107	-0.000006	0.657					971.7978
		80	0.1600	1117.60	(90)	0.000190	0.000190	1117.62	-0.0248	0.000000	0.001					971.7978
		80	0.2000	1156.90	(90)	0.000206	0.000201	1158.27	-1.3719	0.000005	1.882					971.7978
0.65		95	0.0845	1035.84	(20)	0.000162	0.000167	1035.39	0.4530	-0.000005	0.205				73.938	961.9004
0.20186		98.67	0.0279	983.30	(114)	0.000131	0.000153	982.68	0.6129	-0.000023	0.376			18.54		959.3157
0.20229		98.67	0.0279	983.35	(114)	0.000130	0.000153	982.73	0.6222	-0.000023	0.387			18.5		959.3157
0.52286		98.67	0.0691	1019.45	(114)	0.000153	0.000162	1018.80	0.6576	-0.000009	0.432			21.74		959.3157
0.70028		98.67	0.0905	1038.75	(114)	0.000161	0.000167	1038.21	0.5346	-0.000005	0.286			22.93		959.3157
0.01		100	0.0014	959.90	(27)	-0.000134	0.000147	959.53	0.3674	-0.000281	0.135		!			958.3637
0.0334		100	0.0047	963.00	(52)	-0.000020	0.000148	962.26	0.7370	-0.000168	0.543					958.3637
0.05		100	0.0071	965.20	(27)	-0.000004	0.000149	964.20	1.0041	-0.000153	1.008					958.3637
		100	0.0100	967.10	(90)	0.000101	0.000149	966.65	0.4518	-0.000048	0.204					958.3637
0.1		100	0.0140	971.00	(27)	0.000074	0.000150	970.00	1.0029	-0.000076	1.006					958.3637
		100	0.0200	975.80	(90)	0.000111	0.000151	975.04	0.7627	-0.000040	0.582					958.3637
0.15		100	0.0209	976.90	(27)	0.000095	0.000151	975.77	1.1326	-0.000057	1.283					958.3637
0.2367		100	0.0325	986.90	(52)	0.000116	0.000154	985.70	1.2000	-0.000038	1.440					958.3637
		100	0.0400	993.40	(90)	0.000123	0.000156	992.13	1.2654	-0.000032	1.601					958.3637
0.4784		100	0.0636	1014.00	(52)	0.000144	0.000161	1012.90	1.0980	-0.000017	1.206					958.3637
		100	0.0800	1029.20	(90)	0.000146	0.000164	1027.64	1.5559	-0.000018	2.421					958.3637
		100	0.1200	1066.10	(90)	0.000165	0.000173	1064.98	1.1198	-0.000008	1.254					958.3637
1.1836		100	0.1439	1088.70	(52)	0.000176	0.000178	1088.24	0.4640	-0.000003	0.215					958.3637
		100	0.1600	1104.20	(90)	0.000182	0.000182	1104.23	-0.0309	0.000000	0.001					958.3637
0.01		125	0.0014	940.80	(27)	-0.000384	0.000140	940.14	0.6569	-0.000524	0.431		!			938.9841
0.0336		125	0.0048	944.00	(52)	-0.000126	0.000140	942.87	1.1258	-0.000266	1.267		!			938.9841
0.05		125	0.0071	946.00	(27)	-0.000055	0.000140	944.77	1.2313	-0.000195	1.516		!			938.9841
0.1		125	0.0140	952.00	(27)	0.000025	0.000142	950.53	1.4727	-0.000116	2.169					938.9841
0.15		125	0.0209	957.70	(27)	0.000067	0.000143	956.26	1.4399	-0.000075	2.073					938.9841
0.2381		125	0.0327	968.30	(52)	0.000079	0.000145	966.30	2.0015	-0.000065	4.006					938.9841
0.4761		125	0.0634	995.60	(52)	0.000109	0.000150	993.02	2.5820	-0.000041	6.667		!			938.9841
1.1904		125	0.1446	1071.00	(52)	0.000157	0.000165	1069.76	1.2366	-0.000007	1.529					938.9841
Average Res									0.1661	-0.000019	99.37	Sum chi sqr				

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water at t°C kg/m³
								Std dev Res	0.5152	0.000042						
								Avg - 4std	-1.8948	-0.000188						
								Avg + 4std	2.2270	0.000150						

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	-1.2E-07
c1	4.35E-07
c2	0.153639
c3	0.007251
c4	4731.543
Min T	0
Max T	125
Min w	0.000316
Max w	0.24
Avg dens res	0.1661
Std dens res	0.515223
Avg app vol res *10 ³	-0.01924
Std app vol res *10 ³	0.04224
No of points in corr	340
No of inconsistent pair	9

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

0.001	15	0.0001	1000.4	(47)	-0.008158	0.000099	999.23	1.1722	-0.008258	1.374	!	!	1.3	999.0996
0.005	15	0.0007	1005.6	(47)	-0.008158	0.000099	999.74	5.8640	-0.008258	34.386	!	!	6.5	999.0996
0.01001	15	0.0014	1012.2	(47)	-0.008220	0.000100	1000.37	11.8346	-0.008319	140.058	!	!	13.1	999.0996
0.02002	15	0.0028	1025.1	(47)	-0.008149	0.000100	1001.60	23.4995	-0.008250	552.227	!	!	26	999.0996
0.05006	15	0.0067	1063.6	(47)	-0.008077	0.000102	1005.14	58.4633	-0.008179	3417.954	!	!	64.5	999.0996
0.06007	15	0.0079	1077.1	(47)	-0.008148	0.000102	1006.26	70.8430	-0.008250	5018.730	!	!	78	999.0996
0.08009	15	0.0103	1101.5	(47)	-0.008007	0.000103	1008.44	93.0591	-0.008111	8659.988	!	!	102.4	999.0996
0.10012	15	0.0126	1129.1	(47)	-0.008147	0.000104	1010.50	118.5969	-0.008252	14065.213	!	!	130	999.0996
0.14016	15	0.0168	1183.2	(47)	-0.008254	0.000106	1014.36	168.8377	-0.008360	28506.178	!	!	184.1	999.0996

Density of aqueous solutions of **NH3**

- References (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.
 (106) Rashkovskaya, E. A.; Chernen'kaya, E. I. Densities of Solutions of NH_4HCO_3 , NaHCO_3 , NH_4Cl and Ammonia in the 20-100° Range. *J. Appl. Chem. USSR* **1967**, 40, 301-308.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		0	0.0100	995.9	(90)	0.001396	0.001417	995.7	0.2141	-0.000022	0.046			999.8395
		0	0.0200	991.9	(90)	0.001400	0.001414	991.6	0.2682	-0.000014	0.072			999.8395
		0	0.0400	984.2	(90)	0.001397	0.001408	983.8	0.3949	-0.000010	0.156			999.8395
		0	0.0800	969.5	(90)	0.001391	0.001396	969.2	0.3270	-0.000004	0.107			999.8395
		0	0.1200	956.1	(90)	0.001381	0.001385	955.7	0.3694	-0.000003	0.136			999.8395
		0	0.1600	943.5	(90)	0.001373	0.001375	943.3	0.1931	-0.000001	0.037			999.8395
		0	0.2000	931.6	(90)	0.001366	0.001366	931.8	-0.1629	0.000001	0.027			999.8395
		0	0.2400	920.2	(90)	0.001361	0.001357	921.0	-0.7842	0.000004	0.615			999.8395
		0	0.2800	909.4	(90)	0.001355	0.001349	910.9	-1.4760	0.000006	2.179			999.8395
		0	0.3000	904.0	(90)	0.001354	0.001345	906.0	-2.0481	0.000008	4.195			999.8395
		5	0.0100	995.8	(90)	0.001418	0.001424	995.7	0.0623	-0.000006	0.004			999.9638
		5	0.0200	991.7	(90)	0.001417	0.001421	991.6	0.0942	-0.000005	0.009			999.9638
		5	0.0400	983.7	(90)	0.001413	0.001416	983.6	0.0903	-0.000002	0.008			999.9638
		5	0.0800	968.6	(90)	0.001405	0.001405	968.6	0.0101	0.000000	0.000			999.9638
		5	0.1200	954.8	(90)	0.001394	0.001395	954.7	0.0928	-0.000001	0.009			999.9638
		5	0.1600	942.0	(90)	0.001385	0.001386	941.8	0.1973	-0.000001	0.039			999.9638
		5	0.2000	929.6	(90)	0.001379	0.001378	929.7	-0.1465	0.000001	0.021			999.9638
		5	0.2400	917.9	(90)	0.001373	0.001370	918.4	-0.5315	0.000003	0.282			999.9638
		5	0.2800	906.7	(90)	0.001367	0.001363	907.8	-1.0687	0.000005	1.142			999.9638
		5	0.3000	901.2	(90)	0.001365	0.001359	902.7	-1.4581	0.000006	2.126			999.9638
		10	0.0100	995.8	(90)	0.001392	0.001431	995.4	0.3827	-0.000039	0.146			999.6996
		10	0.0200	991.7	(90)	0.001404	0.001428	991.2	0.4765	-0.000024	0.227			999.6996
		10	0.0400	983.7	(90)	0.001407	0.001423	983.1	0.6129	-0.000016	0.376			999.6996
		10	0.0800	968.6	(90)	0.001402	0.001413	967.7	0.8686	-0.000012	0.755			999.6996
		10	0.1200	954.8	(90)	0.001392	0.001405	953.5	1.3473	-0.000012	1.815			999.6996
		10	0.1600	942.0	(90)	0.001383	0.001397	940.1	1.8944	-0.000013	3.589			999.6996
		10	0.2000	929.6	(90)	0.001377	0.001389	927.6	2.0290	-0.000012	4.117			999.6996
		10	0.2400	917.9	(90)	0.001372	0.001382	915.8	2.1499	-0.000011	4.622			999.6996
		10	0.2800	906.7	(90)	0.001367	0.001376	904.6	2.1394	-0.000009	4.577			999.6996
		10	0.3000	901.2	(90)	0.001365	0.001373	899.2	2.0195	-0.000008	4.078			999.6996
		20	0.0100	993.9	(90)	0.001436	0.001440	993.9	0.0422	-0.000004	0.002			998.2041
		20	0.0200	989.5	(90)	0.001442	0.001438	989.6	-0.0860	0.000004	0.007			998.2041
		20	0.0200	989.4	(106)	0.001448	0.001438	989.6	-0.1860	0.000009	0.035			998.2041
		20	0.0400	981.1	(90)	0.001438	0.001434	981.3	-0.1553	0.000004	0.024			998.2041
		20	0.0400	981.1	(106)	0.001438	0.001434	981.3	-0.1553	0.000004	0.024			998.2041
		20	0.0600	973.0	(106)	0.001434	0.001431	973.2	-0.1921	0.000003	0.037			998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		20	0.0800	965.1	(90)	0.001431	0.001428	965.4	-0.2783	0.000004	0.077			998.2041
		20	0.0800	965.1	(106)	0.001431	0.001428	965.4	-0.2783	0.000004	0.077			998.2041
		20	0.1000	957.5	(106)	0.001428	0.001424	957.8	-0.2974	0.000003	0.088			998.2041
		20	0.1200	950.1	(90)	0.001424	0.001421	950.4	-0.3348	0.000003	0.112			998.2041
		20	0.1200	950.1	(106)	0.001424	0.001421	950.4	-0.3348	0.000003	0.112			998.2041
		20	0.1400	943.0	(106)	0.001421	0.001418	943.3	-0.2770	0.000002	0.077			998.2041
		20	0.1600	936.2	(90)	0.001416	0.001416	936.3	-0.1118	0.000001	0.012			998.2041
		20	0.1600	936.7	(106)	0.001413	0.001416	936.3	0.3882	-0.000003	0.151			998.2041
		20	0.2000	922.9	(90)	0.001411	0.001410	922.9	-0.0152	0.000000	0.000			998.2041
		20	0.2400	910.1	(90)	0.001406	0.001406	910.2	-0.0667	0.000000	0.004			998.2041
		20	0.2800	898.0	(90)	0.001401	0.001401	898.0	0.0001	0.000000	0.000			998.2041
		20	0.3000	892.0	(90)	0.001399	0.001399	892.1	-0.1168	0.000000	0.014			998.2041
		25	0.0200	988.2	(106)	0.001452	0.001441	988.4	-0.2028	0.000010	0.041			997.0449
		25	0.0400	979.9	(106)	0.001442	0.001439	980.0	-0.1178	0.000003	0.014			997.0449
		25	0.0600	971.7	(106)	0.001439	0.001436	971.9	-0.1734	0.000003	0.030			997.0449
		25	0.0800	963.6	(106)	0.001438	0.001433	964.0	-0.3546	0.000005	0.126			997.0449
		25	0.1000	955.9	(106)	0.001435	0.001431	956.2	-0.3480	0.000004	0.121			997.0449
		25	0.1200	948.2	(106)	0.001434	0.001428	948.7	-0.5412	0.000005	0.293			997.0449
		25	0.1400	941.0	(106)	0.001430	0.001426	941.4	-0.4230	0.000003	0.179			997.0449
		25	0.1600	934.9	(106)	0.001420	0.001424	934.3	0.6169	-0.000004	0.381			997.0449
		30	0.0200	986.8	(106)	0.001455	0.001444	987.0	-0.2128	0.000011	0.045			995.6473
		30	0.0400	978.5	(106)	0.001444	0.001442	978.6	-0.1021	0.000003	0.010			995.6473
		30	0.0600	970.4	(106)	0.001440	0.001440	970.4	-0.0026	0.000000	0.000			995.6473
		30	0.0800	962.1	(106)	0.001442	0.001438	962.4	-0.3028	0.000004	0.092			995.6473
		30	0.1000	954.2	(106)	0.001441	0.001436	954.6	-0.3921	0.000004	0.154			995.6473
		30	0.1200	946.3	(106)	0.001441	0.001435	947.0	-0.6609	0.000006	0.437			995.6473
		30	0.1400	939.1	(106)	0.001436	0.001433	939.5	-0.4004	0.000003	0.160			995.6473
		30	0.1600	933.0	(106)	0.001426	0.001432	932.2	0.7976	-0.000006	0.636			995.6473
		35	0.0200	985.2	(106)	0.001457	0.001445	985.4	-0.2370	0.000012	0.056			994.0319
		35	0.0400	977.0	(106)	0.001444	0.001444	977.0	-0.0297	0.000001	0.001			994.0319
		35	0.0600	968.8	(106)	0.001443	0.001443	968.8	-0.0015	0.000000	0.000			994.0319
		35	0.0800	960.5	(106)	0.001445	0.001442	960.7	-0.2445	0.000003	0.060			994.0319
		35	0.1000	952.4	(106)	0.001446	0.001441	952.9	-0.4515	0.000005	0.204			994.0319
		35	0.1200	944.4	(106)	0.001447	0.001440	945.1	-0.7159	0.000007	0.512			994.0319
		35	0.1400	937.0	(106)	0.001443	0.001439	937.5	-0.5312	0.000004	0.282			994.0319
		35	0.1600	931.0	(106)	0.001432	0.001438	930.1	0.9082	-0.000007	0.825			994.0319
		40	0.0200	983.6	(106)	0.001449	0.001444	983.7	-0.0930	0.000005	0.009			992.2158
		40	0.0400	975.4	(106)	0.001442	0.001444	975.3	0.0814	-0.000002	0.007			992.2158
		40	0.0600	967.1	(106)	0.001444	0.001444	967.1	0.0116	0.000000	0.000			992.2158
		40	0.0800	958.8	(106)	0.001447	0.001444	959.0	-0.1986	0.000003	0.039			992.2158

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		40	0.1000	950.5	(106)	0.001450	0.001444	951.0	-0.5454	0.000006	0.297			992.2158
		40	0.1400	935.0	(106)	0.001448	0.001444	935.5	-0.5347	0.000004	0.286			992.2158
		40	0.1600	928.8	(106)	0.001438	0.001444	928.0	0.8295	-0.000006	0.688			992.2158
		45	0.0200	981.8	(106)	0.001443	0.001443	981.8	0.0044	0.000000	0.000			990.2132
		45	0.0400	973.6	(106)	0.001441	0.001444	973.5	0.1159	-0.000003	0.013			990.2132
		45	0.0600	965.3	(106)	0.001444	0.001445	965.3	0.0209	0.000000	0.000			990.2132
		45	0.0800	957.0	(106)	0.001448	0.001446	957.2	-0.1811	0.000002	0.033			990.2132
		45	0.1000	948.6	(106)	0.001453	0.001446	949.2	-0.5901	0.000007	0.348			990.2132
		45	0.1200	940.5	(106)	0.001455	0.001447	941.3	-0.8058	0.000008	0.649			990.2132
		45	0.1400	932.9	(106)	0.001453	0.001448	933.5	-0.6279	0.000005	0.394			990.2132
		45	0.1600	926.8	(106)	0.001442	0.001449	925.9	0.9444	-0.000007	0.892			990.2132
		50	0.0200	979.9	(106)	0.001432	0.001440	979.8	0.1425	-0.000007	0.020			988.0363
		50	0.0400	971.7	(106)	0.001437	0.001442	971.5	0.1606	-0.000004	0.026			988.0363
		50	0.0600	963.4	(106)	0.001443	0.001444	963.4	0.0124	0.000000	0.000			988.0363
		50	0.0800	955.1	(106)	0.001448	0.001446	955.3	-0.2066	0.000003	0.043			988.0363
		50	0.1000	946.7	(106)	0.001454	0.001447	947.3	-0.6006	0.000007	0.361			988.0363
		50	0.1200	938.6	(106)	0.001456	0.001449	939.4	-0.7728	0.000007	0.597			988.0363
		50	0.1400	930.9	(106)	0.001456	0.001451	931.5	-0.6260	0.000005	0.392			988.0363
		50	0.1600	924.6	(106)	0.001446	0.001452	923.8	0.8374	-0.000006	0.701			988.0363
		55	0.0200	977.9	(106)	0.001419	0.001435	977.6	0.3103	-0.000016	0.096			985.6952
		55	0.0400	969.7	(106)	0.001433	0.001438	969.5	0.2037	-0.000005	0.041			985.6952
		55	0.0600	961.5	(106)	0.001440	0.001441	961.4	0.0741	-0.000001	0.005			985.6952
		55	0.0800	953.1	(106)	0.001448	0.001444	953.4	-0.2877	0.000004	0.083			985.6952
		55	0.1000	944.8	(106)	0.001454	0.001447	945.4	-0.5900	0.000007	0.348			985.6952
		55	0.1200	936.7	(106)	0.001457	0.001450	937.4	-0.7397	0.000007	0.547			985.6952
		55	0.1400	928.9	(106)	0.001458	0.001452	929.5	-0.6433	0.000005	0.414			985.6952
		55	0.1600	922.6	(106)	0.001448	0.001455	921.7	0.8940	-0.000007	0.799			985.6952
		60	0.0200	975.8	(106)	0.001403	0.001429	975.3	0.4984	-0.000026	0.248			983.1989
		60	0.0400	967.7	(106)	0.001424	0.001433	967.4	0.3350	-0.000009	0.112			983.1989
		60	0.0600	959.5	(106)	0.001436	0.001437	959.4	0.0949	-0.000002	0.009			983.1989
		60	0.0800	951.2	(106)	0.001445	0.001442	951.4	-0.2360	0.000003	0.056			983.1989
		60	0.1000	943.0	(106)	0.001451	0.001445	943.5	-0.4704	0.000005	0.221			983.1989
		60	0.1200	934.8	(106)	0.001456	0.001449	935.5	-0.7193	0.000007	0.517			983.1989
		60	0.1400	926.8	(106)	0.001459	0.001453	927.6	-0.7926	0.000007	0.628			983.1989
		60	0.1600	920.6	(106)	0.001449	0.001456	919.7	0.9012	-0.000007	0.812			983.1989
		65	0.0200	973.5	(106)	0.001389	0.001421	972.9	0.5984	-0.000032	0.358			980.5548
		65	0.0400	965.5	(106)	0.001417	0.001427	965.2	0.3455	-0.000009	0.119			980.5548
		65	0.0600	957.4	(106)	0.001431	0.001432	957.3	0.0651	-0.000001	0.004			980.5548
		65	0.0800	949.3	(106)	0.001440	0.001437	949.5	-0.1621	0.000002	0.026			980.5548
		65	0.1000	941.2	(106)	0.001446	0.001442	941.6	-0.3531	0.000004	0.125			980.5548

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		65	0.1200	933.0	(106)	0.001453	0.001447	933.6	-0.6232	0.000006	0.388			980.5548
		65	0.1400	924.8	(106)	0.001459	0.001452	925.7	-0.8860	0.000007	0.785			980.5548
		65	0.1600	918.8	(106)	0.001448	0.001456	917.8	1.0462	-0.000008	1.095			980.5548
		70	0.0200	971.2	(106)	0.001369	0.001411	970.4	0.8028	-0.000043	0.645			977.7696
		70	0.0400	963.3	(106)	0.001407	0.001418	962.9	0.4269	-0.000012	0.182			977.7696
		70	0.0600	955.3	(106)	0.001424	0.001425	955.2	0.0756	-0.000001	0.006			977.7696
		70	0.0800	947.4	(106)	0.001433	0.001431	947.5	-0.0755	0.000001	0.006			977.7696
		70	0.1000	939.4	(106)	0.001440	0.001438	939.6	-0.2483	0.000003	0.062			977.7696
		70	0.1200	931.2	(106)	0.001449	0.001444	931.8	-0.5623	0.000005	0.316			977.7696
		70	0.1400	923.0	(106)	0.001456	0.001449	923.8	-0.8352	0.000007	0.698			977.7696
		70	0.1600	917.1	(106)	0.001446	0.001455	915.9	1.2173	-0.000009	1.482			977.7696
		75	0.0200	968.8	(106)	0.001346	0.001400	967.8	1.0053	-0.000054	1.011			974.849
		75	0.0400	961.0	(106)	0.001395	0.001408	960.5	0.4720	-0.000013	0.223			974.849
		75	0.0600	953.1	(106)	0.001416	0.001416	953.1	0.0183	0.000000	0.000			974.849
		75	0.0800	945.5	(106)	0.001424	0.001424	945.5	0.0146	0.000000	0.000			974.849
		75	0.1000	937.6	(106)	0.001433	0.001431	937.8	-0.1658	0.000002	0.027			974.849
		75	0.1200	929.4	(106)	0.001444	0.001439	929.9	-0.5471	0.000005	0.299			974.849
		75	0.1400	921.3	(106)	0.001452	0.001445	922.1	-0.7510	0.000006	0.564			974.849
		75	0.1600	915.4	(106)	0.001442	0.001452	914.1	1.3029	-0.000010	1.697			974.849
		80	0.0200	966.4	(106)	0.001316	0.001386	965.1	1.3000	-0.000070	1.690		!	971.7978
		80	0.0400	958.8	(106)	0.001378	0.001396	958.1	0.6740	-0.000018	0.454			971.7978
		80	0.0600	951.0	(106)	0.001404	0.001406	950.9	0.0856	-0.000002	0.007			971.7978
		80	0.0800	943.7	(106)	0.001412	0.001415	943.5	0.2000	-0.000003	0.040			971.7978
		80	0.1000	935.8	(106)	0.001425	0.001424	935.9	-0.1148	0.000001	0.013			971.7978
		80	0.1200	927.6	(106)	0.001438	0.001432	928.2	-0.5874	0.000006	0.345			971.7978
		80	0.1400	919.5	(106)	0.001447	0.001440	920.3	-0.8440	0.000007	0.712			971.7978
		80	0.1600	913.8	(106)	0.001437	0.001448	912.4	1.3919	-0.000010	1.937			971.7978
		85	0.0200	964.0	(106)	0.001280	0.001370	962.3	1.6820	-0.000091	2.829		!	968.6203
		85	0.0400	956.5	(106)	0.001359	0.001382	955.7	0.8270	-0.000023	0.684			968.6203
		85	0.0600	948.8	(106)	0.001392	0.001393	948.7	0.0708	-0.000001	0.005			968.6203
		85	0.1000	934.1	(106)	0.001414	0.001414	934.1	-0.0039	0.000000	0.000			968.6203
		85	0.1200	925.9	(106)	0.001429	0.001424	926.5	-0.5928	0.000006	0.351			968.6203
		85	0.1400	917.8	(106)	0.001441	0.001433	918.7	-0.9244	0.000008	0.855			968.6203
		85	0.1600	912.2	(106)	0.001431	0.001442	910.8	1.3735	-0.000010	1.886			968.6203
		90	0.0200	961.5	(106)	0.001242	0.001353	959.5	2.0466	-0.000111	4.189		!	965.3201
		90	0.0400	954.2	(106)	0.001338	0.001366	953.2	1.0257	-0.000028	1.052			965.3201
		90	0.0600	946.5	(106)	0.001379	0.001379	946.5	-0.0328	0.000001	0.001			965.3201
		90	0.0800	940.0	(106)	0.001385	0.001391	939.6	0.4255	-0.000006	0.181			965.3201
		90	0.1000	932.4	(106)	0.001402	0.001402	932.3	0.0584	-0.000001	0.003			965.3201
		90	0.1200	924.2	(106)	0.001420	0.001413	924.9	-0.6724	0.000007	0.452			965.3201

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		90	0.1400	916.5	(106)	0.001430	0.001424	917.2	-0.7023	0.000006	0.493			965.3201
		90	0.1600	910.5	(106)	0.001426	0.001434	909.4	1.1369	-0.000009	1.293			965.3201
		95	0.0400	951.8	(106)	0.001315	0.001348	950.6	1.1650	-0.000032	1.357			961.9004
		95	0.0600	944.3	(106)	0.001363	0.001362	944.3	-0.0309	0.000001	0.001			961.9004
		95	0.0800	938.3	(106)	0.001366	0.001376	937.6	0.6513	-0.000009	0.424			961.9004
		95	0.1000	930.8	(106)	0.001387	0.001389	930.6	0.1642	-0.000002	0.027			961.9004
		95	0.1200	922.5	(106)	0.001410	0.001401	923.3	-0.8354	0.000008	0.698			961.9004
		95	0.1400	914.5	(106)	0.001425	0.001414	915.8	-1.2874	0.000011	1.657			961.9004
		95	0.1600	908.9	(106)	0.001418	0.001425	908.0	0.8716	-0.000007	0.760			961.9004
		100	0.0400	949.5	(106)	0.001287	0.001327	948.1	1.4405	-0.000040	2.075			958.3637
		100	0.0600	942.1	(106)	0.001344	0.001343	942.1	-0.0292	0.000001	0.001			958.3637
		100	0.0800	936.6	(106)	0.001347	0.001359	935.8	0.8434	-0.000012	0.711			958.3637
		100	0.1000	929.3	(106)	0.001370	0.001373	929.0	0.3058	-0.000004	0.094			958.3637
		100	0.1200	920.9	(106)	0.001397	0.001387	921.9	-0.9903	0.000010	0.981			958.3637
		100	0.1400	912.9	(106)	0.001415	0.001401	914.5	-1.5896	0.000014	2.527			958.3637
		100	0.1600	907.3	(106)	0.001410	0.001414	906.8	0.4670	-0.000004	0.218			958.3637
								Average Res	0.0543	-0.000004	92.884	Sum chi sqr		
								Std dev Res	0.7350	0.000016				
								Avg - 4std	-2.8857	-0.000067				
								Avg + 4std	2.9943	0.000059				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	0.126926
c1	0.104704
c2	1.030214
c3	-0.00508
c4	-2973.708
Min T	0
Max T	100
Min w	0.01
Max w	0.3
Avg dens res	0.054308
Std dens res	0.734992
Avg app vol res *10 ³	-0.003633
Std app vol res *10 ³	0.015776
No of points in corr	172
No of inconsistent pair	4

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

40	0.1200	947.4	(106)	0.001405	0.001444	943.2	4.1748	-0.000039	17.429	!			992.2158
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molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m ³
		85	0.0800	946.8	(106)	0.001330	0.001404	941.5	5.2727	-0.000074	27.802	!	!	968.6203
		95	0.0200	959.0	(106)	0.001197	0.001333	956.5	2.4900	-0.000136	6.200		!	961.9004
		100	0.0200	951.4	(106)	0.001425	0.001310	953.5	-2.0912	0.000115	4.373		!	958.3637

Density of aqueous solutions of **NH4Cl**

- References
- (40) Herz, W. Internal Friction of Salt Solutions (C. A. Trans. from German). *Z. Anorg. Chemie* **1914**, *89*, 393-396.
- (45) Isono, T. Densities, Viscosities, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions at Several Temperatures. Alkaline-Earth Chlorides, LaCl_3 , Na_2SO_4 , NaNO_3 , NaBr , KNO_3 , KBr , and $\text{Cd}(\text{NO}_3)_2$. *J. Chem. Eng. Data* **1984**, *29*, 45-52.
- (47) Kaminsky, M. Experimental Investigations of the Concentration and Temperature Dependence of the Viscosity of Aqueous Solutions of Strong Electrolytes. I. Potassium Iodide, Ammonium Chloride, and Sodium Sulphate Solutions. *Z. Physik. Chem. N. F.* **1955**, *5*, 154-191.
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, *61*, 1492-1498.
- (74) Motin, M. A., Temperature and Concentration Dependence of Apparent Molar Volumes and Viscosities of NaCl, NH4Cl, CuCl2, and MgSO4 in Pure Water and Water + Urea Mixtures, *J. Chem. Eng. Data*, **2004**, *49*, 94-98
- (84) Pearce, J. N.; Pumplun, G. G. The Apparent and Partial Molal Volume of Ammonium Chloride and of Cupric Sulfate in Aqueous Solutions at 25°C. *J. Am. Chem. Soc.* **1937**, *59*, 1221-1222.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (106) Rashkovskaya, E. A.; Chemen'kaya, E. I. Densities of Solutions of NH_4HCO_3 , NaHCO_3 , NH_4Cl and Ammonia in the 20-100° Range. *J. Appl. Chem. USSR* **1967**, *40*, 301-308.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Apparent molal volume water / cm³/mol	Density of water / kg/m³
		0	0.01	1003.3	(90)	0.000655	0.000695	1002.9	0.4013	-0.000040	0.161					999.8395
		0	0.02	1006.7	(90)	0.000659	0.000696	1006.0	0.7418	-0.000037	0.550					999.8395
		0	0.04	1013.5	(90)	0.000663	0.000698	1012.1	1.4218	-0.000035	2.022					999.8395
		0	0.08	1026.6	(90)	0.000674	0.000701	1024.3	2.2824	-0.000027	5.209					999.8395
		0	0.12	1039.1	(90)	0.000685	0.000705	1036.5	2.5503	-0.000020	6.504	!				999.8395
		0	0.16	1051.0	(90)	0.000696	0.000709	1048.8	2.2342	-0.000013	4.992					999.8395
		0	0.20	1062.5	(90)	0.000705	0.000712	1061.0	1.5429	-0.000007	2.381					999.8395
		0	0.24	1073.9	(90)	0.000713	0.000716	1073.1	0.7855	-0.000003	0.617					999.8395
		10	0.01	1002.9	(90)	0.000681	0.000700	1002.7	0.1923	-0.000019	0.037					999.6996
		10	0.02	1006.2	(90)	0.000677	0.000701	1005.7	0.4856	-0.000024	0.236					999.6996
		10	0.04	1012.6	(90)	0.000682	0.000703	1011.7	0.8768	-0.000021	0.769					999.6996
		10	0.08	1025.1	(90)	0.000690	0.000707	1023.7	1.3815	-0.000016	1.908					999.6996
		10	0.12	1037.0	(90)	0.000700	0.000711	1035.7	1.3239	-0.000010	1.753					999.6996
		10	0.16	1048.5	(90)	0.000709	0.000715	1047.6	0.9140	-0.000005	0.835					999.6996
		10	0.20	1059.6	(90)	0.000718	0.000718	1059.4	0.1619	-0.000001	0.026					999.6996
		10	0.24	1070.5	(90)	0.000725	0.000722	1071.2	-0.7221	0.000003	0.521					999.6996
0.001		12.5	0.0001	999.46	(47)	0.000645	0.000700	999.5	0.0030	-0.000055	0.000			0.19		999.4388
0.002		12.5	0.0001	999.48	(47)	0.000626	0.000700	999.5	0.0079	-0.000074	0.000			0.4		999.4388
0.005		12.5	0.0003	999.53	(47)	0.000664	0.000700	999.5	0.0098	-0.000037	0.000			0.9		999.4388
0.01001		12.5	0.0005	999.62	(47)	0.000664	0.000700	999.6	0.0194	-0.000036	0.000			1.8		999.4388
0.02002		12.5	0.0011	999.82	(47)	0.000645	0.000700	999.8	0.0590	-0.000055	0.003			3.8		999.4388
0.05006		12.5	0.0027	1000.38	(47)	0.000649	0.000701	1000.2	0.1387	-0.000052	0.019			9.4		999.4388
0.10013		12.5	0.0053	1001.28	(47)	0.000656	0.000701	1001.0	0.2417	-0.000045	0.058			18.4		999.4388
0.20026		12.5	0.0106	1002.93	(47)	0.000672	0.000701	1002.6	0.3110	-0.000029	0.097			34.9		999.4388
0.50065		12.5	0.0261	1007.78	(47)	0.000683	0.000703	1007.3	0.5305	-0.000020	0.281			83.5		999.4388

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.60078		12.5	0.0311	1009.48	(47)	0.000681	0.000703	1008.8	0.7167	-0.000023	0.514			100.5		999.4388
		15	0.0001	999.11	(47)	0.000814	0.000701	999.1	-0.0060	0.000112	0.000		!	0.1		999.0996
		15	0.0001	999.13	(47)	0.000720	0.000701	999.1	-0.0020	0.000019	0.000			0.3		999.0996
		15	0.0003	999.18	(47)	0.000701	0.000701	999.2	0.0000	0.000000	0.000			0.8		999.0996
		15	0.0005	999.28	(47)	0.000664	0.000701	999.3	0.0199	-0.000037	0.000			1.8		999.0996
		15	0.0011	999.47	(47)	0.000655	0.000702	999.4	0.0499	-0.000047	0.002			3.7		999.0996
0.05		15	0.0027	999.98	(45)	0.000671	0.000702	999.9	0.0831	-0.000031	0.007					999.0996
		15	0.0027	1000.02	(47)	0.000656	0.000702	999.9	0.1209	-0.000045	0.015			9.2		999.0996
0.07		15	0.0037	1000.34	(45)	0.000668	0.000702	1000.2	0.1254	-0.000034	0.016					999.0996
0.1		15	0.0053	1000.85	(45)	0.000672	0.000702	1000.7	0.1602	-0.000030	0.026					999.0996
		15	0.0053	1000.92	(47)	0.000660	0.000702	1000.7	0.2261	-0.000042	0.051			18.2		999.0996
0.2		15	0.0106	1002.41	(45)	0.000689	0.000702	1002.3	0.1474	-0.000014	0.022					999.0996
		15	0.0106	1002.58	(47)	0.000673	0.000702	1002.3	0.3098	-0.000029	0.096			34.8		999.0996
0.3		15	0.0158	1004.27	(45)	0.000675	0.000703	1003.8	0.4517	-0.000028	0.204					999.0996
0.5		15	0.0260	1007.4	(45)	0.000684	0.000704	1006.9	0.5208	-0.000020	0.271					999.0996
		15	0.0261	1007.41	(47)	0.000684	0.000704	1006.9	0.5231	-0.000020	0.274			83.2		999.0996
		15	0.0311	1010.11	(47)	0.000651	0.000705	1008.4	1.7131	-0.000054	2.935			110.2		999.0996
1		15	0.0508	1015.12	(45)	0.000690	0.000706	1014.2	0.8711	-0.000017	0.759					999.0996
1.5		15	0.0743	1022.17	(45)	0.000697	0.000709	1021.2	0.9320	-0.000012	0.869					999.0996
2		15	0.0966	1028.6	(45)	0.000704	0.000711	1027.9	0.7266	-0.000007	0.528					999.0996
3		15	0.1383	1040.61	(45)	0.000712	0.000715	1040.2	0.4313	-0.000003	0.186					999.0996
4		15	0.1763	1051.83	(45)	0.000716	0.000719	1051.3	0.4934	-0.000003	0.243					999.0996
5		15	0.2110	1059.89	(45)	0.000729	0.000722	1061.5	-1.6019	0.000007	2.566					999.0996
0.05		20	0.0027	999.07	(45)	0.000676	0.000704	999.0	0.0728	-0.000027	0.005					998.2041
0.07		20	0.0037	999.42	(45)	0.000675	0.000704	999.3	0.1068	-0.000029	0.011					998.2041
0.1		20	0.0053	999.9	(45)	0.000682	0.000704	999.8	0.1141	-0.000021	0.013					998.2041
		20	0.01	1001.3	(90)	0.000692	0.000704	1001.2	0.1237	-0.000012	0.015					998.2041
0.2		20	0.0106	1001.45	(45)	0.000695	0.000704	1001.4	0.0999	-0.000009	0.010					998.2041
0.3		20	0.0158	1003.29	(45)	0.000680	0.000705	1002.9	0.3929	-0.000025	0.154					998.2041
		20	0.02	1004.5	(90)	0.000688	0.000705	1004.1	0.3544	-0.000018	0.126					998.2041
0.5		20	0.0260	1006.38	(45)	0.000689	0.000706	1005.9	0.4397	-0.000017	0.193					998.2041
		20	0.04	1010.7	(90)	0.000692	0.000707	1010.1	0.6250	-0.000015	0.391					998.2041
1		20	0.0508	1014	(45)	0.000694	0.000709	1013.3	0.7359	-0.000014	0.541					998.2041
1.5		20	0.0743	1020.95	(45)	0.000701	0.000711	1020.2	0.7448	-0.000010	0.555					998.2041
		20	0.08	1022.7	(90)	0.000702	0.000712	1021.9	0.8079	-0.000010	0.653					998.2041
2		20	0.0966	1027.31	(45)	0.000708	0.000713	1026.8	0.5192	-0.000005	0.270					998.2041
		20	0.12	1034.4	(90)	0.000710	0.000716	1033.6	0.7555	-0.000006	0.571					998.2041
3		20	0.1383	1039.17	(45)	0.000716	0.000717	1039.0	0.1780	-0.000001	0.032					998.2041
		20	0.16	1045.7	(90)	0.000717	0.000720	1045.3	0.3787	-0.000002	0.143					998.2041
4		20	0.1763	1050.28	(45)	0.000720	0.000721	1050.0	0.2380	-0.000001	0.057					998.2041
		20	0.20	1056.7	(90)	0.000725	0.000724	1056.9	-0.2111	0.000001	0.045					998.2041
5		20	0.2110	1058.3	(45)	0.000732	0.000725	1060.1	-1.7871	0.000008	3.194					998.2041
		20	0.24	1067.4	(90)	0.000731	0.000728	1068.4	-1.0023	0.000004	1.005					998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Apparent molal volume / cm³/mol	Density of water / kg/m³
		25	0.0001	997.05	(47)	0.000815	0.000705	997.1	-0.0059	0.000110	0.000		!	0.1		997.0449
		25	0.0001	997.08	(47)	0.000628	0.000705	997.1	0.0082	-0.000077	0.000			0.4		997.0449
		25	0.0003	997.12	(47)	0.000703	0.000705	997.1	0.0006	-0.000002	0.000			0.8		997.0449
		25	0.0005	997.22	(47)	0.000666	0.000705	997.2	0.0210	-0.000039	0.000			1.8		997.0449
		25	0.0011	997.40	(47)	0.000666	0.000705	997.4	0.0421	-0.000040	0.002			3.6		997.0449
0.05		25	0.0027	997.9	(45)	0.000681	0.000705	997.8	0.0652	-0.000025	0.004					997.0449
		25	0.0027	997.92	(47)	0.000673	0.000705	997.8	0.0866	-0.000033	0.007			8.8		997.0449
0.07		25	0.0037	998.24	(45)	0.000681	0.000705	998.1	0.0905	-0.000024	0.008					997.0449
0.1		25	0.0053	998.72	(45)	0.000687	0.000706	998.6	0.0998	-0.000019	0.010					997.0449
0.1		25	0.0053	998.79	(84)	0.000674	0.000706	998.6	0.1688	-0.000032	0.028					997.0449
		25	0.0053	998.79	(47)	0.000674	0.000706	998.6	0.1675	-0.000032	0.028			17.5		997.0449
0.2		25	0.0106	1000.26	(45)	0.000698	0.000706	1000.2	0.0821	-0.000008	0.007					997.0449
0.2		25	0.0106	1000.45	(84)	0.000680	0.000706	1000.2	0.2731	-0.000026	0.075					997.0449
		25	0.0106	1000.42	(47)	0.000683	0.000706	1000.2	0.2430	-0.000023	0.059			33.9		997.0449
0.20027		25	0.0106	1000.44	(73)	0.000682	0.000706	1000.2	0.2579	-0.000024	0.067					997.0449
0.3		25	0.0158	1002.07	(45)	0.000685	0.000707	1001.7	0.3518	-0.000022	0.124					997.0449
0.4		25	0.0209	1003.67	(84)	0.000687	0.000707	1003.2	0.4237	-0.000020	0.179					997.0449
0.40722		25	0.0213	1003.75	(73)	0.000689	0.000707	1003.4	0.3993	-0.000019	0.159					997.0449
0.49999		25	0.0260	1005.2	(73)	0.000691	0.000708	1004.7	0.4525	-0.000017	0.205					997.0449
0.5		25	0.0260	1005.12	(45)	0.000694	0.000708	1004.7	0.3723	-0.000014	0.139					997.0449
		25	0.0261	1005.30	(47)	0.000687	0.000708	1004.8	0.5430	-0.000021	0.295			82.8		997.0449
0.59872		25	0.0310	1006.71	(73)	0.000693	0.000708	1006.2	0.4916	-0.000016	0.242					997.0449
0.6		25	0.0311	1006.76	(84)	0.000692	0.000708	1006.2	0.5216	-0.000017	0.272					997.0449
		25	0.0311	1006.87	(47)	0.000689	0.000708	1006.2	0.6168	-0.000020	0.380			98.5		997.0449
0.69941		25	0.0361	1007.23	(73)	0.000722	0.000709	1007.7	-0.4721	0.000013	0.223					997.0449
0.79957		25	0.0410	1009.72	(73)	0.000696	0.000709	1009.2	0.5582	-0.000013	0.312					997.0449
0.8		25	0.0410	1009.75	(84)	0.000695	0.000709	1009.2	0.5850	-0.000014	0.342					997.0449
0.89964		25	0.0459	1011.19	(73)	0.000697	0.000710	1010.6	0.5857	-0.000012	0.343					997.0449
1		25	0.0508	1012.65	(45)	0.000699	0.000710	1012.0	0.6148	-0.000012	0.378					997.0449
1		25	0.0508	1012.64	(84)	0.000699	0.000710	1012.0	0.6088	-0.000012	0.371					997.0449
1.00084		25	0.0508	1012.65	(73)	0.000699	0.000710	1012.0	0.6028	-0.000012	0.363					997.0449
	1.268	25	0.0667	1016.40	(40)	0.000717	0.000712	1016.7	-0.3246	0.000005	0.105					997.0449
1.5		25	0.0743	1019.54	(45)	0.000705	0.000713	1018.9	0.6023	-0.000008	0.363					997.0449
2		25	0.0966	1025.87	(45)	0.000711	0.000715	1025.5	0.3873	-0.000004	0.150					997.0449
2		25	0.0966	1026.02	(84)	0.000710	0.000715	1025.5	0.5323	-0.000005	0.283					997.0449
	2.536	25	0.1311	1034.60	(40)	0.000725	0.000719	1035.5	-0.9199	0.000007	0.846					997.0449
3		25	0.1383	1037.62	(45)	0.000719	0.000719	1037.6	0.0221	0.000000	0.000					997.0449
3		25	0.1383	1037.81	(84)	0.000718	0.000719	1037.6	0.2121	-0.000001	0.045					997.0449
4		25	0.1763	1048.63	(45)	0.000723	0.000723	1048.6	0.0730	0.000000	0.005					997.0449
4		25	0.1763	1048.32	(84)	0.000725	0.000723	1048.6	-0.2420	0.000001	0.059					997.0449
	3.83	25	0.1947	1052.00	(40)	0.000734	0.000725	1053.9	-1.8606	0.000009	3.462					997.0449
5		25	0.2110	1056.59	(45)	0.000735	0.000727	1058.5	-1.9182	0.000008	3.679					997.0449
5		25	0.2110	1057.80	(84)	0.000730	0.000727	1058.5	-0.7122	0.000003	0.507					997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Apparent molal volume / cm³/mol	Density of water / kg/m³
6		25	0.2430	1066.46	(84)	0.000734	0.000730	1067.6	-1.1214	0.000004	1.258					997.0449
7.38		25	0.2830	1077.30	(84)	0.000739	0.000734	1078.8	-1.5351	0.000005	2.356					997.0449
0.05		30	0.0027	996.5	(45)	0.000682	0.000707	996.4	0.0651	-0.000025	0.004					995.6473
0.07		30	0.0037	996.84	(45)	0.000682	0.000707	996.7	0.0913	-0.000025	0.008					995.6473
0.1		30	0.0053	997.32	(45)	0.000688	0.000707	997.2	0.1019	-0.000019	0.010					995.6473
		30	0.01	998.7	(90)	0.000697	0.000708	998.6	0.1014	-0.000010	0.010					995.6473
0.2		30	0.0106	998.84	(45)	0.000701	0.000708	998.8	0.0688	-0.000007	0.005					995.6473
0.3		30	0.0158	1000.64	(45)	0.000687	0.000708	1000.3	0.3332	-0.000021	0.111					995.6473
		30	0.02	1001.8	(90)	0.000696	0.000709	1001.5	0.2542	-0.000013	0.065					995.6473
0.5		30	0.0260	1003.67	(45)	0.000696	0.000709	1003.3	0.3435	-0.000013	0.118					995.6473
		30	0.04	1007.7	(90)	0.000704	0.000711	1007.4	0.2733	-0.000007	0.075					995.6473
1		30	0.0508	1011.16	(45)	0.000701	0.000712	1010.6	0.5725	-0.000011	0.328					995.6473
1.5		30	0.0743	1017.98	(45)	0.000708	0.000714	1017.5	0.5192	-0.000007	0.270					995.6473
		30	0.08	1019.5	(90)	0.000711	0.000715	1019.1	0.3701	-0.000004	0.137					995.6473
2		30	0.0966	1024.27	(45)	0.000714	0.000717	1024.0	0.2957	-0.000003	0.087					995.6473
		30	0.12	1031.0	(90)	0.000717	0.000719	1030.7	0.2552	-0.000002	0.065					995.6473
3		30	0.1383	1035.95	(45)	0.000722	0.000721	1036.0	-0.0713	0.000000	0.005					995.6473
		30	0.16	1042.2	(90)	0.000724	0.000724	1042.3	-0.0592	0.000000	0.004					995.6473
4		30	0.1763	1046.91	(45)	0.000725	0.000725	1046.9	0.0034	0.000000	0.000					995.6473
		30	0.20	1053.2	(90)	0.000730	0.000728	1053.7	-0.4606	0.000002	0.212					995.6473
5		30	0.2110	1054.84	(45)	0.000737	0.000729	1056.8	-1.9400	0.000008	3.764					995.6473
		30	0.24	1064.1	(90)	0.000735	0.000732	1064.9	-0.8363	0.000003	0.699					995.6473
		35	0.0001	994.04	(47)	0.000818	0.000708	994.0	-0.0058	0.000110	0.000		!	0.1		994.0319
		35	0.0001	994.06	(47)	0.000724	0.000708	994.1	-0.0017	0.000016	0.000			0.3		994.0319
		35	0.0003	994.11	(47)	0.000705	0.000708	994.1	0.0007	-0.000003	0.000			0.8		994.0319
		35	0.0005	994.19	(47)	0.000705	0.000708	994.2	0.0012	-0.000002	0.000			1.6		994.0319
		35	0.0011	994.37	(47)	0.000686	0.000708	994.3	0.0225	-0.000021	0.001			3.4		994.0319
0.05		35	0.0027	994.87	(45)	0.000688	0.000708	994.8	0.0517	-0.000020	0.003					994.0319
		35	0.0027	994.86	(47)	0.000694	0.000708	994.8	0.0377	-0.000014	0.001			8.3		994.0319
0.0625		35	0.0033	995.06	(74)	0.000695	0.000708	995.0	0.0412	-0.000012	0.002				37.2	994.0319
0.07		35	0.0037	995.22	(45)	0.000684	0.000708	995.1	0.0884	-0.000024	0.008					994.0319
0.1		35	0.0053	995.69	(45)	0.000691	0.000708	995.6	0.0897	-0.000017	0.008					994.0319
		35	0.0053	995.66	(47)	0.000697	0.000708	995.6	0.0598	-0.000011	0.004			16.4		994.0319
0.125		35	0.0066	996.06	(74)	0.000697	0.000708	996.0	0.0725	-0.000011	0.005				37.3	994.0319
0.2		35	0.0106	997.2	(45)	0.000704	0.000709	997.2	0.0493	-0.000005	0.002					994.0319
		35	0.0106	997.26	(47)	0.000699	0.000709	997.2	0.1077	-0.000010	0.012			32.5		994.0319
0.25		35	0.0132	998.05	(74)	0.000699	0.000709	997.9	0.1296	-0.000010	0.017				37.4	994.0319
0.3		35	0.0158	998.99	(45)	0.000690	0.000709	998.7	0.3064	-0.000019	0.094					994.0319
0.5		35	0.0260	1002.01	(45)	0.000699	0.000710	1001.7	0.3126	-0.000012	0.098					994.0319
0.5		35	0.0260	1001.89	(74)	0.000703	0.000710	1001.7	0.1975	-0.000008	0.039				37.6	994.0319
		35	0.0261	1001.97	(47)	0.000700	0.000710	1001.7	0.2671	-0.000010	0.071			79.9		994.0319
		35	0.0311	1003.49	(47)	0.000702	0.000711	1003.2	0.2947	-0.000009	0.087			95.1		994.0319
1		35	0.0508	1009.46	(45)	0.000703	0.000713	1008.9	0.5185	-0.000010	0.269					994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Apparent molal volume / cm³/mol	Density of water / kg/m³
1		35	0.0508	1009.38	(74)	0.000705	0.000713	1008.9	0.4364	-0.000008	0.190				37.7	994.0319
1.5		35	0.0743	1016.25	(45)	0.000710	0.000716	1015.8	0.4549	-0.000006	0.207					994.0319
2		35	0.0966	1022.51	(45)	0.000716	0.000718	1022.3	0.2235	-0.000002	0.050					994.0319
3		35	0.1383	1034.15	(45)	0.000724	0.000723	1034.3	-0.1330	0.000001	0.018					994.0319
4		35	0.1763	1045.07	(45)	0.000727	0.000727	1045.1	-0.0413	0.000000	0.002					994.0319
5		35	0.2110	1052.96	(45)	0.000739	0.000731	1054.9	-1.9631	0.000008	3.854					994.0319
0.05		40	0.0027	993.05	(45)	0.000690	0.000709	993.0	0.0480	-0.000018	0.002					992.2158
0.07		40	0.0037	993.39	(45)	0.000688	0.000709	993.3	0.0748	-0.000020	0.006					992.2158
0.1		40	0.0053	993.86	(45)	0.000694	0.000709	993.8	0.0763	-0.000015	0.006					992.2158
0.2		40	0.0106	995.37	(45)	0.000706	0.000710	995.3	0.0364	-0.000003	0.001					992.2158
0.3		40	0.0158	997.17	(45)	0.000691	0.000710	996.9	0.3044	-0.000019	0.093					992.2158
0.5		40	0.0260	1000.17	(45)	0.000700	0.000711	999.9	0.2925	-0.000011	0.086					992.2158
1		40	0.0508	1007.61	(45)	0.000705	0.000714	1007.1	0.4956	-0.000010	0.246					992.2158
1.5		40	0.0743	1014.39	(45)	0.000711	0.000717	1014.0	0.4322	-0.000006	0.187					992.2158
2		40	0.0966	1020.63	(45)	0.000718	0.000719	1020.4	0.1937	-0.000002	0.038					992.2158
3		40	0.1383	1032.25	(45)	0.000725	0.000724	1032.4	-0.1501	0.000001	0.023					992.2158
4		40	0.1763	1043.13	(45)	0.000729	0.000728	1043.2	-0.0584	0.000000	0.003					992.2158
5		40	0.2110	1051.01	(45)	0.000741	0.000732	1053.0	-1.9445	0.000008	3.781					992.2158
		42.5	0.0001	991.25	(47)	0.000820	0.000709	991.3	-0.0059	0.000112	0.000		!	0.1		991.237
		42.5	0.0001	991.27	(47)	0.000726	0.000709	991.3	-0.0018	0.000017	0.000			0.3		991.237
		42.5	0.0003	991.31	(47)	0.000745	0.000709	991.3	-0.0095	0.000036	0.000			0.7		991.237
		42.5	0.0005	991.40	(47)	0.000707	0.000709	991.4	0.0008	-0.000001	0.000			1.6		991.237
		42.5	0.0011	991.56	(47)	0.000698	0.000709	991.6	0.0116	-0.000011	0.000			3.3		991.237
		42.5	0.0027	992.02	(47)	0.000711	0.000709	992.0	-0.0044	0.000002	0.000			7.9		991.237
		42.5	0.0053	992.79	(47)	0.000712	0.000709	992.8	-0.0142	0.000003	0.000			15.7		991.237
		42.5	0.0106	994.37	(47)	0.000709	0.000710	994.4	0.0095	-0.000001	0.000			31.6		991.237
		42.5	0.0261	998.97	(47)	0.000709	0.000712	998.9	0.0584	-0.000002	0.003			78		991.237
		42.5	0.0311	1000.46	(47)	0.000710	0.000712	1000.4	0.0630	-0.000002	0.004			93		991.237
0.05		45	0.0027	991.04	(45)	0.000694	0.000709	991.0	0.0397	-0.000015	0.002					990.2132
0.0625		45	0.0033	991.21	(74)	0.000705	0.000709	991.2	0.0148	-0.000005	0.000				37.7	990.2132
0.07		45	0.0037	991.38	(45)	0.000691	0.000709	991.3	0.0662	-0.000018	0.004					990.2132
0.1		45	0.0053	991.86	(45)	0.000695	0.000710	991.8	0.0773	-0.000015	0.006					990.2132
0.125		45	0.0066	992.19	(74)	0.000707	0.000710	992.2	0.0198	-0.000003	0.000				37.8	990.2132
0.2		45	0.0106	993.35	(45)	0.000709	0.000710	993.3	0.0161	-0.000002	0.000					990.2132
0.25		45	0.0132	994.13	(74)	0.000709	0.000710	994.1	0.0253	-0.000002	0.001				37.9	990.2132
0.3		45	0.0158	995.15	(45)	0.000693	0.000711	994.9	0.2828	-0.000018	0.080					990.2132
0.5		45	0.0260	998.16	(45)	0.000701	0.000712	997.9	0.2789	-0.000011	0.078					990.2132
0.5		45	0.0260	997.92	(74)	0.000710	0.000712	997.9	0.0412	-0.000002	0.002				38	990.2132
1		45	0.0508	1005.6	(45)	0.000706	0.000715	1005.1	0.4794	-0.000009	0.230					990.2132
1		45	0.0508	1005.16	(74)	0.000714	0.000715	1005.1	0.0395	-0.000001	0.002				38.2	990.2132
1.5		45	0.0743	1012.37	(45)	0.000712	0.000718	1012.0	0.4068	-0.000005	0.165					990.2132
2		45	0.0966	1018.62	(45)	0.000718	0.000720	1018.4	0.1820	-0.000002	0.033					990.2132
3		45	0.1383	1030.23	(45)	0.000726	0.000725	1030.4	-0.1570	0.000001	0.025					990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Apparent molal volume / cm³/mol	Density of water / kg/m³
4		45	0.1763	1041.11	(45)	0.000730	0.000730	1041.2	-0.0423	0.000000	0.002					990.2132
5		45	0.2110	1048.99	(45)	0.000742	0.000734	1050.9	-1.8988	0.000008	3.605					990.2132
0.05		50	0.0027	988.88	(45)	0.000688	0.000709	988.8	0.0549	-0.000021	0.003					988.0363
0.07		50	0.0037	989.23	(45)	0.000685	0.000710	989.1	0.0906	-0.000025	0.008					988.0363
0.1		50	0.0053	989.7	(45)	0.000692	0.000710	989.6	0.0907	-0.000017	0.008					988.0363
		50	0.01	991.0	(90)	0.000709	0.000710	991.0	0.0087	-0.000001	0.000					988.0363
0.2		50	0.0106	991.21	(45)	0.000706	0.000710	991.2	0.0460	-0.000004	0.002					988.0363
0.3		50	0.0158	993.02	(45)	0.000690	0.000711	992.7	0.3195	-0.000021	0.102					988.0363
		50	0.02	994.0	(90)	0.000708	0.000712	993.9	0.0601	-0.000003	0.004					988.0363
0.5		50	0.0260	996.03	(45)	0.000700	0.000712	995.7	0.3096	-0.000012	0.096					988.0363
		50	0.04	999.9	(90)	0.000712	0.000714	999.8	0.0829	-0.000002	0.007					988.0363
1		50	0.0508	1003.48	(45)	0.000705	0.000715	1003.0	0.5079	-0.000010	0.258					988.0363
1.5		50	0.0743	1010.26	(45)	0.000712	0.000718	1009.8	0.4364	-0.000006	0.190					988.0363
		50	0.08	1011.6	(90)	0.000717	0.000719	1011.5	0.1146	-0.000001	0.013					988.0363
2		50	0.0966	1016.52	(45)	0.000719	0.000721	1016.3	0.2159	-0.000002	0.047					988.0363
		50	0.12	1023.1	(90)	0.000723	0.000724	1023.0	0.0732	-0.000001	0.005					988.0363
3		50	0.1383	1028.14	(45)	0.000727	0.000726	1028.3	-0.1162	0.000001	0.013					988.0363
		50	0.1400	1028.7	(106)	0.000726	0.000726	1028.7	-0.0454	0.000000	0.002					988.0363
		50	0.16	1034.3	(90)	0.000729	0.000728	1034.4	-0.1268	0.000001	0.016					988.0363
		50	0.1600	1034.3	(106)	0.000729	0.000728	1034.4	-0.1268	0.000001	0.016					988.0363
4		50	0.1763	1039.05	(45)	0.000730	0.000730	1039.0	0.0346	0.000000	0.001					988.0363
		50	0.1800	1039.9	(106)	0.000732	0.000731	1040.1	-0.1691	0.000001	0.029					988.0363
		50	0.20	1045.4	(90)	0.000734	0.000733	1045.7	-0.2704	0.000001	0.073					988.0363
		50	0.2000	1045.4	(106)	0.000734	0.000733	1045.7	-0.2704	0.000001	0.073					988.0363
5		50	0.2110	1046.91	(45)	0.000742	0.000734	1048.7	-1.8285	0.000008	3.343					988.0363
		50	0.2200	1050.9	(106)	0.000737	0.000736	1051.2	-0.3290	0.000001	0.108					988.0363
		50	0.24	1056.4	(90)	0.000739	0.000738	1056.7	-0.3429	0.000001	0.118					988.0363
		50	0.2400	1056.4	(106)	0.000739	0.000738	1056.7	-0.3429	0.000001	0.118					988.0363
		50	0.2600	1062.0	(106)	0.000741	0.000740	1062.2	-0.2101	0.000001	0.044					988.0363
		50	0.2800	1067.5	(106)	0.000743	0.000743	1067.6	-0.1289	0.000000	0.017					988.0363
		50	0.3000	1073.0	(106)	0.000745	0.000745	1073.0	0.0027	0.000000	0.000					988.0363
		50	0.3200	1078.6	(106)	0.000747	0.000747	1078.3	0.2866	-0.000001	0.082					988.0363
0.05		55	0.0027	986.54	(45)	0.000689	0.000709	986.5	0.0531	-0.000020	0.003					985.6952
0.0625		55	0.0033	986.67	(74)	0.000714	0.000709	986.7	-0.0154	0.000005	0.000				38.2	985.6952
0.07		55	0.0037	986.87	(45)	0.000691	0.000709	986.8	0.0678	-0.000019	0.005					985.6952
0.1		55	0.0053	987.35	(45)	0.000695	0.000710	987.3	0.0761	-0.000015	0.006					985.6952
0.125		55	0.0066	987.63	(74)	0.000716	0.000710	987.7	-0.0402	0.000006	0.002				38.3	985.6952
0.2		55	0.0106	988.86	(45)	0.000708	0.000710	988.8	0.0261	-0.000003	0.001					985.6952
0.25		55	0.0132	989.49	(74)	0.000720	0.000711	989.6	-0.1178	0.000009	0.014				38.5	985.6952
0.3		55	0.0158	990.67	(45)	0.000692	0.000711	990.4	0.2943	-0.000019	0.087					985.6952
0.5		55	0.0260	993.71	(45)	0.000700	0.000712	993.4	0.3045	-0.000012	0.093					985.6952
0.5		55	0.0260	993.16	(74)	0.000722	0.000712	993.4	-0.2409	0.000009	0.058				38.6	985.6952
1		55	0.0508	1001.17	(45)	0.000706	0.000715	1000.7	0.4906	-0.000010	0.241					985.6952

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Apparent molal volume / cm³/mol	Density of water / kg/m³
1		55	0.0508	1000.27	(74)	0.000723	0.000715	1000.7	-0.4142	0.000008	0.172				38.7	985.6952
1.5		55	0.0743	1007.98	(45)	0.000713	0.000718	1007.5	0.4307	-0.000006	0.185					985.6952
2		55	0.0966	1014.25	(45)	0.000719	0.000721	1014.0	0.2052	-0.000002	0.042					985.6952
3		55	0.1383	1025.91	(45)	0.000727	0.000726	1026.0	-0.1081	0.000001	0.012					985.6952
		55	0.1400	1026.5	(106)	0.000726	0.000726	1026.5	-0.0080	0.000000	0.000					985.6952
		55	0.1600	1032.1	(106)	0.000729	0.000729	1032.2	-0.0961	0.000001	0.009					985.6952
4		55	0.1763	1036.84	(45)	0.000731	0.000731	1036.8	0.0516	0.000000	0.003					985.6952
		55	0.1800	1037.7	(106)	0.000732	0.000731	1037.8	-0.1428	0.000001	0.020					985.6952
		55	0.2000	1043.1	(106)	0.000735	0.000734	1043.4	-0.3462	0.000002	0.120					985.6952
5		55	0.2110	1044.73	(45)	0.000743	0.000735	1046.5	-1.7843	0.000008	3.184					985.6952
		55	0.2200	1048.7	(106)	0.000737	0.000736	1049.0	-0.3044	0.000001	0.093					985.6952
		55	0.2400	1054.3	(106)	0.000739	0.000739	1054.5	-0.2154	0.000001	0.046					985.6952
		55	0.2600	1059.8	(106)	0.000742	0.000741	1060.0	-0.1772	0.000001	0.031					985.6952
		55	0.2800	1065.4	(106)	0.000743	0.000743	1065.4	0.0120	0.000000	0.000					985.6952
		55	0.3000	1070.9	(106)	0.000745	0.000746	1070.7	0.1544	0.000000	0.024					985.6952
		55	0.3200	1076.5	(106)	0.000747	0.000748	1076.0	0.4518	-0.000001	0.204					985.6952
		55	0.3400	1082.0	(106)	0.000749	0.000751	1081.3	0.7062	-0.000002	0.499					985.6952
		60	0.1400	1023.9	(106)	0.000728	0.000726	1024.2	-0.2734	0.000002	0.075					983.1989
		60	0.1600	1029.6	(106)	0.000731	0.000729	1029.9	-0.2771	0.000002	0.077					983.1989
		60	0.1800	1035.3	(106)	0.000733	0.000731	1035.5	-0.2374	0.000001	0.056					983.1989
		60	0.2000	1040.9	(106)	0.000735	0.000734	1041.2	-0.2522	0.000001	0.064					983.1989
		60	0.2200	1046.4	(106)	0.000738	0.000737	1046.7	-0.3196	0.000001	0.102					983.1989
		60	0.2400	1052.0	(106)	0.000740	0.000739	1052.2	-0.2375	0.000001	0.056					983.1989
		60	0.2600	1057.6	(106)	0.000742	0.000742	1057.7	-0.1038	0.000000	0.011					983.1989
		60	0.2800	1063.1	(106)	0.000744	0.000744	1063.1	-0.0166	0.000000	0.000					983.1989
		60	0.3000	1068.7	(106)	0.000746	0.000747	1068.5	0.2263	-0.000001	0.051					983.1989
		60	0.3200	1074.4	(106)	0.000747	0.000749	1073.8	0.6269	-0.000002	0.393					983.1989
		60	0.3400	1079.9	(106)	0.000749	0.000751	1079.0	0.8872	-0.000002	0.787					983.1989
		65	0.1400	1021.6	(106)	0.000727	0.000726	1021.7	-0.1495	0.000001	0.022					980.5548
		65	0.1600	1027.2	(106)	0.000730	0.000729	1027.5	-0.2779	0.000002	0.077					980.5548
		65	0.1800	1032.8	(106)	0.000733	0.000731	1033.2	-0.3611	0.000002	0.130					980.5548
		65	0.2000	1038.4	(106)	0.000736	0.000734	1038.8	-0.3968	0.000002	0.157					980.5548
		65	0.2200	1044.0	(106)	0.000738	0.000737	1044.4	-0.3830	0.000002	0.147					980.5548
		65	0.2400	1049.4	(106)	0.000741	0.000739	1049.9	-0.5175	0.000002	0.268					980.5548
		65	0.2600	1055.2	(106)	0.000742	0.000742	1055.4	-0.1983	0.000001	0.039					980.5548
		65	0.2800	1060.8	(106)	0.000744	0.000744	1060.8	-0.0232	0.000000	0.001					980.5548
		65	0.3000	1066.3	(106)	0.000746	0.000747	1066.2	0.1100	0.000000	0.012					980.5548
		65	0.3200	1071.9	(106)	0.000748	0.000749	1071.5	0.4032	-0.000001	0.163					980.5548
		65	0.3400	1077.5	(106)	0.000750	0.000752	1076.7	0.7588	-0.000002	0.576					980.5548
		65	0.3600	1083.0	(106)	0.000752	0.000754	1081.9	1.0787	-0.000003	1.164					980.5548
		70	0.1400	1019.4	(106)	0.000724	0.000725	1019.2	0.1568	-0.000001	0.025					977.7696
		70	0.1600	1024.8	(106)	0.000729	0.000728	1025.0	-0.2056	0.000001	0.042					977.7696
		70	0.1800	1030.5	(106)	0.000732	0.000731	1030.7	-0.2210	0.000001	0.049					977.7696

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Apparent molal volume / cm³/mol	Density of water / kg/m³
		70	0.2000	1036.1	(106)	0.000735	0.000734	1036.4	-0.2871	0.000001	0.082					977.7696
		70	0.2200	1041.6	(106)	0.000738	0.000736	1042.0	-0.4018	0.000002	0.161					977.7696
		70	0.2400	1047.2	(106)	0.000740	0.000739	1047.6	-0.3629	0.000001	0.132					977.7696
		70	0.2600	1052.8	(106)	0.000742	0.000741	1053.1	-0.2682	0.000001	0.072					977.7696
		70	0.2800	1058.4	(106)	0.000744	0.000744	1058.5	-0.1154	0.000000	0.013					977.7696
		70	0.3000	1064.0	(106)	0.000746	0.000747	1063.9	0.0976	0.000000	0.010					977.7696
		70	0.3200	1069.6	(106)	0.000748	0.000749	1069.2	0.3730	-0.000001	0.139					977.7696
		70	0.3400	1075.2	(106)	0.000750	0.000752	1074.5	0.7130	-0.000002	0.508					977.7696
		70	0.3600	1080.8	(106)	0.000752	0.000755	1079.7	1.1199	-0.000003	1.254					977.7696
		75	0.1400	1016.5	(106)	0.000726	0.000724	1016.7	-0.1607	0.000001	0.026					974.849
		75	0.1600	1022.3	(106)	0.000728	0.000727	1022.5	-0.1663	0.000001	0.028					974.849
		75	0.1800	1028.0	(106)	0.000731	0.000730	1028.2	-0.2234	0.000001	0.050					974.849
		75	0.2000	1033.6	(106)	0.000734	0.000733	1033.9	-0.3296	0.000002	0.109					974.849
		75	0.2200	1039.2	(106)	0.000737	0.000735	1039.6	-0.3826	0.000002	0.146					974.849
		75	0.2400	1044.9	(106)	0.000739	0.000738	1045.2	-0.2803	0.000001	0.079					974.849
		75	0.2600	1050.5	(106)	0.000742	0.000741	1050.7	-0.2202	0.000001	0.048					974.849
		75	0.2800	1056.2	(106)	0.000744	0.000744	1056.2	-0.0002	0.000000	0.000					974.849
		75	0.3000	1061.7	(106)	0.000746	0.000746	1061.6	0.0822	0.000000	0.007					974.849
		75	0.3200	1067.4	(106)	0.000748	0.000749	1067.0	0.4290	-0.000001	0.184					974.849
		75	0.3400	1073.0	(106)	0.000750	0.000752	1072.3	0.7428	-0.000002	0.552					974.849
		75	0.3600	1078.6	(106)	0.000752	0.000754	1077.5	1.1256	-0.000003	1.267					974.849
		80	0.01	974.9	(90)	0.000702	0.000704	974.9	0.0268	-0.000003	0.001					971.7978
		80	0.02	978.0	(90)	0.000703	0.000706	977.9	0.0595	-0.000003	0.004					971.7978
		80	0.04	984.2	(90)	0.000705	0.000709	984.0	0.1506	-0.000004	0.023					971.7978
		80	0.08	996.3	(90)	0.000713	0.000714	996.2	0.1433	-0.000002	0.021					971.7978
		80	0.12	1008.1	(90)	0.000720	0.000720	1008.1	-0.0016	0.000000	0.000					971.7978
		80	0.1400	1014.0	(106)	0.000723	0.000723	1014.0	-0.0073	0.000000	0.000					971.7978
		80	0.16	1019.8	(90)	0.000726	0.000726	1019.9	-0.0655	0.000000	0.004					971.7978
		80	0.1600	1019.8	(106)	0.000726	0.000726	1019.9	-0.0655	0.000000	0.004					971.7978
		80	0.1800	1025.5	(106)	0.000730	0.000729	1025.7	-0.1737	0.000001	0.030					971.7978
		80	0.20	1031.2	(90)	0.000733	0.000732	1031.4	-0.2297	0.000001	0.053					971.7978
		80	0.2000	1031.2	(106)	0.000733	0.000732	1031.4	-0.2297	0.000001	0.053					971.7978
		80	0.2200	1036.9	(106)	0.000735	0.000734	1037.1	-0.2311	0.000001	0.053					971.7978
		80	0.24	1042.6	(90)	0.000738	0.000737	1042.8	-0.1754	0.000001	0.031					971.7978
		80	0.2400	1042.6	(106)	0.000738	0.000737	1042.8	-0.1754	0.000001	0.031					971.7978
		80	0.2600	1048.2	(106)	0.000741	0.000740	1048.4	-0.1603	0.000001	0.026					971.7978
		80	0.2800	1053.8	(106)	0.000743	0.000743	1053.9	-0.0835	0.000000	0.007					971.7978
		80	0.3000	1059.5	(106)	0.000745	0.000746	1059.3	0.1575	0.000000	0.025					971.7978
		80	0.3200	1065.2	(106)	0.000747	0.000748	1064.7	0.4650	-0.000001	0.216					971.7978
		80	0.3400	1070.8	(106)	0.000749	0.000751	1070.1	0.7414	-0.000002	0.550					971.7978
		80	0.3600	1076.4	(106)	0.000751	0.000754	1075.3	1.0891	-0.000003	1.186					971.7978
		80	0.3800	1082.0	(106)	0.000753	0.000757	1080.5	1.5104	-0.000003	2.281					971.7978
		85	0.1400	1011.8	(106)	0.000718	0.000721	1011.3	0.5123	-0.000004	0.262					968.6203

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10 ⁴	Apparent molal volume / cm³/mol	Density of water / kg/m³
		85	0.1600	1017.4	(106)	0.000723	0.000724	1017.2	0.1922	-0.000001	0.037					968.6203
		85	0.1800	1023.2	(106)	0.000726	0.000727	1023.1	0.1231	-0.000001	0.015					968.6203
		85	0.2000	1028.8	(106)	0.000730	0.000730	1028.9	-0.0926	0.000000	0.009					968.6203
		85	0.2200	1034.5	(106)	0.000734	0.000733	1034.7	-0.1522	0.000001	0.023					968.6203
		85	0.2400	1040.1	(106)	0.000737	0.000736	1040.4	-0.2535	0.000001	0.064					968.6203
		85	0.2600	1045.8	(106)	0.000739	0.000739	1046.0	-0.1939	0.000001	0.038					968.6203
		85	0.2800	1051.4	(106)	0.000742	0.000742	1051.6	-0.1709	0.000001	0.029					968.6203
		85	0.3000	1057.0	(106)	0.000745	0.000744	1057.1	-0.0820	0.000000	0.007					968.6203
		85	0.3200	1062.5	(106)	0.000747	0.000747	1062.5	-0.0249	0.000000	0.001					968.6203
		85	0.3400	1068.2	(106)	0.000749	0.000750	1067.9	0.3030	-0.000001	0.092					968.6203
		85	0.3600	1074.8	(106)	0.000749	0.000753	1073.2	1.6042	-0.000004	2.573					968.6203
		85	0.3800	1079.4	(106)	0.000754	0.000756	1078.4	0.9811	-0.000002	0.962					968.6203
		90	0.1400	1009.4	(106)	0.000713	0.000719	1008.5	0.8942	-0.000006	0.800					965.3201
		90	0.1600	1016.0	(106)	0.000713	0.000722	1014.5	1.5025	-0.000009	2.258					965.3201
		90	0.1800	1020.7	(106)	0.000724	0.000725	1020.4	0.2628	-0.000001	0.069					965.3201
		90	0.2000	1026.4	(106)	0.000728	0.000728	1026.3	0.0775	0.000000	0.006					965.3201
		90	0.2200	1032.1	(106)	0.000731	0.000731	1032.2	-0.0507	0.000000	0.003					965.3201
		90	0.2400	1037.7	(106)	0.000735	0.000734	1037.9	-0.2192	0.000001	0.048					965.3201
		90	0.2600	1043.3	(106)	0.000738	0.000737	1043.6	-0.3256	0.000001	0.106					965.3201
		90	0.2800	1048.9	(106)	0.000741	0.000740	1049.3	-0.3673	0.000001	0.135					965.3201
		90	0.3000	1054.5	(106)	0.000744	0.000743	1054.8	-0.3416	0.000001	0.117					965.3201
		90	0.3200	1060.1	(106)	0.000746	0.000746	1060.3	-0.2459	0.000001	0.060					965.3201
		90	0.3400	1065.7	(106)	0.000749	0.000749	1065.8	-0.0778	0.000000	0.006					965.3201
		90	0.3600	1071.3	(106)	0.000751	0.000752	1071.1	0.1653	0.000000	0.027					965.3201
		90	0.3800	1076.8	(106)	0.000754	0.000755	1076.4	0.3860	-0.000001	0.149					965.3201
		90	0.4000	1082.4	(106)	0.000756	0.000757	1081.6	0.7868	-0.000002	0.619					965.3201
		95	0.1400	1007.1	(106)	0.000706	0.000716	1005.7	1.4349	-0.000010	2.059					961.9004
		95	0.1600	1013.7	(106)	0.000708	0.000720	1011.7	1.9621	-0.000012	3.850					961.9004
		95	0.1800	1018.4	(106)	0.000719	0.000723	1017.8	0.6418	-0.000003	0.412					961.9004
		95	0.2000	1024.9	(106)	0.000720	0.000726	1023.7	1.1768	-0.000006	1.385					961.9004
		95	0.2200	1029.5	(106)	0.000729	0.000729	1029.6	-0.1302	0.000001	0.017					961.9004
		95	0.2400	1035.2	(106)	0.000733	0.000732	1035.5	-0.2767	0.000001	0.077					961.9004
		95	0.2600	1040.8	(106)	0.000736	0.000735	1041.3	-0.4599	0.000002	0.211					961.9004
		95	0.2800	1046.4	(106)	0.000740	0.000738	1047.0	-0.5771	0.000002	0.333					961.9004
		95	0.3000	1052.0	(106)	0.000743	0.000741	1052.6	-0.6257	0.000002	0.391					961.9004
		95	0.3200	1057.6	(106)	0.000746	0.000744	1058.2	-0.6030	0.000002	0.364					961.9004
		95	0.3400	1063.2	(106)	0.000748	0.000747	1063.7	-0.5063	0.000001	0.256					961.9004
		95	0.3800	1074.3	(106)	0.000753	0.000753	1074.5	-0.1803	0.000000	0.032					961.9004
		95	0.4000	1079.9	(106)	0.000756	0.000756	1079.7	0.1543	0.000000	0.024					961.9004
		100	0.01	961.7	(90)	0.000681	0.000693	961.6	0.1023	-0.000011	0.010					958.3637
		100	0.02	965.1	(90)	0.000679	0.000694	964.8	0.2766	-0.000015	0.077					958.3637
		100	0.04	971.8	(90)	0.000683	0.000697	971.2	0.5512	-0.000015	0.304					958.3637
		100	0.08	984.9	(90)	0.000692	0.000704	984.0	0.9140	-0.000012	0.835					958.3637

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	(Dens rel - 1)*10^4	Apparent molal volume / cm³/mol	Density of water / kg/m³
		100	0.12	997.5	(90)	0.000702	0.000710	996.6	0.9456	-0.000008	0.894					958.3637
		100	0.1400	1004.6	(106)	0.000700	0.000713	1002.8	1.8315	-0.000013	3.354					958.3637
		100	0.16	1009.6	(90)	0.000712	0.000717	1008.9	0.6677	-0.000004	0.446					958.3637
		100	0.1600	1009.6	(106)	0.000712	0.000717	1008.9	0.6677	-0.000004	0.446					958.3637
		100	0.1800	1015.5	(106)	0.000717	0.000720	1015.0	0.4569	-0.000002	0.209					958.3637
		100	0.20	1021.3	(90)	0.000722	0.000723	1021.1	0.2020	-0.000001	0.041					958.3637
		100	0.2000	1021.3	(106)	0.000722	0.000723	1021.1	0.2020	-0.000001	0.041					958.3637
		100	0.2200	1027.1	(106)	0.000726	0.000726	1027.1	0.0056	0.000000	0.000					958.3637
		100	0.24	1032.7	(90)	0.000730	0.000729	1033.0	-0.3294	0.000001	0.109					958.3637
		100	0.2400	1032.7	(106)	0.000730	0.000729	1033.0	-0.3294	0.000001	0.109					958.3637
		100	0.2600	1038.3	(106)	0.000734	0.000732	1038.9	-0.6004	0.000002	0.360					958.3637
		100	0.2800	1043.9	(106)	0.000738	0.000735	1044.7	-0.8043	0.000003	0.647					958.3637
		100	0.3000	1049.4	(106)	0.000742	0.000739	1050.4	-1.0386	0.000003	1.079					958.3637
		100	0.3200	1055.0	(106)	0.000745	0.000742	1056.1	-1.1004	0.000003	1.211					958.3637
		100	0.3400	1060.6	(106)	0.000748	0.000745	1061.7	-1.0869	0.000003	1.181					958.3637
		100	0.3600	1066.1	(106)	0.000751	0.000748	1067.2	-1.0953	0.000003	1.200					958.3637
		100	0.3800	1071.7	(106)	0.000753	0.000751	1072.6	-0.9228	0.000002	0.852					958.3637
		100	0.4000	1077.3	(106)	0.000755	0.000754	1078.0	-0.6668	0.000001	0.445					958.3637
Average Res									0.1037	-0.000006	139.750	Sum Chi sqr				
Std dev Res									0.5927	0.000018						
Avg - 4std									-2.2669	-0.000077						
Avg + 4std									2.4744	0.000065						
Curve fit for the model App vol=(w+c2+c3*t °C)/(c0*w + c1)/e^(0.000001*(t °C+c4)^2)																
c0		6.561521														
c1		89.77197														
c2		4.902429														
c3		-0.01657														
c4		-2089.32														
Min T		0														
Max T		100														
Min w		5.35E-05														
Max w		0.4														
Avg dens res		0.1037														
Std dens res		0.59267														
Avg app vol res *10^3		-0.00599														
Std app vol res *10^3		0.017782														
No of points in corr		387														
No of inconsistent pair		2														
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)																
	5.071	25	0.2540	1068.00	(40)	0.000741	0.000731	1070.7	-2.6848	0.000009	7.208	!				997.0449
		95	0.3600	1087.0	(106)	0.000707	0.000750	1069.1	17.8671	-0.000043	319.232	!				961.9004

Density of aqueous solutions of **NH4NO3**

- References
- (1) Adams, L. H. Equilibrium in Binary Systems Under Pressure. III. The Influence of Pressure on the Solubility of Ammonium Nitrate in Water at 25°C. *J. Am. Chem. Soc.* **1932**, *54*, 4520-4537.
- (10) Campbell, A. N.; Kartzmark, E. M. The Conductances of Strong Solutions of Strong Electrolytes at 95°C. *Can. J. Chem.* **1952**, *30*, 128-134.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, **1997**.
- (108) Roux, A.; Musbally, G. M.; Perron, G.; Singh, P. P.; Woolley, E. M.; Hepler, L. G. Apparent Molal Heat Capacities and Volumes of Aqueous Electrolytes at 25°C: NaClO₃, NaClO₄, NaNO₃, NaBrO₃, NaIO₃, KClO₃, KBrO₃, KIO₃, NH₄NO₃, NH₄Cl, and NH₄ClO₄. *Can. J. Chem.* **1978**, *56*, 24-28.
- (110) Roy, Mahendra Nath; Jha, Anupam; Choudhury, Ankan, Densities, Viscosities and Adiabatic Compressibilities of Some Mineral Salts in Water at Different Temperatures, *J. Chem. Eng. Data* **2004**, *49*, 291-296.
- (120) Sharma R. C.; Gaur, H. C. Densities and Molar Volumes of the Ammonium Nitrate-Water System. *J. Chem. Eng. Data* **1977**, *22*, 41-44.

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Molar ratio water / nitrate	Density of water / kg/m ³
		0	0.0100	1004.30	(90)	0.000556	0.000567	1004.2	0.1134	-0.000011	0.013				999.8395
		0	0.0200	1008.80	(90)	0.000556	0.000569	1008.5	0.2615	-0.000013	0.068				999.8395
		0	0.0400	1017.80	(90)	0.000559	0.000572	1017.3	0.5395	-0.000013	0.291				999.8395
		0	0.0800	1035.80	(90)	0.000566	0.000578	1034.8	1.0016	-0.000012	1.003				999.8395
		0	0.1200	1053.90	(90)	0.000573	0.000583	1052.5	1.4003	-0.000011	1.961				999.8395
		0	0.1600	1072.10	(90)	0.000579	0.000588	1070.4	1.6926	-0.000009	2.865				999.8395
		0	0.2000	1090.50	(90)	0.000584	0.000593	1088.6	1.9387	-0.000008	3.759				999.8395
		0	0.2400	1109.00	(90)	0.000590	0.000597	1107.0	2.0010	-0.000007	4.004				999.8395
		0	0.2800	1127.70	(90)	0.000595	0.000601	1125.8	1.9432	-0.000005	3.776				999.8395
		0	0.3000	1137.10	(90)	0.000598	0.000602	1135.3	1.8334	-0.000005	3.361				999.8395
		0	0.4000	1186.20	(90)	0.000607	0.000611	1184.3	1.9032	-0.000003	3.622				999.8395
		0	0.5000	1238.00	(90)	0.000615	0.000618	1236.2	1.8130	-0.000002	3.287				999.8395
		10	0.0100	1003.90	(90)	0.000582	0.000577	1003.9	-0.0469	0.000005	0.002				999.6996
		10	0.0200	1008.20	(90)	0.000579	0.000579	1008.2	-0.0005	0.000000	0.000				999.6996
		10	0.0400	1016.80	(90)	0.000580	0.000581	1016.7	0.0706	-0.000002	0.005				999.6996
		10	0.0800	1034.00	(90)	0.000586	0.000587	1033.9	0.1047	-0.000001	0.011				999.6996
		10	0.1200	1051.50	(90)	0.000590	0.000592	1051.2	0.2586	-0.000002	0.067				999.6996
		10	0.1600	1069.10	(90)	0.000594	0.000596	1068.8	0.2915	-0.000002	0.085				999.6996
		10	0.2000	1087.00	(90)	0.000599	0.000600	1086.6	0.3654	-0.000002	0.134				999.6996
		10	0.2400	1105.10	(90)	0.000603	0.000604	1104.8	0.3444	-0.000001	0.119				999.6996
		10	0.2800	1123.40	(90)	0.000607	0.000607	1123.2	0.1938	-0.000001	0.038				999.6996
		10	0.3000	1132.70	(90)	0.000609	0.000609	1132.6	0.1344	0.000000	0.018				999.6996
		10	0.4000	1181.00	(90)	0.000616	0.000617	1180.9	0.1306	0.000000	0.017				999.6996
		10	0.5000	1232.00	(90)	0.000623	0.000623	1232.1	-0.0645	0.000000	0.004				999.6996
0.05619		25	0.0045	998.85	(108)	0.000599	0.000591	998.9	-0.0371	0.000008	0.001				997.0449
0.05726		25	0.0046	998.88	(108)	0.000599	0.000591	998.9	-0.0349	0.000008	0.001				997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Molar ratio water / nitrate	Density of water / kg/m³
0.07591		25	0.0060	999.49	(108)	0.000597	0.000591	999.5	-0.0332	0.000005	0.001				997.0449
0.10587		25	0.0084	1000.42	(108)	0.000600	0.000591	1000.5	-0.0742	0.000009	0.006				997.0449
		25	0.0100	1001.11	(1)	0.000595	0.000592	1001.1	-0.0346	0.000003	0.001				997.0449
		25	0.0100	1001.10	(90)	0.000597	0.000592	1001.2	-0.0509	0.000005	0.003				997.0449
0.14494		25	0.0115	1001.66	(108)	0.000600	0.000592	1001.8	-0.0985	0.000009	0.010				997.0449
0.16235		25	0.0128	1002.20	(108)	0.000601	0.000592	1002.3	-0.1129	0.000009	0.013				997.0449
0.21516		25	0.0169	1003.87	(108)	0.000600	0.000592	1004.0	-0.1344	0.000008	0.018				997.0449
		25	0.0200	1005.10	(90)	0.000601	0.000593	1005.3	-0.1656	0.000008	0.027				997.0449
		25	0.0400	1013.20	(90)	0.000603	0.000595	1013.5	-0.3236	0.000008	0.105				997.0449
		25	0.0500	1017.29	(1)	0.000603	0.000596	1017.7	-0.3619	0.000007	0.131				997.0449
		25	0.0800	1029.70	(90)	0.000605	0.000600	1030.2	-0.4733	0.000006	0.224				997.0449
		25	0.0991	1037.52	(1)	0.000608	0.000602	1038.2	-0.6930	0.000006	0.480				997.0449
		25	0.1200	1046.40	(90)	0.000609	0.000604	1047.0	-0.6343	0.000005	0.402				997.0449
		25	0.1501	1059.02	(1)	0.000612	0.000607	1059.9	-0.8851	0.000005	0.783				997.0449
		25	0.1600	1063.30	(90)	0.000612	0.000608	1064.1	-0.8442	0.000005	0.713				997.0449
		25	0.2000	1080.60	(90)	0.000615	0.000611	1081.5	-0.9381	0.000004	0.880				997.0449
		25	0.2001	1080.63	(1)	0.000615	0.000611	1081.6	-0.9717	0.000004	0.944				997.0449
		25	0.2400	1098.20	(90)	0.000618	0.000614	1099.2	-1.0496	0.000004	1.102				997.0449
		25	0.2499	1102.74	(1)	0.000618	0.000615	1103.7	-0.9505	0.000003	0.903				997.0449
		25	0.2500	1102.79	(1)	0.000618	0.000615	1103.8	-0.9600	0.000003	0.922				997.0449
		25	0.2800	1116.10	(90)	0.000621	0.000617	1117.3	-1.2113	0.000003	1.467				997.0449
		25	0.3000	1125.20	(90)	0.000622	0.000619	1126.5	-1.2835	0.000003	1.647				997.0449
		25	0.3501	1149.03	(1)	0.000624	0.000622	1149.9	-0.8750	0.000002	0.766				997.0449
		25	0.4000	1172.70	(90)	0.000627	0.000625	1173.9	-1.2155	0.000002	1.478				997.0449
		25	0.4471	1196.32	(1)	0.000629	0.000628	1197.3	-0.9498	0.000001	0.902				997.0449
		25	0.5000	1222.90	(90)	0.000632	0.000631	1224.3	-1.4333	0.000002	2.054				997.0449
		25	0.5498	1249.26	(1)	0.000635	0.000633	1250.7	-1.4758	0.000002	2.178				997.0449
		25	0.5970	1278.20	(120)	0.000633	0.000635	1276.6	1.6050	-0.000002	2.576			3	997.0449
		25	0.5999	1276.26	(1)	0.000637	0.000635	1278.2	-1.9637	0.000002	3.856				997.0449
		25	0.6400	1302.60	(120)	0.000635	0.000637	1300.9	1.6612	-0.000002	2.760			2.5	997.0449
		25	0.6493	1303.74	(1)	0.000640	0.000637	1306.3	-2.5925	0.000002	6.721				997.0449
		25	0.6519	1305.21	(1)	0.000640	0.000637	1307.8	-2.6337	0.000002	6.936				997.0449
		25	0.6776	1319.88	(1)	0.000641	0.000638	1322.9	-3.0207	0.000003	9.125				997.0449
		30	0.5970	1275.00	(120)	0.000636	0.000637	1273.6	1.4398	-0.000001	2.073			3	995.6473
		30	0.6400	1299.20	(120)	0.000638	0.000639	1297.8	1.3539	-0.000001	1.833			2.5	995.6473
		30	0.6897	1326.00	(120)	0.000642	0.000641	1326.9	-0.9060	0.000001	0.821			2	995.6473
		30	0.7353	1353.60	(120)	0.000643	0.000642	1354.6	-1.0316	0.000001	1.064			1.6	995.6473
		35	0.5970	1271.80	(120)	0.000638	0.000639	1270.4	1.3643	-0.000001	1.861			3	994.0319
		35	0.6400	1295.80	(120)	0.000640	0.000641	1294.7	1.1211	-0.000001	1.257			2.5	994.0319
		35	0.6897	1322.70	(120)	0.000644	0.000643	1323.7	-0.9999	0.000001	1.000			2	994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Molar ratio water / nitrate	Density of water / kg/m³
		35	0.7117	1337.30	(120)	0.000643	0.000643	1337.0	0.3208	0.000000	0.103			1.8	994.0319
		35	0.7353	1350.30	(120)	0.000645	0.000644	1351.4	-1.0998	0.000001	1.210			1.6	994.0319
		40	0.0100	996.10	(90)	0.000615	0.000606	996.2	-0.0911	0.000009	0.008				992.2158
		40	0.0200	1000.00	(90)	0.000616	0.000607	1000.2	-0.1777	0.000009	0.032				992.2158
		40	0.0400	1007.90	(90)	0.000616	0.000609	1008.2	-0.2875	0.000007	0.083				992.2158
		40	0.0800	1023.80	(90)	0.000619	0.000612	1024.4	-0.5699	0.000007	0.325				992.2158
		40	0.1200	1040.00	(90)	0.000622	0.000616	1040.8	-0.7995	0.000006	0.639				992.2158
		40	0.1600	1056.50	(90)	0.000625	0.000619	1057.5	-1.0105	0.000006	1.021				992.2158
		40	0.2000	1073.40	(90)	0.000627	0.000622	1074.5	-1.1356	0.000005	1.290				992.2158
		40	0.2400	1090.70	(90)	0.000629	0.000624	1091.9	-1.2060	0.000004	1.454				992.2158
		40	0.2800	1108.20	(90)	0.000631	0.000627	1109.7	-1.4526	0.000004	2.110				992.2158
		40	0.3000	1117.10	(90)	0.000632	0.000628	1118.7	-1.5764	0.000004	2.485				992.2158
		40	0.4000	1164.00	(90)	0.000636	0.000633	1165.5	-1.4533	0.000003	2.112				992.2158
		40	0.5000	1213.60	(90)	0.000640	0.000638	1215.4	-1.7514	0.000002	3.067				992.2158
		40	0.5970	1268.70	(120)	0.000640	0.000641	1267.2	1.4668	-0.000002	2.152			3	992.2158
		40	0.6400	1292.60	(120)	0.000642	0.000643	1291.4	1.1521	-0.000001	1.327			2.5	992.2158
		40	0.6897	1319.00	(120)	0.000646	0.000645	1320.4	-1.4478	0.000001	2.096			2	992.2158
		40	0.7117	1334.00	(120)	0.000645	0.000645	1333.7	0.2781	0.000000	0.077			1.8	992.2158
		40	0.7353	1346.90	(120)	0.000647	0.000646	1348.1	-1.2399	0.000001	1.537			1.6	992.2158
		40	0.7605	1365.10	(120)	0.000646	0.000647	1363.9	1.2424	-0.000001	1.543			1.4	992.2158
		45	0.5970	1265.30	(120)	0.000642	0.000644	1264.0	1.3381	-0.000001	1.790			3	990.2132
		45	0.6400	1289.40	(120)	0.000644	0.000645	1288.2	1.2382	-0.000001	1.533			2.5	990.2132
		45	0.6897	1315.70	(120)	0.000648	0.000646	1317.2	-1.4574	0.000001	2.124			2	990.2132
		45	0.7117	1331.10	(120)	0.000647	0.000647	1330.4	0.6658	-0.000001	0.443			1.8	990.2132
		45	0.7353	1343.60	(120)	0.000649	0.000648	1344.9	-1.2584	0.000001	1.583			1.6	990.2132
		45	0.7605	1361.80	(120)	0.000648	0.000648	1360.6	1.2134	-0.000001	1.472			1.4	990.2132
		50	0.5970	1261.90	(120)	0.000644	0.000646	1260.6	1.2701	-0.000001	1.613			3	988.0363
		50	0.6400	1286.00	(120)	0.000646	0.000647	1284.8	1.1723	-0.000001	1.374			2.5	988.0363
		50	0.6897	1312.30	(120)	0.000649	0.000648	1313.8	-1.5349	0.000001	2.356			2	988.0363
		50	0.7117	1327.80	(120)	0.000648	0.000649	1327.1	0.6779	-0.000001	0.459			1.8	988.0363
		50	0.7353	1340.10	(120)	0.000650	0.000649	1341.6	-1.4608	0.000001	2.134			1.6	988.0363
		50	0.7605	1358.50	(120)	0.000649	0.000650	1357.3	1.1912	-0.000001	1.419			1.4	988.0363
		50	0.7874	1377.00	(120)	0.000649	0.000651	1374.6	2.4457	-0.000002	5.982			1.2	988.0363
		55	0.5970	1258.80	(120)	0.000646	0.000647	1257.2	1.5564	-0.000002	2.422			3	985.6952
		55	0.6400	1282.60	(120)	0.000648	0.000649	1281.5	1.1485	-0.000001	1.319			2.5	985.6952
		55	0.6897	1309.10	(120)	0.000651	0.000650	1310.5	-1.3858	0.000001	1.920			2	985.6952
		55	0.7117	1324.50	(120)	0.000650	0.000650	1323.8	0.7095	-0.000001	0.503			1.8	985.6952
		55	0.7353	1336.50	(120)	0.000652	0.000651	1338.3	-1.7518	0.000001	3.069			1.6	985.6952
		55	0.7605	1354.50	(120)	0.000651	0.000652	1354.0	0.4715	0.000000	0.222			1.4	985.6952
		55	0.7874	1373.20	(120)	0.000651	0.000652	1371.3	1.8898	-0.000001	3.572			1.2	985.6952

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Molar ratio water / nitrate	Density of water / kg/m³
		60	0.0100	987.00	(90)	0.000625	0.000624	987.0	-0.0170	0.000002	0.000				983.1989
		60	0.0200	990.80	(90)	0.000627	0.000624	990.9	-0.0503	0.000003	0.003				983.1989
		60	0.0400	998.50	(90)	0.000627	0.000626	998.6	-0.0647	0.000002	0.004				983.1989
		60	0.0800	1014.20	(90)	0.000628	0.000628	1014.2	0.0015	0.000000	0.000				983.1989
		60	0.1200	1030.10	(90)	0.000631	0.000631	1030.1	-0.0320	0.000000	0.001				983.1989
		60	0.1600	1046.20	(90)	0.000634	0.000633	1046.4	-0.1952	0.000001	0.038				983.1989
		60	0.2000	1062.70	(90)	0.000637	0.000635	1063.0	-0.3173	0.000001	0.101				983.1989
		60	0.2400	1079.60	(90)	0.000639	0.000637	1080.0	-0.4271	0.000002	0.182				983.1989
		60	0.2800	1096.80	(90)	0.000641	0.000639	1097.5	-0.6532	0.000002	0.427				983.1989
		60	0.3000	1105.50	(90)	0.000642	0.000640	1106.3	-0.8314	0.000002	0.691				983.1989
		60	0.4000	1151.50	(90)	0.000645	0.000644	1152.5	-1.0198	0.000002	1.040				983.1989
		60	0.5000	1200.60	(90)	0.000649	0.000647	1202.1	-1.4568	0.000002	2.122				983.1989
		60	0.5970	1255.30	(120)	0.000648	0.000649	1253.8	1.4915	-0.000002	2.225			3	983.1989
		60	0.6400	1279.50	(120)	0.000649	0.000650	1278.0	1.4618	-0.000001	2.137			2.5	983.1989
		60	0.6897	1305.70	(120)	0.000653	0.000652	1307.1	-1.4141	0.000001	2.000			2	983.1989
		60	0.7117	1321.40	(120)	0.000651	0.000652	1320.4	0.9567	-0.000001	0.915			1.8	983.1989
		60	0.7353	1333.00	(120)	0.000654	0.000653	1334.9	-1.9349	0.000001	3.744			1.6	983.1989
		60	0.7605	1351.30	(120)	0.000653	0.000653	1350.7	0.5511	0.000000	0.304			1.4	983.1989
		60	0.7874	1369.70	(120)	0.000653	0.000654	1368.1	1.6236	-0.000001	2.636			1.2	983.1989
		65	0.5970	1252.10	(120)	0.000649	0.000651	1250.3	1.7710	-0.000002	3.136			3	980.5548
		65	0.6400	1276.20	(120)	0.000651	0.000652	1274.6	1.6081	-0.000002	2.586			2.5	980.5548
		65	0.6897	1302.20	(120)	0.000655	0.000653	1303.7	-1.5236	0.000001	2.321			2	980.5548
		65	0.7117	1318.00	(120)	0.000653	0.000654	1317.1	0.9161	-0.000001	0.839			1.8	980.5548
		65	0.7353	1329.50	(120)	0.000656	0.000654	1331.6	-2.1131	0.000002	4.465			1.6	980.5548
		65	0.7605	1347.80	(120)	0.000654	0.000655	1347.5	0.3273	0.000000	0.107			1.4	980.5548
		65	0.7874	1366.30	(120)	0.000654	0.000655	1364.9	1.4446	-0.000001	2.087			1.2	980.5548
		70	0.5970	1248.90	(120)	0.000651	0.000653	1246.8	2.0909	-0.000002	4.372			3	977.7696
		70	0.6400	1272.90	(120)	0.000652	0.000654	1271.1	1.7839	-0.000002	3.182			2.5	977.7696
		70	0.6897	1298.80	(120)	0.000656	0.000655	1300.3	-1.5171	0.000001	2.302			2	977.7696
		70	0.7117	1314.50	(120)	0.000655	0.000655	1313.7	0.7851	-0.000001	0.616			1.8	977.7696
		70	0.7353	1326.00	(120)	0.000657	0.000656	1328.3	-2.2890	0.000002	5.239			1.6	977.7696
		70	0.7874	1363.10	(120)	0.000656	0.000657	1361.6	1.4511	-0.000001	2.106			1.2	977.7696
		80	0.0100	975.50	(90)	0.000638	0.000641	975.5	0.0214	-0.000002	0.000				971.7978
		80	0.0200	979.30	(90)	0.000635	0.000641	979.2	0.1214	-0.000006	0.015				971.7978
		80	0.0400	986.90	(90)	0.000635	0.000642	986.6	0.2619	-0.000007	0.069				971.7978
		80	0.0800	1002.40	(90)	0.000636	0.000644	1001.8	0.5933	-0.000007	0.352				971.7978
		80	0.1200	1018.10	(90)	0.000639	0.000645	1017.3	0.7698	-0.000006	0.593				971.7978
		80	0.1600	1034.20	(90)	0.000641	0.000647	1033.2	0.9649	-0.000006	0.931				971.7978
		80	0.2000	1050.60	(90)	0.000643	0.000648	1049.5	1.0526	-0.000005	1.108				971.7978
		80	0.2400	1067.30	(90)	0.000645	0.000649	1066.3	1.0062	-0.000004	1.012				971.7978

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Residual	Inconsistent based on density	Inconsistent based on apparent volume	Molar ratio water / nitrate	Density of water / kg/m³
		80	0.2800	1084.40	(90)	0.000647	0.000650	1083.5	0.8989	-0.000003	0.808				971.7978
		80	0.3000	1093.10	(90)	0.000648	0.000651	1092.3	0.8139	-0.000002	0.662				971.7978
		80	0.4000	1138.50	(90)	0.000652	0.000653	1138.2	0.3300	-0.000001	0.109				971.7978
		80	0.5000	1186.80	(90)	0.000656	0.000655	1187.7	-0.8716	0.000001	0.760				971.7978
		95	0.0161	967.70	(10)	0.000651	0.000653	967.7	0.0254	-0.000002	0.001				961.9004
		95	0.0804	991.80	(10)	0.000650	0.000655	991.4	0.3737	-0.000005	0.140				961.9004
		95	0.1212	1007.10	(10)	0.000655	0.000655	1007.0	0.0974	-0.000001	0.009				961.9004
		95	0.1990	1036.50	(10)	0.000664	0.000657	1037.9	-1.4405	0.000007	2.075				961.9004
		95	0.2696	1069.00	(10)	0.000653	0.000658	1067.6	1.4153	-0.000005	2.003				961.9004
		95	0.3112	1086.00	(10)	0.000658	0.000658	1085.8	0.2339	-0.000001	0.055				961.9004
		95	0.3813	1118.00	(10)	0.000659	0.000659	1117.8	0.1961	0.000000	0.038				961.9004
		95	0.4589	1157.00	(10)	0.000658	0.000660	1155.4	1.5967	-0.000003	2.550				961.9004
		95	0.5312	1198.00	(10)	0.000654	0.000661	1192.7	5.3194	-0.000007	28.296				961.9004
		95	0.5750	1217.00	(10)	0.000661	0.000661	1216.4	0.5868	-0.000001	0.344				961.9004
		95	0.6465	1253.00	(10)	0.000666	0.000662	1257.2	-4.1863	0.000004	17.525				961.9004
		95	0.6954	1281.00	(10)	0.000667	0.000662	1286.6	-5.6386	0.000005	31.794	!			961.9004
Average Res									-0.0027	0.000000	293.716	Sum chi sqr			
Std dev Res									1.3507	0.000004					
Avg - 4std									-5.4054	-0.000017					
Avg + 4std									5.4000	0.000017					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	1379.293
c1	1124.381
c2	0.655978
c3	0.001411
c4	176.4124
Min T	0
Max T	95
Min w	0.004478
Max w	0.787404
Avg dens res	-0.002685
Std dens res	1.350673
Avg app vol res *10 ³	0.000372
Std app vol res *10 ³	0.00426
No of points in corr	162
No of inconsistent pair	26

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

0.03768	25	0.0030	1000.05	(108)	0.000001	0.000591	998.3	1.7706	-0.000590	3.135		!			997.0449
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Density of aqueous solutions of **(NH4)2SO4**

- References (30) Goldsack, D. E.; Franchetto, A. A. The Viscosity of Concentrated Electrolyte Solutions. III. A Mixture Law. *Electrochimica Acta* **1977**, 22, 1287-1294.
- (46) Isono, T. Densities, Viscosities, and Electrolytic Conductivities of Concentrated Aqueous Electrolyte Solutions of 31 Solutes in the Temperature Range 15-55°C and Empirical Equations for the Relative Viscosity. *Rikagaku Kenkyusho Hokoku* **1985**, 61, 53-79
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		0	0.0100	1006.10	(90)	0.000378	0.000417	1005.7	0.3958	-0.000039	0.157			999.8395
		0	0.0200	1012.40	(90)	0.000380	0.000419	1011.6	0.8113	-0.000040	0.658			999.8395
		0	0.0400	1024.80	(90)	0.000391	0.000424	1023.4	1.3862	-0.000033	1.922			999.8395
		0	0.0800	1049.50	(90)	0.000409	0.000434	1047.3	2.2405	-0.000025	5.020			999.8395
		0	0.1200	1074.00	(90)	0.000425	0.000444	1071.3	2.6952	-0.000020	7.264			999.8395
		0	0.1600	1098.00	(90)	0.000441	0.000454	1095.5	2.5342	-0.000013	6.422			999.8395
		0	0.2000	1121.50	(90)	0.000458	0.000465	1119.6	1.8547	-0.000007	3.440			999.8395
		0	0.2400	1144.80	(90)	0.000472	0.000476	1143.7	1.0678	-0.000003	1.140			999.8395
		0	0.2800	1167.70	(90)	0.000487	0.000487	1167.6	0.0996	0.000000	0.010			999.8395
		0	0.3500	1207.20	(90)	0.000509	0.000507	1208.4	-1.2097	0.000002	1.463			999.8395
		0	0.4000	1235.00	(90)	0.000524	0.000522	1236.4	-1.4017	0.000002	1.965			999.8395
		0	0.5000	1289.90	(90)	0.000550	0.000553	1287.9	2.0248	-0.000002	4.100			999.8395
0.05		15	0.0066	1003.17	(46)	0.000382	0.000425	1002.9	0.2811	-0.000043	0.079			999.0996
0.07		15	0.0092	1004.72	(46)	0.000390	0.000425	1004.4	0.3270	-0.000035	0.107			999.0996
0.1		15	0.0130	1007.09	(46)	0.000392	0.000426	1006.6	0.4532	-0.000034	0.205			999.0996
0.2		15	0.0257	1014.72	(46)	0.000402	0.000429	1014.0	0.7098	-0.000027	0.504			999.0996
0.3		15	0.0381	1022.06	(46)	0.000411	0.000432	1021.2	0.8368	-0.000021	0.700			999.0996
0.5		15	0.0620	1036.16	(46)	0.000423	0.000438	1035.2	0.9795	-0.000015	0.959			999.0996
1		15	0.1167	1068.17	(46)	0.000446	0.000452	1067.5	0.6812	-0.000005	0.464			999.0996
1.5		15	0.1654	1096.74	(46)	0.000462	0.000464	1096.4	0.3297	-0.000002	0.109			999.0996
2		15	0.2090	1122.12	(46)	0.000476	0.000475	1122.3	-0.1839	0.000001	0.034			999.0996
3		15	0.2839	1165.50	(46)	0.000498	0.000495	1166.3	-0.7912	0.000002	0.626			999.0996
4		15	0.3458	1201.06	(46)	0.000514	0.000513	1201.7	-0.6510	0.000001	0.424			999.0996
5		15	0.3978	1230.45	(46)	0.000528	0.000528	1230.4	0.0846	0.000000	0.007			999.0996
0.05		20	0.0066	1002.23	(46)	0.000389	0.000427	1002.0	0.2533	-0.000038	0.064			998.2041
0.07		20	0.0092	1003.79	(46)	0.000394	0.000428	1003.5	0.3159	-0.000034	0.100			998.2041
		20	0.0100	1004.10	(90)	0.000414	0.000428	1004.0	0.1450	-0.000014	0.021			998.2041
0.1		20	0.0130	1006.11	(46)	0.000398	0.000429	1005.7	0.4020	-0.000030	0.162			998.2041
		20	0.0200	1010.10	(90)	0.000412	0.000430	1009.7	0.3754	-0.000018	0.141			998.2041
0.2		20	0.0257	1013.66	(46)	0.000409	0.000432	1013.0	0.6113	-0.000023	0.374			998.2041
0.3		20	0.0381	1020.94	(46)	0.000417	0.000435	1020.2	0.7105	-0.000018	0.505			998.2041
		20	0.0400	1022.00	(90)	0.000419	0.000435	1021.3	0.6842	-0.000016	0.468			998.2041
0.5		20	0.0620	1034.91	(46)	0.000428	0.000440	1034.1	0.7856	-0.000012	0.617			998.2041
		20	0.0800	1045.60	(90)	0.000434	0.000445	1044.7	0.9206	-0.000011	0.848			998.2041
1		20	0.1167	1066.81	(46)	0.000450	0.000454	1066.3	0.5227	-0.000004	0.273			998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m ³
		20	0.1200	1069.10	(90)	0.000448	0.000455	1068.2	0.8752	-0.000006	0.766			998.2041
		20	0.1600	1092.40	(90)	0.000462	0.000465	1091.9	0.5295	-0.000003	0.280			998.2041
1.5		20	0.1654	1095.13	(46)	0.000466	0.000466	1095.1	0.0517	0.000000	0.003			998.2041
		20	0.2000	1115.40	(90)	0.000476	0.000475	1115.5	-0.1226	0.000000	0.015			998.2041
2		20	0.2090	1120.40	(46)	0.000479	0.000477	1120.9	-0.4557	0.000002	0.208			998.2041
		20	0.2400	1138.30	(90)	0.000488	0.000486	1139.1	-0.7735	0.000002	0.598			998.2041
		20	0.2800	1160.90	(90)	0.000500	0.000496	1162.4	-1.5019	0.000004	2.256			998.2041
3		20	0.2839	1163.70	(46)	0.000500	0.000497	1164.6	-0.9497	0.000002	0.902			998.2041
4		20	0.3458	1199.22	(46)	0.000516	0.000515	1199.9	-0.7014	0.000001	0.492			998.2041
5		20	0.3978	1228.64	(46)	0.000530	0.000530	1228.5	0.1753	0.000000	0.031			998.2041
		20	0.4000	1227.70	(90)	0.000534	0.000530	1229.6	-1.9187	0.000003	3.681			998.2041
		20	0.5000	1282.50	(90)	0.000558	0.000561	1279.9	2.5771	-0.000003	6.641			998.2041
0.05		25	0.0066	1001.02	(46)	0.000396	0.000429	1000.8	0.2180	-0.000033	0.048			997.0449
0.07		25	0.0092	1002.56	(46)	0.000401	0.000430	1002.3	0.2667	-0.000029	0.071			997.0449
0.1		25	0.0130	1004.86	(46)	0.000405	0.000431	1004.5	0.3420	-0.000026	0.117			997.0449
0.2		25	0.0257	1012.36	(46)	0.000414	0.000434	1011.8	0.5313	-0.000020	0.282			997.0449
0.3		25	0.0381	1019.61	(46)	0.000421	0.000437	1019.0	0.6298	-0.000016	0.397			997.0449
0.5		25	0.0620	1033.20	(30)	0.000437	0.000442	1032.8	0.3816	-0.000006	0.146			997.0449
0.5		25	0.0620	1033.46	(46)	0.000433	0.000442	1032.8	0.6416	-0.000010	0.412			997.0449
1		25	0.1167	1065.00	(30)	0.000455	0.000456	1064.9	0.1485	-0.000001	0.022			997.0449
1		25	0.1167	1065.20	(46)	0.000453	0.000456	1064.9	0.3485	-0.000003	0.121			997.0449
1.5		25	0.1654	1092.70	(30)	0.000472	0.000468	1093.5	-0.8287	0.000004	0.687			997.0449
1.5		25	0.1654	1093.40	(46)	0.000469	0.000468	1093.5	-0.1287	0.000001	0.017			997.0449
2		25	0.2090	1117.70	(30)	0.000485	0.000479	1119.2	-1.5075	0.000006	2.273			997.0449
2		25	0.2090	1118.66	(46)	0.000481	0.000479	1119.2	-0.5475	0.000002	0.300			997.0449
2.5		25	0.2483	1140.40	(30)	0.000495	0.000490	1142.2	-1.8144	0.000006	3.292			997.0449
3		25	0.2839	1160.70	(30)	0.000505	0.000499	1162.8	-2.1446	0.000006	4.599			997.0449
3		25	0.2839	1161.86	(46)	0.000502	0.000499	1162.8	-0.9846	0.000003	0.969			997.0449
4		25	0.3458	1195.90	(30)	0.000521	0.000516	1198.0	-2.1044	0.000004	4.428			997.0449
4		25	0.3458	1197.34	(46)	0.000518	0.000516	1198.0	-0.6644	0.000001	0.441			997.0449
5		25	0.3978	1226.77	(46)	0.000531	0.000531	1226.5	0.2986	0.000000	0.089			997.0449
0.05		30	0.0066	999.59	(46)	0.000401	0.000431	999.4	0.1998	-0.000030	0.040			995.6473
0.07		30	0.0092	1001.13	(46)	0.000404	0.000432	1000.9	0.2541	-0.000028	0.065			995.6473
0.1		30	0.0130	1003.42	(46)	0.000408	0.000433	1003.1	0.3277	-0.000025	0.107			995.6473
0.2		30	0.0257	1010.87	(46)	0.000417	0.000436	1010.4	0.4945	-0.000019	0.244			995.6473
0.3		30	0.0381	1018.07	(46)	0.000424	0.000439	1017.5	0.5696	-0.000014	0.324			995.6473
0.5		30	0.0620	1031.86	(46)	0.000436	0.000444	1031.3	0.5724	-0.000009	0.328			995.6473
1		30	0.1167	1063.46	(46)	0.000456	0.000458	1063.2	0.2539	-0.000002	0.064			995.6473
1.5		30	0.1654	1091.58	(46)	0.000471	0.000470	1091.8	-0.2059	0.000001	0.042			995.6473
2		30	0.2090	1116.77	(46)	0.000483	0.000481	1117.4	-0.6130	0.000002	0.376			995.6473
3		30	0.2839	1159.95	(46)	0.000503	0.000501	1160.9	-0.9478	0.000002	0.898			995.6473
4		30	0.3458	1195.45	(46)	0.000519	0.000518	1196.0	-0.5301	0.000001	0.281			995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m ³
5		30	0.3978	1224.91	(46)	0.000532	0.000533	1224.4	0.5060	-0.000001	0.256			995.6473
0.05		35	0.0066	997.95	(46)	0.000404	0.000433	997.8	0.1881	-0.000029	0.035			994.0319
0.07		35	0.0092	999.48	(46)	0.000408	0.000434	999.2	0.2375	-0.000026	0.056			994.0319
0.1		35	0.0130	1001.75	(46)	0.000412	0.000435	1001.5	0.2988	-0.000023	0.089			994.0319
0.2		35	0.0257	1009.17	(46)	0.000420	0.000437	1008.7	0.4602	-0.000018	0.212			994.0319
0.3		35	0.0381	1016.34	(46)	0.000427	0.000440	1015.8	0.5294	-0.000013	0.280			994.0319
0.5		35	0.0620	1030.09	(46)	0.000438	0.000446	1029.6	0.5375	-0.000008	0.289			994.0319
1		35	0.1167	1061.59	(46)	0.000457	0.000459	1061.4	0.2190	-0.000002	0.048			994.0319
1.5		35	0.1654	1089.65	(46)	0.000472	0.000471	1089.9	-0.2191	0.000001	0.048			994.0319
2		35	0.2090	1114.81	(46)	0.000485	0.000482	1115.4	-0.5908	0.000002	0.349			994.0319
3		35	0.2839	1157.94	(46)	0.000504	0.000502	1158.8	-0.8866	0.000002	0.786			994.0319
4		35	0.3458	1193.47	(46)	0.000520	0.000519	1193.9	-0.3943	0.000001	0.155			994.0319
5		35	0.3978	1222.99	(46)	0.000533	0.000534	1222.3	0.7136	-0.000001	0.509			994.0319
0.05		40	0.0066	996.13	(46)	0.000404	0.000435	995.9	0.1959	-0.000030	0.038			992.2158
0.07		40	0.0092	997.64	(46)	0.000410	0.000435	997.4	0.2299	-0.000025	0.053			992.2158
		40	0.0100	998.00	(90)	0.000424	0.000435	997.9	0.1159	-0.000012	0.013			992.2158
0.1		40	0.0130	999.92	(46)	0.000412	0.000436	999.6	0.3080	-0.000024	0.095			992.2158
		40	0.0200	1003.90	(90)	0.000421	0.000438	1003.6	0.3287	-0.000016	0.108			992.2158
0.2		40	0.0257	1007.30	(46)	0.000422	0.000439	1006.8	0.4517	-0.000017	0.204			992.2158
0.3		40	0.0381	1014.44	(46)	0.000429	0.000442	1013.9	0.5121	-0.000013	0.262			992.2158
		40	0.0400	1015.50	(90)	0.000430	0.000442	1015.0	0.5010	-0.000012	0.251			992.2158
0.5		40	0.0620	1028.17	(46)	0.000439	0.000447	1027.6	0.5404	-0.000008	0.292			992.2158
		40	0.0800	1038.70	(90)	0.000444	0.000452	1038.0	0.6593	-0.000008	0.435			992.2158
1		40	0.1167	1059.59	(46)	0.000459	0.000461	1059.4	0.2274	-0.000002	0.052			992.2158
		40	0.1200	1061.90	(90)	0.000457	0.000461	1061.3	0.6250	-0.000005	0.391			992.2158
		40	0.1600	1084.90	(90)	0.000470	0.000471	1084.6	0.2750	-0.000001	0.076			992.2158
1.5		40	0.1654	1087.62	(46)	0.000473	0.000473	1087.8	-0.1741	0.000001	0.030			992.2158
		40	0.2000	1107.70	(90)	0.000482	0.000481	1108.0	-0.3017	0.000001	0.091			992.2158
2		40	0.2090	1112.77	(46)	0.000486	0.000484	1113.3	-0.5060	0.000002	0.256			992.2158
		40	0.2400	1130.40	(90)	0.000495	0.000492	1131.3	-0.9036	0.000003	0.817			992.2158
		40	0.2800	1152.90	(90)	0.000506	0.000502	1154.4	-1.5156	0.000004	2.297			992.2158
3		40	0.2839	1155.86	(46)	0.000505	0.000503	1156.6	-0.7845	0.000002	0.615			992.2158
4		40	0.3458	1191.43	(46)	0.000521	0.000520	1191.7	-0.2388	0.000000	0.057			992.2158
		40	0.3500	1191.90	(90)	0.000525	0.000521	1194.0	-2.1086	0.000004	4.446			992.2158
5		40	0.3978	1221.04	(46)	0.000533	0.000535	1220.1	0.9408	-0.000002	0.885			992.2158
		40	0.4000	1219.60	(90)	0.000538	0.000535	1221.3	-1.6507	0.000003	2.725			992.2158
		40	0.5000	1274.50	(90)	0.000561	0.000565	1271.7	2.8405	-0.000004	8.069			992.2158
0.05		45	0.0066	994.11	(46)	0.000407	0.000436	993.9	0.1889	-0.000029	0.036			990.2132
0.07		45	0.0092	995.61	(46)	0.000413	0.000436	995.4	0.2171	-0.000024	0.047			990.2132
0.1		45	0.0130	997.88	(46)	0.000415	0.000437	997.6	0.2912	-0.000022	0.085			990.2132
0.2		45	0.0257	1005.25	(46)	0.000423	0.000440	1004.8	0.4447	-0.000017	0.198			990.2132
0.3		45	0.0381	1012.40	(46)	0.000429	0.000443	1011.9	0.5340	-0.000014	0.285			990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m ³
0.5		45	0.0620	1026.09	(46)	0.000440	0.000449	1025.5	0.5570	-0.000009	0.310			990.2132
1		45	0.1167	1057.49	(46)	0.000459	0.000462	1057.2	0.2959	-0.000002	0.088			990.2132
1.5		45	0.1654	1085.43	(46)	0.000474	0.000474	1085.6	-0.1435	0.000001	0.021			990.2132
2		45	0.2090	1110.59	(46)	0.000486	0.000485	1111.0	-0.4307	0.000002	0.186			990.2132
3		45	0.2839	1153.74	(46)	0.000506	0.000504	1154.4	-0.6223	0.000002	0.387			990.2132
4		45	0.3458	1189.37	(46)	0.000521	0.000521	1189.4	-0.0331	0.000000	0.001			990.2132
5		45	0.3978	1219.04	(46)	0.000533	0.000535	1217.9	1.1597	-0.000002	1.345			990.2132
0.05		50	0.0066	991.95	(46)	0.000404	0.000437	991.7	0.2152	-0.000033	0.046			988.0363
0.07		50	0.0092	993.45	(46)	0.000410	0.000438	993.2	0.2470	-0.000027	0.061			988.0363
0.1		50	0.0130	995.72	(46)	0.000413	0.000439	995.4	0.3266	-0.000025	0.107			988.0363
0.2		50	0.0257	1003.08	(46)	0.000423	0.000441	1002.6	0.4874	-0.000019	0.238			988.0363
0.3		50	0.0381	1010.22	(46)	0.000429	0.000444	1009.6	0.5830	-0.000015	0.340			988.0363
0.5		50	0.0620	1023.90	(46)	0.000440	0.000450	1023.3	0.6259	-0.000010	0.392			988.0363
1		50	0.1167	1055.27	(46)	0.000460	0.000463	1054.9	0.3933	-0.000003	0.155			988.0363
1.5		50	0.1654	1083.23	(46)	0.000474	0.000474	1083.2	0.0120	0.000000	0.000			988.0363
2		50	0.2090	1108.37	(46)	0.000486	0.000485	1108.6	-0.2748	0.000001	0.076			988.0363
3		50	0.2839	1151.61	(46)	0.000506	0.000505	1152.0	-0.3784	0.000001	0.143			988.0363
4		50	0.3458	1187.29	(46)	0.000521	0.000521	1187.1	0.2158	0.000000	0.047			988.0363
5		50	0.3978	1217.02	(46)	0.000533	0.000536	1215.6	1.3947	-0.000002	1.945			988.0363
0.05		55	0.0066	989.59	(46)	0.000406	0.000438	989.4	0.2044	-0.000032	0.042			985.6952
0.07		55	0.0092	991.09	(46)	0.000412	0.000439	990.9	0.2394	-0.000027	0.057			985.6952
0.1		55	0.0130	993.36	(46)	0.000414	0.000439	993.0	0.3237	-0.000025	0.105			985.6952
0.2		55	0.0257	1000.74	(46)	0.000422	0.000442	1000.2	0.5196	-0.000020	0.270			985.6952
0.3		55	0.0381	1007.84	(46)	0.000430	0.000445	1007.3	0.5892	-0.000015	0.347			985.6952
0.5		55	0.0620	1021.56	(46)	0.000440	0.000451	1020.9	0.6971	-0.000011	0.486			985.6952
1		55	0.1167	1052.88	(46)	0.000460	0.000463	1052.4	0.4604	-0.000004	0.212			985.6952
1.5		55	0.1654	1080.87	(46)	0.000474	0.000475	1080.7	0.1338	-0.000001	0.018			985.6952
2		55	0.2090	1106.07	(46)	0.000486	0.000486	1106.2	-0.0862	0.000000	0.007			985.6952
3		55	0.2839	1149.33	(46)	0.000506	0.000505	1149.5	-0.1997	0.000001	0.040			985.6952
4		55	0.3458	1185.11	(46)	0.000521	0.000522	1184.7	0.4225	-0.000001	0.179			985.6952
5		55	0.3978	1214.93	(46)	0.000533	0.000536	1213.3	1.5914	-0.000003	2.533			985.6952
		80	0.0100	977.70	(90)	0.000408	0.000441	977.4	0.3153	-0.000033	0.099			971.7978
		80	0.0200	983.60	(90)	0.000412	0.000443	983.0	0.6056	-0.000031	0.367			971.7978
		80	0.0400	995.30	(90)	0.000422	0.000447	994.3	1.0209	-0.000026	1.042			971.7978
		80	0.0800	1018.70	(90)	0.000437	0.000456	1017.1	1.6106	-0.000019	2.594			971.7978
		80	0.1200	1042.10	(90)	0.000451	0.000465	1040.2	1.9248	-0.000015	3.705			971.7978
		80	0.1600	1065.30	(90)	0.000465	0.000475	1063.5	1.8268	-0.000010	3.337			971.7978
		80	0.2000	1088.30	(90)	0.000478	0.000484	1086.9	1.3908	-0.000006	1.934			971.7978
		80	0.2400	1111.10	(90)	0.000491	0.000494	1110.4	0.7027	-0.000002	0.494			971.7978
		80	0.2800	1133.80	(90)	0.000504	0.000504	1133.8	-0.0389	0.000000	0.002			971.7978
		80	0.3500	1173.10	(90)	0.000525	0.000522	1174.4	-1.3053	0.000003	1.704			971.7978
		80	0.4000	1201.10	(90)	0.000538	0.000535	1202.7	-1.5953	0.000003	2.545			971.7978

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
		80	0.5000	1256.80	(90)	0.000562	0.000563	1256.2	0.5769	-0.000001	0.333			971.7978
		100	0.0100	964.40	(90)	0.000390	0.000440	963.9	0.4574	-0.000049	0.209			958.3637
		100	0.0200	970.50	(90)	0.000391	0.000442	969.5	0.9525	-0.000051	0.907			958.3637
		100	0.0400	982.60	(90)	0.000400	0.000446	980.8	1.7673	-0.000046	3.123			958.3637
		100	0.0800	1006.60	(90)	0.000418	0.000454	1003.7	2.9130	-0.000036	8.485			958.3637
		100	0.1200	1030.30	(90)	0.000436	0.000463	1026.9	3.4187	-0.000027	11.688			958.3637
		100	0.1600	1053.90	(90)	0.000452	0.000472	1050.4	3.5392	-0.000020	12.526			958.3637
		100	0.2000	1077.20	(90)	0.000468	0.000481	1074.1	3.1393	-0.000014	9.856			958.3637
		100	0.2400	1100.30	(90)	0.000483	0.000491	1097.9	2.3954	-0.000008	5.738			958.3637
		100	0.2800	1123.20	(90)	0.000497	0.000501	1121.8	1.3959	-0.000004	1.948			958.3637
		100	0.3500	1162.90	(90)	0.000519	0.000518	1163.4	-0.5489	0.000001	0.301			958.3637
		100	0.4000	1191.00	(90)	0.000534	0.000531	1192.8	-1.7506	0.000003	3.065			958.3637
		100	0.5000	1246.60	(90)	0.000561	0.000558	1249.0	-2.3882	0.000003	5.703			958.3637
									Average Res	0.2771	-0.000011	196.914	Sum Chi sqr	
									Std dev Res	1.0300	0.000014			
									Avg - 4std	-3.8430	-0.000065			
									Avg + 4std	4.3973	0.000044			

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	-123.2165
c1	452.5876
c2	3.289804
c3	0.016292
c4	1692.395
Min T	0
Max T	100
Min w	0.006564
Max w	0.5
Avg dens res	0.277127
Std dens res	1.030043
Avg app vol res *10 ³	-0.01061
Std app vol res *10 ³	0.013539
No of points in corr	174
No of inconsistent poir	0

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

Density of aqueous solutions of **NiCl2**

- References (23) Dolian, F. E. The Viscosities of Solutions of Chlorides in Certain Solvents. *J. Phys. Chem.* **1937**, *41*, 1129-1138.
- (37) Herrington, Thelma M.; Roffey, Michael G.; Smith, David P.; Densities of Aqueous Electrolytes MnCl₂, CoCl₂, NiCl₂, ZnCl₂ and CdCl₂ from 25 to 72°C at 1 atm, *J. Chem. Eng. Data*, **1986**, *31*, 221-225
- (83) Pearce, J. N.; Eckstrom, H. C. The Vapor Pressure and some Thermodynamic Properties of Aqueous Solutions of Nickel Chloride at 25°C. *J. Phys. Chem.* **1937**, *41*, 563-565.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.
- (91) Phang, S. Viscosity and Transference Number Measurements of Concentrated Nickel Chloride Solutions at 298.15K. *Aust. J. Chem.* **1979**, *32*, 1149-1153.
- (97) Pogue, R. F.; Atkinson, G. Solution Thermodynamics of First-Row Transition Elements. 1. Apparent Molal Volumes of Aqueous NiCl₂, Ni(ClO₄)₂, CuCl₂, and Cu(ClO₄)₂, from 15 to 55°C. *J. Chem. Eng. Data* **1988**, *33*, 370-376.
- (105) Rard, J. A. Densities and Apparent Molal Volumes of Aqueous Nickel Chloride at 25 °C. *J. Chem. Eng. Data* **1986**, *31*, 183-185.
- (117) Schmelzer, N.; Einfeldt, J. Density Measurements in Some Aqueous and Non-Aqueous Electrolyte Solutions at 25°C. *Wiss. Z. Uni. Rostock* **1989**, *38*, 81-82.
- (123) Spitzer, J. J.; Singh, P. P.; McCurdy, K. G.; Hepler, L. G. Apparent Molar Heat Capacities and Volumes of Aqueous Electrolytes: CaCl₂, Cd(NO₃)₂, CoCl₂, Cu(ClO₄)₂, Mg(ClO₄)₂, and NiCl₂. *J. Sol. Chem.* **1978**, *7*, 81-86.
- (124) Stokes, R. H.; Phang, S.; Mills, R. Density, Conductance, Transference Numbers, and Diffusion Measurements in Concentrated Solutions of Nickel Chloride. *J. Sol. Chem.* **1979**, *8*, 489-500.

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
0.00906		15	0.0012	1000.21	(97)	0.000051	0.000085	1000.17	0.0398	-0.000034	0.002			6.5600	999.0996
0.01948		15	0.0025	1001.49	(97)	0.000052	0.000085	1001.41	0.0835	-0.000033	0.007			6.7000	999.0996
0.02981		15	0.0038	1002.76	(97)	0.000052	0.000085	1002.63	0.1258	-0.000033	0.016			6.8000	999.0996
0.0491		15	0.0063	1005.10	(97)	0.000055	0.000085	1004.91	0.1908	-0.000030	0.036			7.1900	999.0996
0.07449		15	0.0096	1008.18	(97)	0.000058	0.000086	1007.91	0.2727	-0.000028	0.074			7.4900	999.0996
0.1023		15	0.0131	1011.55	(97)	0.000060	0.000086	1011.19	0.3570	-0.000027	0.127			7.7400	999.0996
0.2025		15	0.0256	1023.59	(97)	0.000064	0.000088	1022.95	0.6400	-0.000024	0.410			8.3500	999.0996
0.3925		15	0.0484	1046.02	(97)	0.000073	0.000092	1045.05	0.9761	-0.000018	0.953			9.5200	999.0996
0.6		15	0.0722	1070.10	(97)	0.000081	0.000096	1068.86	1.2417	-0.000015	1.542			10.4500	999.0996
0.8003		15	0.0940	1092.92	(97)	0.000087	0.000099	1091.52	1.3985	-0.000012	1.956			11.2400	999.0996
0.9881		15	0.1135	1113.91	(97)	0.000092	0.000102	1112.49	1.4238	-0.000010	2.027			11.9600	999.0996
1.497		15	0.1625	1169.36	(97)	0.000104	0.000111	1167.92	1.4315	-0.000006	2.049			13.5000	999.0996
1.9982		15	0.2057	1221.58	(97)	0.000115	0.000118	1220.58	1.0084	-0.000003	1.017			14.8800	999.0996
2.5079		15	0.2453	1273.04	(97)	0.000123	0.000125	1272.17	0.8636	-0.000002	0.746			15.9400	999.0996
2.9976		15	0.2798	1321.41	(97)	0.000128	0.000131	1319.93	1.4721	-0.000003	2.167			16.6500	999.0996
3.3543		15	0.3030	1354.21	(97)	0.000135	0.000136	1353.63	0.5733	-0.000001	0.329			17.4700	999.0996
		18	0.0100	1008.20	(90)	0.000047	0.000086	1007.81	0.3892	-0.000038	0.152				998.5956
		18	0.0200	1017.90	(90)	0.000052	0.000087	1017.16	0.7350	-0.000035	0.540				998.5956
		18	0.0400	1037.50	(90)	0.000063	0.000091	1036.30	1.1987	-0.000028	1.437				998.5956
		18	0.0800	1078.50	(90)	0.000074	0.000097	1076.36	2.1367	-0.000023	4.566				998.5956
0.003506		25	0.0005	997.47	(117)	0.000062	0.000083	997.46	0.0097	-0.000022	0.000				997.0449
0.00366		25	0.0005	997.50	(124)	0.000038	0.000083	997.48	0.0215	-0.000046	0.000				997.0449
0.008446		25	0.0011	998.07	(117)	0.000061	0.000084	998.05	0.0246	-0.000023	0.001				997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
0.01004		25	0.0013	998.27	(97)	0.000055	0.000084	998.23	0.0365	-0.000028	0.001			7.1800	997.0449
0.01031		25	0.0013	998.31	(124)	0.000051	0.000084	998.27	0.0439	-0.000033	0.002				997.0449
0.0198		25	0.0026	999.45	(97)	0.000059	0.000084	999.39	0.0628	-0.000025	0.004			7.6800	997.0449
0.02149		25	0.0028	999.68	(124)	0.000051	0.000084	999.59	0.0906	-0.000033	0.008				997.0449
0.02467		25	0.0032	1000.05	(117)	0.000057	0.000084	999.97	0.0844	-0.000026	0.007				997.0449
0.02912		25	0.0038	1000.58	(97)	0.000060	0.000084	1000.49	0.0894	-0.000024	0.008			7.8100	997.0449
0.039987		25	0.0052	1001.89	(105)	0.000062	0.000084	1001.78	0.1164	-0.000022	0.014				997.0449
0.04212		25	0.0054	1002.18	(124)	0.000057	0.000084	1002.03	0.1514	-0.000028	0.023				997.0449
0.04488		25	0.0058	1002.46	(123)	0.000066	0.000084	1002.35	0.1064	-0.000018	0.011			8.5600	997.0449
	0.0494	25	0.0064	1003.05	(91)	0.000062	0.000084	1002.91	0.1430	-0.000022	0.020				997.0449
0.04962		25	0.0064	1003.05	(97)	0.000063	0.000084	1002.91	0.1392	-0.000022	0.019			8.1400	997.0449
0.07489		25	0.0096	1006.06	(123)	0.000069	0.000085	1005.90	0.1595	-0.000016	0.025			8.8900	997.0449
0.07527		25	0.0097	1006.14	(97)	0.000065	0.000085	1005.94	0.1966	-0.000020	0.039			8.4100	997.0449
0.07571		25	0.0097	1006.12	(123)	0.000072	0.000085	1005.99	0.1303	-0.000013	0.017			9.3000	997.0449
0.07941		25	0.0102	1006.84	(117)	0.000045	0.000085	1006.43	0.4111	-0.000040	0.169				997.0449
0.0828		25	0.0106	1007.10	(124)	0.000060	0.000085	1006.83	0.2716	-0.000025	0.074				997.0449
		25	0.0114	1007.48	(23)	0.000092	0.000085	1007.55	-0.0744	0.000006	0.006				997.0449
0.089987		25	0.0115	1007.91	(105)	0.000065	0.000085	1007.67	0.2370	-0.000020	0.056				997.0449
0.09012		25	0.0115	1007.90	(123)	0.000067	0.000085	1007.69	0.2105	-0.000018	0.044			8.7300	997.0449
0.1		25	0.0128	1009.11	(83)	0.000066	0.000086	1008.85	0.2512	-0.000019	0.063				997.0449
0.1023		25	0.0131	1009.37	(97)	0.000067	0.000086	1009.12	0.2457	-0.000018	0.060			8.7000	997.0449
0.104		25	0.0133	1009.66	(124)	0.000061	0.000086	1009.32	0.3356	-0.000025	0.113				997.0449
0.1167		25	0.0149	1010.96	(124)	0.000077	0.000086	1010.82	0.1420	-0.000009	0.020				997.0449
0.1264		25	0.0161	1012.20	(123)	0.000071	0.000086	1011.96	0.2452	-0.000015	0.060			9.2300	997.0449
	0.1266	25	0.0162	1012.27	(91)	0.000072	0.000086	1012.04	0.2268	-0.000014	0.051				997.0449
0.13234		25	0.0169	1013.36	(117)	0.000045	0.000086	1012.66	0.7045	-0.000041	0.496				997.0449
0.1498		25	0.0190	1014.97	(123)	0.000073	0.000087	1014.70	0.2660	-0.000014	0.071			9.4600	997.0449
0.1511		25	0.0192	1015.19	(123)	0.000070	0.000087	1014.86	0.3300	-0.000017	0.109			9.0600	997.0449
0.15996		25	0.0203	1016.25	(105)	0.000070	0.000087	1015.90	0.3513	-0.000017	0.123				997.0449
		25	0.0225	1018.48	(23)	0.000065	0.000087	1017.96	0.5205	-0.000022	0.271				997.0449
0.1997		25	0.0252	1020.95	(97)	0.000072	0.000088	1020.55	0.4060	-0.000015	0.165			9.3500	997.0449
0.2		25	0.0253	1020.93	(83)	0.000074	0.000088	1020.58	0.3481	-0.000013	0.121				997.0449
0.2015		25	0.0255	1021.12	(123)	0.000074	0.000088	1020.76	0.3677	-0.000014	0.135			9.5600	997.0449
0.24988		25	0.0314	1026.81	(105)	0.000076	0.000089	1026.40	0.4033	-0.000012	0.163				997.0449
	0.2782	25	0.0350	1030.24	(91)	0.000080	0.000089	1029.89	0.3537	-0.000010	0.125				997.0449
0.2985		25	0.0373	1032.49	(124)	0.000079	0.000090	1032.06	0.4349	-0.000011	0.189				997.0449
0.3001		25	0.0374	1032.77	(37)	0.000076	0.000090	1032.24	0.5292	-0.000013	0.280				997.0449
0.35101		25	0.0435	1040.34	(117)	0.000044	0.000091	1038.14	2.2007	-0.000047	4.843				997.0449
	0.3532	25	0.0441	1039.07	(91)	0.000082	0.000091	1038.67	0.4015	-0.000008	0.161				997.0449
		25	0.0441	1039.74	(23)	0.000069	0.000091	1038.71	1.0328	-0.000022	1.067				997.0449
0.35986		25	0.0446	1039.66	(105)	0.000080	0.000091	1039.16	0.4975	-0.000010	0.248				997.0449
0.4		25	0.0493	1044.19	(83)	0.000084	0.000092	1043.80	0.3976	-0.000007	0.158				997.0449
0.4045		25	0.0498	1044.89	(97)	0.000081	0.000092	1044.31	0.5741	-0.000011	0.330			10.5200	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
0.4677		25	0.0572	1052.28	(37)	0.000082	0.000093	1051.58	0.7004	-0.000011	0.490				997.0449
0.48997		25	0.0597	1054.66	(105)	0.000085	0.000093	1054.13	0.5279	-0.000008	0.279				997.0449
	0.5406	25	0.0660	1060.95	(91)	0.000088	0.000094	1060.49	0.4620	-0.000006	0.213				997.0449
0.5957		25	0.0717	1066.87	(97)	0.000087	0.000095	1066.20	0.6755	-0.000008	0.456			11.3000	997.0449
0.6		25	0.0722	1067.01	(83)	0.000092	0.000096	1066.68	0.3248	-0.000004	0.106				997.0449
	0.6375	25	0.0771	1072.15	(91)	0.000091	0.000096	1071.70	0.4452	-0.000005	0.198				997.0449
0.64587		25	0.0773	1072.42	(105)	0.000090	0.000096	1071.89	0.5321	-0.000006	0.283				997.0449
0.6996		25	0.0831	1078.78	(37)	0.000089	0.000097	1077.96	0.8185	-0.000008	0.670				997.0449
0.7891		25	0.0928	1088.73	(97)	0.000093	0.000099	1088.03	0.7033	-0.000006	0.495			12.0200	997.0449
0.8		25	0.0940	1089.48	(83)	0.000097	0.000099	1089.25	0.2353	-0.000002	0.055				997.0449
0.81012		25	0.0950	1090.87	(105)	0.000095	0.000100	1090.38	0.4892	-0.000004	0.239				997.0449
	0.8545	25	0.1010	1097.06	(91)	0.000097	0.000101	1096.66	0.3965	-0.000003	0.157				997.0449
0.9188		25	0.1064	1103.33	(37)	0.000095	0.000102	1102.50	0.8335	-0.000006	0.695				997.0449
0.9881		25	0.1135	1110.80	(97)	0.000098	0.000103	1110.17	0.6301	-0.000005	0.397			12.7400	997.0449
0.99961		25	0.1147	1111.84	(105)	0.000100	0.000103	1111.44	0.3970	-0.000003	0.158				997.0449
1		25	0.1147	1111.58	(83)	0.000102	0.000103	1111.49	0.0929	-0.000001	0.009				997.0449
1.159		25	0.1306	1129.69	(37)	0.000101	0.000106	1128.93	0.7561	-0.000005	0.572				997.0449
1.2097		25	0.1355	1134.71	(105)	0.000105	0.000107	1134.45	0.2557	-0.000001	0.065				997.0449
	1.2360	25	0.1405	1140.19	(91)	0.000107	0.000108	1140.05	0.1439	-0.000001	0.021				997.0449
1.4107		25	0.1546	1156.75	(37)	0.000107	0.000110	1156.14	0.6142	-0.000003	0.377				997.0449
1.4398		25	0.1573	1159.30	(105)	0.000110	0.000111	1159.25	0.0522	0.000000	0.003				997.0449
1.4973		25	0.1625	1166.01	(97)	0.000109	0.000112	1165.38	0.6307	-0.000003	0.398			14.1000	997.0449
1.5		25	0.1628	1165.33	(83)	0.000113	0.000112	1165.66	-0.3299	0.000001	0.109				997.0449
1.6526		25	0.1764	1182.23	(37)	0.000112	0.000114	1181.80	0.4322	-0.000002	0.187				997.0449
1.6661		25	0.1776	1183.01	(105)	0.000115	0.000114	1183.22	-0.2062	0.000001	0.043				997.0449
	1.6270	25	0.1782	1183.67	(91)	0.000115	0.000115	1183.89	-0.2211	0.000001	0.049				997.0449
1.8985		25	0.1975	1207.64	(37)	0.000117	0.000118	1207.40	0.2353	-0.000001	0.055				997.0449
1.9982		25	0.2057	1218.01	(97)	0.000119	0.000120	1217.65	0.3629	-0.000001	0.132			15.3600	997.0449
1.9994		25	0.2058	1217.28	(105)	0.000121	0.000120	1217.77	-0.4930	0.000002	0.243				997.0449
2		25	0.2059	1216.74	(83)	0.000123	0.000120	1217.83	-1.0944	0.000004	1.198				997.0449
2.0001		25	0.2059	1217.34	(105)	0.000121	0.000120	1217.84	-0.5046	0.000002	0.255				997.0449
2.148		25	0.2178	1232.95	(37)	0.000122	0.000122	1232.90	0.0535	0.000000	0.003				997.0449
2.3331		25	0.2322	1250.67	(105)	0.000127	0.000125	1251.49	-0.8227	0.000002	0.677				997.0449
2.3916		25	0.2366	1257.23	(37)	0.000126	0.000126	1257.31	-0.0843	0.000000	0.007				997.0449
2.5		25	0.2447	1266.39	(83)	0.000131	0.000127	1268.03	-1.6428	0.000004	2.699				997.0449
2.5075		25	0.2453	1269.04	(97)	0.000127	0.000127	1268.77	0.2723	-0.000001	0.074			16.4100	997.0449
2.6336		25	0.2545	1280.97	(37)	0.000129	0.000129	1281.12	-0.1460	0.000000	0.021				997.0449
2.6652		25	0.2568	1283.14	(105)	0.000132	0.000130	1284.19	-1.0508	0.000002	1.104				997.0449
2.8917		25	0.2726	1305.88	(37)	0.000133	0.000133	1306.01	-0.1270	0.000000	0.016				997.0449
3		25	0.2800	1314.34	(83)	0.000138	0.000134	1316.30	-1.9621	0.000004	3.850				997.0449
3.0008		25	0.2800	1315.19	(105)	0.000137	0.000134	1316.38	-1.1868	0.000002	1.409				997.0449
3.0023		25	0.2801	1316.71	(97)	0.000134	0.000134	1316.52	0.1892	0.000000	0.036			17.3400	997.0449
3.3082		25	0.3001	1343.93	(105)	0.000140	0.000138	1345.12	-1.1866	0.000002	1.408				997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
3.3543		25	0.3030	1349.79	(97)	0.000138	0.000139	1349.37	0.4190	-0.000001	0.176			17.8900	997.0449
3.6128		25	0.3189	1371.87	(105)	0.000144	0.000142	1372.91	-1.0385	0.000002	1.079				997.0449
3.9221		25	0.3370	1399.64	(105)	0.000147	0.000146	1400.44	-0.8047	0.000001	0.647				997.0449
4		25	0.3414	1406.07	(83)	0.000148	0.000147	1407.27	-1.2048	0.000002	1.452				997.0449
4.2549		25	0.3555	1428.90	(105)	0.000150	0.000150	1429.32	-0.4193	0.000001	0.176				997.0449
4.4271		25	0.3646	1443.80	(105)	0.000152	0.000152	1443.96	-0.1591	0.000000	0.025				997.0449
4.9116		25	0.3890	1485.42	(83)	0.000155	0.000157	1484.08	1.3401	-0.000002	1.796				997.0449
4.9832		25	0.3924	1490.71	(105)	0.000157	0.000158	1489.87	0.8362	-0.000001	0.699				997.0449
0.00906		35	0.0012	995.13	(97)	0.000059	0.000082	995.10	0.0259	-0.000022	0.001			7.6900	994.0319
0.01947		35	0.0025	996.39	(97)	0.000061	0.000082	996.34	0.0521	-0.000021	0.003			7.9100	994.0319
0.02975		35	0.0038	997.62	(97)	0.000064	0.000082	997.55	0.0708	-0.000019	0.005			8.2400	994.0319
0.04911		35	0.0063	999.94	(97)	0.000066	0.000083	999.84	0.1053	-0.000017	0.011			8.5400	994.0319
0.07449		35	0.0096	1002.97	(97)	0.000069	0.000083	1002.83	0.1404	-0.000015	0.020			8.8800	994.0319
0.1023		35	0.0131	1006.28	(97)	0.000071	0.000084	1006.10	0.1731	-0.000013	0.030			9.1600	994.0319
0.2025		35	0.0256	1018.12	(97)	0.000075	0.000086	1017.84	0.2830	-0.000011	0.080			9.7600	994.0319
0.3001		35	0.0374	1029.51	(37)	0.000080	0.000088	1029.19	0.3180	-0.000008	0.101				994.0319
0.3925		35	0.0484	1040.20	(97)	0.000084	0.000090	1039.87	0.3356	-0.000006	0.113			10.8500	994.0319
0.4677		35	0.0572	1048.90	(37)	0.000085	0.000092	1048.50	0.4018	-0.000006	0.161				994.0319
0.6		35	0.0722	1063.92	(97)	0.000090	0.000094	1063.57	0.3451	-0.000004	0.119			11.7000	994.0319
0.6996		35	0.0831	1075.24	(37)	0.000092	0.000097	1074.82	0.4202	-0.000004	0.177				994.0319
0.8003		35	0.0940	1086.37	(97)	0.000096	0.000099	1086.11	0.2627	-0.000002	0.069			12.4700	994.0319
0.9188		35	0.1064	1099.65	(37)	0.000098	0.000101	1099.28	0.3685	-0.000003	0.136				994.0319
0.9881		35	0.1135	1107.14	(97)	0.000101	0.000102	1106.93	0.2126	-0.000002	0.045			13.0600	994.0319
1.159		35	0.1306	1125.88	(37)	0.000104	0.000106	1125.62	0.2598	-0.000002	0.067				994.0319
1.4107		35	0.1546	1152.80	(37)	0.000110	0.000110	1152.70	0.1018	0.000000	0.010				994.0319
1.497		35	0.1625	1161.90	(97)	0.000112	0.000112	1161.86	0.0366	0.000000	0.001			14.4700	994.0319
1.6526		35	0.1764	1178.16	(37)	0.000115	0.000115	1178.22	-0.0615	0.000000	0.004				994.0319
1.8985		35	0.1975	1203.46	(37)	0.000120	0.000119	1203.67	-0.2076	0.000001	0.043				994.0319
1.9982		35	0.2057	1213.23	(97)	0.000123	0.000120	1213.84	-0.6171	0.000002	0.381			15.8800	994.0319
2.148		35	0.2178	1228.66	(37)	0.000124	0.000123	1228.98	-0.3164	0.000001	0.100				994.0319
2.3916		35	0.2366	1252.85	(37)	0.000128	0.000127	1253.20	-0.3464	0.000001	0.120				994.0319
2.5079		35	0.2453	1264.46	(97)	0.000129	0.000129	1264.59	-0.1296	0.000000	0.017			16.7200	994.0319
2.6336		35	0.2545	1276.49	(37)	0.000131	0.000131	1276.78	-0.2933	0.000001	0.086				994.0319
2.8917		35	0.2726	1301.30	(37)	0.000135	0.000134	1301.43	-0.1257	0.000000	0.016				994.0319
2.9976		35	0.2798	1311.67	(97)	0.000135	0.000136	1311.38	0.2846	-0.000001	0.081			17.5500	994.0319
3.3543		35	0.3030	1344.96	(97)	0.000140	0.000141	1344.29	0.6720	-0.000001	0.452			18.1200	994.0319
0.00906		45	0.0012	991.31	(97)	0.000062	0.000078	991.29	0.0194	-0.000017	0.000			7.9900	990.2132
0.01991		45	0.0026	992.61	(97)	0.000063	0.000079	992.57	0.0393	-0.000015	0.002			8.2000	990.2132
0.03033		45	0.0039	993.85	(97)	0.000065	0.000079	993.80	0.0537	-0.000014	0.003			8.4400	990.2132
0.04911		45	0.0063	996.09	(97)	0.000068	0.000079	996.02	0.0750	-0.000012	0.006			8.7500	990.2132
0.0752		45	0.0097	999.19	(97)	0.000070	0.000080	999.09	0.0938	-0.000010	0.009			9.1200	990.2132
0.1026		45	0.0131	1002.42	(97)	0.000073	0.000081	1002.32	0.1087	-0.000008	0.012			9.4000	990.2132
0.2025		45	0.0256	1014.17	(97)	0.000077	0.000083	1014.01	0.1561	-0.000006	0.024			10.0100	990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
0.3001		45	0.0374	1025.56	(37)	0.000080	0.000085	1025.36	0.2040	-0.000005	0.042				990.2132
0.3925		45	0.0484	1036.16	(97)	0.000085	0.000088	1036.02	0.1390	-0.000003	0.019			11.0100	990.2132
0.4677		45	0.0572	1044.88	(37)	0.000086	0.000089	1044.64	0.2392	-0.000004	0.057				990.2132
0.6		45	0.0722	1059.74	(97)	0.000092	0.000092	1059.69	0.0542	-0.000001	0.003			11.8800	990.2132
0.6996		45	0.0831	1071.14	(37)	0.000092	0.000095	1070.92	0.2217	-0.000002	0.049				990.2132
0.8025		45	0.0942	1082.34	(97)	0.000098	0.000097	1082.43	-0.0833	0.000001	0.007			12.6400	990.2132
0.9188		45	0.1064	1095.48	(37)	0.000098	0.000099	1095.32	0.1571	-0.000001	0.025				990.2132
0.9925		45	0.1140	1103.21	(97)	0.000102	0.000101	1103.43	-0.2192	0.000002	0.048			13.2700	990.2132
1.159		45	0.1306	1121.62	(37)	0.000104	0.000104	1121.58	0.0385	0.000000	0.001				990.2132
1.4107		45	0.1546	1148.47	(37)	0.000110	0.000109	1148.56	-0.0859	0.000000	0.007				990.2132
1.497		45	0.1625	1157.19	(97)	0.000113	0.000111	1157.68	-0.4866	0.000002	0.237			14.6700	990.2132
1.6526		45	0.1764	1173.77	(37)	0.000115	0.000114	1173.96	-0.1906	0.000001	0.036				990.2132
1.8985		45	0.1975	1199.01	(37)	0.000119	0.000118	1199.27	-0.2571	0.000001	0.066				990.2132
1.9982		45	0.2057	1208.36	(97)	0.000124	0.000120	1209.38	-1.0211	0.000003	1.043			16.0300	990.2132
2.148		45	0.2178	1224.15	(37)	0.000124	0.000123	1224.41	-0.2650	0.000001	0.070				990.2132
2.3916		45	0.2366	1248.28	(37)	0.000128	0.000127	1248.46	-0.1793	0.000000	0.032				990.2132
2.5186		45	0.2461	1260.45	(97)	0.000130	0.000129	1260.80	-0.3490	0.000001	0.122			16.8700	990.2132
2.6336		45	0.2545	1271.88	(37)	0.000131	0.000131	1271.85	0.0261	0.000000	0.001				990.2132
2.8917		45	0.2726	1296.63	(37)	0.000135	0.000135	1296.27	0.3580	-0.000001	0.128				990.2132
3.0275		45	0.2818	1309.40	(97)	0.000136	0.000137	1308.90	0.4947	-0.000001	0.245			17.6800	990.2132
3.3595		45	0.3034	1339.93	(97)	0.000141	0.000142	1339.15	0.7739	-0.000001	0.599			18.2800	990.2132
0.00977		55	0.0013	986.87	(97)	0.000064	0.000074	986.85	0.0126	-0.000010	0.000			8.2600	985.6952
0.02005		55	0.0026	988.09	(97)	0.000065	0.000074	988.07	0.0231	-0.000009	0.001			8.4400	985.6952
0.03209		55	0.0041	989.52	(97)	0.000067	0.000075	989.49	0.0321	-0.000008	0.001			8.6400	985.6952
0.04935		55	0.0064	991.57	(97)	0.000069	0.000075	991.53	0.0383	-0.000006	0.001			8.9300	985.6952
0.07582		55	0.0097	994.69	(97)	0.000072	0.000076	994.65	0.0367	-0.000004	0.001			9.3200	985.6952
0.103		55	0.0132	997.88	(97)	0.000075	0.000076	997.85	0.0249	-0.000002	0.001			9.6600	985.6952
0.2036		55	0.0257	1009.64	(97)	0.000079	0.000079	1009.63	0.0025	0.000000	0.000			10.2300	985.6952
0.3001		55	0.0374	1020.89	(37)	0.000080	0.000081	1020.85	0.0411	-0.000001	0.002				985.6952
0.3958		55	0.0488	1031.76	(97)	0.000086	0.000084	1031.89	-0.1242	0.000002	0.015			11.1800	985.6952
0.4677		55	0.0572	1040.15	(37)	0.000085	0.000086	1040.13	0.0212	0.000000	0.000				985.6952
0.6012		55	0.0723	1054.97	(97)	0.000093	0.000089	1055.30	-0.3297	0.000004	0.109			12.0500	985.6952
0.6996		55	0.0831	1066.36	(37)	0.000091	0.000091	1066.39	-0.0265	0.000000	0.001				985.6952
0.8043		55	0.0944	1077.50	(97)	0.000099	0.000094	1078.08	-0.5842	0.000005	0.341			12.8300	985.6952
0.9188		55	0.1064	1090.66	(37)	0.000097	0.000096	1090.76	-0.0977	0.000001	0.010				985.6952
1.0032		55	0.1151	1099.27	(97)	0.000104	0.000098	1100.03	-0.7540	0.000005	0.568			13.4300	985.6952
1.159		55	0.1306	1116.79	(37)	0.000103	0.000102	1116.96	-0.1733	0.000001	0.030				985.6952
1.4107		55	0.1546	1143.63	(37)	0.000108	0.000107	1143.86	-0.2334	0.000001	0.054				985.6952
1.497		55	0.1625	1151.77	(97)	0.000114	0.000109	1152.96	-1.1816	0.000005	1.396			14.8200	985.6952
1.6526		55	0.1764	1168.91	(37)	0.000113	0.000112	1169.18	-0.2685	0.000001	0.072				985.6952
1.8985		55	0.1975	1194.14	(37)	0.000118	0.000117	1194.38	-0.2357	0.000001	0.056				985.6952
1.9982		55	0.2057	1202.78	(97)	0.000124	0.000119	1204.44	-1.6543	0.000006	2.737			16.1300	985.6952
2.148		55	0.2178	1219.25	(37)	0.000122	0.000122	1219.39	-0.1439	0.000000	0.021				985.6952

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Density of water / kg/m³
2.3916		55	0.2366	1243.33	(37)	0.000126	0.000126	1243.29	0.0364	0.000000	0.001				985.6952
2.5079		55	0.2453	1253.53	(97)	0.000131	0.000128	1254.52	-0.9890	0.000003	0.978			16.9700	985.6952
2.6336		55	0.2545	1266.86	(37)	0.000130	0.000131	1266.53	0.3328	-0.000001	0.111				985.6952
2.8917		55	0.2726	1291.50	(37)	0.000133	0.000135	1290.75	0.7452	-0.000002	0.555				985.6952
2.9976		55	0.2798	1300.33	(97)	0.000137	0.000137	1300.53	-0.1981	0.000000	0.039			17.7900	985.6952
0.3001		65	0.0374	1015.69	(37)	0.000078	0.000076	1015.76	-0.0667	0.000002	0.004				980.5548
0.4677		65	0.0572	1034.94	(37)	0.000082	0.000080	1035.05	-0.1139	0.000002	0.013				980.5548
0.6996		65	0.0831	1061.13	(37)	0.000088	0.000086	1061.32	-0.1934	0.000002	0.037				980.5548
0.9188		65	0.1064	1085.43	(37)	0.000094	0.000092	1085.69	-0.2625	0.000002	0.069				980.5548
1.159		65	0.1306	1111.55	(37)	0.000100	0.000098	1111.88	-0.3305	0.000002	0.109				980.5548
1.4107		65	0.1546	1138.38	(37)	0.000105	0.000103	1138.74	-0.3645	0.000002	0.133				980.5548
1.6526		65	0.1764	1163.67	(37)	0.000110	0.000109	1164.01	-0.3377	0.000001	0.114				980.5548
1.8985		65	0.1975	1188.89	(37)	0.000115	0.000114	1189.13	-0.2447	0.000001	0.060				980.5548
2.148		65	0.2178	1214.00	(37)	0.000119	0.000119	1214.06	-0.0638	0.000000	0.004				980.5548
2.3916		65	0.2366	1238.06	(37)	0.000123	0.000124	1237.86	0.2009	-0.000001	0.040				980.5548
2.6336		65	0.2545	1261.56	(37)	0.000127	0.000129	1260.97	0.5880	-0.000001	0.346				980.5548
2.8917		65	0.2726	1286.17	(37)	0.000131	0.000133	1285.05	1.1172	-0.000002	1.248				980.5548
0.3001		75	0.0374	1009.95	(37)	0.000074	0.000069	1010.15	-0.1956	0.000005	0.038				974.849
0.4677		75	0.0572	1029.21	(37)	0.000078	0.000073	1029.49	-0.2775	0.000005	0.077				974.849
0.6996		75	0.0831	1055.43	(37)	0.000084	0.000080	1055.81	-0.3782	0.000004	0.143				974.849
0.9188		75	0.1064	1079.76	(37)	0.000089	0.000086	1080.21	-0.4539	0.000004	0.206				974.849
1.159		75	0.1306	1105.93	(37)	0.000095	0.000092	1106.43	-0.4981	0.000003	0.248				974.849
1.4107		75	0.1546	1132.81	(37)	0.000101	0.000098	1133.30	-0.4934	0.000002	0.243				974.849
1.6526		75	0.1764	1158.14	(37)	0.000106	0.000104	1158.56	-0.4214	0.000002	0.178				974.849
1.8985		75	0.1975	1183.39	(37)	0.000110	0.000109	1183.67	-0.2768	0.000001	0.077				974.849
2.148		75	0.2178	1208.52	(37)	0.000115	0.000115	1208.56	-0.0367	0.000000	0.001				974.849
2.3916		75	0.2366	1232.59	(37)	0.000119	0.000120	1232.30	0.2927	-0.000001	0.086				974.849
2.6336		75	0.2545	1256.07	(37)	0.000123	0.000125	1255.34	0.7305	-0.000002	0.534				974.849
2.8917		75	0.2726	1280.62	(37)	0.000127	0.000130	1279.33	1.2929	-0.000003	1.672				974.849
Average Res									0.1224	-0.000007	74.204	Sum Chi sqr			
Std dev Res									0.5637	0.000011					
Avg - 4std									-2.1323	-0.000052					
Avg + 4std									2.3770	0.000037					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0 -1.4E-06
c1 4.19E-06
c2 0.777343
c3 -0.00669
c4 -4638.13
Min T 15
Max T 75
Min w 0.000454

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Density of water / kg/m ³
Max w	0.392438														
Avg dens res	0.122376														
Std dens res	0.56366														
Avg app vol res *10 ³	-0.00722														
Std app vol res *10 ³	0.011085														
No of points in corr	224														
No of inconsistent poin	6														
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)															
18	0.1200	1121.70	(90)	0.000086	0.000104	1118.97	2.7312	-0.000018	7.459	!				998.5956	
18	0.1600	1167.40	(90)	0.000096	0.000111	1164.32	3.0793	-0.000014	9.482	!				998.5956	
18	0.2000	1216.3	(90)	0.000105	0.000118	1212.64	3.6619	-0.000012	13.409	!				998.5956	
18	0.3000	1353.0	(90)	0.000127	0.000136	1348.00	4.9998	-0.000009	24.998	!				998.5956	
25	0.0029	999.91	(23)	0.000012	0.000084	999.70	0.2084	-0.000072	0.043			!		997.0449	
25	0.0057	1002.70	(23)	0.000011	0.000084	1002.28	0.4225	-0.000074	0.178			!		997.0449

Density of aqueous solutions of **NiSO4**

- References (44) Isono, T. Measurements of Density, Viscosity, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions. *Rikagaku Kenkyusho Hokoku* **1980**, 56, 103-114.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.
- (94) Phillips, V. R. Specific Gravity, Viscosity, and Solubility for Aqueous Nickel Sulfate Solutions. *J. Chem. Eng. Data* **1972**, 17, 357-360.
- (117) Schmelzer, N.; Einfeldt, J. Density Measurements in Some Aqueous and Non-Aqueous Electrolyte Solutions at 25°C. *Wiss. Z. Uni. Rostock* **1989**, 38, 81-82.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	wt % NiSO4.6H2O	Density of water / kg/m³
0.05		15	0.008	1007.4	(44)	-0.000067	-0.000040	1007.1	0.2096	-0.000027	0.044				999.0996
0.1		15	0.015	1015.4	(44)	-0.000055	-0.000037	1015.1	0.2817	-0.000018	0.079				999.0996
0.5		15	0.072	1078.0	(44)	-0.000019	-0.000019	1078.0	-0.0423	0.000001	0.002				999.0996
1		15	0.134	1153.8	(44)	0.000000	0.000001	1153.5	0.3095	-0.000002	0.096				999.0996
1.5		15	0.188	1225.7	(44)	0.000019	0.000020	1225.4	0.2418	-0.000001	0.058				999.0996
2		15	0.236	1295.1	(44)	0.000033	0.000036	1293.9	1.2484	-0.000003	1.559				999.0996
		18	0.010	1009.1	(90)	-0.000041	-0.000037	1009.1	0.0379	-0.000004	0.001				998.5956
		18	0.020	1019.8	(90)	-0.000040	-0.000034	1019.7	0.1149	-0.000006	0.013				998.5956
		18	0.040	1041.5	(90)	-0.000030	-0.000028	1041.4	0.0891	-0.000002	0.008				998.5956
0.05		20	0.008	1006.4	(44)	-0.000061	-0.000037	1006.2	0.1841	-0.000024	0.034				998.2041
0.1		20	0.015	1014.5	(44)	-0.000053	-0.000035	1014.2	0.2844	-0.000018	0.081				998.2041
		20	0.059	1062.2	(94)	-0.000023	-0.000021	1062.0	0.1512	-0.000002	0.023			10	998.2041
0.5		20	0.072	1076.6	(44)	-0.000014	-0.000017	1076.9	-0.2251	0.000003	0.051				998.2041
		20	0.118	1131.7	(94)	-0.000002	-0.000002	1131.8	-0.0853	0.000001	0.007			20	998.2041
1		20	0.134	1152.3	(44)	0.000002	0.000003	1152.2	0.0987	-0.000001	0.010				998.2041
		20	0.177	1208.0	(94)	0.000017	0.000017	1208.0	0.0085	0.000000	0.000			30	998.2041
1.5		20	0.188	1223.9	(44)	0.000021	0.000021	1224.1	-0.2006	0.000001	0.040				998.2041
		20	0.236	1291.9	(94)	0.000035	0.000036	1291.3	0.6310	-0.000002	0.398			40	998.2041
2		20	0.236	1293.2	(44)	0.000035	0.000037	1292.5	0.6708	-0.000002	0.450				998.2041
0.000329		25	0.000	997.1	(117)	-0.000086	-0.000037	997.1	0.0025	-0.000050	0.000		!		997.0449
0.002991		25	0.000	997.5	(117)	-0.000073	-0.000036	997.5	0.0168	-0.000036	0.000				997.0449
0.006661		25	0.001	998.1	(117)	-0.000046	-0.000036	998.1	0.0099	-0.000010	0.000				997.0449
0.02936		25	0.005	1001.9	(117)	-0.000065	-0.000035	1001.7	0.1345	-0.000030	0.018				997.0449
0.05		25	0.008	1005.2	(44)	-0.000058	-0.000034	1005.0	0.1834	-0.000024	0.034				997.0449
0.1		25	0.015	1013.3	(44)	-0.000050	-0.000032	1013.0	0.2830	-0.000018	0.080				997.0449
0.20735		25	0.031	1031.1	(117)	-0.000061	-0.000027	1029.9	1.1200	-0.000034	1.254				997.0449
		25	0.059	1060.9	(94)	-0.000022	-0.000019	1060.7	0.2295	-0.000003	0.053			10	997.0449
0.5		25	0.072	1075.1	(44)	-0.000011	-0.000015	1075.4	-0.3133	0.000004	0.098				997.0449
		25	0.118	1129.9	(94)	0.000002	-0.000001	1130.2	-0.3287	0.000002	0.108			20	997.0449
1		25	0.134	1150.5	(44)	0.000005	0.000004	1150.6	-0.0862	0.000000	0.007				997.0449
		25	0.177	1206.0	(94)	0.000019	0.000018	1206.3	-0.3261	0.000001	0.106			30	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	wt % NiSO4.6H2O	Density of water / kg/m³
1.5		25	0.188	1221.9	(44)	0.000024	0.000022	1222.4	-0.5250	0.000002	0.276				997.0449
		25	0.236	1289.9	(94)	0.000036	0.000037	1289.6	0.2949	-0.000001	0.087			40	997.0449
2		25	0.236	1291.1	(44)	0.000037	0.000037	1290.9	0.2036	-0.000001	0.041				997.0449
0.05		30	0.008	1003.8	(44)	-0.000053	-0.000032	1003.6	0.1620	-0.000021	0.026				995.6473
0.1		30	0.015	1011.8	(44)	-0.000046	-0.000030	1011.5	0.2517	-0.000016	0.063				995.6473
		30	0.059	1059.1	(94)	-0.000018	-0.000017	1059.0	0.0535	-0.000001	0.003			10	995.6473
0.5		30	0.072	1073.4	(44)	-0.000009	-0.000013	1073.8	-0.3639	0.000004	0.132				995.6473
		30	0.118	1128.1	(94)	0.000003	0.000001	1128.4	-0.3174	0.000002	0.101			20	995.6473
1		30	0.134	1148.6	(44)	0.000007	0.000006	1148.7	-0.1437	0.000001	0.021				995.6473
		30	0.177	1203.9	(94)	0.000021	0.000019	1204.4	-0.4953	0.000002	0.245			30	995.6473
1.5		30	0.188	1219.7	(44)	0.000025	0.000023	1220.4	-0.6917	0.000002	0.478				995.6473
		30	0.236	1287.6	(94)	0.000037	0.000037	1287.7	-0.0622	0.000000	0.004			40	995.6473
2		30	0.236	1288.8	(44)	0.000038	0.000038	1288.9	-0.0844	0.000000	0.007				995.6473
		30	0.294	1379.1	(94)	0.000056	0.000056	1378.9	0.1634	0.000000	0.027			50	995.6473
0.05		35	0.008	1002.1	(44)	-0.000053	-0.000029	1002.0	0.1791	-0.000023	0.032				994.0319
0.1		35	0.015	1010.1	(44)	-0.000045	-0.000027	1009.8	0.2698	-0.000017	0.073				994.0319
		35	0.059	1057.2	(94)	-0.000015	-0.000015	1057.2	0.0016	0.000000	0.000			10	994.0319
0.5		35	0.072	1071.6	(44)	-0.000007	-0.000011	1071.9	-0.3190	0.000004	0.102				994.0319
		35	0.118	1125.9	(94)	0.000005	0.000002	1126.4	-0.4746	0.000003	0.225			20	994.0319
1		35	0.134	1146.5	(44)	0.000008	0.000007	1146.6	-0.1072	0.000001	0.012				994.0319
		35	0.177	1201.6	(94)	0.000022	0.000020	1202.2	-0.6232	0.000002	0.388			30	994.0319
1.5		35	0.188	1217.6	(44)	0.000026	0.000023	1218.2	-0.6848	0.000002	0.469				994.0319
		35	0.236	1285.2	(94)	0.000038	0.000038	1285.5	-0.2654	0.000001	0.070			40	994.0319
2		35	0.236	1286.6	(44)	0.000038	0.000038	1286.7	-0.1382	0.000000	0.019				994.0319
		35	0.294	1376.7	(94)	0.000056	0.000056	1376.9	-0.1741	0.000000	0.030			50	994.0319
		35	0.309	1401.2	(94)	0.000060	0.000061	1401.1	0.1033	0.000000	0.011			52.5	994.0319
		40	0.059	1055.3	(94)	-0.000015	-0.000013	1055.1	0.1556	-0.000002	0.024			10	992.2158
		40	0.118	1123.7	(94)	0.000006	0.000004	1124.1	-0.4191	0.000003	0.176			20	992.2158
		40	0.177	1199.4	(94)	0.000022	0.000021	1199.8	-0.4295	0.000002	0.185			30	992.2158
		40	0.236	1282.7	(94)	0.000039	0.000038	1283.0	-0.3350	0.000001	0.112			40	992.2158
		40	0.294	1374.2	(94)	0.000056	0.000056	1374.6	-0.3620	0.000001	0.131			50	992.2158
		40	0.309	1398.8	(94)	0.000060	0.000060	1398.8	-0.0466	0.000000	0.002			52.5	992.2158
0.05		45	0.008	998.2	(44)	-0.000048	-0.000025	998.1	0.1730	-0.000023	0.030				990.2132
0.1		45	0.015	1006.2	(44)	-0.000042	-0.000023	1005.9	0.2973	-0.000019	0.088				990.2132
		45	0.059	1053.1	(94)	-0.000014	-0.000011	1052.9	0.2007	-0.000003	0.040			10	990.2132
0.5		45	0.072	1067.3	(44)	-0.000006	-0.000008	1067.5	-0.1422	0.000002	0.020				990.2132
		45	0.118	1121.4	(94)	0.000007	0.000005	1121.7	-0.2665	0.000002	0.071			20	990.2132
1		45	0.134	1142.0	(44)	0.000009	0.000009	1141.8	0.1447	-0.000001	0.021				990.2132
		45	0.177	1196.9	(94)	0.000023	0.000021	1197.2	-0.3306	0.000001	0.109			30	990.2132
1.5		45	0.188	1212.9	(44)	0.000026	0.000025	1213.2	-0.3564	0.000001	0.127				990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	wt % NiSO4.6H2O	Density of water / kg/m³
2		45	0.236	1280.2	(94)	0.000039	0.000038	1280.4	-0.1881	0.000000	0.035			40	990.2132
		45	0.236	1281.6	(44)	0.000039	0.000038	1281.6	-0.0516	0.000000	0.003				990.2132
		45	0.294	1371.6	(94)	0.000056	0.000055	1372.0	-0.4179	0.000001	0.175			50	990.2132
		45	0.309	1396.2	(94)	0.000060	0.000060	1396.4	-0.1597	0.000000	0.025			52.5	990.2132
		45	0.324	1421.1	(94)	0.000064	0.000064	1421.3	-0.2061	0.000000	0.042			55	990.2132
		50	0.059	1050.9	(94)	-0.000016	-0.000010	1050.5	0.4242	-0.000007	0.180			10	988.0363
		50	0.118	1119.0	(94)	0.000006	0.000006	1119.0	-0.0299	0.000000	0.001			20	988.0363
		50	0.177	1194.4	(94)	0.000022	0.000022	1194.4	-0.0399	0.000000	0.002			30	988.0363
		50	0.236	1277.5	(94)	0.000038	0.000038	1277.5	-0.0387	0.000000	0.001			40	988.0363
		50	0.294	1368.9	(94)	0.000056	0.000055	1369.3	-0.3561	0.000001	0.127			50	988.0363
		50	0.309	1393.5	(94)	0.000059	0.000059	1393.7	-0.1505	0.000000	0.023			52.5	988.0363
		50	0.324	1418.4	(94)	0.000064	0.000063	1418.7	-0.2644	0.000000	0.070			55	988.0363
		50	0.339	1444.4	(94)	0.000068	0.000068	1444.3	0.0848	0.000000	0.007			57.5	988.0363
0.05	55	0.008	993.7	(44)	-0.000047	-0.000021	993.5	0.1982	-0.000026	0.039				985.6952	
0.1	55	0.015	1001.6	(44)	-0.000044	-0.000019	1001.2	0.3880	-0.000025	0.151				985.6952	
0.5	55	0.059	1048.5	(94)	-0.000018	-0.000008	1047.9	0.6154	-0.000010	0.379			10	985.6952	
	55	0.072	1062.5	(44)	-0.000006	-0.000005	1062.4	0.1444	-0.000002	0.021				985.6952	
1	55	0.118	1116.4	(94)	0.000006	0.000007	1116.2	0.1795	-0.000001	0.032			20	985.6952	
	55	0.134	1136.9	(44)	0.000008	0.000011	1136.3	0.6620	-0.000004	0.438				985.6952	
1.5	55	0.177	1191.7	(94)	0.000022	0.000023	1191.5	0.2309	-0.000001	0.053			30	985.6952	
	55	0.188	1207.7	(44)	0.000025	0.000026	1207.4	0.3084	-0.000001	0.095				985.6952	
2	55	0.236	1274.8	(94)	0.000038	0.000038	1274.5	0.3014	-0.000001	0.091			40	985.6952	
	55	0.236	1276.3	(44)	0.000037	0.000039	1275.8	0.5579	-0.000001	0.311				985.6952	
	55	0.294	1366.1	(94)	0.000055	0.000055	1366.3	-0.1887	0.000000	0.036			50	985.6952	
	55	0.309	1390.7	(94)	0.000059	0.000059	1390.7	-0.0312	0.000000	0.001			52.5	985.6952	
	55	0.324	1415.7	(94)	0.000063	0.000063	1415.8	-0.1076	0.000000	0.012			55	985.6952	
	55	0.339	1441.7	(94)	0.000067	0.000067	1441.5	0.1631	0.000000	0.027			57.5	985.6952	
	60	0.059	1046.0	(94)	-0.000020	-0.000007	1045.1	0.8653	-0.000013	0.749			10	983.1989	
	60	0.118	1113.8	(94)	0.000004	0.000008	1113.2	0.5523	-0.000004	0.305			20	983.1989	
	60	0.177	1188.9	(94)	0.000021	0.000023	1188.3	0.5721	-0.000002	0.327			30	983.1989	
	60	0.236	1272.1	(94)	0.000036	0.000039	1271.3	0.8222	-0.000002	0.676			40	983.1989	
	60	0.294	1363.3	(94)	0.000054	0.000054	1363.1	0.1741	0.000000	0.030			50	983.1989	
	60	0.309	1387.9	(94)	0.000058	0.000058	1387.6	0.2881	0.000000	0.083			52.5	983.1989	
	60	0.324	1412.8	(94)	0.000062	0.000062	1412.7	0.0540	0.000000	0.003			55	983.1989	
	60	0.339	1438.9	(94)	0.000066	0.000066	1438.5	0.3516	-0.000001	0.124			57.5	983.1989	
	60	0.353	1465.0	(94)	0.000070	0.000070	1465.0	-0.0400	0.000000	0.002			60	983.1989	
Average Res									0.0476	-0.000005	13.468	Sum Chi sqr			
Std dev Res									0.3532	0.000010					
Avg - 4std									-1.3653	-0.000045					
Avg + 4std									1.4605	0.000036					

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	wt % NiSO4.6H2O	Density of water / kg/m³
Curve fit for the model $\text{App vol} = (w + c_2 + c_3 * t \text{ } ^\circ\text{C}) / (c_0 * w + c_1) / e^{(0.000001 * (t \text{ } ^\circ\text{C} + c_4) ^ 2)}$															
c0		-0.038942													
c1		0.221094													
c2		-0.144428													
c3		0.000987													
c4		3073.747													
Min T		15													
Max T		60													
Min w		5.09E-05													
Max w		0.353294													
Avg dens res		0.047639													
Std dens res		0.353227													
Avg app vol res *10 ³		-0.004562													
Std app vol res *10 ³		0.010116													
No of points in corr		107													
No of inconsistent pair		8													
Inconsistent data not used (Residual greater than average +/- 4 standard deviations)															
		18	0.080	1085.2	(90)	0.000002	-0.000015	1086.9	-1.6559	0.000018	2.742	!			998.5956
		18	0.120	1132.5	(90)	0.000015	-0.000002	1135.1	-2.6038	0.000017	6.780	!			998.5956
		18	0.160	1182.5	(90)	0.000028	0.000011	1186.3	-3.8339	0.000017	14.699	!			998.5956
		18	0.180	1209.0	(90)	0.000033	0.000018	1213.1	-4.1245	0.000016	17.012	!			998.5956
0.00075		25	0.000	997.2	(117)	-0.000168	-0.000037	997.2	0.0152	-0.000132	0.000		!		997.0449
0.45858		25	0.066	1072.8	(117)	-0.000066	-0.000017	1069.1	3.7582	-0.000049	14.124	!	!		997.0449
0.83634		25	0.115	1141.8	(117)	-0.000106	-0.000002	1126.3	15.4422	-0.000105	238.462	!	!		997.0449
0.87034		25	0.119	1150.2	(117)	-0.000122	0.000000	1131.4	18.8295	-0.000122	354.552	!	!		997.0449

Density of aqueous solutions of **SrCl2**

- References (40) Herz, W. Internal Friction of Salt Solutions (C. A. Trans. from German). *Z. Anorg. Chemie* **1914**, 89, 393-396
- (45) Isono, T. Densities, Viscosities, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions at Several Temperatures. Alkaline-Earth Chlorides, LaCl_3 , Na_2SO_4 , NaNO_3 , NaBr , KNO_3 , KBr , and $\text{Cd}(\text{NO}_3)_2$. *J. Chem. Eng. Data* **1984**, 29, 45-52.
- (73) Millero, F. J.; Ward, G. K.; Chetirkin, P. V. Relative Sound Velocities of Sea Salts at 25°C. *J. Acoust. Soc. Am.* **1977**, 61, 1492-1498.
- (87) Perron, G.; Desnoyers, J. E. Apparent Molal Volumes and Heat Capacities of Alkaline Earth Chlorides in Water at 25°C. *Can. J. Chem.* **1974**, 52, 3738-3741.
- (96) Pilar Peña, M.; Vercher, E.; Martínez-Andreu, A. Apparent Molar Volumes of Strontium Chloride in Ethanol + Water at 298.15 K. *J. Chem. Eng. Data* **1997**, 42, 187-189.
- (113) Saluja, P. P. S.; LeBlanc, J. C. Apparent Molar Heat Capacities and Volumes of Aqueous Solutions of MgCl_2 , CaCl_2 , and SrCl_2 at Elevated Temperatures. *J. Chem. Eng. Data* **1987**, 32, 72-76.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
0.0500		15	0.0079	1006.1	(45)	0.000110	0.000123	1006.04	0.1042	-0.000013	0.011					999.0996
0.1000		15	0.0156	1013.2	(45)	0.000109	0.000125	1012.94	0.2511	-0.000016	0.063					999.0996
0.5000		15	0.0734	1067.5	(45)	0.000128	0.000135	1066.88	0.6070	-0.000007	0.368					999.0996
1.0000		15	0.1368	1131.9	(45)	0.000143	0.000150	1130.66	1.2696	-0.000007	1.612					999.0996
1.5000		15	0.1921	1192.3	(45)	0.000157	0.000167	1189.52	2.7437	-0.000010	7.528					999.0996
2.0000		15	0.2407	1239.5	(45)	0.000195	0.000187	1242.31	-2.8343	0.000008	8.033					999.0996
2.5000		15	0.2838	1288.4	(45)	0.000209	0.000211	1287.63	0.7424	-0.000002	0.551					999.0996
0.0500		20	0.0079	1005.2	(45)	0.000118	0.000126	1005.12	0.0627	-0.000008	0.004					998.2041
0.1000		20	0.0156	1012.2	(45)	0.000115	0.000127	1012.00	0.1929	-0.000012	0.037					998.2041
0.5000		20	0.0734	1066.2	(45)	0.000132	0.000137	1065.75	0.4327	-0.000005	0.187					998.2041
1.0000		20	0.1368	1130.2	(45)	0.000147	0.000152	1129.26	0.8861	-0.000005	0.785					998.2041
1.5000		20	0.1921	1190.2	(45)	0.000160	0.000169	1187.84	2.3986	-0.000009	5.753					998.2041
2.0000		20	0.2407	1237.3	(45)	0.000198	0.000189	1240.35	-3.0368	0.000008	9.222					998.2041
2.5000		20	0.2838	1286.0	(45)	0.000212	0.000213	1285.36	0.6511	-0.000001	0.424					998.2041
0.02747		24.04	0.0043	1001.10	(113)	0.000121	0.000127	1001.08	0.0241	-0.000006	0.001			19.212		997.2867
0.10044		24.04	0.0157	1011.10	(113)	0.000129	0.000129	1011.10	0.0008	0.000000	0.000			20.37		997.2867
0.20459		24.04	0.0314	1024.89	(113)	0.000143	0.000131	1025.28	-0.3928	0.000012	0.154			22.68		997.2867
0.68309		24.04	0.0977	1087.28	(113)	0.000153	0.000144	1088.33	-1.0426	0.000009	1.087			24.29		997.2867
1.00093		24.04	0.1369	1125.89	(113)	0.000166	0.000154	1128.05	-2.1679	0.000012	4.700			26.37		997.2867
0.00374		25	0.0006	997.6	(87)	0.000122	0.000127	997.56	0.0025	-0.000004	0.000				0.519	997.0449
0.0126		25	0.0020	998.8	(87)	0.000122	0.000127	998.79	0.0094	-0.000005	0.000				1.75	997.0449
0.0219		25	0.0035	1000.1	(87)	0.000123	0.000127	1000.06	0.0149	-0.000004	0.000				3.031	997.0449
0.0325		25	0.0051	1001.5	(87)	0.000126	0.000127	1001.53	0.0091	-0.000002	0.000				4.491	997.0449
0.0500		25	0.0079	1004.0	(45)	0.000121	0.000128	1003.93	0.0557	-0.000007	0.003					997.0449
0.0652		25	0.0102	1006.0	(87)	0.000127	0.000128	1006.03	0.0093	-0.000001	0.000				8.992	997.0449
	0.0989	25	0.0155	1010.8	(96)	0.000125	0.000129	1010.71	0.0636	-0.000004	0.004					997.0449
0.1000		25	0.0156	1011.0	(45)	0.000118	0.000129	1010.79	0.1799	-0.000011	0.032					997.0449
0.1292		25	0.0201	1014.8	(87)	0.000131	0.000130	1014.78	-0.0224	0.000001	0.001				17.715	997.0449
0.1975		25	0.0304	1024.0	(87)	0.000134	0.000131	1024.06	-0.0807	0.000003	0.007				26.937	997.0449
0.2002		25	0.0308	1024.3	(73)	0.000134	0.000131	1024.42	-0.0808	0.000003	0.007				27.293	997.0449
0.2513		25	0.0383	1031.2	(87)	0.000136	0.000133	1031.32	-0.1362	0.000003	0.019				34.142	997.0449
	0.2678	25	0.0411	1033.8	(96)	0.000136	0.000133	1033.86	-0.0995	0.000002	0.010					997.0449
0.2998		25	0.0454	1037.6	(73)	0.000138	0.000134	1037.84	-0.2033	0.000004	0.041				40.593	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm ³ /mol	Delta density / kg/m ³	Density of water / kg/m ³
0.3286		25	0.0495	1041.5	(87)	0.000139	0.000135	1041.68	-0.2209	0.000004	0.049				44.417	997.0449
0.4002		25	0.0597	1050.9	(73)	0.000142	0.000137	1051.21	-0.3450	0.000005	0.119				53.819	997.0449
	0.4536	25	0.0679	1058.8	(96)	0.000142	0.000138	1059.05	-0.2586	0.000003	0.067					997.0449
0.4996		25	0.0734	1063.8	(73)	0.000146	0.000139	1064.29	-0.5101	0.000006	0.260				66.731	997.0449
0.5000		25	0.0734	1064.7	(45)	0.000136	0.000139	1064.34	0.3264	-0.000004	0.107					997.0449
	0.5625	25	0.0832	1072.2	(40)	0.000158	0.000141	1073.75	-1.5483	0.000016	2.397					997.0449
0.6000		25	0.0868	1076.7	(73)	0.000149	0.000142	1077.34	-0.6426	0.000006	0.413				79.651	997.0449
0.6990		25	0.0998	1089.3	(73)	0.000151	0.000145	1090.05	-0.7480	0.000006	0.559				92.261	997.0449
	0.7633	25	0.1100	1099.6	(96)	0.000153	0.000147	1100.32	-0.6753	0.000005	0.456					997.0449
0.8000		25	0.1125	1102.0	(73)	0.000154	0.000148	1102.84	-0.8199	0.000006	0.672				104.972	997.0449
0.8996		25	0.1248	1114.4	(73)	0.000157	0.000151	1115.27	-0.8478	0.000005	0.719				117.377	997.0449
0.9962		25	0.1364	1126.4	(73)	0.000158	0.000154	1127.14	-0.7249	0.000004	0.525				129.373	997.0449
1.0000		25	0.1368	1128.4	(45)	0.000150	0.000154	1127.60	0.7563	-0.000004	0.572					997.0449
	1.0254	25	0.1434	1133.9	(96)	0.000159	0.000156	1134.36	-0.4900	0.000003	0.240					997.0449
	1.125	25	0.1557	1145.6	(40)	0.000167	0.000160	1147.22	-1.6158	0.000008	2.611					997.0449
	1.2109	25	0.1658	1157.8	(96)	0.000163	0.000163	1157.87	-0.0312	0.000000	0.001					997.0449
1.5000		25	0.1921	1188.2	(45)	0.000163	0.000171	1185.92	2.2323	-0.000008	4.983					997.0449
	1.4484	25	0.1932	1188.4	(96)	0.000167	0.000172	1187.10	1.2679	-0.000005	1.607					997.0449
	1.6458	25	0.2150	1213.4	(96)	0.000171	0.000180	1210.57	2.7849	-0.000009	7.755					997.0449
	1.6875	25	0.2197	1217.6	(40)	0.000176	0.000182	1215.60	1.9977	-0.000006	3.991					997.0449
2.0000		25	0.2407	1235.1	(45)	0.000200	0.000192	1238.16	-3.0388	0.000008	9.234					997.0449
2.5000		25	0.2838	1283.5	(45)	0.000214	0.000216	1282.91	0.5962	-0.000001	0.355					997.0449
0.0500		30	0.0079	1002.6	(45)	0.000124	0.000130	1002.51	0.0476	-0.000006	0.002					995.6473
0.1000		30	0.0156	1009.5	(45)	0.000121	0.000131	1009.34	0.1661	-0.000010	0.028					995.6473
0.5000		30	0.0734	1063.0	(45)	0.000138	0.000141	1062.70	0.2800	-0.000003	0.078					995.6473
1.0000		30	0.1368	1126.4	(45)	0.000152	0.000156	1125.71	0.6786	-0.000004	0.460					995.6473
1.5000		30	0.1921	1186.0	(45)	0.000165	0.000173	1183.78	2.1991	-0.000008	4.836					995.6473
2.0000		30	0.2407	1232.7	(45)	0.000202	0.000194	1235.79	-3.0806	0.000008	9.490					995.6473
2.5000		30	0.2838	1281.0	(45)	0.000216	0.000218	1280.34	0.6323	-0.000001	0.400					995.6473
0.0500		35	0.0079	1000.9	(45)	0.000124	0.000132	1000.87	0.0575	-0.000007	0.003					994.0319
0.1000		35	0.0156	1007.9	(45)	0.000121	0.000133	1007.68	0.1906	-0.000012	0.036					994.0319
0.5000		35	0.0734	1061.1	(45)	0.000140	0.000143	1060.84	0.2899	-0.000004	0.084					994.0319
1.0000		35	0.1368	1124.3	(45)	0.000154	0.000158	1123.61	0.7163	-0.000004	0.513					994.0319
1.5000		35	0.1921	1183.8	(45)	0.000167	0.000175	1181.46	2.3084	-0.000009	5.329					994.0319
2.0000		35	0.2407	1230.3	(45)	0.000203	0.000195	1233.28	-2.9471	0.000008	8.685					994.0319
2.5000		35	0.2838	1278.4	(45)	0.000218	0.000219	1277.67	0.7291	-0.000002	0.532					994.0319
0.0500		45	0.0079	997.1	(45)	0.000127	0.000135	997.01	0.0650	-0.000008	0.004					990.2132
0.1000		45	0.0156	1004.0	(45)	0.000124	0.000136	1003.76	0.1966	-0.000013	0.039					990.2132
0.5000		45	0.0734	1056.9	(45)	0.000142	0.000147	1056.55	0.3833	-0.000005	0.147					990.2132
1.0000		45	0.1368	1119.8	(45)	0.000156	0.000161	1118.89	0.8998	-0.000005	0.810					990.2132
1.5000		45	0.1921	1178.9	(45)	0.000169	0.000178	1176.38	2.4915	-0.000009	6.207					990.2132
2.0000		45	0.2407	1225.2	(45)	0.000205	0.000198	1227.94	-2.7559	0.000008	7.595					990.2132
2.5000		45	0.2838	1273.0	(45)	0.000219	0.000221	1272.21	0.7807	-0.000002	0.609					990.2132
0.02747		48.75	0.0043	992.34	(113)	0.000130	0.000136	992.32	0.0225	-0.000005	0.001			20.66		988.5963
0.10044		48.75	0.0157	1002.17	(113)	0.000138	0.000137	1002.17	-0.0037	0.000000	0.000			21.81		988.5963
0.20459		48.75	0.0314	1015.67	(113)	0.000153	0.000140	1016.10	-0.4302	0.000013	0.185			24.28		988.5963
0.68309		48.75	0.0977	1076.90	(113)	0.000163	0.000153	1078.04	-1.1409	0.000010	1.302			25.78		988.5963

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Apparent molal volume / cm³/mol	Delta density / kg/m³	Density of water / kg/m³
1.00093		48.75	0.1369	1114.79	(113)	0.000175	0.000162	1117.07	-2.2850	0.000013	5.221			27.8		988.5963
0.0500		55	0.0079	992.5	(45)	0.000125	0.000138	992.44	0.1000	-0.000013	0.010					985.6952
0.1000		55	0.0156	999.4	(45)	0.000123	0.000139	999.15	0.2481	-0.000016	0.062					985.6952
0.5000		55	0.0734	1052.2	(45)	0.000142	0.000149	1051.59	0.5805	-0.000007	0.337					985.6952
1.0000		55	0.1368	1114.8	(45)	0.000156	0.000163	1113.58	1.2162	-0.000007	1.479					985.6952
1.5000		55	0.1921	1173.7	(45)	0.000169	0.000179	1170.85	2.8603	-0.000011	8.181					985.6952
2.0000		55	0.2407	1219.8	(45)	0.000206	0.000199	1222.35	-2.5546	0.000007	6.526					985.6952
2.5000		55	0.2838	1267.4	(45)	0.000220	0.000221	1266.80	0.6346	-0.000001	0.403					985.6952
0.02747		73.77	0.0043	979.31	(113)	0.000126	0.000140	979.25	0.0593	-0.000014	0.004			19.9		975.5797
0.10044		73.77	0.0157	989.07	(113)	0.000133	0.000141	988.94	0.1319	-0.000009	0.017			21.04		975.5797
0.20459		73.77	0.0314	1002.51	(113)	0.000148	0.000144	1002.66	-0.1537	0.000005	0.024			23.53		975.5797
0.68309		73.77	0.0977	1063.31	(113)	0.000159	0.000155	1063.84	-0.5233	0.000005	0.274			25.27		975.5797
1.00093		73.77	0.1369	1100.91	(113)	0.000173	0.000163	1102.57	-1.6609	0.000010	2.759			27.41		975.5797
0.0998		98.81	0.0156	972.37	(113)	0.000137	0.000137	972.37	-0.0029	0.000000	0.000			21.76		959.2159
0.2058		98.81	0.0316	986.19	(113)	0.000140	0.000139	986.23	-0.0426	0.000001	0.002			22.2		959.2159
0.5013		98.81	0.0736	1024.24	(113)	0.000144	0.000143	1024.25	-0.0149	0.000000	0.000			22.75		959.2159
1.0454		98.81	0.1422	1091.08	(113)	0.000156	0.000153	1091.63	-0.5463	0.000003	0.298			24.76		959.2159
1.9989		98.81	0.2406	1200.20	(113)	0.000173	0.000174	1199.63	0.5657	-0.000002	0.320			27.36		959.2159
Average Res									-0.0056	-0.000001	151.631	Sum Chi sqr				
Std dev Res									1.2503	0.000007						
Avg - 4std									-5.0067	-0.000031						
Avg + 4std									4.9954	0.000028						

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \cdot ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot ^\circ\text{C} + c_4)^2)}$

c0	1.35E-06
c1	-7.49E-07
c2	-1.935633
c3	0.010704
c4	-4882.145
Min T	15
Max T	98.81
Min w	0.000593
Max w	0.283822
Avg dens res	-0.005642
Std dens res	1.250269
Avg app vol res *10 ³	-0.001313
Std app vol res *10 ³	0.007377
No of points in corr	98
No of inconsistent points	6

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

2.25	25	0.2769	1287.9	(40)	0.000185	0.000211	1276.00	11.8974	-0.000026	141.549	!					997.0449
1.8667	25	0.2384	1241.2	(96)	0.000175	0.000190	1235.68	5.5386	-0.000015	30.676	!					997.0449
2.1147	25	0.2634	1272.5	(96)	0.000179	0.000203	1262.13	10.3573	-0.000024	107.273	!					997.0449
2.4265	25	0.2934	1311.1	(96)	0.000184	0.000222	1292.29	18.7783	-0.000038	352.626	!		!			997.0449
2.9214	25	0.3375	1372.3	(96)	0.000190	0.000259	1330.15	42.1108	-0.000068	1773.321	!		!			997.0449
3.2561	25	0.3652	1413.3	(96)	0.000194	0.000291	1346.21	67.1037	-0.000097	4502.903	!		!			997.0449

Density of aqueous solutions of **ZnCl2**

- References (37) Herrington, Thelma M.; Roffey, Michael G.; Smith, David P.; Densities of Aqueous Electrolytes MnCl₂, CoCl₂, NiCl₂, ZnCl₂ and CdCl₂ from 25 to 72°C at 1 atm, *J. Chem. Eng. Data*, **1986**, 31, 221-225
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.
- (100) Pogue, R. F.; Atkinson, G. Solution Thermodynamics of First-Row Transition Elements. 3. Apparent Molal Volumes of Aqueous ZnCl₂ and Zn(ClO₄)₂ from 15 to 55°C and an Examination of Solute-Solute and Solute-Solvent Interactions. *J. Sol. Chem.* **1989**, 18, 249-264.
- (104) Rard, J. A.; Miller, D. G. Densities and Apparent Molal Volumes of Aqueous Manganese, Cadmium, and Zinc Chlorides at 25 °C. *J. Chem. Eng. Data* **1984**, 29, 151-156.
- (132) Weingärtner, H.; Müller, K. J.; Hertz, H. G.; Edge, A. V. J.; Mills, R. Unusual Behavior of Transport Coefficients in Aqueous Solutions of Zinc Chloride. *J. Phys. Chem.* **1984**, 88, 2173-2178.

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m ³	Density of water / kg/m ³
		0	0.0200	1019.20	(90)	0.000050	0.000013	1020.0	-0.7718	0.000037	0.596				999.8395
		0	0.0400	1038.40	(90)	0.000072	0.000049	1039.4	-0.9594	0.000022	0.920				999.8395
		0	0.0800	1076.90	(90)	0.000106	0.000104	1077.1	-0.1754	0.000002	0.031				999.8395
		0	0.1200	1115.90	(90)	0.000133	0.000142	1114.6	1.3279	-0.000009	1.763				999.8395
		0	0.1600	1155.80	(90)	0.000157	0.000171	1152.7	3.0564	-0.000014	9.342				999.8395
0.01012		15	0.0014	1000.37	(100)	0.000078	0.000011	1000.5	-0.0924	0.000067	0.009		!	1.27	999.0996
0.02017		15	0.0027	1001.64	(100)	0.000075	0.000014	1001.8	-0.1671	0.000061	0.028		!	2.54	999.0996
0.02986		15	0.0041	1002.84	(100)	0.000080	0.000017	1003.1	-0.2559	0.000063	0.065		!	3.74	999.0996
0.07469		15	0.0101	1008.38	(100)	0.000087	0.000030	1009.0	-0.5856	0.000057	0.343			9.28	999.0996
0.09463		15	0.0127	1010.83	(100)	0.000089	0.000035	1011.5	-0.7001	0.000054	0.490			11.73	999.0996
0.2009		15	0.0267	1023.82	(100)	0.000094	0.000060	1024.8	-0.9563	0.000034	0.915			24.72	999.0996
0.2322		15	0.0307	1027.56	(100)	0.000097	0.000067	1028.6	-0.9971	0.000031	0.994			28.46	999.0996
0.5014		15	0.0640	1058.94	(100)	0.000117	0.000111	1059.3	-0.3829	0.000005	0.147			59.84	999.0996
0.7432		15	0.0920	1085.46	(100)	0.000135	0.000140	1085.0	0.5068	-0.000005	0.257			86.36	999.0996
0.9842		15	0.1183	1110.03	(100)	0.000155	0.000161	1109.2	0.8757	-0.000006	0.767			110.93	999.0996
1.9458		15	0.2096	1198.44	(100)	0.000207	0.000212	1196.9	1.5287	-0.000005	2.337			199.34	999.0996
2.814		15	0.2772	1270.09	(100)	0.000231	0.000235	1267.9	2.1872	-0.000005	4.784			270.99	999.0996
		20	0.0200	1016.70	(90)	0.000091	0.000060	1017.3	-0.6307	0.000030	0.398				998.2041
		20	0.0400	1035.00	(90)	0.000111	0.000091	1035.9	-0.8860	0.000021	0.785				998.2041
		20	0.0800	1071.50	(90)	0.000145	0.000137	1072.3	-0.7949	0.000009	0.632				998.2041
		20	0.1200	1108.50	(90)	0.000171	0.000169	1108.8	-0.3004	0.000002	0.090				998.2041
		20	0.1600	1146.80	(90)	0.000191	0.000193	1146.2	0.6154	-0.000003	0.379				998.2041
		20	0.2000	1186.60	(90)	0.000207	0.000212	1185.0	1.6237	-0.000006	2.636				998.2041
		20	0.3000	1292.80	(90)	0.000241	0.000245	1290.7	2.0788	-0.000004	4.321				998.2041
		20	0.4000	1417.30	(90)	0.000261	0.000266	1413.5	3.7983	-0.000005	14.427		!		998.2041
		20	0.7000	1962.00	(90)	0.000299	0.000299	1960.1	1.8545	-0.000001	3.439				998.2041
0.01012		25	0.0014	998.30	(100)	0.000084	0.000038	998.4	-0.0638	0.000046	0.004			1.26	997.0449
0.02018		25	0.0027	999.56	(100)	0.000081	0.000040	999.7	-0.1120	0.000041	0.013			2.52	997.0449
0.02986		25	0.0041	1000.76	(100)	0.000083	0.000043	1000.9	-0.1638	0.000040	0.027			3.72	997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
0.04001		25	0.0054	1002.00	(104)	0.000088	0.000046	1002.2	-0.2339	0.000043	0.055				997.0449
0.04595		25	0.0062	1002.74	(100)	0.000087	0.000047	1003.0	-0.2495	0.000040	0.062			5.7	997.0449
0.07469		25	0.0101	1006.27	(100)	0.000090	0.000054	1006.6	-0.3652	0.000036	0.133			9.23	997.0449
0.089958		25	0.0121	1008.14	(104)	0.000092	0.000058	1008.6	-0.4148	0.000034	0.172				997.0449
0.09463		25	0.0127	1008.70	(100)	0.000093	0.000059	1009.1	-0.4329	0.000033	0.187			11.66	997.0449
0.09964		25	0.0134	1009.30	(132)	0.000094	0.000060	1009.8	-0.4615	0.000034	0.213				997.0449
0.15994		25	0.0213	1016.61	(104)	0.000098	0.000074	1017.2	-0.5426	0.000025	0.294				997.0449
0.1968		25	0.0261	1021.00	(132)	0.000102	0.000081	1021.6	-0.5732	0.000021	0.329				997.0449
0.2009		25	0.0267	1021.46	(100)	0.000103	0.000082	1022.1	-0.5958	0.000021	0.355			24.42	997.0449
0.2322		25	0.0307	1025.14	(100)	0.000107	0.000088	1025.8	-0.6106	0.000019	0.373			28.1	997.0449
0.2348		25	0.0310	1025.39	(37)	0.000109	0.000088	1026.1	-0.6703	0.000021	0.449				997.0449
0.23987		25	0.0317	1026.07	(104)	0.000107	0.000089	1026.7	-0.5839	0.000018	0.341				997.0449
0.28986		25	0.0380	1031.91	(104)	0.000111	0.000098	1032.4	-0.5358	0.000013	0.287				997.0449
0.29985		25	0.0393	1033.03	(104)	0.000113	0.000100	1033.6	-0.5605	0.000013	0.314				997.0449
0.29985		25	0.0393	1033.07	(104)	0.000112	0.000100	1033.6	-0.5205	0.000012	0.271				997.0449
0.3279		25	0.0428	1036.30	(104)	0.000115	0.000104	1036.8	-0.4835	0.000011	0.234				997.0449
0.33191		25	0.0433	1036.79	(104)	0.000115	0.000105	1037.2	-0.4474	0.000010	0.200				997.0449
0.33194		25	0.0433	1036.78	(104)	0.000115	0.000105	1037.2	-0.4608	0.000010	0.212				997.0449
0.37981		25	0.0492	1042.11	(104)	0.000122	0.000112	1042.6	-0.5035	0.000009	0.254				997.0449
0.398		25	0.0515	1044.24	(132)	0.000122	0.000115	1044.6	-0.3936	0.000007	0.155				997.0449
0.41978		25	0.0541	1046.68	(104)	0.000124	0.000118	1047.0	-0.3575	0.000006	0.128				997.0449
0.4654		25	0.0597	1051.55	(37)	0.000131	0.000124	1052.0	-0.4724	0.000007	0.223				997.0449
0.47991		25	0.0614	1053.30	(104)	0.000130	0.000126	1053.6	-0.2943	0.000004	0.087				997.0449
0.5014		25	0.0640	1055.99	(100)	0.000128	0.000129	1055.9	0.0841	-0.000001	0.007			58.95	997.0449
0.51976		25	0.0662	1057.67	(104)	0.000134	0.000131	1057.9	-0.2092	0.000003	0.044				997.0449
0.592		25	0.0747	1065.36	(132)	0.000142	0.000140	1065.5	-0.1734	0.000002	0.030				997.0449
0.6969		25	0.0867	1076.35	(37)	0.000151	0.000150	1076.4	-0.0622	0.000001	0.004				997.0449
0.7439		25	0.0921	1081.58	(100)	0.000151	0.000155	1081.2	0.3810	-0.000004	0.145			84.54	997.0449
0.74978		25	0.0927	1081.74	(104)	0.000156	0.000155	1081.8	-0.0600	0.000001	0.004				997.0449
0.787		25	0.0969	1085.51	(132)	0.000159	0.000159	1085.6	-0.0465	0.000000	0.002				997.0449
0.92673		25	0.1121	1099.42	(104)	0.000170	0.000170	1099.4	0.0046	0.000000	0.000				997.0449
0.9333		25	0.1129	1100.33	(37)	0.000169	0.000171	1100.1	0.2718	-0.000002	0.074				997.0449
0.94975		25	0.1146	1101.61	(104)	0.000172	0.000172	1101.7	-0.0542	0.000000	0.003				997.0449
0.97261		25	0.1170	1103.89	(104)	0.000174	0.000174	1103.9	0.0018	0.000000	0.000				997.0449
0.9842		25	0.1183	1105.55	(100)	0.000171	0.000174	1105.0	0.5425	-0.000004	0.294			108.51	997.0449
0.99563		25	0.1195	1106.11	(104)	0.000175	0.000175	1106.1	-0.0088	0.000000	0.000				997.0449
1.1759		25	0.1381	1123.71	(37)	0.000185	0.000187	1123.3	0.4154	-0.000002	0.173				997.0449
1.2275		25	0.1433	1128.06	(104)	0.000190	0.000190	1128.1	-0.0618	0.000000	0.004				997.0449
1.2324		25	0.1438	1128.52	(132)	0.000190	0.000190	1128.6	-0.0582	0.000000	0.003				997.0449
1.2711		25	0.1477	1132.12	(104)	0.000193	0.000192	1132.2	-0.0517	0.000000	0.003				997.0449
1.4209		25	0.1622	1146.27	(37)	0.000198	0.000200	1145.9	0.3745	-0.000002	0.140				997.0449

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
1.4733		25	0.1672	1150.45	(104)	0.000203	0.000202	1150.6	-0.1798	0.000001	0.032				997.0449
1.5253		25	0.1721	1155.13	(104)	0.000205	0.000205	1155.3	-0.1656	0.000001	0.027				997.0449
1.6722		25	0.1856	1168.51	(37)	0.000210	0.000211	1168.3	0.1995	-0.000001	0.040				997.0449
1.7505		25	0.1926	1174.96	(104)	0.000215	0.000214	1175.2	-0.1918	0.000001	0.037				997.0449
1.9309		25	0.2083	1190.43	(104)	0.000221	0.000220	1190.7	-0.2462	0.000001	0.061				997.0449
1.9317		25	0.2084	1190.75	(37)	0.000220	0.000220	1190.7	0.0057	0.000000	0.000				997.0449
1.9458		25	0.2096	1192.46	(100)	0.000219	0.000221	1191.9	0.5208	-0.000002	0.271			195.42	997.0449
1.965		25	0.2113	1193.26	(132)	0.000222	0.000221	1193.6	-0.3149	0.000001	0.099				997.0449
1.9693		25	0.2116	1193.64	(104)	0.000222	0.000221	1193.9	-0.2996	0.000001	0.090				997.0449
1.9893		25	0.2133	1195.34	(104)	0.000223	0.000222	1195.6	-0.2938	0.000001	0.086				997.0449
2.0298		25	0.2167	1198.77	(104)	0.000224	0.000223	1199.1	-0.2831	0.000001	0.080				997.0449
2.2667		25	0.2360	1218.77	(37)	0.000230	0.000230	1218.8	0.0127	0.000000	0.000				997.0449
2.4457		25	0.2500	1233.57	(37)	0.000234	0.000234	1233.3	0.2433	-0.000001	0.059				997.0449
2.4998		25	0.2541	1237.29	(104)	0.000237	0.000236	1237.7	-0.3886	0.000001	0.151				997.0449
2.6199		25	0.2631	1247.97	(37)	0.000237	0.000238	1247.3	0.7128	-0.000002	0.508				997.0449
2.814		25	0.2772	1263.29	(100)	0.000240	0.000242	1262.5	0.7900	-0.000002	0.624			266.25	997.0449
2.956		25	0.2872	1273.06	(132)	0.000246	0.000245	1273.5	-0.4244	0.000001	0.180				997.0449
2.9664		25	0.2879	1273.83	(104)	0.000246	0.000245	1274.3	-0.4529	0.000001	0.205				997.0449
2.9867		25	0.2893	1278.58	(37)	0.000240	0.000245	1275.8	2.7408	-0.000006	7.512				997.0449
3.0332		25	0.2925	1278.90	(104)	0.000247	0.000246	1279.4	-0.4934	0.000001	0.243				997.0449
3.4979		25	0.3228	1313.66	(104)	0.000254	0.000253	1314.1	-0.4493	0.000001	0.202				997.0449
3.93		25	0.3488	1344.67	(132)	0.000260	0.000259	1345.2	-0.4884	0.000001	0.239				997.0449
3.9653		25	0.3508	1347.12	(104)	0.000260	0.000259	1347.6	-0.5254	0.000001	0.276				997.0449
4.0332		25	0.3547	1351.91	(104)	0.000261	0.000260	1352.4	-0.4988	0.000001	0.249				997.0449
4.4945		25	0.3799	1383.49	(104)	0.000265	0.000265	1384.1	-0.5903	0.000001	0.348				997.0449
4.911		25	0.4010	1411.05	(132)	0.000269	0.000268	1411.7	-0.6409	0.000001	0.411				997.0449
5.0018		25	0.4054	1416.90	(104)	0.000270	0.000269	1417.6	-0.6918	0.000001	0.479				997.0449
5.4975		25	0.4283	1448.26	(104)	0.000273	0.000273	1449.1	-0.8327	0.000001	0.693				997.0449
5.902		25	0.4458	1472.94	(132)	0.000276	0.000275	1473.9	-1.0017	0.000001	1.003				997.0449
6.001		25	0.4499	1478.89	(104)	0.000277	0.000276	1479.9	-1.0211	0.000001	1.043				997.0449
6.5043		25	0.4699	1508.36	(104)	0.000279	0.000278	1509.6	-1.2426	0.000001	1.544				997.0449
6.9026		25	0.4848	1530.87	(104)	0.000281	0.000280	1532.4	-1.4829	0.000001	2.199				997.0449
7.106		25	0.4920	1542.15	(132)	0.000282	0.000281	1543.7	-1.5769	0.000001	2.487				997.0449
7.3213		25	0.4995	1553.83	(104)	0.000283	0.000282	1555.6	-1.7621	0.000001	3.105				997.0449
7.933		25	0.5195	1585.57	(132)	0.000286	0.000284	1588.4	-2.7913	0.000002	7.791				997.0449
0.01012		35	0.0014	995.28	(100)	0.000089	0.000063	995.3	-0.0351	0.000026	0.001			1.25	994.0319
0.02018		35	0.0027	996.52	(100)	0.000090	0.000066	996.6	-0.0656	0.000024	0.004			2.49	994.0319
0.02986		35	0.0041	997.71	(100)	0.000091	0.000068	997.8	-0.0916	0.000023	0.008			3.68	994.0319
0.04595		35	0.0062	999.68	(100)	0.000092	0.000072	999.8	-0.1293	0.000021	0.017			5.65	994.0319
0.07469		35	0.0101	1003.18	(100)	0.000096	0.000078	1003.4	-0.1748	0.000017	0.031			9.15	994.0319
0.09462		35	0.0127	1005.60	(100)	0.000097	0.000083	1005.8	-0.1846	0.000014	0.034			11.57	994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
0.2009		35	0.0267	1018.19	(100)	0.000110	0.000103	1018.4	-0.1955	0.000007	0.038			24.16	994.0319
0.2322		35	0.0307	1021.81	(100)	0.000114	0.000109	1022.0	-0.1842	0.000006	0.034			27.78	994.0319
0.2348		35	0.0310	1021.87	(37)	0.000122	0.000109	1022.3	-0.4240	0.000013	0.180				994.0319
0.4654		35	0.0597	1047.52	(37)	0.000145	0.000142	1047.7	-0.2030	0.000003	0.041				994.0319
0.5014		35	0.0640	1051.92	(100)	0.000141	0.000146	1051.5	0.3811	-0.000005	0.145			57.89	994.0319
0.6969		35	0.0867	1071.82	(37)	0.000164	0.000166	1071.7	0.1159	-0.000001	0.013				994.0319
0.7439		35	0.0921	1076.84	(100)	0.000166	0.000170	1076.4	0.4177	-0.000004	0.174			82.81	994.0319
0.9333		35	0.1129	1095.31	(37)	0.000182	0.000184	1095.0	0.2905	-0.000002	0.084				994.0319
0.9842		35	0.1183	1100.26	(100)	0.000185	0.000187	1099.9	0.3506	-0.000002	0.123			106.23	994.0319
1.1759		35	0.1381	1118.24	(37)	0.000197	0.000199	1118.0	0.2597	-0.000002	0.067				994.0319
1.4209		35	0.1622	1140.36	(37)	0.000210	0.000210	1140.4	0.0098	0.000000	0.000				994.0319
1.6722		35	0.1856	1162.25	(37)	0.000222	0.000220	1162.6	-0.3154	0.000001	0.100				994.0319
1.9317		35	0.2084	1184.19	(37)	0.000231	0.000229	1184.8	-0.6335	0.000002	0.401				994.0319
1.9458		35	0.2096	1185.86	(100)	0.000230	0.000229	1186.0	-0.1527	0.000001	0.023			191.83	994.0319
2.2667		35	0.2360	1211.95	(37)	0.000240	0.000238	1212.6	-0.6951	0.000002	0.483				994.0319
2.4457		35	0.2500	1226.69	(37)	0.000243	0.000242	1227.1	-0.4354	0.000001	0.190				994.0319
2.6199		35	0.2631	1241.07	(37)	0.000245	0.000245	1241.0	0.0933	0.000000	0.009				994.0319
2.814		35	0.2772	1255.89	(100)	0.000249	0.000249	1256.1	-0.2518	0.000001	0.063			261.86	994.0319
2.9867		35	0.2893	1271.84	(37)	0.000246	0.000252	1269.4	2.4277	-0.000005	5.894				994.0319
		40	0.0200	1009.99	(90)	0.000121	0.000105	1010.3	-0.3313	0.000016	0.110				992.2158
		40	0.0400	1027.40	(90)	0.000145	0.000130	1028.0	-0.6312	0.000015	0.398				992.2158
		40	0.0800	1062.40	(90)	0.000176	0.000168	1063.1	-0.7096	0.000008	0.504				992.2158
		40	0.1200	1098.00	(90)	0.000199	0.000195	1098.6	-0.6021	0.000004	0.362				992.2158
		40	0.1600	1135.00	(90)	0.000215	0.000215	1135.2	-0.1784	0.000001	0.032				992.2158
		40	0.2000	1173.60	(90)	0.000229	0.000230	1173.3	0.2950	-0.000001	0.087				992.2158
		40	0.3000	1277.80	(90)	0.000257	0.000257	1277.8	-0.0024	0.000000	0.000				992.2158
		40	0.4000	1400.30	(90)	0.000274	0.000274	1399.8	0.5411	-0.000001	0.293				992.2158
		40	0.5000	1549.50	(90)	0.000283	0.000286	1545.5	4.0161	-0.000003	16.129	!			992.2158
0.01012		45	0.0014	991.46	(100)	0.000086	0.000088	991.5	0.0032	-0.000002	0.000			1.25	990.2132
0.02018		45	0.0027	992.70	(100)	0.000086	0.000090	992.7	0.0101	-0.000004	0.000			2.49	990.2132
0.02986		45	0.0041	993.88	(100)	0.000090	0.000092	993.9	0.0095	-0.000002	0.000			3.67	990.2132
0.04595		45	0.0062	995.84	(100)	0.000093	0.000096	995.8	0.0194	-0.000003	0.000			5.63	990.2132
0.07469		45	0.0101	999.30	(100)	0.000098	0.000102	999.3	0.0329	-0.000003	0.001			9.09	990.2132
0.09463		45	0.0127	1001.67	(100)	0.000103	0.000106	1001.6	0.0380	-0.000003	0.001			11.46	990.2132
0.2009		45	0.0267	1014.06	(100)	0.000119	0.000124	1013.9	0.1485	-0.000005	0.022			23.85	990.2132
0.2322		45	0.0307	1017.53	(100)	0.000126	0.000129	1017.4	0.0949	-0.000003	0.009			27.32	990.2132
0.2348		45	0.0310	1017.52	(37)	0.000136	0.000129	1017.7	-0.2093	0.000007	0.044				990.2132
0.4654		45	0.0597	1042.68	(37)	0.000158	0.000159	1042.6	0.0499	-0.000001	0.002				990.2132
0.5014		45	0.0640	1046.78	(100)	0.000157	0.000163	1046.4	0.4051	-0.000006	0.164			56.57	990.2132
0.6969		45	0.0867	1066.52	(37)	0.000177	0.000180	1066.2	0.3138	-0.000003	0.098				990.2132
0.7439		45	0.0921	1071.08	(100)	0.000182	0.000184	1070.9	0.2281	-0.000002	0.052			80.87	990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
0.9333		45	0.1129	1089.59	(37)	0.000194	0.000197	1089.2	0.3964	-0.000003	0.157				990.2132
0.9842		45	0.1183	1093.93	(100)	0.000200	0.000200	1094.0	-0.0900	0.000001	0.008			103.72	990.2132
1.1759		45	0.1381	1112.11	(37)	0.000209	0.000210	1111.9	0.2295	-0.000001	0.053				990.2132
1.4209		45	0.1622	1133.89	(37)	0.000221	0.000221	1134.0	-0.1310	0.000001	0.017				990.2132
1.6722		45	0.1856	1155.45	(37)	0.000232	0.000229	1156.0	-0.5876	0.000002	0.345				990.2132
1.9317		45	0.2084	1177.12	(37)	0.000240	0.000237	1178.1	-1.0010	0.000003	1.002				990.2132
1.9458		45	0.2096	1178.07	(100)	0.000242	0.000237	1179.3	-1.2300	0.000004	1.513			187.86	990.2132
2.2667		45	0.2360	1204.61	(37)	0.000248	0.000245	1205.8	-1.1424	0.000003	1.305				990.2132
2.4457		45	0.2500	1219.25	(37)	0.000251	0.000249	1220.1	-0.8943	0.000002	0.800				990.2132
2.6199		45	0.2631	1233.56	(37)	0.000253	0.000252	1233.9	-0.3571	0.000001	0.128				990.2132
2.814		45	0.2772	1247.13	(100)	0.000259	0.000255	1249.0	-1.8711	0.000004	3.501			256.92	990.2132
2.9867		45	0.2893	1264.27	(37)	0.000253	0.000258	1262.2	2.0620	-0.000004	4.252				990.2132
0.01012		55	0.0014	986.94	(100)	0.000089	0.000112	986.9	0.0308	-0.000023	0.001			1.24	985.6952
0.02018		55	0.0027	988.17	(100)	0.000090	0.000114	988.1	0.0645	-0.000024	0.004			2.47	985.6952
0.02986		55	0.0041	989.34	(100)	0.000094	0.000116	989.2	0.0887	-0.000022	0.008			3.64	985.6952
0.04595		55	0.0062	991.28	(100)	0.000097	0.000119	991.1	0.1353	-0.000022	0.018			5.58	985.6952
0.07469		55	0.0101	994.69	(100)	0.000105	0.000124	994.5	0.1963	-0.000020	0.039			8.99	985.6952
0.09463		55	0.0127	997.06	(100)	0.000107	0.000128	996.8	0.2664	-0.000021	0.071			11.36	985.6952
0.2009		55	0.0267	1009.25	(100)	0.000126	0.000144	1008.8	0.4917	-0.000018	0.242			23.55	985.6952
0.2322		55	0.0307	1012.67	(100)	0.000134	0.000149	1012.2	0.4719	-0.000015	0.223			26.97	985.6952
0.2348		55	0.0310	1012.49	(37)	0.000149	0.000149	1012.5	0.0125	0.000000	0.000				985.6952
0.4654		55	0.0597	1037.17	(37)	0.000170	0.000175	1036.9	0.3112	-0.000005	0.097				985.6952
0.5014		55	0.0640	1041.82	(100)	0.000160	0.000179	1040.5	1.2773	-0.000018	1.631			56.12	985.6952
0.6969		55	0.0867	1060.59	(37)	0.000189	0.000194	1060.0	0.5541	-0.000006	0.307				985.6952
0.7439		55	0.0921	1065.01	(100)	0.000194	0.000198	1064.6	0.3904	-0.000004	0.152			79.31	985.6952
0.9333		55	0.1129	1083.27	(37)	0.000205	0.000209	1082.7	0.5700	-0.000004	0.325				985.6952
0.9842		55	0.1183	1087.44	(100)	0.000212	0.000212	1087.5	-0.0333	0.000000	0.001			101.74	985.6952
1.1759		55	0.1381	1105.45	(37)	0.000219	0.000221	1105.1	0.3332	-0.000002	0.111				985.6952
1.4209		55	0.1622	1126.93	(37)	0.000231	0.000230	1127.0	-0.1006	0.000000	0.010				985.6952
1.6722		55	0.1856	1148.22	(37)	0.000241	0.000238	1148.9	-0.6312	0.000003	0.398				985.6952
1.9317		55	0.2084	1169.66	(37)	0.000249	0.000245	1170.8	-1.1020	0.000004	1.214				985.6952
1.9458		55	0.2096	1170.43	(100)	0.000251	0.000245	1171.9	-1.5104	0.000005	2.281			184.73	985.6952
2.2667		55	0.2360	1196.92	(37)	0.000256	0.000252	1198.2	-1.2856	0.000004	1.653				985.6952
2.4457		55	0.2500	1211.46	(37)	0.000258	0.000255	1212.5	-1.0504	0.000003	1.103				985.6952
2.6199		55	0.2631	1225.69	(37)	0.000260	0.000258	1226.2	-0.5159	0.000001	0.266				985.6952
2.814		55	0.2772	1238.94	(100)	0.000266	0.000261	1241.2	-2.2793	0.000005	5.195			253.24	985.6952
2.9867		55	0.2893	1256.27	(37)	0.000259	0.000263	1254.4	1.9155	-0.000004	3.669				985.6952
		60	0.0200	1000.30	(90)	0.000148	0.000147	1000.3	-0.0093	0.000000	0.000				983.1989
		60	0.0400	1017.20	(90)	0.000167	0.000167	1017.2	0.0048	0.000000	0.000				983.1989
		60	0.0800	1050.80	(90)	0.000199	0.000197	1051.0	-0.1751	0.000002	0.031				983.1989
		60	0.1200	1085.30	(90)	0.000220	0.000218	1085.5	-0.1760	0.000001	0.031				983.1989

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
		60	0.1600	1121.20	(90)	0.000235	0.000234	1121.3	-0.0597	0.000000	0.004				983.1989
		60	0.2000	1159.00	(90)	0.000246	0.000247	1158.7	0.2672	-0.000001	0.071				983.1989
		60	0.3000	1261.40	(90)	0.000269	0.000268	1262.0	-0.6108	0.000001	0.373				983.1989
		60	0.4000	1382.40	(90)	0.000283	0.000282	1383.2	-0.7957	0.000001	0.633				983.1989
		60	0.5000	1530.00	(90)	0.000290	0.000291	1528.6	1.4013	-0.000001	1.964				983.1989
0.2348		65	0.0310	1006.79	(37)	0.000163	0.000168	1006.6	0.1708	-0.000005	0.029				980.5548
0.4654		65	0.0597	1031.03	(37)	0.000183	0.000191	1030.5	0.5381	-0.000008	0.290				980.5548
0.6969		65	0.0867	1054.06	(37)	0.000200	0.000208	1053.3	0.7818	-0.000008	0.611				980.5548
0.9333		65	0.1129	1076.41	(37)	0.000215	0.000221	1075.6	0.7849	-0.000006	0.616				980.5548
1.1759		65	0.1381	1098.31	(37)	0.000228	0.000231	1097.8	0.5334	-0.000003	0.284				980.5548
1.4209		65	0.1622	1119.56	(37)	0.000239	0.000240	1119.5	0.0923	0.000000	0.009				980.5548
1.6722		65	0.1856	1140.65	(37)	0.000249	0.000247	1141.1	-0.4454	0.000002	0.198				980.5548
1.9317		65	0.2084	1161.91	(37)	0.000256	0.000253	1162.8	-0.9264	0.000003	0.858				980.5548
2.2667		65	0.2360	1188.96	(37)	0.000262	0.000259	1190.1	-1.1354	0.000003	1.289				980.5548
2.4457		65	0.2500	1203.39	(37)	0.000264	0.000262	1204.3	-0.9246	0.000003	0.855				980.5548
2.6199		65	0.2631	1217.51	(37)	0.000266	0.000264	1217.9	-0.4241	0.000001	0.180				980.5548
2.9867		65	0.2893	1247.83	(37)	0.000265	0.000269	1245.9	1.8867	-0.000004	3.560				980.5548
0.2348		75	0.0310	1000.34	(37)	0.000183	0.000187	1000.2	0.1260	-0.000004	0.016				974.849
0.4654		75	0.0597	1024.08	(37)	0.000199	0.000207	1023.6	0.4892	-0.000008	0.239				974.849
0.6969		75	0.0867	1046.77	(37)	0.000213	0.000221	1046.0	0.7744	-0.000008	0.600				974.849
0.9333		75	0.1129	1068.89	(37)	0.000226	0.000233	1068.0	0.8575	-0.000007	0.735				974.849
1.1759		75	0.1381	1090.64	(37)	0.000237	0.000242	1089.9	0.7157	-0.000004	0.512				974.849
1.4209		75	0.1622	1111.79	(37)	0.000247	0.000249	1111.4	0.3929	-0.000002	0.154				974.849
1.6722		75	0.1856	1132.79	(37)	0.000255	0.000255	1132.8	-0.0457	0.000000	0.002				974.849
1.9317		75	0.2084	1153.92	(37)	0.000262	0.000260	1154.4	-0.4901	0.000002	0.240				974.849
2.2667		75	0.2360	1180.67	(37)	0.000268	0.000266	1181.5	-0.8179	0.000002	0.669				974.849
2.4457		75	0.2500	1194.84	(37)	0.000270	0.000268	1195.6	-0.7831	0.000002	0.613				974.849
2.6199		75	0.2631	1208.64	(37)	0.000272	0.000270	1209.2	-0.5281	0.000001	0.279				974.849
2.9867		75	0.2893	1237.93	(37)	0.000272	0.000274	1237.0	0.8893	-0.000002	0.791				974.849
		80	0.0200	988.20	(90)	0.000175	0.000187	988.0	0.2404	-0.000012	0.058				971.7978
		80	0.0400	1004.40	(90)	0.000194	0.000202	1004.1	0.3404	-0.000008	0.116				971.7978
		80	0.0800	1036.90	(90)	0.000221	0.000225	1036.6	0.3014	-0.000004	0.091				971.7978
		80	0.1200	1070.40	(90)	0.000239	0.000241	1070.1	0.2515	-0.000002	0.063				971.7978
		80	0.1600	1105.50	(90)	0.000251	0.000253	1105.2	0.3309	-0.000002	0.110				971.7978
		80	0.2000	1142.80	(90)	0.000259	0.000262	1142.0	0.7888	-0.000003	0.622				971.7978
		80	0.3000	1243.80	(90)	0.000279	0.000278	1244.1	-0.3150	0.000001	0.099				971.7978
		80	0.4000	1363.70	(90)	0.000290	0.000289	1364.6	-0.8829	0.000001	0.779				971.7978
		80	0.5000	1509.70	(90)	0.000296	0.000296	1509.8	-0.0613	0.000000	0.004				971.7978
		100	0.0200	973.90	(90)	0.000211	0.000225	973.6	0.2655	-0.000014	0.070				958.3637
		100	0.0400	989.40	(90)	0.000225	0.000235	989.0	0.4047	-0.000010	0.164				958.3637
		100	0.0800	1021.10	(90)	0.000242	0.000251	1020.4	0.7371	-0.000009	0.543				958.3637

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Delta density / kg/m³	Density of water / kg/m³
		100	0.1200	1054.10	(90)	0.000254	0.000262	1053.0	1.0901	-0.000008	1.188				958.3637
		100	0.1600	1088.80	(90)	0.000262	0.000270	1087.3	1.4982	-0.000008	2.245				958.3637
		100	0.2000	1125.50	(90)	0.000269	0.000276	1123.5	1.9612	-0.000008	3.846				958.3637
		100	0.3000	1225.20	(90)	0.000286	0.000287	1224.5	0.6864	-0.000002	0.471				958.3637
		100	0.4000	1344.10	(90)	0.000295	0.000295	1344.3	-0.2089	0.000000	0.044				958.3637
		100	0.5000	1489.20	(90)	0.000300	0.000299	1489.3	-0.1380	0.000000	0.019				958.3637
								Average Res	-0.0240	0.000004	175.410	Sum	Chi sqr		
								Std dev Res	0.8564	0.000014					
								Avg - 4std	-3.4495	-0.000053					
								Avg + 4std	3.4014	0.000060					

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t \text{ } ^\circ\text{C}) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \text{ } ^\circ\text{C} + c_4)^2)}$

c0	1943.596
c1	304.335
c2	-0.013753
c3	0.001154
c4	573.7902
Min T	0
Max T	100
Min w	0.0014
Max w	0.7000
Avg dens res	-0.0240
Std dens res	0.856359
Avg app vol res *10 ³	0.003574
Std app vol res *10 ³	0.014136
No of points in corr	240
No of inconsistent pair	7

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

	0	0.2000	1197.00	(90)	0.000176	0.000193	1192.2	4.8176	-0.000017	23.209	!				999.8395
	0	0.3000	1306.20	(90)	0.000218	0.000232	1299.1	7.0519	-0.000014	49.729	!				999.8395
	0	0.4000	1432.90	(90)	0.000244	0.000257	1422.8	10.1245	-0.000012	102.506	!				999.8395
	0	0.5000	1586.00	(90)	0.000261	0.000274	1569.5	16.5145	-0.000013	272.730	!				999.8395
0.04595	15	0.0062	1004.81	(100)	0.000087	0.000022	1005.2	-0.4098	0.000065	0.168			!	5.71	999.0996
	20	0.5000	1568.10	(90)	0.000274	0.000281	1559.7	8.4381	-0.000007	71.202	!				998.2041
	20	0.6000	1749.00	(90)	0.000285	0.000291	1737.7	11.2883	-0.000006	127.425	!				998.2041

Density of aqueous solutions of **ZnSO4**

- References
- (5) Albright, J. G.; Miller, D. G. Mutual Diffusion Coefficient of ZnSO4 at 25°C. *J. Sol. Chem.* **1975**, *4*, 809-816.
- (7) Bakeev, M. I.; Zharmenov, A. A.; Andamasov, R. S.; Baikenova, N. A.; Abdygalimova, S. Sh. Electrical Conductivity and Viscosity of the Binary Systems MeSO4-H2O (Me=Mn2+, Fe2+, Co2+, Zn2+, Cd2+) at 25-75 Degree and the Structure of Electrolyte Solutions. *Izv. Nats. Akad. Nauk Resp. Kaz., Ser. Khim.* **1994**, *6*, 25-30.
- (44) Isono, T. Measurements of Density, Viscosity, and Electrolytic Conductivity of Concentrated Aqueous Electrolyte Solutions. *Rikagaku Kenkyusho Hokoku* **1980**, *56*, 103-114.
- (90) Perry, R. H.; Green, D. W. *Perry's Chemical Engineers' Handbook*; McGraw Hill: New York, 7th edition, 1997.
- (101) Puchalska, D.; Atkinson, G.; Routh, S. Solution Thermodynamics of First-Row Transition Elements. 4. Apparent Molal Volumes of Aqueous ZnSO4 and CuSO4 Solutions from 15 to 55°C. *J. Sol. Chem.* **1993**, *22*, 625-639.
- (126) Suryanarayana, C. V.; Alamelu, S. Electrical Conductance of Concentrated Aqueous Solutions of Zinc Sulphate. *Acta Chim. Hung.* **1959**, *20*, 91-102.

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
0.01024		15	0.0017	1000.87	(101)	-0.000072	-0.000026	1000.8	0.0753	-0.000046	0.006		!	999.0996
0.03017		15	0.0048	1004.25	(101)	-0.000058	-0.000025	1004.1	0.1616	-0.000033	0.026			999.0996
0.05		15	0.0080	1007.52	(44)	-0.000044	-0.000024	1007.4	0.1616	-0.000020	0.026			999.0996
0.05017		15	0.0080	1007.61	(101)	-0.000051	-0.000024	1007.4	0.2236	-0.000027	0.050			999.0996
0.07016		15	0.0112	1010.96	(101)	-0.000047	-0.000022	1010.7	0.2846	-0.000025	0.081			999.0996
0.1		15	0.0159	1015.86	(44)	-0.000038	-0.000021	1015.6	0.2882	-0.000018	0.083			999.0996
0.10075		15	0.0160	1016.04	(101)	-0.000042	-0.000021	1015.7	0.3453	-0.000021	0.119			999.0996
0.15036		15	0.0237	1024.25	(101)	-0.000036	-0.000018	1023.8	0.4508	-0.000018	0.203			999.0996
0.20039		15	0.0313	1032.45	(101)	-0.000031	-0.000015	1031.9	0.5218	-0.000016	0.272			999.0996
0.30046		15	0.0463	1048.67	(101)	-0.000022	-0.000010	1048.1	0.6129	-0.000012	0.376			999.0996
0.49983		15	0.0747	1080.68	(101)	-0.000011	0.000001	1079.7	0.9960	-0.000011	0.992			999.0996
0.5		15	0.0747	1079.76	(44)	0.000000	0.000001	1079.7	0.0493	-0.000001	0.002			999.0996
0.69894		15	0.1014	1111.89	(101)	0.000000	0.000010	1110.6	1.2702	-0.000010	1.613			999.0996
1		15	0.1390	1156.54	(44)	0.000021	0.000023	1156.2	0.3199	-0.000002	0.102			999.0996
1.00012		15	0.1390	1158.31	(101)	0.000011	0.000023	1156.2	2.0720	-0.000011	4.293			999.0996
1.30026		15	0.1735	1202.98	(101)	0.000023	0.000034	1200.4	2.6186	-0.000010	6.857			999.0996
1.49991		15	0.1950	1232.68	(101)	0.000028	0.000041	1229.0	3.6715	-0.000012	13.480			999.0996
1.5		15	0.1950	1228.46	(44)	0.000042	0.000041	1229.0	-0.5613	0.000002	0.315			999.0996
2		15	0.2441	1296.35	(44)	0.000061	0.000056	1298.4	-2.0890	0.000005	4.364			999.0996
0.05		20	0.0080	1006.57	(44)	-0.000038	-0.000021	1006.4	0.1343	-0.000017	0.018			998.2041
0.1		20	0.0159	1014.87	(44)	-0.000033	-0.000018	1014.6	0.2470	-0.000015	0.061			998.2041
		20	0.0200	1019.00	(90)	-0.000020	-0.000017	1018.9	0.0736	-0.000004	0.005			998.2041
		20	0.0400	1040.30	(90)	-0.000012	-0.000010	1040.2	0.0840	-0.000002	0.007			998.2041
		20	0.0600	1062.00	(90)	-0.000001	-0.000003	1062.1	-0.0992	0.000001	0.010			998.2041
0.5		20	0.0747	1078.36	(44)	0.000005	0.000002	1078.6	-0.2225	0.000003	0.049			998.2041
		20	0.0800	1084.20	(90)	0.000009	0.000004	1084.6	-0.4042	0.000004	0.163			998.2041
		20	0.1000	1107.10	(90)	0.000016	0.000011	1107.8	-0.6608	0.000005	0.437			998.2041
		20	0.1200	1130.80	(90)	0.000023	0.000018	1131.6	-0.8006	0.000005	0.641			998.2041

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
1		20	0.1390	1154.83	(44)	0.000024	0.000024	1154.9	-0.1095	0.000001	0.012			998.2041
		20	0.1400	1155.30	(90)	0.000029	0.000024	1156.2	-0.8574	0.000005	0.735			998.2041
		20	0.1600	1180.60	(90)	0.000034	0.000031	1181.5	-0.8672	0.000004	0.752			998.2041
1.5		20	0.1950	1226.47	(44)	0.000046	0.000041	1227.7	-1.1905	0.000004	1.417			998.2041
2		20	0.2441	1294.37	(44)	0.000063	0.000056	1297.1	-2.6923	0.000007	7.248			998.2041
0.01024		25	0.0017	998.78	(101)	-0.000053	-0.000021	998.7	0.0516	-0.000031	0.003			997.0449
0.03017		25	0.0048	1002.12	(101)	-0.000045	-0.000020	1002.0	0.1201	-0.000025	0.014			997.0449
0.05		25	0.0080	1005.37	(44)	-0.000034	-0.000019	1005.2	0.1220	-0.000015	0.015			997.0449
0.05017		25	0.0080	1005.45	(101)	-0.000040	-0.000019	1005.3	0.1742	-0.000021	0.030			997.0449
0.07016		25	0.0112	1008.75	(101)	-0.000036	-0.000018	1008.5	0.2069	-0.000018	0.043			997.0449
0.0945		25	0.0150	1012.79	(5)	-0.000034	-0.000016	1012.5	0.2779	-0.000018	0.077			997.0449
0.1		25	0.0159	1013.62	(44)	-0.000029	-0.000016	1013.4	0.2125	-0.000013	0.045			997.0449
0.10075		25	0.0160	1013.77	(101)	-0.000031	-0.000016	1013.5	0.2404	-0.000015	0.058			997.0449
0.15036		25	0.0237	1021.89	(101)	-0.000026	-0.000013	1021.6	0.3076	-0.000012	0.095			997.0449
0.20039		25	0.0313	1030.02	(101)	-0.000021	-0.000011	1029.7	0.3590	-0.000011	0.129			997.0449
0.30046		25	0.0463	1046.07	(101)	-0.000013	-0.000005	1045.7	0.3759	-0.000007	0.141			997.0449
0.4676		25	0.0702	1071.81	(5)	0.000006	0.000003	1072.1	-0.2980	0.000004	0.089			997.0449
0.49983		25	0.0747	1077.73	(101)	-0.000002	0.000004	1077.2	0.5799	-0.000007	0.336			997.0449
0.5		25	0.0747	1076.81	(44)	0.000008	0.000004	1077.2	-0.3667	0.000004	0.134			997.0449
0.69894		25	0.1014	1108.84	(101)	0.000006	0.000013	1107.9	0.8991	-0.000007	0.808			997.0449
0.9253		25	0.1300	1141.82	(5)	0.000025	0.000022	1142.2	-0.4000	0.000002	0.160			997.0449
1		25	0.1390	1152.96	(44)	0.000027	0.000025	1153.4	-0.4083	0.000002	0.167			997.0449
1.00012		25	0.1390	1154.78	(101)	0.000018	0.000025	1153.4	1.3939	-0.000008	1.943			997.0449
1.30026		25	0.1735	1198.92	(101)	0.000030	0.000036	1197.4	1.5306	-0.000006	2.343			997.0449
1.3815		25	0.1824	1208.66	(5)	0.000040	0.000039	1209.1	-0.4285	0.000002	0.184			997.0449
1.49991		25	0.1950	1228.10	(101)	0.000035	0.000042	1226.0	2.1162	-0.000007	4.478			997.0449
1.5		25	0.1950	1224.37	(44)	0.000048	0.000042	1226.0	-1.6265	0.000006	2.646			997.0449
1.832		25	0.2283	1272.74	(5)	0.000051	0.000052	1272.4	0.3332	-0.000001	0.111			997.0449
2		25	0.2441	1292.14	(44)	0.000065	0.000057	1295.4	-3.2304	0.000008	10.435			997.0449
2.0698		25	0.2505	1305.09	(5)	0.000058	0.000059	1304.8	0.2787	-0.000001	0.078			997.0449
2.2828		25	0.2693	1333.45	(5)	0.000063	0.000064	1333.3	0.1826	0.000000	0.033			997.0449
2.5226		25	0.2894	1365.05	(5)	0.000069	0.000069	1364.7	0.3669	-0.000001	0.135			997.0449
2.7233		25	0.3054	1391.07	(5)	0.000073	0.000074	1390.5	0.5825	-0.000001	0.339			997.0449
2.9401		25	0.3219	1418.29	(5)	0.000078	0.000078	1417.9	0.4127	-0.000001	0.170			997.0449
3.1606		25	0.3379	1445.33	(5)	0.000082	0.000082	1445.2	0.0962	0.000000	0.009			997.0449
3.4029		25	0.3546	1474.55	(5)	0.000087	0.000087	1474.7	-0.1809	0.000000	0.033			997.0449
3.5434		25	0.3639	1490.93	(5)	0.000090	0.000089	1491.6	-0.6420	0.000001	0.412			997.0449
3.6017		25	0.3677	1497.93	(5)	0.000091	0.000090	1498.5	-0.5746	0.000001	0.330			997.0449
0.05		30	0.0080	1003.92	(44)	-0.000029	-0.000017	1003.8	0.0994	-0.000012	0.010			995.6473
0.1		30	0.0159	1012.14	(44)	-0.000026	-0.000014	1012.0	0.1888	-0.000012	0.036			995.6473

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
0.2266		30	0.0353	1032.00	(126)	0.000002	-0.000007	1032.4	-0.3510	0.000009	0.123			995.6473
0.4652		30	0.0699	1069.00	(126)	0.000018	0.000004	1070.1	-1.0911	0.000014	1.191			995.6473
0.5		30	0.0747	1075.08	(44)	0.000011	0.000006	1075.5	-0.4407	0.000005	0.194			995.6473
0.6428		30	0.0940	1097.00	(126)	0.000018	0.000012	1097.6	-0.6065	0.000005	0.368			995.6473
0.8347		30	0.1188	1127.00	(126)	0.000019	0.000020	1126.8	0.1923	-0.000001	0.037			995.6473
1		30	0.1390	1150.95	(44)	0.000030	0.000026	1151.5	-0.5855	0.000003	0.343			995.6473
1.016		30	0.1409	1153.00	(126)	0.000032	0.000027	1153.9	-0.9086	0.000005	0.826			995.6473
1.19		30	0.1612	1180.00	(126)	0.000031	0.000033	1179.5	0.5116	-0.000002	0.262			995.6473
1.48		30	0.1929	1222.00	(126)	0.000040	0.000043	1221.2	0.7780	-0.000003	0.605			995.6473
1.5		30	0.1950	1222.20	(44)	0.000050	0.000043	1224.1	-1.8599	0.000006	3.459			995.6473
1.77		30	0.2223	1261.00	(126)	0.000054	0.000051	1261.9	-0.8799	0.000002	0.774			995.6473
2		30	0.2441	1289.77	(44)	0.000066	0.000057	1293.4	-3.6251	0.000009	13.141			995.6473
2.06		30	0.2496	1302.00	(126)	0.000058	0.000059	1301.5	0.4866	-0.000001	0.237			995.6473
2.35		30	0.2751	1341.00	(126)	0.000064	0.000066	1340.2	0.8310	-0.000002	0.691			995.6473
2.64		30	0.2989	1379.00	(126)	0.000070	0.000072	1377.9	1.1105	-0.000002	1.233			995.6473
2.93		30	0.3212	1416.00	(126)	0.000076	0.000078	1414.7	1.2858	-0.000002	1.653			995.6473
3.22		30	0.3421	1452.00	(126)	0.000082	0.000083	1450.7	1.3203	-0.000002	1.743			995.6473
3.51		30	0.3617	1486.00	(126)	0.000088	0.000088	1485.8	0.1801	0.000000	0.032			995.6473
0.01024		35	0.0017	995.76	(101)	-0.000052	-0.000017	995.7	0.0571	-0.000035	0.003			994.0319
0.03017		35	0.0048	999.05	(101)	-0.000036	-0.000016	999.0	0.0999	-0.000021	0.010			994.0319
0.05		35	0.0080	1002.28	(44)	-0.000028	-0.000015	1002.2	0.1056	-0.000013	0.011			994.0319
0.05017		35	0.0080	1002.35	(101)	-0.000033	-0.000015	1002.2	0.1480	-0.000018	0.022			994.0319
0.07016		35	0.0112	1005.66	(101)	-0.000032	-0.000013	1005.4	0.2144	-0.000019	0.046			994.0319
0.1		35	0.0159	1010.48	(44)	-0.000025	-0.000012	1010.3	0.2048	-0.000013	0.042			994.0319
0.10075		35	0.0160	1010.64	(101)	-0.000027	-0.000012	1010.4	0.2436	-0.000015	0.059			994.0319
0.15036		35	0.0237	1018.68	(101)	-0.000021	-0.000009	1018.4	0.2874	-0.000012	0.083			994.0319
0.20039		35	0.0313	1026.73	(101)	-0.000016	-0.000007	1026.4	0.3140	-0.000010	0.099			994.0319
0.2266		35	0.0353	1030.00	(126)	0.000011	-0.000005	1030.6	-0.6032	0.000016	0.364			994.0319
0.30046		35	0.0463	1042.62	(101)	-0.000007	-0.000002	1042.3	0.2762	-0.000005	0.076			994.0319
0.4652		35	0.0699	1068.00	(126)	0.000009	0.000006	1068.2	-0.2231	0.000003	0.050			994.0319
0.49983		35	0.0747	1074.04	(101)	0.000003	0.000008	1073.6	0.4297	-0.000005	0.185			994.0319
0.5		35	0.0747	1073.18	(44)	0.000013	0.000008	1073.6	-0.4567	0.000005	0.209			994.0319
0.6428		35	0.0940	1095.00	(126)	0.000020	0.000014	1095.7	-0.6613	0.000006	0.437			994.0319
0.69894		35	0.1014	1104.78	(101)	0.000012	0.000016	1104.2	0.5423	-0.000004	0.294			994.0319
0.8347		35	0.1188	1124.00	(126)	0.000027	0.000021	1124.8	-0.7902	0.000005	0.624			994.0319
1		35	0.1390	1148.83	(44)	0.000031	0.000027	1149.5	-0.6347	0.000003	0.403			994.0319
1.00012		35	0.1390	1150.55	(101)	0.000022	0.000028	1149.5	1.0675	-0.000006	1.140			994.0319
1.016		35	0.1409	1152.00	(126)	0.000027	0.000028	1151.8	0.1669	-0.000001	0.028			994.0319
1.19		35	0.1612	1178.00	(126)	0.000031	0.000034	1177.4	0.6337	-0.000003	0.402			994.0319
1.30026		35	0.1735	1194.85	(101)	0.000032	0.000038	1193.3	1.5113	-0.000006	2.284			994.0319

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
1.48		35	0.1929	1219.00	(126)	0.000043	0.000043	1219.0	-0.0408	0.000000	0.002			994.0319
1.49991		35	0.1950	1223.20	(101)	0.000039	0.000044	1221.9	1.3373	-0.000005	1.788			994.0319
1.5		35	0.1950	1219.91	(44)	0.000051	0.000044	1221.9	-1.9655	0.000007	3.863			994.0319
1.77		35	0.2223	1259.00	(126)	0.000053	0.000052	1259.7	-0.6617	0.000002	0.438			994.0319
2		35	0.2441	1287.34	(44)	0.000067	0.000058	1291.2	-3.8221	0.000009	14.609			994.0319
2.06		35	0.2496	1300.00	(126)	0.000057	0.000059	1299.3	0.7213	-0.000002	0.520			994.0319
2.35		35	0.2751	1339.00	(126)	0.000064	0.000066	1337.9	1.0629	-0.000002	1.130			994.0319
2.64		35	0.2989	1377.00	(126)	0.000070	0.000072	1375.7	1.3217	-0.000002	1.747			994.0319
2.93		35	0.3212	1414.00	(126)	0.000076	0.000078	1412.5	1.4593	-0.000002	2.130			994.0319
3.22		35	0.3421	1449.00	(126)	0.000083	0.000083	1448.6	0.4405	-0.000001	0.194			994.0319
3.51		35	0.3617	1484.00	(126)	0.000088	0.000088	1483.8	0.2323	0.000000	0.054			994.0319
0.2266		40	0.0353	1028.00	(126)	0.000014	-0.000003	1028.7	-0.6506	0.000017	0.423			992.2158
0.4652		40	0.0699	1066.00	(126)	0.000009	0.000008	1066.1	-0.1461	0.000002	0.021			992.2158
0.6428		40	0.0940	1093.00	(126)	0.000020	0.000015	1093.5	-0.5039	0.000004	0.254			992.2158
0.8347		40	0.1188	1122.00	(126)	0.000026	0.000023	1122.6	-0.5571	0.000004	0.310			992.2158
1.016		40	0.1409	1149.00	(126)	0.000032	0.000029	1149.5	-0.5388	0.000003	0.290			992.2158
1.19		40	0.1612	1175.00	(126)	0.000035	0.000035	1175.0	-0.0222	0.000000	0.000			992.2158
1.48		40	0.1929	1217.00	(126)	0.000043	0.000044	1216.6	0.3676	-0.000001	0.135			992.2158
1.77		40	0.2223	1256.00	(126)	0.000056	0.000052	1257.2	-1.2110	0.000003	1.466			992.2158
2.06		40	0.2496	1297.00	(126)	0.000059	0.000059	1296.8	0.1937	0.000000	0.038			992.2158
2.35		40	0.2751	1336.00	(126)	0.000065	0.000066	1335.5	0.5378	-0.000001	0.289			992.2158
2.64		40	0.2989	1374.00	(126)	0.000071	0.000072	1373.2	0.7810	-0.000001	0.610			992.2158
2.93		40	0.3212	1410.00	(126)	0.000078	0.000078	1410.1	-0.1138	0.000000	0.013			992.2158
3.22		40	0.3421	1446.00	(126)	0.000083	0.000083	1446.2	-0.1808	0.000000	0.033			992.2158
3.51		40	0.3617	1481.00	(126)	0.000088	0.000088	1481.5	-0.4518	0.000001	0.204			992.2158
0.01024		45	0.0017	991.93	(101)	-0.000049	-0.000013	991.9	0.0591	-0.000036	0.003			990.2132
0.03017		45	0.0048	995.22	(101)	-0.000038	-0.000012	995.1	0.1275	-0.000027	0.016			990.2132
0.05		45	0.0080	998.41	(44)	-0.000025	-0.000011	998.3	0.1184	-0.000015	0.014			990.2132
0.05017		45	0.0080	998.48	(101)	-0.000031	-0.000010	998.3	0.1610	-0.000020	0.026			990.2132
0.07016		45	0.0112	1001.70	(101)	-0.000024	-0.000009	1001.5	0.1625	-0.000014	0.026			990.2132
0.1		45	0.0159	1006.55	(44)	-0.000022	-0.000008	1006.3	0.2200	-0.000014	0.048			990.2132
0.10075		45	0.0160	1006.63	(101)	-0.000019	-0.000008	1006.5	0.1797	-0.000011	0.032			990.2132
0.15036		45	0.0237	1014.60	(101)	-0.000014	-0.000005	1014.4	0.2135	-0.000009	0.046			990.2132
0.20039		45	0.0313	1022.58	(101)	-0.000010	-0.000003	1022.4	0.2290	-0.000007	0.052			990.2132
0.2266		45	0.0353	1026.00	(126)	0.000012	-0.000002	1026.5	-0.5081	0.000014	0.258			990.2132
0.30046		45	0.0463	1038.32	(101)	-0.000001	0.000002	1038.2	0.1536	-0.000003	0.024			990.2132
0.4652		45	0.0699	1064.00	(126)	0.000008	0.000009	1063.9	0.1246	-0.000002	0.016			990.2132
0.49983		45	0.0747	1069.34	(101)	0.000009	0.000011	1069.2	0.1110	-0.000001	0.012			990.2132
0.5		45	0.0747	1068.91	(44)	0.000015	0.000011	1069.3	-0.3453	0.000004	0.119			990.2132
0.6428		45	0.0940	1091.00	(126)	0.000018	0.000016	1091.1	-0.1499	0.000001	0.022			990.2132

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
0.69894		45	0.1014	1099.84	(101)	0.000017	0.000019	1099.7	0.1612	-0.000001	0.026			990.2132
0.8347		45	0.1188	1120.00	(126)	0.000025	0.000024	1120.1	-0.1243	0.000001	0.015			990.2132
1		45	0.1390	1144.15	(44)	0.000033	0.000030	1144.7	-0.5338	0.000003	0.285			990.2132
1.00012		45	0.1390	1145.15	(101)	0.000027	0.000030	1144.7	0.4486	-0.000002	0.201			990.2132
1.016		45	0.1409	1148.00	(126)	0.000025	0.000030	1147.0	0.9582	-0.000005	0.918			990.2132
1.19		45	0.1612	1173.00	(126)	0.000034	0.000036	1172.5	0.5274	-0.000002	0.278			990.2132
1.30026		45	0.1735	1189.10	(101)	0.000036	0.000039	1188.4	0.7110	-0.000003	0.506			990.2132
1.48		45	0.1929	1214.00	(126)	0.000045	0.000045	1214.0	-0.0137	0.000000	0.000			990.2132
1.49991		45	0.1950	1218.02	(101)	0.000041	0.000045	1216.8	1.1919	-0.000004	1.421			990.2132
1.5		45	0.1950	1214.87	(44)	0.000052	0.000045	1216.8	-1.9708	0.000007	3.884			990.2132
1.77		45	0.2223	1253.00	(126)	0.000057	0.000053	1254.5	-1.5451	0.000004	2.387			990.2132
2		45	0.2441	1282.12	(44)	0.000068	0.000058	1286.0	-3.8840	0.000010	15.085	!		990.2132
2.06		45	0.2496	1295.00	(126)	0.000058	0.000060	1294.1	0.8863	-0.000002	0.785			990.2132
2.35		45	0.2751	1333.00	(126)	0.000066	0.000066	1332.8	0.2377	0.000000	0.057			990.2132
2.64		45	0.2989	1371.00	(126)	0.000071	0.000072	1370.5	0.4704	-0.000001	0.221			990.2132
2.93		45	0.3212	1408.00	(126)	0.000077	0.000078	1407.5	0.5482	-0.000001	0.301			990.2132
3.22		45	0.3421	1444.00	(126)	0.000082	0.000083	1443.6	0.4381	-0.000001	0.192			990.2132
3.51		45	0.3617	1478.00	(126)	0.000089	0.000087	1478.9	-0.8908	0.000001	0.794			990.2132
0.2266		50	0.0353	1024.00	(126)	0.000005	0.000000	1024.2	-0.1880	0.000005	0.035			988.0363
0.4652		50	0.0699	1061.00	(126)	0.000016	0.000011	1061.4	-0.4237	0.000005	0.180			988.0363
0.6428		50	0.0940	1088.00	(126)	0.000023	0.000018	1088.6	-0.6124	0.000005	0.375			988.0363
0.8347		50	0.1188	1118.00	(126)	0.000022	0.000025	1117.5	0.4947	-0.000003	0.245			988.0363
1.016		50	0.1409	1145.00	(126)	0.000028	0.000031	1144.4	0.6441	-0.000003	0.415			988.0363
1.19		50	0.1612	1170.00	(126)	0.000036	0.000037	1169.7	0.2686	-0.000001	0.072			988.0363
1.48		50	0.1929	1212.00	(126)	0.000042	0.000045	1211.2	0.8011	-0.000003	0.642			988.0363
1.77		50	0.2223	1251.00	(126)	0.000055	0.000053	1251.7	-0.6785	0.000002	0.460			988.0363
2.06		50	0.2496	1292.00	(126)	0.000058	0.000060	1291.2	0.7842	-0.000002	0.615			988.0363
2.35		50	0.2751	1330.00	(126)	0.000066	0.000066	1329.9	0.1479	0.000000	0.022			988.0363
2.64		50	0.2989	1369.00	(126)	0.000070	0.000072	1367.6	1.3747	-0.000002	1.890			988.0363
2.93		50	0.3212	1405.00	(126)	0.000077	0.000078	1404.6	0.4300	-0.000001	0.185			988.0363
3.22		50	0.3421	1441.00	(126)	0.000082	0.000082	1440.7	0.2816	0.000000	0.079			988.0363
3.51		50	0.3617	1474.00	(126)	0.000090	0.000087	1476.1	-2.1004	0.000003	4.412			988.0363
0.01024		55	0.0017	987.40	(101)	-0.000047	-0.000009	987.3	0.0609	-0.000038	0.004			985.6952
0.03017		55	0.0048	990.66	(101)	-0.000034	-0.000008	990.5	0.1261	-0.000027	0.016			985.6952
0.05		55	0.0080	993.85	(44)	-0.000025	-0.000007	993.7	0.1433	-0.000018	0.021			985.6952
0.05017		55	0.0080	993.91	(101)	-0.000029	-0.000007	993.7	0.1762	-0.000022	0.031			985.6952
0.07016		55	0.0112	997.12	(101)	-0.000023	-0.000006	996.9	0.1939	-0.000017	0.038			985.6952
0.1		55	0.0159	1001.95	(44)	-0.000021	-0.000004	1001.7	0.2700	-0.000017	0.073			985.6952
0.10075		55	0.0160	1002.04	(101)	-0.000019	-0.000004	1001.8	0.2407	-0.000015	0.058			985.6952
0.15036		55	0.0237	1009.98	(101)	-0.000015	-0.000002	1009.7	0.3074	-0.000013	0.094			985.6952

molarity	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
0.20039		55	0.0313	1017.72	(101)	-0.000004	0.000000	1017.6	0.1445	-0.000004	0.021			985.6952
0.2266		55	0.0353	1022.00	(126)	-0.000006	0.000002	1021.7	0.2990	-0.000008	0.089			985.6952
0.30046		55	0.0463	1033.33	(101)	0.000004	0.000005	1033.3	0.0572	-0.000001	0.003			985.6952
0.4652		55	0.0699	1059.00	(126)	0.000009	0.000012	1058.8	0.1979	-0.000003	0.039			985.6952
0.49983		55	0.0747	1064.20	(101)	0.000012	0.000013	1064.1	0.0798	-0.000001	0.006			985.6952
0.5		55	0.0747	1064.03	(44)	0.000015	0.000013	1064.1	-0.1163	0.000001	0.014			985.6952
0.6428		55	0.0940	1086.00	(126)	0.000018	0.000019	1085.9	0.0974	-0.000001	0.009			985.6952
0.69894		55	0.1014	1094.94	(101)	0.000016	0.000021	1094.4	0.5593	-0.000005	0.313			985.6952
0.8347		55	0.1188	1114.00	(126)	0.000031	0.000026	1114.7	-0.7113	0.000005	0.506			985.6952
1		55	0.1390	1138.91	(44)	0.000033	0.000031	1139.1	-0.2356	0.000001	0.056			985.6952
1.00012		55	0.1390	1139.77	(101)	0.000028	0.000031	1139.2	0.6067	-0.000003	0.368			985.6952
1.016		55	0.1409	1141.00	(126)	0.000035	0.000032	1141.5	-0.4925	0.000003	0.243			985.6952
1.19		55	0.1612	1168.00	(126)	0.000032	0.000037	1166.8	1.1898	-0.000005	1.416			985.6952
1.30026		55	0.1735	1183.93	(101)	0.000036	0.000041	1182.7	1.2663	-0.000005	1.604			985.6952
1.48		55	0.1929	1209.00	(126)	0.000043	0.000046	1208.2	0.8002	-0.000003	0.640			985.6952
1.49991		55	0.1950	1212.49	(101)	0.000041	0.000046	1211.0	1.4845	-0.000005	2.204			985.6952
1.5		55	0.1950	1209.53	(44)	0.000052	0.000046	1211.0	-1.4881	0.000005	2.215			985.6952
1.77		55	0.2223	1248.00	(126)	0.000055	0.000053	1248.6	-0.6233	0.000002	0.388			985.6952
2		55	0.2441	1276.39	(44)	0.000068	0.000059	1280.0	-3.6357	0.000009	13.218			985.6952
2.06		55	0.2496	1289.00	(126)	0.000058	0.000060	1288.1	0.8752	-0.000002	0.766			985.6952
2.35		55	0.2751	1327.00	(126)	0.000066	0.000066	1326.7	0.2556	-0.000001	0.065			985.6952
2.64		55	0.2989	1366.00	(126)	0.000069	0.000072	1364.5	1.4814	-0.000003	2.194			985.6952
2.93		55	0.3212	1403.00	(126)	0.000075	0.000077	1401.5	1.5188	-0.000002	2.307			985.6952
3.22		55	0.3421	1437.00	(126)	0.000083	0.000082	1437.7	-0.6632	0.000001	0.440			985.6952
3.51		55	0.3617	1472.00	(126)	0.000088	0.000087	1473.1	-1.0934	0.000001	1.195			985.6952
0.2266		60	0.0353	1020.00	(126)	-0.000023	0.000003	1019.1	0.9439	-0.000026	0.891			983.1989
0.4652		60	0.0699	1056.00	(126)	0.000013	0.000013	1056.0	-0.0197	0.000000	0.000			983.1989
0.6428		60	0.0940	1082.00	(126)	0.000029	0.000020	1083.0	-1.0300	0.000009	1.061			983.1989
0.8347		60	0.1188	1111.00	(126)	0.000032	0.000027	1111.8	-0.7520	0.000005	0.566			983.1989
1.016		60	0.1409	1139.00	(126)	0.000030	0.000033	1138.5	0.5386	-0.000003	0.290			983.1989
1.19		60	0.1612	1163.00	(126)	0.000042	0.000038	1163.7	-0.7191	0.000003	0.517			983.1989
1.48		60	0.1929	1205.00	(126)	0.000046	0.000046	1205.0	-0.0268	0.000000	0.001			983.1989
1.77		60	0.2223	1245.00	(126)	0.000055	0.000054	1245.4	-0.3899	0.000001	0.152			983.1989
2.06		60	0.2496	1286.00	(126)	0.000058	0.000060	1284.9	1.1487	-0.000003	1.320			983.1989
2.35		60	0.2751	1324.00	(126)	0.000065	0.000066	1323.4	0.5504	-0.000001	0.303			983.1989
2.64		60	0.2989	1362.00	(126)	0.000071	0.000072	1361.2	0.7795	-0.000001	0.608			983.1989
2.93		60	0.3212	1399.00	(126)	0.000076	0.000077	1398.2	0.8037	-0.000001	0.646			983.1989
3.22		60	0.3421	1434.00	(126)	0.000082	0.000082	1434.4	-0.4071	0.000001	0.166			983.1989
3.51		60	0.3617	1469.00	(126)	0.000087	0.000086	1469.9	-0.8808	0.000001	0.776			983.1989
Average Res									0.0350	-0.000004	210.878	Sum Chi sqr		

molality	molarity	t / °C	mass frac	Density exp / kg/m³	Ref	App vol exp / m³/kg	App vol Calc / m³/kg	Density calc / kg/m³	Density Residual / kg/m³	App Vol Residual / m³/kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m³
								Std dev Res	0.9653	0.000010				
								Avg - 4std	-3.8263	-0.000044				
								Avg + 4std	3.8963	0.000036				

Curve fit for the model $\text{App vol} = (w + c_2 + c_3 \cdot t) / (c_0 \cdot w + c_1) / e^{(0.000001 \cdot (t \cdot C + c_4)^2)}$

c0	18.37777
c1	35.92677
c2	-0.089193
c3	0.001077
c4	2066.297
Min T	15
Max T	60
Min w	0.0017
Max w	0.3677
Avg dens res	0.034984
Std dens res	0.965329
Avg app vol res *10 ³	-0.004011
Std app vol res *10 ³	0.009897
No of points in corr	227
No of inconsistent pair	33

Inconsistent data not used (Residual greater than average +/- 4 standard deviations)

25	0.0050	1001.10	(7)	0.000189	-0.000020	1002.1	-1.0455	0.000209	1.093		!	997.0449
25	0.0200	1014.80	(7)	0.000123	-0.000015	1017.6	-2.8444	0.000138	8.091		!	997.0449
25	0.0899	1075.30	(7)	0.000191	0.000009	1094.5	-19.1761	0.000181	367.722	!	!	997.0449
25	0.1098	1093.10	(7)	0.000200	0.000016	1117.9	-24.7522	0.000184	612.671	!	!	997.0449
25	0.1498	1134.50	(7)	0.000192	0.000029	1166.9	-32.3948	0.000163	1049.421	!	!	997.0449
25	0.1789	1173.60	(7)	0.000160	0.000038	1204.5	-30.8947	0.000122	954.482	!	!	997.0449
25	0.2098	1191.20	(7)	0.000224	0.000047	1246.4	-55.1512	0.000177	3041.652	!	!	997.0449
25	0.2298	1216.20	(7)	0.000217	0.000053	1274.6	-58.4384	0.000164	3415.047	!	!	997.0449
25	0.2499	1237.70	(7)	0.000223	0.000058	1303.9	-66.2003	0.000164	4382.481	!	!	997.0449
25	0.2699	1251.20	(7)	0.000248	0.000064	1334.2	-82.9763	0.000184	6885.074	!	!	997.0449
25	0.2994	1293.90	(7)	0.000234	0.000072	1380.7	-86.7951	0.000162	7533.381	!	!	997.0449
50	0.0200	1004.90	(7)	0.000161	-0.000005	1008.2	-3.3464	0.000166	11.198		!	988.0363
50	0.0050	992.60	(7)	0.000080	-0.000010	993.0	-0.4384	0.000089	0.192		!	988.0363
50	0.0899	1066.90	(7)	0.000179	0.000016	1083.8	-16.9347	0.000163	286.782	!	!	988.0363
50	0.1098	1086.50	(7)	0.000177	0.000022	1106.9	-20.3994	0.000154	416.134	!	!	988.0363
50	0.1498	1123.20	(7)	0.000199	0.000034	1155.4	-32.1924	0.000166	1036.348	!	!	988.0363
50	0.1789	1151.60	(7)	0.000209	0.000042	1192.7	-41.0675	0.000167	1686.539	!	!	988.0363
50	0.2098	1180.30	(7)	0.000226	0.000050	1234.3	-53.9624	0.000177	2911.941	!	!	988.0363

molality	molarity	t / °C	mass frac	Density exp / kg/m ³	Ref	App vol exp / m ³ /kg	App vol Calc / m ³ /kg	Density calc / kg/m ³	Density Residual / kg/m ³	App Vol Residual / m ³ /kg	Square of Density Res	Inconsistent based on density	Inconsistent based on apparent volume	Density of water / kg/m ³
		50	0.2298	1205.00	(7)	0.000219	0.000055	1262.4	-57.4332	0.000164	3298.567	!	!	988.0363
		50	0.2499	1227.10	(7)	0.000223	0.000060	1291.6	-64.5262	0.000163	4163.632	!	!	988.0363
		50	0.2699	1248.10	(7)	0.000231	0.000065	1321.9	-73.7867	0.000166	5444.471	!	!	988.0363
		50	0.2994	1281.20	(7)	0.000239	0.000072	1368.5	-87.2926	0.000166	7619.999	!	!	988.0363
		75	0.0200	992.10	(7)	0.000132	0.000003	994.6	-2.5290	0.000128	6.396		!	974.849
		75	0.0050	981.80	(7)	-0.000430	-0.000001	979.7	2.0575	-0.000429	4.233		!	974.849
		75	0.0899	1054.00	(7)	0.000168	0.000022	1068.8	-14.8114	0.000146	219.378	!	!	974.849
		75	0.1098	1078.30	(7)	0.000129	0.000027	1091.5	-13.2115	0.000102	174.545	!	!	974.849
		75	0.1498	1109.70	(7)	0.000194	0.000037	1139.3	-29.6374	0.000156	878.378	!	!	974.849
		75	0.1789	1137.40	(7)	0.000206	0.000044	1176.2	-38.7920	0.000162	1504.820	!	!	974.849
		75	0.2098	1166.00	(7)	0.000224	0.000052	1217.4	-51.4129	0.000173	2643.291	!	!	974.849
		75	0.2298	1191.30	(7)	0.000215	0.000056	1245.4	-54.0878	0.000159	2925.491	!	!	974.849
		75	0.2499	1222.50	(7)	0.000194	0.000061	1274.4	-51.9270	0.000133	2696.413	!	!	974.849
		75	0.2699	1231.60	(7)	0.000234	0.000065	1304.6	-72.9809	0.000168	5326.213	!	!	974.849
		75	0.2994	1268.10	(7)	0.000234	0.000072	1351.1	-83.0286	0.000162	6893.756	!	!	974.849