Supporting Information

Protonic Ammonium Nitrate Ionic Liquids and Their Mixtures: Insights into Their Thermophysical Behaviour

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1. EXPERIMENTAL RESULTS

Table S1. Experimental density, ρ, dynamic viscosity, η, and ionic conductivity, σ, of pure $[N_{0002}][NO_3]$, $[N_{0003}][NO_3]$ and $[N_{0004}][NO_3]$.

ρ / cm^3 mol^{-1}

T / K	$[N_{0002}]^+$	$[N_{0003}]^+$	$[N_{0004}]^+$	T / K	$[N_{0002}]^+$	$[N_{0003}]^+$	$[N_{0004}]^+$	T / K	$[N_{0002}]^+$	$[N_{0003}]^+$	$[N_{0004}]^+$
288.15	1.2188	1.1572	-	310.15	1.2050	1.1436	-	332.15	1.1917	1.1306	1.0849
289.15	1.2182	1.1565	-	311.15	1.2044	1.1430	-	333.15	1.1912	1.1300	1.0843
290.15	1.2175	1.1559	-	312.15	1.2037	1.1424	-	334.15	1.1906	1.1294	1.0837
291.15	1.2169	1.1553	-	313.15	1.2031	1.1418	1.0964	335.15	1.1900	1.1289	1.0831
292.15	1.2162	1.1546	-	314.15	1.2025	1.1412	1.0958	336.15	1.1894	1.1283	1.0825
293.15	1.2156	1.1540	-	315.15	1.2019	1.1406	1.0952	337.15	1.1888	1.1277	1.0820
294.15	1.2150	1.1534	-	316.15	1.2013	1.1400	1.0946	338.15	1.1882	1.1271	1.0814
295.15	1.2143	1.1528	-	317.15	1.2007	1.1394	1.0939	339.15	1.1876	1.1266	1.0808
296.15	1.2137	1.1521	-	318.15	1.2001	1.1388	1.0933	340.15	1.1870	1.1260	1.0802
297.15	1.2131	1.1515	-	319.15	1.1995	1.1382	1.0927	341.15	1.1865	1.1254	1.0796
298.15	1.2124	1.1509	-	320.15	1.1989	1.1376	1.0921	342.15	1.1859	1.1248	1.0790
299.15	1.2118	1.1503	-	321.15	1.1983	1.1370	1.0915	343.15	1.1853	1.1243	1.0784
300.15	1.2112	1.1497	-	322.15	1.1977	1.1364	1.0909	344.15	1.1847	1.1237	1.0778
301.15	1.2105	1.1491	-	323.15	1.1971	1.1359	1.0903	345.15	1.1841	1.1231	1.0773
302.15	1.2099	1.1484	-	324.15	1.1965	1.1353	1.0897	346.15	1.1836	1.1225	1.0767
303.15	1.2093	1.1478	-	325.15	1.1959	1.1347	1.0891	347.15	1.1830	1.1220	1.0761
304.15	1.2087	1.1472	-	326.15	1.1953	1.1341	1.0885	348.15	1.1824	1.1214	1.0755
305.15	1.2081	1.1466	-	327.15	1.1947	1.1335	1.0879	349.15	1.1818	1.1208	1.0749
306.15	1.2074	1.1460	-	328.15	1.1941	1.1329	1.0873	350.15	1.1813	1.1203	1.0744
307.15	1.2068	1.1454	-	329.15	1.1935	1.1323	1.0867	351.15	1.1807	1.1197	1.0738
308.15	1.2062	1.1448	-	330.15	1.1929	1.1318	1.0861	352.15	1.1801	1.1191	1.0732
309.15	1.2056	1.1442	-	331.15	1.1923	1.1312	1.0855	353.15	1.1795	1.1186	1.0726

η / mPa s

T / K	$[N_{0002}]^+$	$[N_{0003}]^+$	$[N_{0004}]^+$
288.15	52.6	117.0	-
293.15	43.5	93.0	-
298.15	36.5	75.0	-
303.15	31.0	61.5	-
308.15	26.5	51.0	-
313.15	22.8	42.9	-
318.15	20.0	36.2	48.2
323.15	17.6	31.0	40.7
328.15	15.6	26.8	34.7
333.15	13.8	23.4	30.5
338.15	12.5	20.5	26.0
343.15	11.2	18.2	22.7
348.15	10.2	16.2	20.2
353.15	9.21	14.6	17.8

σ / mS cm^{-1}

T / K	$[N_{0002}]^+$	$[N_{0003}]^+$	T / K	$[N_{0004}]^+$
288.15	16.2	5.34	313.2	7.24
293.15	19.3	6.60	315.7	7.99
298.15	22.5	8.01	318.2	8.48
303.15	26.0	9.62	320.7	9.31
308.15	29.7	11.3	323.2	9.83
313.15	33.7	13.2	-	-
318.15	37.8	15.3	-	-
323.15	42.2	17.5	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-

Table S2. Experimental density, ρ, dynamic viscosity, η, and ionic conductivity, σ, of binary mixtures composed of monoalkylammonium nitrate ionic liquids

ρ / cm^3 mol^{-1}

	n = 2.5		*n* = 3	*n* = 3.5	
***T* / K**	$\{N_{0002}]_{0.75}[N_{0004}]_{0.25}\}^+$	$\{[N_{0002}]_{0.5}[N_{0003}]_{0.5}\}^+$	$\{[N_{0002}]_{0.5}[N_{0004}]_{0.5}\}^+$	$\{[N_{0002}]_{0.25}[N_{0004}]_{0.75}\}^+$	$\{[N_{0003}]_{0.5}[N_{0004}]_{0.5}\}^+$
293.15	1.1805	1.1816	1.1540	1.1294	1.1297
298.15	1.1774	1.1785	1.1509	1.1263	1.1266
303.15	1.1743	1.1754	1.1478	1.1231	1.1234
308.15	1.1712	1.1724	1.1448	1.1200	1.1204
313.15	1.1682	1.1693	1.1418	1.1170	1.1173
318.15	1.1652	1.1663	1.1388	1.1139	1.1143
323.15	1.1622	1.1634	1.1359	1.1109	1.1113
328.15	1.1593	1.1604	1.1329	1.1079	1.1083
333.15	1.1563	1.1575	1.1300	1.1050	1.1054
338.15	1.1534	1.1546	1.1271	1.1020	1.1025
343.15	1.1506	1.1517	1.1243	1.0991	1.0996
348.15	1.1477	1.1488	1.1214	1.0962	1.0967
353.15	1.1448	1.1460	1.1186	1.0934	1.0938

η / mPa s

	n = 2.5		*n* = 3	*n* = 3.5	
***T* / K**	$\{[N_{0002}]_{0.75}[N_{0004}]_{0.25}\}^+$	$\{[N_{0002}]_{0.5}[N_{0003}]_{0.5}\}^+$	$\{[N_{0002}]_{0.5}[N_{0004}]_{0.5}\}^+$	$\{[N_{0002}]_{0.25}[N_{0004}]_{0.75}\}^+$	$\{[N_{0003}]_{0.5}[N_{0004}]_{0.5}\}^+$
293.15	62.0	64.5	82.3	104.4	100.4
298.15	50.6	53.0	66.6	83.7	80.6
303.15	42.1	44.1	54.7	68.1	65.7
308.15	35.5	37.1	45.6	56.1	54.2
313.15	30.6	31.6	38.5	47.0	45.4
318.15	26.0	27.1	32.7	39.5	38.3
323.15	22.6	23.5	28.1	33.7	32.6
328.15	19.8	20.5	24.4	29.0	28.1
333.15	17.6	18.1	21.3	25.2	24.4
338.15	15.5	16.0	18.7	22.0	21.3
343.15	13.8	14.3	16.6	19.4	18.8
348.15	12.4	12.8	14.8	17.2	16.7
353.15	11.3	11.5	13.3	15.4	14.9

σ / mS cm^{-1}

	n = 2.5		*n* = 3	*n* = 3.5	
***T* / K**	$\{[N_{0002}]_{0.75}[N_{0004}]_{0.25}\}^+$	$\{[N_{0002}]_{0.5}[N_{0003}]_{0.5}\}^+$	$\{[N_{0002}]_{0.5}[N_{0004}]_{0.5}\}^+$	$\{[N_{0002}]_{0.25}[N_{0004}]_{0.75}\}^+$	$\{[N_{0003}]_{0.5}[N_{0004}]_{0.5}\}^+$
288.15	-	9.91	6.46	-	-
293.15	12.0	12.0	7.92	5.07	4.96
298.15	14.3	14.2	9.51	6.15	6.06
303.15	16.8	16.7	11.3	7.42	7.29
308.15	19.5	19.3	13.3	8.80	8.66
313.15	22.4	22.2	15.4	10.3	10.2
318.15	25.5	25.3	17.7	12.0	11.8
323.15	28.8	28.5	20.2	13.8	13.6

n = number of equivalent carbons in the cation

Table S3. Comparison between our values of density, ρ, dynamic viscosity, η and ionic conductivity, σ, for pure $[N_{0002}][NO_3]$, $[N_{0003}][NO_3]$ and $[N_{0004}][NO_3]$ with those available in literature.

		ρ / cm^3 mol^{-1}		η / mPa s		σ / mS cm^{-1}	
	T / K	This Work	Literature	This Work	Literature	This Work	Literature
$[N_{0002}]^+$	298.15	1.2124	1.122[1]	36.5	32.1,[1] 32[2]	22.5	26.9[2]
	300.15	1.2112	1.216[2]	-	-	-	-
$[N_{0003}]^+$	298.15	1.1509	1.157[1]	75.1	66.6[1]	-	-
$[N_{0004}]^+$	313.15	1.0964	1.09217[3]	-	-	-	-

Table S4. Fitting parameters for experimental density, ρ, dynamic viscosity, η, and ionic conductivity, σ, respectively used in equations (1), (2) and (3) of the manuscript, with the corresponding standard deviation (SD) of the overall fitting. The $[NO_3]^-$ anion is omitted from the table heading.

	Pure compounds			Binary mixtures				
				n = 2.5		n = 3	n = 3.5	
Fitting parameter	$[N_{0002}]^+$	$[N_{0003}]^+$	$[N_{0004}]^+$	$\{[N_{0002}]_{0.75}[N_{0004}]_{0.25}\}^+$	$\{[N_{0002}]_{0.5}[N_{0003}]_{0.5}\}^+$	$\{[N_{0002}]_{0.5}[N_{0004}]_{0.5}\}^+$	$\{[N_{0002}]_{0.25}[N_{0004}]_{0.75}\}^+$	$\{[N_{0003}]_{0.5}[N_{0004}]_{0.5}\}^+$
Equation (1)								
$A_2 \cdot 10^7$	3.34	3.1	2.8	3.16	2.96	3.01	3.33	2.92
$A_1 \cdot 10^4$	-7.18	-7.2	-7.34	-7.15	-7.01	-7.13	-7.56	-7.26
$A_0 \cdot 10$	3.77	3.28	2.95	3.48	3.47	3.26	3.15	3.1
$SD \cdot 10^5$	1.29	1.70	0.23	0.89	1.06	1.15	1.23	0.66
Equation (2)								
A_η	0.2199	0.2082	0.2203	0.1886	0.189	0.1968	0.2102	0.2062
B_η	765.2	836.0	836.7	835.5	835.6	836.0	837.9	837.8
$T0_\eta$	148.5	156.1	162.9	148.8	149.9	154.6	158.2	157.8
$SD \cdot 10^2$	3.63	5.33	18.19	2.79	0.96	4.63	6.19	5.14
Equation (3)								
A_σ	1473	1449.5	1428.7	1465.1	1465.1	1451.7	1440.8	1441.2
B_σ	587.6	729.8	864.1	652.9	653	712.5	788.3	786.6
$T0_\sigma$	157.7	157.8	149.4	157.0	157.3	156.4	153.6	154.4
$SD \cdot 10^2$	4.50	2.34	7.71	1.41	3.19	2.33	1.39	0.86

n = number of equivalent carbons in the cation

Table S5. Experimental density data, ρ, viscosity data, η, and conductivity data, σ, for binary mixtures composed of di-, tri- or tetra-ethylammonium nitrate w ethylammonium nitrate

$\{[N_{0\,0\,2\,2}]_x[N_{0\,0\,0\,2}]_{(1-x)}\}[NO_3]$

	ρ / cm^3 mol^{-1}								η / mPa s							
x / T / K	0	0.0499	0.0998	0.1499	0.1999	0.2501	0.2998	0.3501	0	0.0499	0.0998	0.1499	0.1999	0.2501	0.2998	0.3501
293.15	1.2156	1.2062	1.1981	1.1894	1.1821	1.1740	1.1691	1.1610	43.5	44.4	43.2	45.4	49.7	46.0	45.6	49.7
298.15	1.2124	1.2031	1.1950	1.1863	1.1790	1.1709	1.1660	1.1579	36.5	37.2	36.2	37.9	41.3	38.3	37.9	41.2
303.15	1.2093	1.2000	1.1919	1.1832	1.1760	1.1678	1.1629	1.1548	31.0	31.5	30.6	31.9	34.7	32.2	31.9	34.5
308.15	1.2062	1.1969	1.1888	1.1802	1.1729	1.1648	1.1599	1.1518	26.5	27.0	26.2	27.3	29.4	27.4	27.2	29.2
313.15	1.2031	1.1938	1.1858	1.1772	1.1699	1.1618	1.1569	1.1488	22.8	23.2	22.4	23.4	25.1	23.4	23.3	24.9
318.15	1.2001	1.1908	1.1828	1.1742	1.1669	1.1588	1.1540	1.1458	20.0	20.2	19.7	20.4	21.8	20.4	20.3	21.6
323.15	1.1971	1.1878	1.1798	1.1712	1.1640	1.1559	1.1510	1.1429	17.6	17.8	17.3	17.9	19.1	17.8	17.8	18.8
328.15	1.1941	1.1849	1.1769	1.1683	1.1611	1.1529	1.1481	1.1400	15.6	15.7	15.3	15.8	16.7	15.7	15.7	16.5
333.15	1.1912	1.1819	1.1740	1.1654	1.1582	1.1500	1.1452	1.1371	13.8	13.9	13.6	14.0	14.7	13.9	13.9	14.6
338.15	1.1882	1.1790	1.1711	1.1625	1.1553	1.1471	1.1423	1.1342	12.5	12.5	12.1	12.5	13.1	12.5	12.2	13.0
343.15	1.1853	1.1761	1.1682	1.1596	1.1524	1.1443	1.1395	1.1313	11.2	11.2	10.8	11.2	11.9	11.2	10.9	11.7
348.15	1.1824	1.1733	1.1653	1.1567	1.1496	1.1415	1.1366	1.1284	10.2	10.2	9.8	10.1	10.7	10.1	9.6	10.5
353.15	1.1795	1.1704	1.1625	1.1539	1.1468	1.1386	1.1338	1.1253	9.21	9.20	8.96	8.99	9.70	9.14	8.69	9.47

	σ / mS cm^{-1}							
x / T / K	0	0.0499	0.0998	0.1499	0.1999	0.2501	0.2998	0.3501
288.15	16.2	-	-	-	-	-	-	-
293.15	19.3	18.0	17.3	16.9	15.5	15.9	15.5	14.6
298.15	22.5	21.0	20.2	19.9	18.3	18.7	18.7	17.2
303.15	26.0	24.3	23.4	23.1	21.2	21.8	21.8	20.0
308.15	29.7	27.8	26.9	26.4	24.4	25.0	25.0	23.0
313.15	33.7	31.6	30.6	30.1	27.9	28.4	28.4	26.3
318.15	37.8	35.5	34.4	33.9	31.5	32.0	32.0	29.7
323.15	42.2	39.7	38.5	37.9	35.3	35.9	35.9	33.4

$\{[N_{0\,2\,2\,2}]_x[N_{0\,0\,0\,2}]_{(1-x)}\}[NO_3]$

	ρ / cm^3 mol^{-1}											
x / T / K	0	0.0499	0.0999	0.149	0.1997	0.25	0.2993	0.3475	0.3995	0.4472	0.5003	0.5485
293.15	1.2156	1.2008	1.1881	1.1755	1.1680	1.1583	1.1452	1.1426	1.1351	1.1284	1.1224	1.1168
298.15	1.2124	1.1977	1.1850	1.1724	1.1650	1.1553	1.1422	1.1395	1.1321	1.1253	1.1194	1.1137
303.15	1.2093	1.1946	1.1820	1.1694	1.1619	1.1523	1.1392	1.1365	1.1291	1.1223	1.1164	1.1107
308.15	1.2062	1.1916	1.1789	1.1664	1.1589	1.1493	1.1362	1.1336	1.1261	1.1194	1.1134	1.1077
313.15	1.2031	1.1886	1.1760	1.1634	1.1560	1.1464	1.1333	1.1306	1.1232	1.1164	1.1105	1.1048
318.15	1.2001	1.1856	1.1730	1.1604	1.1530	1.1434	1.1304	1.1277	1.1202	1.1135	1.1075	1.1018
323.15	1.1971	1.1826	1.1701	1.1575	1.1501	1.1405	1.1275	1.1248	1.1173	1.1106	1.1046	1.0989
328.15	1.1941	1.1797	1.1671	1.1546	1.1472	1.1377	1.1246	1.122	1.1144	1.1077	1.1017	1.0960
333.15	1.1912	1.1768	1.1643	1.1517	1.1444	1.1348	1.1218	1.1191	1.1116	1.1049	-	-
338.15	1.1882	1.1739	1.1614	1.1489	1.1415	-	-	-	-	-	-	-
343.15	1.1853	1.1710	1.1585	1.146	-	-	-	-	-	-	-	-
348.15	1.1824	1.1682	1.1557	1.1432	-	-	-	-	-	-	-	-
353.15	1.1795	1.1653	1.1529	1.1404	-	-	-	-	-	-	-	-

η / mPa s

T / K \ x	0	0.0499	0.0999	0.1490	0.1997	0.2500	0.2993	0.3475	0.3995	0.4472	0.5003	0.5485
293.15	43.5	46.6	51.2	55.3	62.8	69.1	76.9	83.5	90.2	100.0	108.1	105.4
298.15	36.5	39.0	42.5	45.3	51.1	56.2	62.4	66.9	71.8	79.3	85.2	83.1
303.15	31.0	32.9	35.7	37.9	42.5	46.5	51.4	54.8	58.5	64.3	68.8	67.0
308.15	26.5	28.1	30.3	32.1	35.7	39.0	42.8	45.4	48.3	52.8	56.3	54.7
313.15	22.8	24.1	26.0	27.7	30.7	33.0	36.1	38.5	40.8	44.4	47.1	45.8
318.15	20.0	21.0	22.6	23.7	26.0	28.2	30.6	32.3	34.1	36.9	39.1	37.9
323.15	17.6	18.4	19.7	20.6	22.5	24.2	26.3	27.6	29.1	31.3	33.1	32.1
328.15	15.6	16.3	17.3	18.1	19.7	21.0	22.8	23.9	25.1	26.9	28.3	27.4
333.15	13.8	14.4	15.3	16.1	17.5	18.4	19.9	21.0	22.0	23.5	24.7	23.9
338.15	12.5	12.9	13.7	14.2	15.2	16.3	17.3	18.2	19.0	20.3	21.2	20.5
343.15	11.2	11.6	12.3	12.7	13.5	14.5	15.3	16.1	16.8	17.8	19.3	17.9
348.15	10.2	10.5	11.1	11.4	12.1	13.0	13.7	14.3	14.9	15.7	-	-
353.15	9.2	9.6	9.6	10.4	11.0	11.7	12.4	13.0	13.5	14.2	-	-

σ / mS cm^{-1}

T / K \ x	0	0.0499	0.0999	0.1490	0.1997	0.2500	0.2993	0.3475	0.3995	0.4472	0.5003	0.5485
293.15	19.3	16.7	14.5	12.8	11.5	9.7	8.6	7.9	7.1	6.2	5.6	5.6
298.15	22.5	19.6	17.1	15.2	13.6	11.6	10.2	9.5	8.5	7.5	6.8	6.8
303.15	26.0	22.7	19.9	17.7	15.9	13.6	12.0	11.2	10.1	9.0	8.2	8.1
308.15	29.7	26.0	22.9	20.5	18.4	15.8	14.0	13.1	11.8	10.6	9.6	9.6
313.15	33.7	29.6	26.1	23.5	21.2	18.1	16.3	15.2	13.8	12.3	11.3	11.2
318.15	37.8	33.3	29.5	26.6	24.1	20.7	18.6	17.4	15.8	14.1	13.0	12.9
323.15	42.2	37.3	33.1	29.9	27.1	23.4	21.1	19.7	18.0	16.1	14.8	14.8

$\{[N_{2222}]_x[N_{0002}]_{(1-x)}\}[NO_3]$

	ρ / cm^3 mol								η / mPa s							
T / K \ x	0	0.0501	0.1000	0.1500	0.2001	0.2567	0.2995	0.3500	0	0.0501	0.1000	0.1500	0.2001	0.2567	0.2995	0.3500
293.15	1.2156	1.1983	1.1840	1.1717	1.1606	1.1501	1.1428	1.1359	43.5	50.7	60.1	74.1	91.6	122.0	144.0	211.0
298.15	1.2124	1.1953	1.1809	1.1688	1.1577	1.1472	1.1399	1.1331	36.5	42.2	49.6	60.4	74.0	96.9	114.0	167.0
303.15	1.2093	1.1922	1.1780	1.1658	1.1547	1.1443	1.1370	1.1302	31.0	35.5	41.4	50.0	60.7	78.3	91.3	131.0
308.15	1.2062	1.1892	1.1750	1.1629	1.1519	1.1415	1.1342	1.1274	26.5	30.3	35.5	41.9	50.4	64.1	74.2	104.0
313.15	1.2031	1.1862	1.1721	1.1600	1.1490	1.1387	1.1314	1.1246	22.8	26.0	30.3	35.6	42.4	53.4	61.3	85.4
318.15	1.2001	1.1833	1.1692	1.1572	1.1462	1.1359	1.1286	1.1218	20.0	22.5	26.1	30.4	35.9	44.7	50.9	69.4
323.15	1.1971	1.1803	1.1663	1.1543	1.1434	1.1331	1.1259	1.1191	17.6	19.7	22.7	26.2	30.7	37.9	42.8	57.6
328.15	1.1941	1.1774	1.1635	1.1515	1.1407	1.1304	1.1232	1.1164	15.6	17.3	19.9	22.8	26.6	32.4	36.4	48.3
333.15	1.1912	1.1746	1.1606	1.1487	1.1379	1.1277	1.1205	1.1137	13.8	15.3	17.5	20.1	23.2	28.1	31.3	41.5
338.15	1.1882	1.1717	1.1578	1.1460	1.1352	1.1250	1.1178	1.1110	12.5	13.7	15.5	17.7	20.3	24.3	27.0	35.1
343.15	1.1853	1.1688	1.1550	1.1432	1.1325	1.1223	1.1151	1.1084	11.2	12.3	13.6	15.7	18.0	21.4	23.6	30.2
348.15	1.1824	1.1660	1.1522	1.1405	1.1298	1.1196	1.1125	1.1057	10.2	11.1	12.2	14.1	16.0	18.9	20.7	26.3
353.15	1.1795	1.1632	1.1495	1.1378	1.1271	1.1170	1.1098	1.1031	9.2	10.0	11.0	12.7	14.4	16.9	18.4	23.4

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σ / mS cm^{-1}

T / K \ x	0.0501	0.1000	0.1500	0.2001	0.2567	0.2995	0.3500	0.0501
293.15	19.3	15.6	12.7	10.1	7.97	6.23	3.92	3.59
298.15	22.5	18.3	15.0	12.1	9.6	7.62	4.89	4.62
303.15	26.0	21.3	17.6	14.2	11.4	9.12	5.94	5.65
308.15	29.7	24.4	20.3	16.5	13.4	10.8	7.15	6.71
313.15	33.7	27.8	23.3	19.1	15.6	12.6	8.48	8.04
318.15	37.8	31.4	26.5	21.7	17.9	14.6	10.4	9.48
323.15	42.2	35.2	29.9	24.6	20.4	16.8	12.2	11.1

Table S6. Calculated excess molar volumes, V^E, of the binary mixtures composed of di-, tri- and tetra-ethylammonium nitrate plus ethylammonium nitrate, and the respective molar volume, V_m, of the di-, tri- and tetraethylammonium cations

$\{[N_{0\,0\,2\,2}]_x[N_{0\,0\,0\,2}]_{(1-x)}\}[NO_3]$

	V^E/ cm^3 mol^{-1}							V_m / cm^3 mol^{-1}
T / K \ x	0.0499	0.0998	0.1499	0.1999	0.2501	0.2998	0.3501	1
293.15	0.16	0.24	0.40	0.47	0.63	0.55	0.75	122.8
298.15	0.16	0.24	0.39	0.47	0.63	0.54	0.74	123.2
303.15	0.15	0.23	0.39	0.46	0.62	0.52	0.73	123.6
308.15	0.15	0.23	0.38	0.45	0.61	0.51	0.72	124.0
313.15	0.15	0.23	0.38	0.44	0.60	0.50	0.71	124.3
318.15	0.14	0.22	0.37	0.43	0.59	0.49	0.69	124.7
323.15	0.14	0.22	0.36	0.42	0.58	0.48	0.68	125.1
328.15	0.14	0.21	0.36	0.42	0.58	0.48	0.68	125.4
333.15	0.14	0.21	0.36	0.42	0.57	0.47	0.67	125.8
338.15	0.14	0.21	0.35	0.41	0.56	0.46	0.66	126.1
343.15	0.13	0.20	0.34	0.39	0.55	0.44	0.64	126.5
348.15	0.13	0.19	0.33	0.37	0.53	0.41	0.62	127.0
353.15	0.12	0.17	0.30	0.33	0.48	0.35	0.58	127.5

$\{[N_{0\,2\,2\,2}]_x[N_{0\,0\,0\,2}]_{(1-x)}\}[NO_3]$

	V^E / cm^3 mol^{-1}											V_m / cm^3 mol^{-1}
T / K \ x	0.0499	0.0999	0.149	0.1997	0.25	0.2993	0.3475	0.3995	0.4472	0.5003	0.5485	1
293.15	0.40	0.72	1.12	1.11	1.36	1.99	1.69	1.84	2.01	2.07	2.18	149.5
298.15	0.40	0.72	1.11	1.10	1.34	1.97	1.67	1.82	1.99	2.05	2.16	150.0
303.15	0.39	0.71	1.10	1.09	1.33	1.96	1.65	1.80	1.97	2.03	2.14	150.5
308.15	0.39	0.70	1.09	1.08	1.32	1.95	1.64	1.79	1.95	2.01	2.12	150.9
313.15	0.39	0.70	1.09	1.07	1.30	1.94	1.62	1.77	1.93	1.99	2.10	151.4
318.15	0.38	0.69	1.08	1.06	1.29	1.92	1.60	1.75	1.92	1.97	2.08	151.8
323.15	0.38	0.68	1.07	1.05	1.28	1.91	1.59	1.74	1.90	1.95	2.06	152.3
328.15	0.38	0.68	1.07	1.04	1.26	1.90	1.57	1.73	1.88	1.93	2.04	152.8
333.15	0.37	0.68	1.07	1.04	1.26	1.90	1.58	1.73	1.89	-	2.06	153.2

$\{[N_{2\,2\,2\,2}]_x[N_{0\,0\,0\,2}]_{(1-x)}\}[NO_3]$

	V^E / cm^3 mol^{-1}							V_m / cm^3 mol^{-1}
T / K \ x	0.0501	0.1000	0.1500	0.2001	0.2567	0.2995	0.3500	1
293.15	0.60	1.11	1.54	1.96	2.34	2.63	2.84	172.7
298.15	0.60	1.10	1.52	1.94	2.32	2.61	2.82	173.2
303.15	0.59	1.09	1.51	1.92	2.30	2.58	2.79	173.8
308.15	0.59	1.08	1.50	1.91	2.28	2.56	2.77	174.3
313.15	0.58	1.07	1.48	1.89	2.26	2.54	2.74	174.8
318.15	0.58	1.06	1.47	1.87	2.24	2.51	2.72	175.3
323.15	0.57	1.05	1.46	1.86	2.22	2.5	2.69	175.8
328.15	0.57	1.05	1.45	1.85	2.21	2.49	2.69	176.2
333.15	0.56	1.04	1.44	1.84	2.2	2.47	2.67	176.7
338.15	0.56	1.04	1.44	1.83	2.18	2.46	2.65	177.2
343.15	0.56	1.03	1.43	1.83	2.18	2.45	2.65	177.6
348.15	0.55	1.02	1.41	1.80	2.15	2.42	2.61	178.2
353.15	0.55	1.01	1.40	1.79	2.13	2.40	2.59	178.7

2 NOTES AND REFERENCES

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