Preparation of Unsymmetrical Sulfonylureas from N, N'-Sulfuryldiimidazoles.

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1,2-Dimethyl-3-(2-methyl-imidazole-1-sulfonyl)-3H-imidazol-1-ium Triflate (4b):

Using the method described for **4a**, this compound (7.85 g, 91%) was obtained as a white solid from **3b** (5.00 g, 22.1 mmol) and methyl triflate (3.61 g, 22.1 mmol). This compound is hygroscopic and could be used without loss of reactivity. ¹H-NMR (300 MHz, CD₃OD): δ 2.62 (3 H, s), 2.88 (3 H, s), 3.88 (3 H, s), 7.10 (1 H, d, J = 2.1 Hz), 7.76 (1 H, d, J = 2.4 Hz), 7.91 (1 H, d, J = 2.1 Hz), 7.10 (1 H, d, J = 2.1 Hz), 8.29 (1 H, d, J = 2.4 Hz).

2-(2-Methyl-imidazole-1-sulfonyl)-1,2,3,4-tetrahydro-isoquinoline (5b): This

compound (2.14 g, 86%) was obtained as a light brown solid in the same manner as described for **7a** using **4b** (4.68 g, 12.0 mmol) and 1,2,3,4-tetrahydroisoquinoline (1.20 g, 9.0 mmol). Mp 60-61 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.25 (1 H, bs), 2.63 (3 H, s), 2.92 (2 H, t, J = 5.9 Hz), 3.61 (2 H, t, J = 5.9 Hz), 4.49 (2 H, s), 6.91 (1 H, s), 7.06-7.22 (6 H, m). IR (film) 3475, 3154, 3119, 3028, 2937, 1540, 1499, 1382, 1275, 1174, 1076, 1042, 1026 cm⁻¹. Anal. Calcd for C₁₃H₁₅N₃O₂S: C, 56.30; H, 5.45; N, 15.15. Found: C, 56.29; H, 5.42; N, 15.29.

2-(2,3-Dimethyl-imidazole-1-sulfonyl)-1,2,3,4-tetrahydro-isoquinoline (6b): This

compound (2.41 g, 75%) was obtained as a white solid in the same manner as described for **7a** using **5b** (1.94 g, 6.99 mmol) and methyl triflate (1.26 g, 7.69 mmol). ¹H-NMR (300 MHz, CD₃OD): δ 2.96 (3 H, s), 3.10 (2 H, t, J = 5.9 Hz), 3.92-3.96 (5 H, m), 4.81 (2 H, s), 7.29-7.33 (4 H, m), 7.70 (1 H, d, J = 2.4 Hz), 8.04 (1 H, d, J = 2.4 Hz). IR (KBr) 3132, 3027, 1597, 1473, 1417, 1267, 1226, 1192, 1149, 1080, 1032 cm⁻¹. Anal. Calcd for C₁₅H₁₈F₃N₃O₅S₂: C, 40.81; H, 4.11; N, 9.52. Found: C, 40.77; H, 4.16; N, 9.54.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid *p*-Tolylamide (7b): This compound (112 mg, 92%) was obtained as a light brown solid in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and *p*-toluidine (47 mg, 0.44 mmol). Mp 109-110 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.28 (3 H, s), 2.82 (2 H, t, *J*= 6.0 Hz), 3.53 (2 H, t, *J*= 6.0 Hz), 4.47 (2 H, s), 6.52 (1 H, bs), 7.01-7.17 (8 H, m). IR (KBr) 3254, 3021, 2926, 2817, 1513, 1454, 1398, 1337, 1123, 1066, 1024 cm⁻¹. Anal. Calcd for C₁₆H₁₈N₂O₂S: C, 63.55; H, 6.00; N, 9.26. Found: C, 63.28; H, 6.08; N, 9.15.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (4-Methoxy-phenyl)-amide (7c): This compound (122 mg, 96%) was obtained as a light yellow solid in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and *p*-anisidine (54 mg, 0.44 mmol). Mp 54-55 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.81 (2 H, t, *J*= 6.0 Hz), 3.51 (2 H, t, *J*= 5.9 Hz), 3.76 (3 H, s), 4.45 (2 H, s), 6.45 (1 H, bs), 6.79 (2 H, d, *J*= 9.0 Hz), 7.01-7.18 (6 H, m). IR (KBr) 3252, 2933, 2838, 1613, 1509, 1462, 1400, 1338, 1291, 1251, 1153, 1024 cm⁻¹. Anal. Calcd for C₁₆H₁₈N₂O₃S: C, 60.36; H, 5.70; N, 8.80. Found: C, 60.34; H, 5.60; N, 8.93.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (4-Dimethylamino-phenyl)-amide (7d): This compound (79 mg, 58%) was obtained as a tan solid in the same manner as described for **7a** using **6a** (175 mg, 0.41 mmol) and *N,N*-dimethyl-benzene-1,4-diamine (61 mg, 0.45 mmol). Mp 158-159 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.82 (2 H, t, *J*= 5.9 Hz), 2.94 (6 H, s), 3.51 (2 H, t, *J*= 5.9 Hz), 4.45 (2 H, s), 6.76 (1 H, bs), 7.02-7.18 (8 H, m). IR (KBr) 3227, 2920, 2866, 2811, 1612, 1519, 1454, 1334, 1316, 1226, 1141, 1076, 1023 cm⁻¹. Anal. Calcd for C₁₇H₂₁N₃O₂S: C, 61.61; H, 6.39; N, 12.68. Found: C, 61.46; H, 6.46; N, 12.44.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (4-Fluoro-phenyl)-amide (7e): This compound (111 mg, 91%) was obtained as a white solid in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and 4-fluoroaniline (49 mg, 0.44 mmol). Mp 102-103 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.81 (2 H, t, *J*= 5.9 Hz), 3.54 (2 H, t, *J*= 5.9 Hz), 4.47 (2 H, s), 6.73 (1 H, s), 6.92-7.18 (8 H, m). IR (KBr) 3269, 2902, 2842, 1506, 1457, 1397, 1399, 1241, 1214, 1152, 1070, 1024 cm⁻¹. Anal. Calcd for C₁₅H₁₅FN₂O₂S: C, 58.81; H, 4.94; N, 9.14. Found: C, 58.62; H, 4.89; N, 9.10.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (4-Chloro-phenyl)-amide (7f): This compound (118 mg, 89%) was obtained as a tan solid in the same manner as described for **7a** using **6a** (175 mg, 0.41 mmol) and 4-chloroaniline (52 mg, 0.41 mmol). The reaction mixture was heated at 80 °C for 48 h. Mp 107-108 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.83 (2 H, t, *J*= 5.9 Hz), 3.55 (2 H, t, *J*= 5.9 Hz), 4.47 (2 H, s), 6.67 (1 H, s), 7.03-7.26 (8 H, m). IR (KBr) 3237, 3060, 2928, 2866, 1596, 1491, 1462, 1397, 1336, 1273, 1226, 1152, 1092, 1074, 1024 cm⁻¹. Anal. Calcd for C₁₅H₁₅ClN₂O₂S: C, 55.81; H, 4.68; N, 8.68. Found: C, 55.61; H, 4.75; N, 8.54.

4-(3,4-Dihydro-1*H*-isoquinoline-2-sulfonylamino)-benzoic Acid Ethyl Ester (7g): This compound (68.5 mg, 66%) was obtained as a tan white solid in the same manner as described for **7a** using **6a** (123 mg, 0.29 mmol) and 4-amino-benzoic acid ethyl ester (48 mg, 0.29 mmol). Mp 142-143 °C. ¹H-NMR (300 MHz, CDCl₃): δ 1.37 (3 H, t, *J*=7.0 Hz), 2.84 (2 H, t, *J*= 5.9 Hz), 3.59 (2 H, t, *J*= 5.9 Hz), 4.34 (2 H, q, *J*=7.1), 4.50 (2 H, s), 6.99-7.19 (4 H, m), 7.71 (1 H, s), 7.93 (2 H, d, *J*=8.7). IR (KBr) 3220, 3066, 2940, 1694, 1609, 1514, 1480, 1411, 1367, 1342, 1299, 1241, 1154, 1066, 1022 cm⁻¹. Anal. Calcd for C₁₈H₂₀N₂O₄S: C, 59.98; H, 5.59; N, 7.77. Found: C, 59.99; H, 5.68; N, 7.72.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (2-Isopropyl-phenyl)-amide (7h): This compound (110 mg, 83%) was obtained as a colorless oil in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and 2-isopropylaniline (59 mg, 0.44 mmol). ¹H-NMR (300 MHz, CDCl₃): δ 1.23 (6 H, d, *J*= 6.8 Hz), 2.85 (2 H, t, *J*= 5.9 Hz), 3.15 (1 H, septuplet, *J*= 6.8 Hz), 3.58 (2 H, t, *J*= 5.9 Hz), 4.50 (2 H, s), 6.29 (1 H, bs), 7.06-7.24 (8 H, m), 7.40-7.43 (1 H, m). IR (film) 3289, 2965, 2930, 2868, 1495, 1453, 1403, 1333, 1150, 1075, 1024 cm⁻¹. Anal. Calcd for C₁₈H₂₂N₂O₄S: C, 65.42; H, 6.71; N, 8.48. Found: C, 65.53; H, 6.83; N, 8.45.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (2-Methoxy-phenyl)-amide (7i): This compound (109 mg, 86%) was obtained as a light yellow solid in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and *p*-anisidine (54 mg, 0.44 mmol). Mp 96-97 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.74 (2 H, t, *J*= 5.9 Hz), 3.50 (2 H, t, *J*= 5.9 Hz), 3.76 (3 H, s), 4.44 (2 H, s), 6.78 (1 H, d, *J*= 8.0 Hz), 7.00-7.16 (7 H, m), 7.52 (1 H, dd, *J*= 1.6, 7.8). IR (KBr) 3309, 3023, 2964, 2928, 2836, 1598, 1497, 1456, 1410, 1354, 1253, 1168, 1112, 1025 cm⁻¹. Anal. Calcd for C₁₆H₁₈N₂O₃S: C, 60.36; H, 5.70; N, 8.80. Found: C, 60.43; H, 5.77; N, 8.80.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (2-Fluoro-phenyl)-amide (7j): This compound (91 mg, 74%) was obtained as a white solid in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and 2-fluoroaniline (49 mg, 0.44 mmol). Mp 85-86 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.84 (2 H, d, *J*= 5.9 Hz), 3.53 (2 H, t, *J*= 5.9 Hz), 4.46 (2 H, s), 6.66 (1 H, bs), 6.99-7.17 (7 H, m), 7.55-7.61 (1 H, m). IR (KBr) 3261, 3079, 2905, 2853, 1595, 1498, 1462, 1405, 1354, 1256, 1165, 1073, 1022 cm⁻¹. Anal. Calcd for C₁₅H₁₅FN₂O₂S: C, 58.81; H, 4.94; N, 9.14. Found: C, 58.92; H, 4.98; N, 9.10.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (2-Chloro-phenyl)-amide (7k): This compound (92 mg, 71%) was obtained as a white solid in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and 2-chloroaniline (56 mg, 0.44 mmol). The reaction mixture was heated at 80 °C for 48 h. Mp 93-95 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.84 (2 H, t, *J*= 6.0 Hz), 3.54 (2 H, t, *J*= 6.0 Hz), 4.47 (2 H, s), 6.89 (1 H, s), 7.00-7.26 (6 H, m), 7.32 (1 H, d, *J*= 8.0 Hz), 7.66 (1 H, d, *J*= 8.2 Hz). IR (KBr) 3310, 3025, 2937, 2831, 1592, 1482, 1401, 1337, 1155, 1077, 1037, 1025 cm⁻¹. Anal. Calcd for C₁₅H₁₅ClN₂O₂S: C, 55.81; H, 4.68; N, 8.68. Found: C, 56.10; H, 4.84; N, 8.46.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (2,6-Diisopropyl-phenyl)-amide (7l): This compound (55 mg, 48%) was obtained as a white solid in the same manner as described for **7a** using **6a** (132mg, 0.31 mmol) and 2,6-diisopropylaniline (58 mg, 0.31 mmol). Mp 72-73 °C. ¹H-NMR (300 MHz, CDCl₃): δ 1.18 (12 H, d, *J*= 6.8 Hz), 2.97 (2 H, t, *J*= 5.9 Hz), 3.45-3.59 (2 H, m), 3.63 (2 H, t, *J*= 5.9 Hz), 4.55 (2 H, s), 5.93 (1 H, s), 7.08-7.33 (7 H, m). IR (KBr) 3263, 2968, 2873, 1430, 1307, 1132, 1068, 1026, 1008 cm⁻¹. Anal. Calcd for C₂₁H₂₈N₂O₂S: C, 67.71; H, 7.58; N, 7.52. Found: C, 67.88; H, 7.37; N, 7.57.

2-(3,4-Dihydro-1*H*-isoquinoline-2-sulfonylamino)-benzoic Acid Methyl Ester (7m): This compound (96 mg, 69%) was obtained as a colorless oil in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and methyl anthranilate (67 mg, 0.44 mmol). Mp 70-71 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.83 (2 H, t, *J*= 5.9 Hz), 3.58 (2 H, t, *J*= 5.9 Hz), 3.91 (3 H, s), 4.49 (2 H, s), 7.01-7.16 (5 H, m), 7.95 (1 H, d, *J*= 1.5 Hz), 7.47 (1 H, td, *J*= 1.5, 8.0 Hz), 7.97 (1 H, d, *J*= 1.4 Hz), 10.56 (1 H, s). IR (film) 3212, 3067, 3026, 2954, 2850, 1694, 1682, 1605, 1585, 1495, 1455, 1312, 1260, 1152, 1088

cm⁻¹. Anal. Calcd for C₁₇H₁₈N₂O₄S: C, 58.94; H, 5.24; N, 8.09. Found: C, 59.08; H, 5.24; N, 8.09.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Methyl-phenyl-amide (8a): This compound (82 mg, 90%) was obtained as a white solid in the same manner as described for **7a** using **6a** (129 mg, 0.30 mmol) and N-methylaniline (33 μ L, 0.30 mmol). Mp 81 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.83 (2 H, t, *J*= 5.9 Hz), 3.30 (3 H, s), 3.48 (2 H, t, *J*= 5.9 Hz), 4.43 (2 H, s), 7.02-7.43 (9 H, m). IR (KBr) 3069, 3026, 2927, 2844, 1595, 1496, 1457, 1357, 1271, 1172, 1148, 1067, 1024 cm⁻¹. Anal. Calcd for C₁₆H₁₈N₂O₂S: C, 63.55; H, 6.00; N, 9.26. Found: C, 63.56; H, 6.11; N, 9.15.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Methyl-*p*-tolyl-amide (8b): This compound (120 mg, 95%) was obtained as a yellow oil in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and N-methyl-*p*-toluidine (53 mg, 0.44 mmol). ¹H-NMR (300 MHz, CDCl₃): δ 2.33 (3 H, s), 2.83 (2 H, t, *J*= 6.0 Hz), 3.26 (3 H, s), 3.46 (2 H, t, *J*= 6.0 Hz), 4.41 (2 H, s), 7.00-7.29 (8 H, m). IR (film) 3027, 2925, 2850, 1512, 1455, 1361, 1336, 1272, 1149, 1068 cm⁻¹. Anal. Calcd for C₁₇H₂₀N₂O₂S: C, 64.53; H, 6.37; N, 8.85. Found: C, 64.68; H, 6.44; N, 8.82.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (4-Methoxy-phenyl)-methyl-amide (8c): This compound (92 mg, 91%) was obtained as a yellow oil in the same manner as described for **7a** using **6a** (130 mg, 0.30 mmol) and N-methyl-*p*-anisidine (42 mg, 0.30 mmol). ¹H-NMR (300 MHz, CDCl₃): δ 2.33 (3 H, s), 2.83 (2 H, t, *J*= 6.0 Hz), 3.26 (3 H, s), 3.46 (2 H, t, *J*= 6.0 Hz), 4.41 (2 H, s), 7.00-7.29 (8 H, m). IR (film) 3010, 2934, 2838, 1608, 1511, 1454, 1334, 1248, 1147 cm⁻¹. Anal. Calcd for C₁₇H₂₀N₂O₃S: C, 61.42; H, 6.06; N, 8.43. Found: C, 61.51; H, 6.33; N, 8.44.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (4-Fluoro-phenyl)-methyl-amide (8d):

This compound (119 mg, 93%) was obtained as a yellow oil in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and N-methyl-4-fluoro-aniline (55 mg, 0.44 mmol). ¹H-NMR (300 MHz, CDCl₃): δ 2.83 (2 H, t, *J* = 5.9 Hz), 3.24 (3 H, s), 3.48 (2 H, t, *J* = 5.9 Hz), 4.41 (2 H, s), 7.02-7.20 (6 H, m), 7.35 (2 H, dd, *J* = 4.9, 8.9 Hz). IR (film) 3068, 3024, 2932, 2859, 1506, 1454, 1361, 1219, 1147, 1066, 1024 cm⁻¹. Anal. Calcd for C₁₆H₁₇FN₂O₂S: C, 59.98; H, 5.35; N, 8.74. Found: C, 60.12; H, 5.31; N, 8.63.

4-[(3,4-Dihydro-1*H*-isoquinoline-2-sulfonyl)-methyl-amino]-benzoic Acid Methyl Ester (8e):

This compound (103 mg, 70%) was obtained as a colorless oil in the same manner as described for **7a** using **6a** (175 mg, 0.41 mmol) and methyl 4-(methylamino) benzoate (68 mg, 0.41 mmol). ¹H-NMR (300 MHz, CDCl₃): δ 2.82 (2 H, t, *J* = 5.9 Hz), 3.34 (3 H, s), 3.48 (2 H, t, *J* = 5.9 Hz), 3.90 (3 H, s), 4.41 (2 H, s), 7.00-7.18 (4 H, m), 7.44 (2 H, d, *J* = 8.7 Hz), 8.00 (2 H, d, *J* = 8.9 Hz). IR (film) 3626, 3417, 2951, 1929, 1714, 1606, 1505, 1434, 1360, 1152, 1064, 1017 cm⁻¹. Anal. Calcd for C₁₈H₂₀N₂O₄S: C, 59.98; H, 5.59; N, 7.77. Found: C, 60.01; H, 5.61; N, 7.74.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Methyl-*o*-tolyl-amide (8f):

This compound (111 mg, 87%) was obtained as a colorless oil in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and N-methyl *o*-toluidine (53 mg, 0.44 mmol). ¹H-NMR (300 MHz, CDCl₃): δ 2.40 (3 H, s), 2.90 (2 H, t, *J* = 5.9 Hz), 3.14 (3 H, s), 3.59 (2 H, t, *J* = 5.9 Hz), 4.51 (2 H, s), 7.02-7.20 (7 H, m), 7.41 (1 H, d, *J* = 6.4 Hz). IR (film) 3064, 3024, 2930, 2857, 1494, 1454, 1334, 1272, 1146, 1064, 1024 cm⁻¹. Anal. Calcd for C₁₇H₂₀N₂O₂S: C, 64.53; H, 6.37; N, 8.85. Found: C, 64.29; H, 6.37; N, 8.85.

2-[(3,4-Dihydro-1*H*-isoquinoline-2-sulfonyl)-methyl-amino]-benzoic Acid Methyl

Ester (8g): This compound (67.6 mg, 50%) was obtained as a tan oil in the same manner as described for **7a** using **6a** (175 mg, 0.41 mmol) and methyl-*N*-methyl-anthranilate (68 mg, 0.41 mmol). ¹H-NMR (300 MHz, CDCl₃): δ 2.86 (2 H, t, *J*= 5.9 Hz), 3.28 (3 H, s), 3.51 (2 H, t, *J*= 5.9 Hz), 3.86 (3 H, s), 4.44 (2 H, s), 7.04-7.56 (7 H, m), 7.81 (1 H, d, *J*=7.2 Hz). IR (film) 3024, 2950, 2844, 1732, 1599, 1494, 1454, 1286, 1148, 1025 cm⁻¹. Anal. Calcd for C₁₈H₂₀N₂O₄S: C, 59.98; H, 5.59; N, 7.77. Found: C, 59.86; H, 5.61; N, 7.76.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Butylamide (9a) from Triflate Salt 6a:

This compound (34 mg, 32%) was obtained as a waxy white solid in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and *n*-butyl amine (32 mg, 0.44 mmol). Mp 38-39 °C ¹H-NMR (300 MHz, CDCl₃): δ 0.89 (3 H, t, *J*= 7.2 Hz), 1.26-1.40 (2 H, m), 1.46-1.55 (2 H, m), 2.96 (2 H, t, *J*= 6.0 Hz), 3.04 (2 H, t, *J*= 7.2 Hz), 3.53 (2 H, t, *J*= 6.0 Hz), 4.35 (1 H, bs), 4.42 (2 H, s), 7.07-7.20 (4 H, m). IR (film) 3300, 2959, 2932, 2873, 1499, 1454, 1482, 1327, 1155, 1071, 1024 cm⁻¹. Anal. Calcd for C₁₃H₂₀N₂O₂S: C, 58.18; H, 7.51; N, 10.44. Found: C, 58.47; H, 7.66; N, 10.30.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Butylamide (9a) from Triflate Salt 6b:

This compound (90 mg, 89%) was obtained as a waxy white solid in the same manner as described for **7a** using **6b** (166 mg, 0.38 mmol) and *n*-butyl amine (32 mg, 0.44 mmol).

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Benzylamide (9b) from Triflate Salt

6a: This compound (38 mg, 50%) was obtained as a white solid in the same manner as described for **7a** using **6a** (108 mg, 0.25 mmol) and benzylamine amine (27 mg, 0.25 mmol). Mp 123-124 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.91 (2 H, t, *J*= 5.9 Hz), 3.52 (2

H, t, $J=5.9$ Hz), 4.22 (2 H, s), 4.41 (2 H, s), 4.50 (1 H, bs), 7.05-7.34 (9 H, m). IR (KBr) 3283, 3064, 3032, 2931, 2901, 1498, 1456, 1334, 1141, 1079, 1051, 1025 cm^{-1} . Anal. Calcd for $\text{C}_{16}\text{H}_{18}\text{N}_2\text{O}_2\text{S}$: C, 63.55; H, 6.00; N, 9.26. Found: C, 63.49; H, 6.06; N, 9.18.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Benzylamide (9b) from Triflate Salt

6b: This compound (106 mg, 93%) was obtained as a white solid in the same manner as described for **7a** using **6b** (166 mg, 0.38 mmol) and benzylamine amine (47 mg, 0.44 mmol).

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Isopropylamide (9c): This compound (85 mg, 89%) was obtained as a colorless oil in the same manner as described for **7a** using **6b** (166 mg, 0.38 mmol) and isopropyl amine (26 mg, 0.44 mmol). ^1H -NMR (300 MHz, CDCl_3): δ 1.20 (6 H, d, $J=6.6$ Hz), 2.96 (2 H, 5.9 Hz), 3.49-3.60 (3 H, m), 4.05 (1 H, bs), 4.41 (2 H, s), 7.07-7.20 (4 H, m). IR (film) 3289, 2975, 2933, 1498, 1429, 1330, 1140 cm^{-1} . Anal. Calcd for $\text{C}_{12}\text{H}_{18}\text{N}_2\text{O}_2\text{S}$: C, 56.67; H, 7.13; N, 11.01. Found: C, 56.63; H, 7.15; N, 10.89.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Cyclopentylamide (9d) from Triflate

Salt 6a: This compound (38 mg, 34%) was obtained as a colorless oil in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and cyclopentyl amine (37 mg, 0.44 mmol). ^1H -NMR (300 MHz, CDCl_3): δ 1.43-1.69 (6 H, m), 1.88-1.96 (2 H, m), 2.96 (2 H, t, $J=5.9$ Hz), 3.52 (2 H, t, $J=5.9$ Hz), 3.69 (1 H, pentuplet, $J=6.4$ Hz), 4.35 (1 H, bs), 4.41 (2 H, s), 7.07-7.20 (4 H, m). IR (film) 3288, 2961, 2871, 1498, 1456, 1319, 1149, 1070, 1024 cm^{-1} . Anal. Calcd for $\text{C}_{14}\text{H}_{20}\text{N}_2\text{O}_2\text{S}$: C, 59.97; H, 7.19; N, 9.99. Found: C, 60.27; H, 7.42; N, 9.92.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Cyclopentylamide (9d) from Triflate

Salt 6b: This compound (95 mg, 90%) was obtained as a colorless oil in the same manner as described for **7a** using **6b** (166 mg, 0.38 mmol) and cyclopentyl amine (37 mg, 0.44 mmol).

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid *tert*-Butylamide (9e) from Triflate Salt

6a: This compound (43mg, 50%) was obtained as a white solid in the same manner as described for **7a** using **6a** (139 mg, 0.33 mmol) and *tert*-butyl amine (24 mg, 0.33 mmol).

Mp 72-73 °C. ¹H-NMR (300 MHz, CDCl₃): δ 1.34 (9 H, s), 2.96 (2 H, t, *J*= 6.0 Hz), 3.51 (2 H, t, *J*= 6.0 Hz), 4.41 (2 H, s), 7.08-7.20 (5 H, m). IR (KBr) 3363, 3027, 2968, 2873, 1498, 1477, 1430, 1307, 1238, 1214, 1132, 1068, 1026, 1008 cm⁻¹. Anal. Calcd for C₁₃H₂₀N₂O₂S: C, 58.18; H, 7.51; N, 10.44. Found: C, 57.94; H, 7.58; N, 10.36.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid *tert*-Butylamide (9e) from Triflate Salt

6b: This compound (88 mg, 87%) was obtained as a white solid in the same manner as described for **7a** using **6b** (166 mg, 0.38 mmol) and *tert*-butyl amine (32 mg, 0.44 mmol).

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Benzyl-methyl-amide (16a) from

Triflate Salt 6a: This compound (58mg, 60%) was obtained as a white solid in the same manner as described for **7a** using **6a** (130 mg, 0.30 mmol) and N-methylbenzylamine (37 mg, 0.30 mmol). Mp 84-85 °C. ¹H-NMR (300 MHz, CDCl₃): δ 2.73 (3 H, s), 2.96 (2 H, t, *J*= 5.9 Hz), 3.58 (2 H, t, *J*= 5.9 Hz), 4.36 (2 H, s), 4.45 (2 H, s), 7.07-7.33 (9 H, m). IR (KBr) 3065, 3031, 2928, 1498, 1455, 1338, 1153, 1072, 1024 cm⁻¹. Anal. Calcd for C₁₇H₂₀N₂O₂S: C, 64.53; H, 6.37; N, 8.85. Found: C, 64.66; H, 6.27; N, 8.72.

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Benzyl-methyl-amide (16a) from

Triflate Salt 6b: This compound (120 mg, 94%) was obtained as a white solid in the

same manner as described for **7a** using **6b** (176 mg, 0.40 mmol) and N-methylbenzylamine (53 mg, 0.44 mmol).

3,4-Dihydro-1H-isoquinoline-2-sulfonic Acid Butyl-methyl-amide (16b): This compound (108 mg, 96%) was obtained as a colorless oil in the same manner as described for **7a** using **6b** (176 mg, 0.40 mmol) and N-methyl-butylamine (38 mg, 0.44 mmol). ¹H-NMR (300 MHz, CDCl₃): δ 0.92 (3 H, t, *J* = 6.7 Hz), 1.27-1.39 (2 H, m), 1.52-1.62 (2 H, m), 2.82 (3 H, s), 2.94 (2 H, t, *J* = 5.9 Hz), 3.19 (2 H, t, *J* = 7.5 Hz), 3.50 (2 H, t, *J* = 5.9 Hz), 4.38 (2 H, s), 7.06-7.20 (4 H, m). IR (film) 3023, 2959, 2932, 2871, 1498, 1455, 1330, 1147 cm⁻¹. Anal. Calcd for C₁₄H₂₂N₂O₂S (%): C, 59.54; H, 7.85; N, 9.92. Found: C, 59.29; H, 7.85; N, 9.92.

3,4-Dihydro-1H-isoquinoline-2-sulfonic Acid Isopropyl-methyl-amide (16c): This compound (96 mg, 90%) was obtained as a colorless oil in the same manner as described for **7a** using **6b** (176 mg, 0.40 mmol) and N-methylisopropylamine (32 mg, 0.44 mmol). ¹H-NMR (300 MHz, CDCl₃): δ 1.17 (6 H, d, *J* = 6.7 Hz), 2.74 (3 H, s), 2.94 (2 H, t, *J* = 5.9 Hz), 3.46 (2 H, t, *J* = 5.9 Hz), 4.10 (1 H, septuplet, *J* = 6.8 Hz), 4.36 (2 H, s), 7.06-7.20 (4 H, m). IR (film) 3024, 2977, 2933, 1498, 1455, 1327, 1195, 1141 cm⁻¹. Anal. Calcd for C₁₃H₂₀N₂O₂S: C, 58.18; H, 7.51; N, 10.44. Found: C, 58.03; H, 7.33; N, 10.19.

3,4-Dihydro-1H-isoquinoline-2-sulfonic Acid *tert*-Butyl-methyl-amide (16d) from Triflate Salt 6a: This compound (53 mg, 47%) contaminated with compound **14** in a ratio of 86:14 (**16d**/**14**) determined by ¹H NMR was obtained as a colorless oil in the same manner as described for **7a** using **6a** (171 mg, 0.40 mmol) and N-methyl-*tert*-butylamine (38 mg, 0.44 mmol). ¹H-NMR (300 MHz, CDCl₃): δ 1.42 (9 H, s), 2.87 (3 H,

s), 2.94 (2 H, t, J = 5.9 Hz), 3.47 (2 H, t, J = 5.9 Hz), 3.55 (t, J = 5.9 Hz, **14**), 4.36 (2 H, s), 4.45 (s, **14**), 7.09-7.23 (4 H, m).

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid *tert*-Butyl-methyl-amide (16d) from Triflate Salt 6b: This compound (69 mg, 65%) was obtained as a colorless oil in the same manner as described for **7a** using **6b** (176 mg, 0.40 mmol) and N-methyl-*tert*-butylamine (38 mg, 0.44 mmol). $^1\text{H-NMR}$ (300 MHz, CDCl_3): δ 1.42 (9 H, s), 2.87 (3 H, s), 2.94 (2 H, t, J = 5.9 Hz), 3.47 (2 H, t, J = 5.9 Hz), 4.36 (2 H, s), 7.09-7.23 (4 H, m). IR (film) 3020, 2982, 2932, 2843, 1498, 1455, 1368, 1326, 1269, 1201, 1142, 1069 cm^{-1} . Anal. Calcd for $\text{C}_{14}\text{H}_{22}\text{N}_2\text{O}_2\text{S}$: C, 59.54; H, 7.85; N, 9.92. Found: C, 59.71; H, 8.08; N, 9.93.

O=C1CCN(S(=O)(=O)N2CCc3ccccc3CC2)CC1 CNCCOC(=O)NC(=O)NS(=O)(=O)N1CCc2ccccc2C1

N,N'-sulfonyl Bis-2-methylimidazole (3b)

3-(Imidazole-1-sulfonyl)-1-methyl-3H-imidazol-1-ium Triflate (4a)

Cc1ccn(c1)S(=O)(=O)n2cc(C)nc2.[O-]S(=O)(=O)F
4b

2-(2-Methyl-imidazole-1-sulfonyl)-1,2,3,4-tetrahydro-isoquinoline (5b)

2-(3-Methyl-imidazole-1-sulfonyl)-1,2,3,4-tetrahydro-isoquinoline Triflate (6a)

2-(2,3-Dimethyl-imidazole-1-sulfonyl)-1,2,3,4-tetrahydro-isoquinoline (6b)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Phenylamide (7a)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid *p*-Tolylamide (7b)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (4-Methoxy-phenyl)-amide (7c)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (4-dimethylamino-phenyl)-amide (7d)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (4-Fluoro-phenyl)-amide (7e)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (4-Chloro-phenyl)-amide (7f)

4-(3,4-Dihydro-1*H*-isoquinoline-2-sulfonylamino)-benzoic Acid Ethyl Ester (7g)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (2-Isopropyl-phenyl)-amide (7h)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (2-Methoxy-phenyl)-amide (7i)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (2-Fluoro-phenyl)-amide (7j)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (2-Chloro-phenyl)-amide (7k)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (2,6-Diisopropyl-phenyl)-amide (71)

2-(3,4-Dihydro-1*H*-isoquinoline-2-sulfonylamino)-benzoic Acid Methyl Ester (7m)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Methyl-phenyl-amide (8a)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Methyl-*p*-tolyl-amide (8b)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (4-Methoxy-phenyl)-methyl-amide (8c)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid (4-Fluoro-phenyl)-methyl-amide (8d)

4-[(3,4-Dihydro-1*H*-isoquinoline-2-sulfonyl)-methyl-amino]-benzoic Acid Methyl Ester (8e)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Methyl-*o*-tolyl-amide (8f)

2-[(3,4-Dihydro-1*H*-isoquinoline-2-sulfonyl)-methyl-amino]-benzoic Acid Methyl Ester (8g)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Butylamide (9a) from Triflate Salt 6a

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Benzylamide (9b) from Triflate Salt 6b

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Isopropylamide (9c)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Cyclopentylamide (9d) from Triflate Salt 6a

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid *tert*-Butylamide (9e) from Triflate Salt 6a

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Benzyl-methyl-amide (16a) from Triflate Salt 6a

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Butyl-methyl-amide (16b)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Isopropyl-methyl-amide (16c)

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid *tert*-Butyl-methyl-amide (16d) from Triflate Salt 6a

3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid *tert*-Butyl-methyl-amide (16d) from Triflate Salt 6b

LC/MS of reaction mixture for 3,4-Dihydro-1*H*-isoquinoline-2-sulfonic acid Butylamide (9a) from Triflate Salt 6a

Wednesday, October 30, 2002

Info for pane 2: 110-130-rx2 (SBeaudoin)

Period 1, Expt. 1; Mass range: 100.0 to 800.0 by 0.1 amu; Dwell: 0.2 ms; Pause: 5.0 ms

Acq. Time: Thu, Jun 27, 2002 at 10:07:46 AM; Samp. Name: 110-130-rx2

Integrated Peak List from:"214 nm" from 110-130-rx2

6 peaks

Peak num.	RT (min)	Area	%Area	Height	%Height	Start (min)	End (min)	Width (min)	Baseline Type
1	0.13	3.082e2	14.318	1.060e2	14.618	0.09	0.20	0.11	Base to Base
2	0.82	2.626e1	1.220	7.419e0	1.023	0.75	0.84	0.09	Base to Base
3	1.11	3.180e2	14.771	9.813e1	13.537	1.04	1.18	0.15	Base to Base
4	1.26	8.121e2	37.727	2.550e2	35.183	1.19	1.33	0.14	Base to Base
5	1.62	6.170e2	28.662	2.302e2	31.760	1.54	1.67	0.13	Base to Base
6	1.76	7.109e1	3.302	2.811e1	3.878	1.70	1.80	0.09	Base to Base

LC/MS of reaction mixture for 3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid Benzylamide (9b) from Triflate Salt 6b

MultiView 1.5

Thursday, October 31, 2002 1:22 PM

page 1 of 1

Info for pane 4: 117-70-2rxn3 (KKinsey)

Period 1, Expt. 1; Mass range: 100.0 to 800.0 by 0.1 amu; Dwell: 0.2 ms; Pause: 5.0 ms

Acq. Time: Fri, May 24, 2002 at 11:28:21 AM; Samp. Name: 117-70-2rxn3

Integrated Peak List from:"214 nm" from 117-70-2rxn3

7 peaks

Peak num.	RT (min)	Area	%Area	Height	%Height	Start (min)	End (min)	Width (min)	Baseline Type
1	1.05	4.041e2	6.016	1.886e2	7.291	1.00	1.09	0.09	Valley
2	1.12	9.331e2	13.891	4.345e2	16.796	1.09	1.17	0.08	Valley
3	1.20	1.047e3	15.583	3.402e2	13.150	1.17	1.28	0.11	Valley
4	1.32	1.673e3	24.902	6.397e2	24.724	1.28	1.40	0.12	Valley
5	1.44	1.790e1	0.266	1.392e1	0.538	1.42	1.45	0.03	Valley
6	1.47	3.076e1	0.458	1.519e1	0.587	1.45	1.57	0.12	Valley
7	1.63	2.612e3	38.883	9.550e2	36.914	1.57	2.47	0.90	Valley

LC/MS of reaction mixture for 3,4-Dihydro-1*H*-isoquinoline-2-sulfonic acid Cyclopentylamide (9d) from Triflate Salt 6a

Wednesday, October 30, 2002

Info for pane 2: Bunching Factor = 1, Noise Threshold = 1.500, Area Threshold = 1.500

Width Ratio = 0.200, Valley to Peak Ratio = 0.010

Peak Height Ratio = 5.000, Adjusted Height Ratio = 4.000, Valley Height Ratio = 3.000

Integrated Peak List from: "214 nm" from 110-131 5 peaks

Peak num.	RT (min)	Area	%Area	Height	%Height	Start (min)	End (min)	Width (min)	Baseline Type
1	0.12	9.413e1	6.210	4.375e1	8.339	0.09	0.17	0.08	Base to Base
2	0.90	3.845e2	25.367	9.296e1	17.719	0.82	0.98	0.16	Base to Base
3	1.10	1.974e2	13.024	7.000e1	13.342	1.03	1.16	0.13	Base to Base
4	1.23	5.785e2	38.171	2.052e2	39.113	1.17	1.29	0.13	Base to Base
5	1.62	2.611e2	17.227	1.127e2	21.487	1.56	1.67	0.11	Base to Base

LC/MS of reaction mixture for 3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid *tert*-Butylamide (9e) from Triflate Salt 6a

MultiView 1.5

Thursday, October 31, 2002 1:37 PM

page 1 of 1

Info for pane 2: Bunching Factor = 1, Noise Threshold = 0.500, Area Threshold = 0.500

Width Ratio = 0.200, Valley to Peak Ratio = 0.010

Peak Height Ratio = 5.000, Adjusted Height Ratio = 4.000, Valley Height Ratio = 3.000

Integrated Peak List from:"254 nm" from 117-73-5rxn3

3 peaks

Peak num.	RT (min)	Area	%Area	Height	%Height	Start (min)	End (min)	Width (min)	Baseline Type
1	0.14	4.602e0	12.263	2.714e0	12.810	0.12	0.16	0.04	Base to B ₂
2	1.23	1.687e1	44.971	9.591e0	45.263	1.19	1.26	0.07	Base to B ₂
3	1.68	1.605e1	42.766	8.884e0	41.927	1.64	1.72	0.08	Base to B ₂

LC/MS of reaction mixture for 3,4-Dihydro-1*H*-isoquinoline-2-sulfonic Acid *tert*-Butyl-methyl-amide (16d) from Triflate Salt 6a

Wednesday, October 30, 2002

Info for pane 2: Bunching Factor = 1, Noise Threshold = 1.500, Area Threshold = 1.500

Width Ratio = 0.200, Valley to Peak Ratio = 0.010

Peak Height Ratio = 5.000, Adjusted Height Ratio = 4.000, Valley Height Ratio = 3.000

Integrated Peak List from: "214 nm" from 110-132-rx2 4 peaks

Peak num.	RT (min)	Area	%Area	Height	%Height	Start (min)	End (min)	Width (min)	Baseline Type
1	0.13	4.474e2	24.768	1.549e2	23.282	0.09	0.21	0.11	Base to Base
2	0.92	2.836e2	15.700	7.697e1	11.570	0.85	0.99	0.15	Base to Base
3	1.67	7.738e2	42.835	3.130e2	47.055	1.60	1.71	0.11	Valley
4	1.75	3.016e2	16.697	1.204e2	18.093	1.71	1.80	0.09	Valley