

CHEMPHYSCHEM

Supporting Information

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Supporting Information

Synthesis, Characterization and Properties of New Ionic Liquids Based on Alkyl(Alkenyl)trifluoroborates

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1-Ethyl-3-methylimidazolium methyltrifluoroborate (EMI[CH₃BF₃]). ¹H NMR: δ = -0.44 (s, 3H), 1.54 (t, J = 7.4Hz, 3H), 4.04 (s, 3H), 4.39 (q, J = 7.3Hz, 2H), 7.75 (s, 1H), 7.83 (s, 1H), 9.48 ppm (s, 1H); ¹⁹F NMR: δ = 132.4 ppm (q, 1J (B,F) = 60.9Hz); ¹¹B NMR: δ = 5.94 ppm (q, 1J (B,F) = 61.6Hz).

1-Ethyl-3-methylimidazolium ethyltrifluoroborate (EMI[C₂H₅BF₃]). ¹H NMR: δ = 0.11 (s, 2H), 0.78 (t, J = 6.8Hz, 3H), 1.53 (t, J = 7.4Hz, 3H), 4.05 (s, 3H), 4.40 (q, J = 7.3Hz, 2H), 7.78 (s, 1H), 7.88 (s, 1H), 9.61 ppm (s, 1H); ¹⁹F NMR: δ = -139.8 ppm (q, 1J (B,F) = 62.0Hz); ¹¹B NMR: δ = 6.12 ppm (q, 1J (B,F) = 63.8Hz).

1-Ethyl-3-methylimidazolium *n*-propyltrifluoroborate (EMI[*n*-C₃H₇BF₃]). ¹H NMR: δ = 0.15 (s, 2H), 0.86 (t, J = 7.2Hz, 3H), 1.29 (m, 2H), 1.54 (t, J = 7.4Hz, 3H), 4.03 (s, 3H), 4.38 (q, J = 7.3Hz, 2H), 7.72 (s, 1H), 7.80 (s, 1H), 9.30 ppm (s, 1H); ¹⁹F NMR: δ = -137.8 ppm (q, 1J (B,F) = 58.9Hz); ¹¹B NMR: δ = 6.12 ppm (q, 1J (B,F) = 62.6Hz).

1-Ethyl-3-methylimidazolium *n*-butyltrifluoroborate (EMI[*n*-C₄H₉BF₃]). ¹H NMR: δ = 0.15 (s, 2H), 0.83 (br s, 3H), 1.26 (m, 4H), 1.54 (t, J = 7.4Hz, 3H), 4.04 (s, 3H), 4.38 (q, J = 7.3Hz, 2H), 7.72 (s, 1H), 7.80 (s, 1H), 9.36 ppm (s, 1H); ¹⁹F NMR: δ = -137.8 ppm (q, 1J (B,F) = 60.0Hz); ¹¹B NMR: δ = 5.98 ppm (q, 1J (B,F) = 63.5Hz).

1-Ethyl-3-methylimidazolium *n*-pentyltrifluoroborate (EMI[*n*-C₅H₁₁BF₃]). ¹H NMR: δ = 0.144 (s, 2H), 0.84 (t, *J* = 7.4Hz, 3H), 1.25 (br s, 3 × 2H), 1.54 (t, *J* = 7.2 Hz, 3H), 4.03 (s, 3H), 4.38 (q, *J* = 7.3Hz, 2H), 7.72 (s, 1H), 7.79 (s, 1H), 9.23 ppm (s, 1H); ¹⁹F NMR: δ = −137.8 ppm (br s); ¹¹B NMR: δ = 5.99 ppm (q, ¹*J* (B,F) = 63.3Hz).

1-Ethyl-3-methylimidazolium vinyltrifluoroborate (EMI[CH₂CHBF₃]). ¹H NMR: δ = 1.54 (t, *J* = 7.4Hz, 3H), 4.05 (s, 3H), 4.42 (q, *J* = 7.3Hz, 2H), 5.11 (br s, 1H), 5.25 (br s, 1H), 7.78 (s, 1H), 7.87 (s, 1H), 9.65 ppm (s, 1H). ¹⁹F NMR: δ = −140.2 ppm (q, ¹*J* (B,F) = 55.0Hz, 3F; BF₃). ¹¹B NMR: δ = 3.22 ppm (q, ¹*J* (B,F) = 54.4 Hz, BF₃).

1-Ethyl-3-methylimidazolium trifluorovinyltrifluoroborate (EMI[CF₂CFBF₃]). ¹H NMR: δ = 1.57 (t, *J* = 7.4Hz, 3H), 4.04 (s, 3H), 4.38 (q, *J* = 7.2Hz, 2H), 7.68 (s, 1H), 7.76 (s, 1H), 8.97 ppm (s, 1H); ¹⁹F NMR: δ = −103.2 ppm (br s, 1F), 125.3 (m, 1F), 143.0 (q, ¹*J*(B,F) = 39 Hz, 3F), 194.2 ppm (br s, 1F); ¹¹B NMR: δ = 1.31 ppm (qdd, ¹*J* (B,F) = 40 Hz, ²*J* (B,F-1) = 24 Hz, ³*J* (B,trans-F-2) = 7 Hz).