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## Supporting Information

### Excess Molar Volume and Viscosity Deviation of [C<sub>2</sub>mim][NTf<sub>2</sub>] / [C<sub>4</sub>mim][NTf<sub>2</sub>] + DMC / DEC

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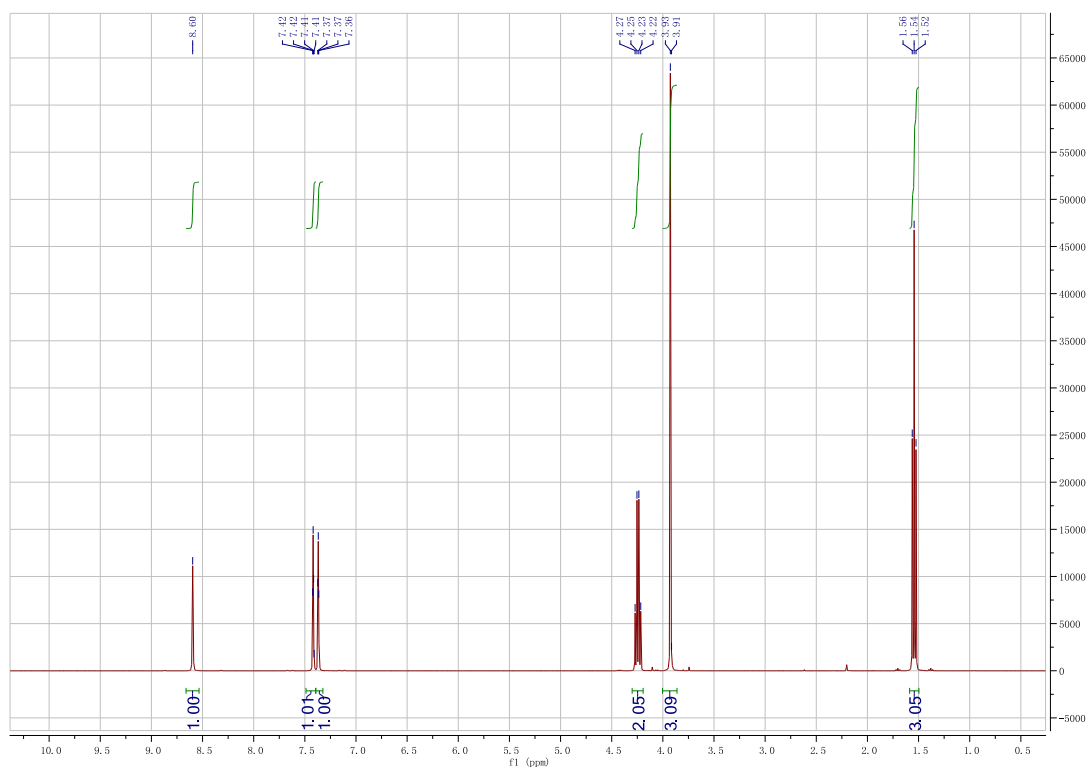


Figure S1.  $^1\text{H}$  NMR of  $[\text{C}_2\text{mim}][\text{NTf}_2]$ .

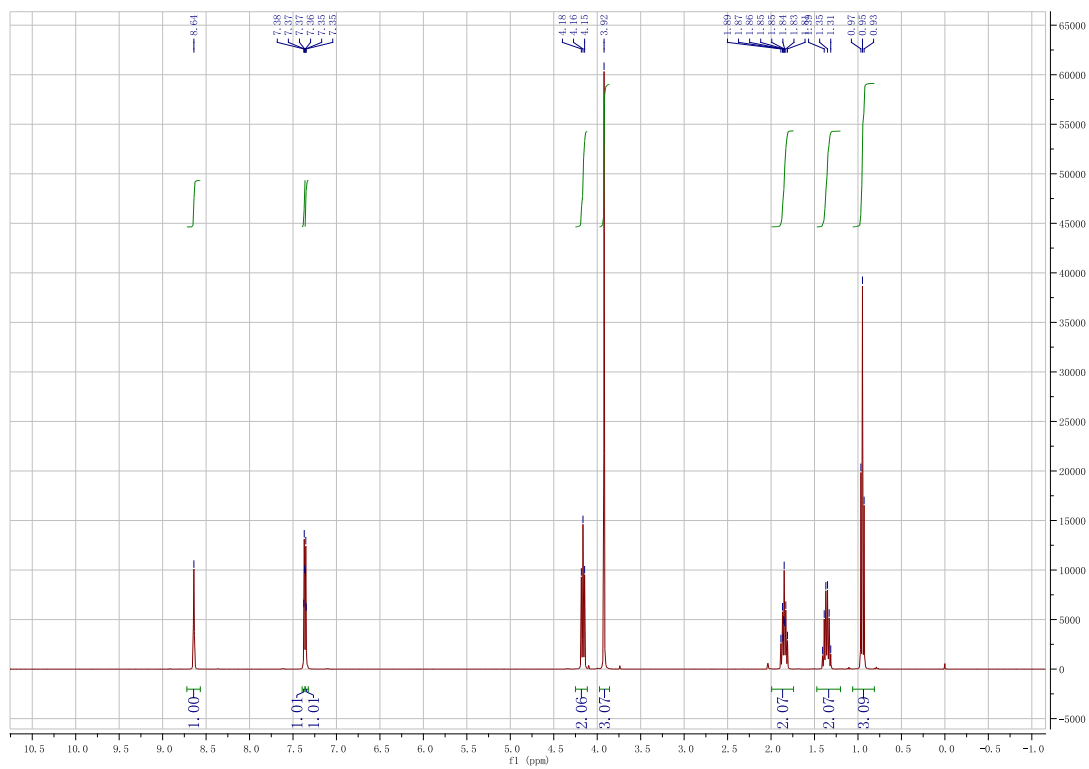


Figure S2.  $^1\text{H}$  NMR of  $[\text{C}_4\text{mim}][\text{NTf}_2]$ .

**Table S1. Shear rates,  $s^{-1}$ , of ILs + solvents at different mole fractions from 288.15K to 328.15K at atmospheric pressure ( $p=101.3kPa$ )**

| $x_{IL} \backslash T/K$                       | 288.15 | 293.15 | 298.15 | 303.15 | 308.15 | 313.15 | 318.15 | 323.15 | 328.15 |
|-----------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| [C <sub>2</sub> mim][NTf <sub>2</sub> ] + DMC |        |        |        |        |        |        |        |        |        |
| 0.0000                                        | 451.7  | 464.3  | 455.4  | 462.7  | 467.7  | 716.5  | 754.4  | 791.4  | 828.3  |
| 0.0989                                        | 419.9  | 456.4  | 452.1  | 454.9  | 448.8  | 448.7  | 452.1  | 451.5  | 446.3  |
| 0.1983                                        | 224.6  | 247.8  | 272.1  | 297.2  | 322.8  | 349.1  | 376.3  | 404.0  | 432.5  |
| 0.2973                                        | 132.2  | 148.2  | 166.6  | 184.3  | 203.2  | 222.1  | 242.1  | 262.5  | 283.6  |
| 0.3958                                        | 108.5  | 99.30  | 111.2  | 124.7  | 138.0  | 158.8  | 168.8  | 184.7  | 199.4  |
| 0.4960                                        | 56.61  | 65.35  | 74.63  | 84.65  | 95.17  | 106.2  | 117.7  | 129.7  | 142.3  |
| 0.5954                                        | 114.5  | 108.8  | 107.2  | 107.6  | 108.2  | 105.6  | 108.9  | 101.0  | 117.0  |
| 0.6967                                        | 103.1  | 122.2  | 113.9  | 108.8  | 108.8  | 105.7  | 105.5  | 102.8  | 105.5  |
| 0.7982                                        | 77.07  | 92.28  | 109.1  | 117.7  | 111.0  | 108.5  | 107.3  | 105.9  | 104.9  |
| 0.9004                                        | 59.95  | 72.53  | 86.54  | 102.0  | 119.1  | 113.0  | 108.0  | 105.4  | 104.8  |
| 1.0000                                        | 46.34  | 56.75  | 68.34  | 80.81  | 94.87  | 110.4  | 124.4  | 114.2  | 112.9  |
| [C <sub>2</sub> mim][NTf <sub>2</sub> ] + DEC |        |        |        |        |        |        |        |        |        |
| 0.0000                                        | 454.5  | 447.3  | 449.5  | 448.0  | 459.7  | 450.8  | 458.4  | 463.9  | 467.5  |
| 0.0991                                        | 347.6  | 380.2  | 413.9  | 448.7  | 453.3  | 452.3  | 453.1  | 447.6  | 452.2  |
| 0.1982                                        | 197.3  | 218.8  | 241.2  | 264.5  | 288.8  | 313.9  | 340.0  | 366.9  | 394.6  |
| 0.3024                                        | 115.8  | 130.5  | 146.1  | 164.1  | 181.4  | 199.4  | 218.2  | 237.6  | 257.8  |
| 0.3979                                        | 75.69  | 86.59  | 98.35  | 110.6  | 123.8  | 137.5  | 153.3  | 168.4  | 184.1  |
| 0.4982                                        | 51.78  | 60.05  | 68.98  | 78.60  | 88.72  | 99.44  | 110.7  | 122.7  | 135.1  |
| 0.5963                                        | 36.94  | 43.40  | 50.43  | 58.03  | 66.21  | 74.96  | 84.04  | 93.74  | 103.9  |
| 0.6992                                        | 96.84  | 115.1  | 116.2  | 111.7  | 108.6  | 106.7  | 107.6  | 105.9  | 105.2  |
| 0.7987                                        | 74.70  | 89.61  | 106.2  | 120.4  | 114.4  | 110.9  | 108.0  | 107.2  | 106.8  |
| 0.9000                                        | 59.08  | 71.48  | 85.31  | 100.6  | 117.4  | 116.6  | 110.5  | 108.5  | 108.6  |
| 1.0000                                        | 46.34  | 56.75  | 68.34  | 80.81  | 94.87  | 110.4  | 124.4  | 114.2  | 112.9  |
| [C <sub>4</sub> mim][NTf <sub>2</sub> ] + DMC |        |        |        |        |        |        |        |        |        |
| 0.0000                                        | 451.7  | 464.3  | 455.4  | 462.7  | 467.7  | 716.5  | 754.4  | 791.4  | 828.3  |
| 0.0898                                        | 414.2  | 451.0  | 452.1  | 451.5  | 473.3  | 454.3  | 451.1  | 451.2  | 447.0  |

|                                               |       |       |       |       |       |       |       |       |       |
|-----------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.1882                                        | 205.0 | 227.6 | 251.4 | 275.9 | 301.0 | 326.8 | 353.6 | 380.0 | 410.9 |
| 0.2749                                        | 120.0 | 135.8 | 153.9 | 171.5 | 189.7 | 208.7 | 228.8 | 249.3 | 270.6 |
| 0.3754                                        | 107.2 | 104.4 | 108.6 | 106.2 | 117.7 | 132.2 | 148.2 | 164.8 | 182.3 |
| 0.4720                                        | 44.80 | 52.80 | 61.53 | 70.98 | 80.92 | 91.58 | 102.9 | 114.8 | 127.2 |
| 0.5745                                        | 104.7 | 120.4 | 112.4 | 109.6 | 107.3 | 106.9 | 106.6 | 102.9 | 93.74 |
| 0.6730                                        | 73.36 | 89.45 | 107.6 | 119.4 | 113.0 | 109.2 | 105.9 | 107.8 | 107.2 |
| 0.7799                                        | 52.34 | 65.07 | 79.33 | 95.32 | 113.3 | 119.1 | 112.0 | 108.7 | 106.3 |
| 0.8948                                        | 37.86 | 47.70 | 58.93 | 70.78 | 83.87 | 98.65 | 116.7 | 120.9 | 113.7 |
| 1.0000                                        | 29.81 | 37.93 | 47.44 | 58.27 | 70.55 | 84.26 | 99.52 | 116.3 | 117.9 |
| [C <sub>4</sub> mim][NTf <sub>2</sub> ] + DEC |       |       |       |       |       |       |       |       |       |
| 0.0000                                        | 454.5 | 447.3 | 449.5 | 448.0 | 459.7 | 450.8 | 458.4 | 463.9 | 467.5 |
| 0.1025                                        | 318.0 | 349.4 | 381.5 | 415.4 | 450.2 | 454.7 | 453.9 | 455.2 | 449.8 |
| 0.2198                                        | 149.4 | 169.3 | 188.7 | 209.2 | 230.5 | 253.0 | 276.4 | 300.8 | 325.7 |
| 0.3178                                        | 87.27 | 100.0 | 113.6 | 128.1 | 143.4 | 164.8 | 182.3 | 200.7 | 219.4 |
| 0.4211                                        | 109.5 | 106.8 | 9.492 | 105.7 | 88.72 | 99.44 | 110.6 | 122.7 | 135.1 |
| 0.5268                                        | 118.4 | 114.3 | 109.5 | 108.8 | 106.7 | 107.3 | 104.6 | 107.9 | 103.9 |
| 0.6220                                        | 83.56 | 101.2 | 121.0 | 113.6 | 109.6 | 108.0 | 108.1 | 108.5 | 105.9 |
| 0.7193                                        | 60.61 | 74.49 | 90.22 | 107.9 | 119.0 | 112.1 | 108.3 | 107.7 | 106.7 |
| 0.8139                                        | 45.88 | 57.23 | 70.23 | 84.71 | 100.7 | 118.9 | 115.5 | 110.1 | 107.9 |
| 0.9088                                        | 35.91 | 45.24 | 56.18 | 68.34 | 82.21 | 98.28 | 116.2 | 111.0 | 106.8 |
| 1.0000                                        | 29.81 | 37.93 | 47.44 | 58.27 | 70.55 | 84.26 | 99.52 | 116.3 | 117.9 |

Standard uncertainties are:  $u(T) = 0.05$  K,  $u(p) = 5$  kPa,  $u(x) = 0.0002$ .