

# Supporting Information

for

## Measurements and Correlation of High Pressure Densities of Imidazolium Based Ionic Liquids

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**Table ST1.** Isothermal Compressibility data for [C<sub>2</sub>mim][MeSO<sub>4</sub>], [C<sub>2</sub>mim][EtSO<sub>4</sub>], [C<sub>2</sub>eim][Tf<sub>2</sub>N] and [C<sub>10</sub>mim][Tf<sub>2</sub>N] as a Function of Temperature and Pressure

<i>p</i> / MPa	<i>k<sub>T</sub></i> / GPa <sup>-1</sup> at <i>T</i> /K							
	293.15	298.15	303.15	313.15	333.15	353.15	373.15	393.15
[C <sub>2</sub> mim][MeSO <sub>4</sub> ]								
0.10	0.33	0.34	0.34	0.35	0.38	0.40	0.43	0.45
2.50	0.33	0.33	0.34	0.35	0.37	0.40	0.42	0.45
5.00	0.32	0.33	0.33	0.34	0.37	0.39	0.41	0.44
7.50	0.32	0.32	0.33	0.34	0.36	0.38	0.41	0.43
10.00	0.31	0.32	0.32	0.33	0.36	0.38	0.40	0.42
15.00	0.31	0.31	0.32	0.33	0.35	0.37	0.39	0.41
20.00	0.30	0.30	0.31	0.32	0.34	0.36	0.37	0.39
25.00	0.29	0.29	0.30	0.31	0.33	0.35	0.36	0.38
30.00	0.28	0.29	0.29	0.30	0.32	0.34	0.35	0.37
35.00	0.28	0.28	0.29	0.29	0.31	0.33	0.34	0.36
[C <sub>2</sub> mim][EtSO <sub>4</sub> ]								
0.10	0.35	0.36	0.36	0.37	0.40	0.42	0.44	0.46
2.50	0.35	0.35	0.36	0.37	0.39	0.42	0.44	0.46
5.00	0.34	0.35	0.36	0.37	0.39	0.41	0.43	0.45
7.50	0.34	0.35	0.35	0.36	0.38	0.41	0.43	0.45
10.00	0.34	0.34	0.35	0.36	0.38	0.40	0.42	0.44
15.00	0.33	0.34	0.34	0.35	0.37	0.39	0.41	0.43
20.00	0.33	0.33	0.34	0.35	0.37	0.38	0.40	0.42
25.00	0.32	0.33	0.33	0.34	0.36	0.38	0.39	0.41
30.00	0.32	0.32	0.32	0.33	0.35	0.37	0.39	0.40
35.00	0.31	0.31	0.32	0.33	0.34	0.36	0.38	0.39
[C <sub>2</sub> eim][Tf <sub>2</sub> N]								
0.10	0.57	0.58	0.59	0.62	0.67	0.73	0.79	0.86
2.50	0.56	0.57	0.58	0.61	0.66	0.71	0.77	0.83
5.00	0.54	0.56	0.57	0.59	0.64	0.70	0.75	0.81
7.50	0.53	0.54	0.56	0.58	0.63	0.68	0.73	0.78
10.00	0.52	0.53	0.55	0.57	0.61	0.66	0.71	0.76
15.00	0.50	0.51	0.52	0.55	0.59	0.63	0.68	0.72
20.00	0.49	0.50	0.50	0.52	0.56	0.60	0.64	0.69
25.00	0.47	0.48	0.49	0.50	0.54	0.58	0.62	0.65
30.00	0.45	0.46	0.47	0.49	0.52	0.55	0.59	0.62
35.00	0.44	0.45	0.45	0.47	0.50	0.53	0.57	0.60
[C <sub>10</sub> mim][Tf <sub>2</sub> N]								
0.10	0.65	0.66	0.68	0.71	0.78	0.85	0.92	1.00
2.50	0.63	0.65	0.66	0.69	0.75	0.82	0.89	0.96
5.00	0.61	0.63	0.64	0.67	0.73	0.79	0.85	0.92
7.50	0.60	0.61	0.63	0.65	0.71	0.76	0.82	0.89
10.00	0.58	0.60	0.61	0.63	0.69	0.74	0.80	0.85
15.00	0.56	0.57	0.58	0.60	0.65	0.70	0.75	0.80
20.00	0.53	0.54	0.55	0.57	0.61	0.66	0.70	0.75
25.00	0.51	0.52	0.53	0.55	0.58	0.62	0.66	0.70
30.00	0.49	0.50	0.50	0.52	0.56	0.59	0.63	0.66
35.00	0.47	0.48	0.48	0.50	0.53	0.56	0.59	0.63

**Table ST2.** Isobaric Expansivity data for [C<sub>2</sub>mim][MeSO<sub>4</sub>], [C<sub>2</sub>mim][EtSO<sub>4</sub>], [C<sub>2</sub>eim][Tf<sub>2</sub>N] and [C<sub>10</sub>mim][Tf<sub>2</sub>N] as a Function of Temperature and Pressure

$p / \text{MPa}$	$\alpha_p \cdot 10^3 / \text{K}^{-1}$ at T/K							
	293.15	298.15	303.15	313.15	333.15	353.15	373.15	393.15
[C <sub>2</sub> mim][MeSO <sub>4</sub> ]								
0.10	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
2.50	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
5.00	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
7.50	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
10.00	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
15.00	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
20.00	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
25.00	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
30.00	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
35.00	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
[C <sub>2</sub> mim][EtSO <sub>4</sub> ]								
0.10	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
2.50	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
5.00	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
7.50	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
10.00	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
15.00	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
20.00	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
25.00	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
30.00	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
35.00	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5
[C <sub>2</sub> eim][Tf <sub>2</sub> N]								
0.10	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7
2.50	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
5.00	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
7.50	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
10.00	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
15.00	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
20.00	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
25.00	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
30.00	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
35.00	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6
[C <sub>10</sub> mim][Tf <sub>2</sub> N]								
0.10	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8
2.50	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8
5.00	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
7.50	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
10.00	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
15.00	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
20.00	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
25.00	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
30.00	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7
35.00	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7

**Table ST3.** Thermal Pressure Coefficient data for [C<sub>2</sub>mim][MeSO<sub>4</sub>], [C<sub>2</sub>mim][EtSO<sub>4</sub>], [C<sub>2</sub>eim][Tf<sub>2</sub>N] and [C<sub>10</sub>mim][Tf<sub>2</sub>N] as a Function of Temperature and Pressure

$p / \text{MPa}$	$\gamma_v / \text{MPa} \cdot \text{K}^{-1}$ at T/K							
	293.15	298.15	303.15	313.15	333.15	353.15	373.15	393.15
[C <sub>2</sub> mim][MeSO <sub>4</sub> ]								
0.10	1.9	1.9	1.8	1.7	1.6	1.4	1.3	1.2
2.50	1.9	1.9	1.8	1.8	1.6	1.5	1.3	1.2
5.00	1.9	1.9	1.9	1.8	1.6	1.5	1.4	1.2
7.50	2.0	1.9	1.9	1.8	1.6	1.5	1.4	1.3
10.00	2.0	1.9	1.9	1.8	1.7	1.5	1.4	1.3
15.00	2.0	2.0	1.9	1.8	1.7	1.5	1.4	1.3
20.00	2.0	2.0	2.0	1.9	1.7	1.6	1.5	1.3
25.00	2.1	2.0	2.0	1.9	1.8	1.6	1.5	1.4
30.00	2.1	2.1	2.0	1.9	1.8	1.6	1.5	1.4
35.00	2.2	2.1	2.1	2.0	1.8	1.7	1.6	1.4
[C <sub>2</sub> mim][EtSO <sub>4</sub> ]								
0.10	1.7	1.7	1.6	1.6	1.5	1.4	1.3	1.3
2.50	1.7	1.7	1.6	1.6	1.5	1.4	1.3	1.3
5.00	1.7	1.7	1.6	1.6	1.5	1.4	1.3	1.3
7.50	1.7	1.7	1.7	1.6	1.5	1.4	1.4	1.3
10.00	1.7	1.7	1.7	1.6	1.5	1.4	1.4	1.3
15.00	1.7	1.7	1.7	1.6	1.5	1.5	1.4	1.3
20.00	1.8	1.7	1.7	1.6	1.6	1.5	1.4	1.3
25.00	1.8	1.7	1.7	1.7	1.6	1.5	1.4	1.4
30.00	1.8	1.8	1.7	1.7	1.6	1.5	1.4	1.4
35.00	1.8	1.8	1.7	1.7	1.6	1.5	1.5	1.4
[C <sub>2</sub> eim][Tf <sub>2</sub> N]								
0.10	1.3	1.3	1.3	1.2	1.1	1.0	0.9	0.8
2.50	1.3	1.3	1.3	1.2	1.1	1.0	0.9	0.9
5.00	1.4	1.3	1.3	1.2	1.1	1.0	1.0	0.9
7.50	1.4	1.4	1.3	1.3	1.2	1.1	1.0	0.9
10.00	1.4	1.4	1.3	1.3	1.2	1.1	1.0	0.9
15.00	1.4	1.4	1.4	1.3	1.2	1.1	1.0	0.9
20.00	1.5	1.4	1.4	1.3	1.2	1.1	1.1	1.0
25.00	1.5	1.5	1.4	1.4	1.3	1.2	1.1	1.0
30.00	1.5	1.5	1.5	1.4	1.3	1.2	1.1	1.0
35.00	1.6	1.5	1.5	1.4	1.3	1.2	1.2	1.1
[C <sub>10</sub> mim][Tf <sub>2</sub> N]								
0.10	1.1	1.1	1.1	1.0	0.9	0.9	0.8	0.8
2.50	1.1	1.1	1.1	1.0	1.0	0.9	0.8	0.8
5.00	1.1	1.1	1.1	1.0	1.0	0.9	0.9	0.8
7.50	1.1	1.1	1.1	1.1	1.0	0.9	0.9	0.8
10.00	1.2	1.1	1.1	1.1	1.0	1.0	0.9	0.9
15.00	1.2	1.2	1.2	1.1	1.1	1.0	0.9	0.9
20.00	1.2	1.2	1.2	1.2	1.1	1.0	1.0	0.9
25.00	1.3	1.3	1.2	1.2	1.1	1.1	1.0	1.0
30.00	1.3	1.3	1.3	1.2	1.2	1.1	1.1	1.0
35.00	1.4	1.3	1.3	1.3	1.2	1.2	1.1	1.1