

SUPPORTING INFORMATION

Physicochemical Characterization of 1-Butyl-3-methylimidazolium and 1-Butyl-1-methylpyrrolidinium Bis(trifluoromethylsulfonyl)imide

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[bmim][NTf₂] = 1-Butyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide

[bmpyr][NTf₂] = 1-Butyl-1-methylpyrrolidinium bis(trifluoromethylsulfonyl)imide

Table S₁: Experimental Density Data for [BMIM][NTf₂] and [BMPy][NTf₂] as a Function of Temperature

$d/\text{g}\cdot\text{cm}^{-3}$					
<i>T/K</i>	Sample 1	Sample 2	Sample 3	Mean	$\sigma\cdot 10^5$
[bmim][NTf₂]					
293.15	1.43931	1.43925	1.43925	1.43927	3.46
298.15	1.43429	1.43428	1.43433	1.43430	2.65
303.15	1.42944	1.42940	1.42936	1.42940	4.00
308.15	1.42460	1.42455	1.42456	1.42457	2.65
313.15	1.41964	1.41963	1.41956	1.41961	4.36
318.15	1.41470	1.41466	1.41465	1.41467	2.65
323.15	1.40960	1.40965	1.40970	1.40965	5.00
328.15	1.40459	1.40463	1.40470	1.40464	5.57
333.15	1.39959	1.39955	1.39966	1.39960	5.57
338.15	1.39448	1.39446	1.39435	1.39443	7.00
343.15	1.38921	1.38911	1.38916	1.38916	5.00
348.15	1.38381	1.38388	1.38386	1.38385	3.61
353.15	1.37856	1.37858	1.37845	1.37853	7.00
[bmpyr][NTf₂]					
293.15	1.39897	1.39904	1.39899	1.39900	3.61
298.15	1.39459	1.39458	1.39454	1.39457	2.65
303.15	1.39007	1.39006	1.38993	1.39002	7.81
308.15	1.38552	1.38542	1.38550	1.38548	5.29
313.15	1.38096	1.38093	1.38090	1.38093	3.00
318.15	1.37627	1.37623	1.37634	1.37628	5.57
323.15	1.37170	1.37167	1.37155	1.37164	7.94
328.15	1.36685	1.36693	1.36692	1.36690	4.36
333.15	1.36217	1.36223	1.36220	1.36220	3.00
338.15	1.35736	1.35739	1.35730	1.35735	4.58
343.15	1.35243	1.35244	1.35245	1.35244	1.00
348.15	1.34747	1.34754	1.34743	1.34748	5.57
353.15	1.34254	1.34242	1.34248	1.34248	6.00

Table S₂: Experimental Conductivity Data and Specific Conductivity for [BMIM][NTf₂] and [BMPy][NTf₂] as a Function of Temperature

T/K	K/mS					Specific conductivity $\kappa/\text{mS}\cdot\text{cm}^{-1}$
	Sample 1	Sample 2	Sample 3	Mean	σ	
[bmim][NTf ₂]						
353.15	19.06	19.10	19.14	19.10	0.03	19.77
352.15	18.65	18.67	18.81	18.71	0.07	19.37
351.15	18.41	18.29	18.31	18.34	0.05	18.99
350.15	17.94	17.96	18.01	17.97	0.03	18.60
349.15	17.55	17.59	17.57	17.57	0.02	18.19
348.15	17.26	17.29	17.14	17.23	0.06	17.84
347.15	16.89	16.84	16.82	16.85	0.03	17.44
346.15	16.41	16.46	16.54	16.47	0.05	17.05
345.15	16.15	16.09	16.05	16.10	0.04	16.67
344.15	15.71	15.80	15.71	15.74	0.04	16.30
343.15	15.35	15.33	15.46	15.38	0.06	15.92
342.15	15.03	15.01	15.02	15.02	0.01	15.55
341.15	14.68	14.70	14.66	14.68	0.02	15.20
340.15	14.28	14.37	14.34	14.33	0.04	14.84
339.15	13.96	14.02	13.98	13.99	0.02	14.48
338.15	13.68	13.65	13.62	13.65	0.02	14.13
337.15	13.28	13.35	13.33	13.32	0.03	13.79
336.15	13.03	12.98	12.93	12.98	0.04	13.44
335.15	12.65	12.62	12.68	12.65	0.03	13.10
334.15	12.28	12.32	12.36	12.32	0.03	12.75
333.15	12.02	12.02	11.96	12.00	0.03	12.42
332.15	11.73	11.72	11.62	11.69	0.05	12.10
331.15	11.34	11.33	11.32	11.33	0.01	11.73
330.15	10.95	10.97	10.97	10.96	0.01	11.35
329.15	10.66	10.65	10.70	10.67	0.02	11.05
328.15	10.35	10.36	10.43	10.38	0.03	10.75
327.15	10.02	10.02	10.12	10.05	0.05	10.40
326.15	9.707	9.740	9.767	9.738	0.02	10.08
325.15	9.490	9.485	9.520	9.498	0.02	9.833
324.15	9.144	9.141	9.220	9.168	0.04	9.492
323.15	8.897	8.916	8.884	8.899	0.01	9.213
322.15	8.586	8.590	8.639	8.605	0.02	8.909
321.15	8.348	8.386	8.358	8.364	0.02	8.659
320.15	8.155	8.110	8.135	8.133	0.02	8.420
319.15	7.943	7.916	7.892	7.917	0.02	8.196
318.15	7.672	7.687	7.693	7.684	0.01	7.955
317.15	7.460	7.491	7.441	7.464	0.02	7.727
316.15	7.234	7.233	7.309	7.259	0.04	7.515
315.15	7.053	7.061	7.008	7.041	0.02	7.290
314.15	6.800	6.799	6.846	6.815	0.02	7.056
313.15	6.618	6.617	6.583	6.606	0.02	6.839
312.15	6.403	6.388	6.442	6.411	0.02	6.637
311.15	6.229	6.209	6.192	6.210	0.01	6.429
310.15	6.012	6.025	5.984	6.007	0.02	6.219

309.15	5.826	5.809	5.795	5.810	0.01	6.015
308.15	5.595	5.603	5.644	5.614	0.02	5.812
307.15	5.427	5.430	5.427	5.428	0.00	5.620
306.15	5.240	5.239	5.260	5.246	0.01	5.431
305.15	5.083	5.061	5.051	5.065	0.01	5.244
304.15	4.877	4.877	4.904	4.886	0.01	5.058
303.15	4.701	4.704	4.726	4.710	0.01	4.876
302.15	4.522	4.521	4.565	4.536	0.02	4.696
301.15	4.387	4.354	4.372	4.371	0.01	4.525
300.15	4.211	4.202	4.181	4.198	0.01	4.346
299.15	4.020	4.040	4.040	4.033	0.01	4.175
298.15	3.891	3.890	3.859	3.880	0.01	4.017

[bmpyr][NTf₂]

353.15	14.43	14.46	14.33	14.41	0.06	14.92
352.15	14.10	14.11	14.18	14.13	0.04	14.63
351.15	13.81	13.76	13.83	13.80	0.03	14.29
350.15	13.46	13.44	13.51	13.47	0.03	13.95
349.15	13.14	13.15	13.01	13.10	0.06	13.56
348.15	12.75	12.81	12.79	12.78	0.02	13.23
347.15	12.49	12.51	12.44	12.48	0.03	12.92
346.15	12.15	12.16	12.14	12.15	0.01	12.58
345.15	11.80	11.79	11.93	11.84	0.06	12.26
344.15	11.59	11.53	11.60	11.57	0.03	11.98
343.15	11.23	11.29	11.23	11.25	0.03	11.65
342.15	10.91	10.98	10.94	10.94	0.03	11.33
341.15	10.71	10.72	10.61	10.68	0.05	11.06
340.15	10.40	10.42	10.37	10.40	0.02	10.77
339.15	10.10	10.13	10.16	10.13	0.02	10.49
338.15	9.874	9.839	9.846	9.853	0.02	10.20
337.15	9.575	9.560	9.644	9.593	0.04	9.932
336.15	9.319	9.349	9.302	9.323	0.02	9.652
335.15	9.048	9.048	9.087	9.061	0.02	9.381
334.15	8.817	8.790	8.802	8.803	0.01	9.114
333.15	8.533	8.548	8.533	8.538	0.01	8.839
332.15	8.273	8.301	8.332	8.302	0.02	8.595
331.15	8.102	8.084	8.126	8.104	0.02	8.390
330.15	7.897	7.867	7.894	7.886	0.01	8.164
329.15	7.704	7.672	7.661	7.679	0.02	7.950
328.15	7.500	7.461	7.492	7.484	0.02	7.748
327.15	7.304	7.300	7.248	7.284	0.03	7.541
326.15	7.069	7.083	7.085	7.079	0.01	7.329
325.15	6.882	6.916	6.875	6.891	0.02	7.134
324.15	6.679	6.714	6.714	6.702	0.02	6.939
323.15	6.531	6.526	6.458	6.505	0.03	6.735
322.15	6.336	6.349	6.300	6.328	0.02	6.551
321.15	6.152	6.134	6.122	6.136	0.01	6.353
320.15	5.931	5.942	5.974	5.949	0.02	6.159
319.15	5.766	5.760	5.807	5.778	0.02	5.982
318.15	5.609	5.628	5.580	5.606	0.02	5.804
317.15	5.428	5.448	5.405	5.427	0.02	5.619
316.15	5.244	5.264	5.263	5.257	0.01	5.443

315.15	5.077	5.074	5.116	5.089	0.02	5.269
314.15	4.912	4.915	4.924	4.917	0.01	5.091
313.15	4.739	4.738	4.788	4.755	0.02	4.923
312.15	4.582	4.587	4.607	4.592	0.01	4.754
311.15	4.419	4.427	4.444	4.430	0.01	4.586
310.15	4.267	4.266	4.295	4.276	0.01	4.427
309.15	4.119	4.117	4.152	4.129	0.02	4.275
308.15	3.976	3.990	3.982	3.983	0.01	4.124
307.15	3.850	3.842	3.825	3.839	0.01	3.975
306.15	3.703	3.681	3.701	3.695	0.01	3.825
305.15	3.542	3.546	3.579	3.556	0.02	3.682
304.15	3.406	3.408	3.437	3.417	0.01	3.538
303.15	3.282	3.293	3.265	3.280	0.01	3.396
302.15	3.152	3.142	3.168	3.154	0.01	3.265
301.15	3.030	3.011	3.027	3.023	0.01	3.130
300.15	2.901	2.903	2.899	2.901	0.00	3.003
299.15	2.794	2.776	2.779	2.783	0.01	2.881
298.15	3.891	3.890	3.859	2.676	0.60	2.770

Table S₃: Experimental Viscosity Data for [BMIM][NTf₂] and [BMPy][NTf₂] as a Function of Temperature

$\eta/\text{mPa}\cdot\text{s}$					
<i>T/K</i>	Sample 1	Sample 2	Sample 3	Mean	σ
[bmim][NTf₂]					
298.15	50.03	50.06	50.07	50.05	0.02
303.15	41.22	41.14	41.37	41.24	0.12
308.15	33.66	33.62	33.66	33.65	0.02
313.15	28.29	28.30	28.23	28.28	0.04
318.15	23.94	23.98	23.82	23.91	0.08
323.15	20.67	20.64	20.61	20.64	0.03
328.15	17.89	17.98	17.83	17.90	0.07
333.15	15.55	15.48	15.50	15.51	0.04
338.15	13.70	13.73	13.70	13.71	0.02
343.15	12.09	12.09	12.08	12.09	0.01
348.15	10.80	10.74	10.79	10.78	0.03
353.15	9.71	9.67	9.70	9.69	0.02
[bmpyr][NTf₂]					
298.15	76.65	76.52	77.02	76.73	0.26
303.15	61.73	61.73	61.55	61.67	0.10
308.15	50.37	50.57	50.52	50.49	0.10
313.15	41.71	41.89	41.59	41.73	0.15
318.15	34.73	34.67	34.61	34.67	0.06
323.15	29.54	29.43	29.48	29.48	0.06
328.15	25.39	25.51	25.39	25.43	0.07
333.15	21.86	21.93	21.91	21.90	0.04
338.15	19.13	19.16	19.19	19.16	0.03
343.15	16.82	16.84	16.79	16.82	0.03
348.15	14.83	14.80	14.77	14.80	0.03
353.15	13.22	13.28	13.21	13.24	0.04