

Supplementary Information for

Self-diffusion, Velocity Cross-correlation Coefficients and
Distinct Diffusion Coefficients of the Ionic Liquid
[BMIM][Tf₂N] at High Pressure.

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Table S1a. Densities and expansivities of [OMIM][Tf₂N] at 0.1 MPa.*†

	sample 1 Canberra densimeter	sample 2 Sendai densimeter	
<i>T</i> /K	ρ /g·cm ⁻³	ρ /g·cm ⁻³	10 ³ α /K ⁻¹
273.15	1.34301	1.34316	0.673
278.15		1.33865	0.673
283.15	1.33391	1.33414	0.673
288.15		1.32963	0.673
293.15	1.32500	1.32513	0.673
298.15	1.32066	1.32063	0.674
303.15	1.31623	1.31617	0.674
313.15	1.30745	1.30731	0.674
323.15	1.29870	1.29853	0.674
333.15	1.28998	1.28981	0.674
343.15	1.28130	1.28115	0.674
353.15	1.27265	1.27255	0.674
363.15	1.26404	1.26400	0.674

* Measured with DMA 5000 vibrating tube densimeters

† Standard uncertainties are $u(T) = 0.01$ K, $u(\rho) = 0.02\%$, $u(\alpha) = 0.015 \cdot 10^{-3}$ K⁻¹.

Table S1b. Densities and expansivities of [BMIM][Tf₂N] and [HMIM][Tf₂N] at 0.1 MPa.^{*,†}

<i>T</i> /K	[BMIM][Tf ₂ N]		[HMIM][Tf ₂ N]	
	$\rho/\text{g}\cdot\text{cm}^{-3}$	$10^3 \alpha/\text{K}^{-1}$	$\rho/\text{g}\cdot\text{cm}^{-3}$	$10^3 \alpha/\text{K}^{-1}$
238.15			1.4289	0.686
243.15	1.4904	0.680	1.4243	0.685
248.15	1.4854	0.679	1.4197	0.684
253.15	1.4803	0.678	1.4149	0.683
258.15	1.4752	0.677	1.4100	0.682
263.15	1.4701	0.676	1.4051	0.682
268.15	1.4651	0.675	1.4001	0.681
273.15	1.4602	0.674	1.3952	0.680
278.15	1.4554	0.673	1.3905	0.679
283.15	1.4507	0.672	1.3858	0.678
288.15	1.4457	0.671	1.3812	0.677
293.15	1.4409	0.670	1.3766	0.676
298.15	1.4360	0.669	1.3720	0.675
303.15	1.4313	0.668	1.3675	0.674
313.15	1.4218	0.666	1.3584	0.671
323.15	1.4124	0.664	1.3493	0.669
333.15	1.4030	0.661	1.3403	0.667
343.15	1.3938	0.659	1.3313	0.665
353.15	1.3846	0.656	1.3224	0.662
363.15	1.3755	0.654	1.3137	0.660

* Measured with the vibrating tube densimeter built into the Stabinger viscometer

† Standard uncertainties are $u(T, T > 288.15 \text{ K}) = 0.02 \text{ K}$, $u(T, T < 288.15 \text{ K}) = 0.05 \text{ K}$, $u(\rho) = 0.04\%$, $u(\alpha, [\text{BMIM}][\text{Tf}_2\text{N}]) = 0.012 \cdot 10^{-3} \text{ K}^{-1}$, $u(\alpha, [\text{HMIM}][\text{Tf}_2\text{N}]) = 0.020 \cdot 10^{-3} \text{ K}^{-1}$.

Table S2. Conductivities of [BMIM][Tf₂N], [HMIM][Tf₂N] and [OMIM][Tf₂N] at 0.1 MPa.

[HMIM][Tf ₂ N] [*]			[OMIM][Tf ₂ N]		
<i>T</i> / K	κ /S·m ⁻¹	Λ / μS·m ² ·mol ⁻¹	<i>T</i> / K	κ /S·m ⁻¹	Λ / μS·m ² ·mol ⁻¹
243.48	0.003937	1.237	273.15	0.03083	10.92
253.30	0.01133	3.584	278.15	0.04320	15.35
263.59	0.02791	8.892	283.15	0.05895	21.01
273.15	0.05621	18.02	288.15	0.07844	28.05
273.36	0.05675	18.20	293.15	0.1023	36.69
278.15	0.07724	24.85	298.15	0.1306	47.04
283.15	0.1034	33.39	303.15	0.1639	59.21
288.15	0.1354	43.85	313.15	0.2463	89.57
293.03	0.1715	55.73	323.15	0.3512	128.6
293.15	0.1732	56.30	333.15	0.4785	176.4
298.15	0.2174	70.87	343.15	0.6271	232.7
303.15	0.2690	88.01	353.15	0.8009	299.2
313.15	0.3926	129.3	[BMIM][Tf ₂ N]		
323.15	0.5446	180.6	242.82	0.009161	2.577
333.15	0.7234	241.5	252.87	0.02555	7.236
343.15	0.9311	312.9	263.49	0.06088	17.37
353.15	1.1687	395.4	273.15	0.1159	33.27
			294.15	0.3362	97.90

* Densities used to calculate Λ were taken from ref. 7.
22 July 2015

Table S3. Viscosities of [HMIM][Tf₂N] at 0.1 MPa: falling body viscometer. ^{*,†}

T / K	t / s^{\ddagger}	$V / \text{cm}^3 \cdot \text{mol}^{-1}$	$\eta / \text{mPa} \cdot \text{s}$	T / K	t / s	$V / \text{cm}^3 \cdot \text{mol}^{-1}$	$\eta / \text{mPa} \cdot \text{s}$
273.15	924.1	320.68	297.8	323.15	80.27	331.56	26.01
273.15	929.7	320.68	299.6	323.15	80.23	331.56	26.00
278.15	658.6	321.74	212.4	323.15	78.58	331.56	25.47
278.15	661.7	321.74	213.4	323.15	78.56	331.56	25.46
283.15	486.4	322.82	156.9	323.15	946.0	331.56	25.82*
283.15	485.7	322.82	156.7	333.15	58.18	333.80	18.88
288.15	358.2	323.89	115.6	333.15	58.07	333.80	18.84
288.15	358.0	323.89	115.6	333.15	688.6	333.80	18.81*
293.15	277.9	324.97	89.76	343.15	44.06	336.05	14.31
293.15	277.8	324.97	89.73	343.15	44.85	336.05	14.57
298.15	218.8	326.06	70.71	343.15	44.51	336.05	14.46
298.15	218.1	326.06	70.49	343.15	513.1	336.05	14.03*
298.15	216.6	326.06	70.02	343.15	515.3	336.05	14.09*
298.15	217.3	326.06	70.24	348.15	448.1	337.19	12.26*
303.15	173.8	327.15	56.19	348.15	447.3	337.19	12.24*
303.15	174.9	327.15	56.55	353.15	398.6	338.33	10.91*
313.15	113.9	329.35	36.86	353.15	401.9	338.33	11.00*
313.15	113.1	329.35	36.60	363.15	319.6	340.62	8.760*
				363.15	319.2	340.62	8.749*

* Most data were obtained with a sinker of a nominal diameter of 6.0 mm: those marked * were obtained with one 6.3 mm in diameter.

† Standard uncertainties u are $u(T) = 0.01 \text{ K}$, $u(p) = 0.2 \text{ MPa}$ above 0.1 MPa, $u(t) = 0.1\%$, $u(\rho/\rho_s) = 0.3\%$; combined expanded uncertainty for the viscosity, $U_c(\eta) = 2\%$.

‡ Fall time
22 July 2015

Table S4. Viscosities of [BMIM][Tf₂N], [HMIM][Tf₂N] and [OMIM][Tf₂N] at 0.1 MPa: Stabinger rotating cylinder viscometer.

[BMIM][Tf ₂ N]		[HMIM][Tf ₂ N]		[OMIM][Tf ₂ N]	
<i>T</i> /K	η /mPa·s	<i>T</i> /K	η /mPa·s	<i>T</i> /K	η /mPa·s
243.15	2698*	238.15	9277*	273.15	426.7
248.15	1556*	243.15	4800*	278.15	300.0
253.15	948.1	248.15	2746	283.15	216.5
258.15	606.1	253.15	1613	288.15	160.4
263.15	402.5	258.15	998.8	293.15	121.3
268.15	277.3	263.15	648.8	293.15	121.3
273.15	197.3	268.15	432.3	293.15	121.4
278.15	144.5	273.15	300.0	298.15	93.60
283.15	108.5	278.15	213.9	303.15	73.55
288.15	83.44	283.15	157.1	313.15	47.71
293.15	65.44	288.15	118.2	323.15	32.68
298.15	51.98	293.15	90.77	333.15	23.42
303.15	42.21	298.15	70.57	343.15	17.43
313.15	29.05	303.15	56.34	353.15	13.39
323.15	20.98	313.15	37.46	363.15	10.56
333.15	15.74	323.15	26.29		
343.15	12.20	333.15	19.22		
353.15	9.711	343.15	14.53		
363.15	7.909	353.15	11.34		
		363.15	9.101		

* These points were omitted from the VFT fits due to large negative residuals. The value of 9277 mPa·s is beyond the calibration limit, 7076 mPa·s : see experimental section.

Table S5. Ion Self-diffusion Coefficients for [BMIM][Tf₂N]

[BMIM] ⁺				[Tf ₂ N] ⁻			
<i>T</i> /°C	<i>T</i> /K	<i>p</i> /MPa	10 ¹² <i>D</i> ₊ /m ² s ⁻¹	<i>T</i> /°C	<i>T</i> /K	<i>p</i> /MPa	10 ¹² <i>D</i> ₋ /m ² s ⁻¹
10.47	283.62	0.1	13.85	15.10	288.25	0.1	13.05
10.47	283.62	0.1	13.85	15.10	288.25	0.1	13.01
10.47	283.62	0.1	13.80	20.11	293.26	0.1	16.64
19.99	293.14	0.1	21.74	20.13	293.28	0.1	16.82
19.99	293.14	0.1	21.83	24.97	298.12	0.1	20.86
19.99	293.14	0.1	21.39	25.11	298.26	0.1	20.48
19.99	293.14	0.1	21.48	25.29	298.44	0.1	21.30
20.23	293.38	0.1	22.31	25.37	298.52	0.1	21.23
20.24	293.39	0.1	22.48	25.21	298.36	9.5	19.04
25.01	298.16	0.1	27.54	25.27	298.42	19.0	17.37
25.06	298.21	0.1	27.26	25.24	298.39	25.0	16.18
25.13	298.28	0.1	27.46	29.99	303.14	0.1	26.54
25.16	298.31	0.1	27.28	30.21	303.36	0.1	26.35
25.30	298.45	0.1	27.99	30.22	303.37	0.1	26.03
25.31	298.46	0.1	26.74	40.20	313.35	0.1	38.83
25.39	298.54	0.1	28.03	40.22	313.37	0.1	39.04
25.14	298.29	5.0	26.46	48.81	321.96	0.1	53.49
25.12	298.27	10.0	24.40	49.57	322.72	0.1	53.91
25.12	298.27	20.0	22.27	49.85	323.00	0.1	53.54
25.06	298.21	40.0	17.40	49.86	323.01	0.1	54.28
30.01	303.16	0.1	34.07	49.91	323.06	0.1	52.59
30.01	303.16	0.1	33.78	49.93	323.08	0.1	53.94
30.03	303.18	0.1	34.11	49.94	323.09	0.1	55.06
30.08	303.23	0.1	33.56	49.94	323.09	0.1	54.19
39.92	313.07	0.1	49.34	50.03	323.18	0.1	54.94
39.98	313.13	0.1	49.20	50.15	323.30	0.1	52.94
40.01	313.16	0.1	48.32	50.70	323.85	0.1	54.79

40.07	313.22	0.1	48.27	49.90	323.05	16.0	46.97
49.83	322.98	0.1	68.32	48.80	321.95	25.0	42.37
49.84	322.99	0.1	65.94	50.06	323.21	25.0	42.65
49.94	323.09	0.1	70.15	50.16	323.31	30.0	39.85
49.95	323.10	0.1	69.65	50.16	323.31	30.0	39.76
49.96	323.11	0.1	68.31	50.10	323.25	35.0	38.60
50.06	323.21	0.1	69.16	50.09	323.24	48.5	34.24
50.08	323.23	0.1	68.26	50.07	323.22	49.0	35.17
50.09	323.24	0.1	68.44	50.30	323.45	50.0	33.82
50.10	323.25	0.1	70.14	50.33	323.48	75.0	27.82
50.10	323.25	0.1	67.93	50.28	323.43	100.0	23.06
50.10	323.25	0.1	68.93	50.31	323.46	100.0	22.97
50.11	323.26	0.1	68.17	59.91	333.06	0.1	74.07
50.12	323.27	0.1	67.58	59.94	333.09	0.1	73.02
50.07	323.22	12.5	61.10	64.93	338.08	0.1	85.40
50.10	323.25	12.5	60.75	64.97	338.12	0.1	82.66
50.06	323.21	25.0	54.68	64.97	338.12	0.1	83.87
50.13	323.28	37.5	48.90	65.00	338.15	0.1	85.45
50.13	323.28	50.0	44.08	65.09	338.24	0.1	84.60
50.14	323.29	75.0	35.58	65.12	338.27	0.1	84.20
50.14	323.29	100.0	30.02	64.97	338.12	9.4	76.83
50.10	323.25	125.0	24.21	64.97	338.12	10.5	76.25
50.08	323.23	150.0	19.43	64.97	338.12	24.3	67.73
50.06	323.21	175.0	15.85	65.04	338.19	25.0	67.83
59.93	333.08	0.1	91.86	64.98	338.13	49.0	55.65
59.93	333.08	0.1	92.49	64.98	338.13	50.0	55.04
69.97	343.12	0.1	122.3	64.98	338.13	74.3	45.86
69.97	343.12	0.1	121.7	64.98	338.13	75.0	44.86
69.98	343.13	0.1	122.9	64.98	338.13	99.8	37.21
74.51	347.66	0.1	137.0	65.01	338.16	100.5	37.33
74.67	347.82	0.1	136.7	65.01	338.16	124.6	31.47
74.73	347.88	0.1	138.1	65.01	338.16	124.7	30.74
74.76	347.91	0.1	138.1	65.00	338.15	150.2	26.17

74.88	348.03	0.1	134.5	65.01	338.16	150.5	25.94
74.88	348.03	0.1	135.3	64.99	338.14	174.2	22.31
74.93	348.08	0.1	136.4	65.00	338.15	175.0	22.21
74.93	348.08	0.1	137.0	65.00	338.15	200.0	18.79
74.93	348.08	0.1	133.5	65.01	338.16	200.0	18.88
74.93	348.08	0.1	134.1	70.10	343.25	0.1	97.01
74.95	348.10	0.1	134.5	70.13	343.28	0.1	97.01
74.95	348.10	0.1	134.3	74.73	347.88	0.1	113.4
74.98	348.13	0.1	136.1	74.74	347.89	0.1	108.4
74.98	348.13	0.1	136.7	74.75	347.90	0.1	110.7
75.00	348.15	0.1	134.3	74.99	348.14	0.1	109.6
75.00	348.15	0.1	134.9	75.07	348.22	0.1	109.3
75.02	348.17	0.1	141.0	75.09	348.24	0.1	109.9
75.02	348.17	0.1	141.6	74.78	347.93	15.0	98.66
75.02	348.17	0.1	140.2	74.73	347.88	29.0	89.66
75.02	348.17	0.1	140.8	74.83	347.98	50.0	76.39
75.12	348.27	0.1	138.0	74.83	347.98	75.0	63.62
74.77	347.92	25.0	109.6	74.85	348.00	100.0	52.37
74.99	348.14	25.0	113.4	74.84	347.99	125.0	44.09
75.00	348.15	37.5	102.5	74.84	347.99	150.0	37.34
74.83	347.98	48.0	95.14	74.76	347.91	152.5	37.76
75.00	348.15	50.0	93.74	74.82	347.97	175.0	32.62
75.01	348.16	75.0	78.44	74.81	347.96	200.0	27.93
75.15	348.30	77.5	78.83	74.81	347.96	224.0	24.20
75.15	348.30	97.0	68.21	74.80	347.95	248.5	21.34
74.87	348.02	99.0	67.41	74.81	347.96	249.5	20.73
75.01	348.16	100.0	65.18	80.20	353.35	0.1	121.9
75.16	348.31	127.5	55.94	80.21	353.36	0.1	122.0
75.16	348.31	150.0	48.16	90.33	363.48	0.1	157.5
75.17	348.32	176.0	40.61				
75.17	348.32	197.0	35.58				
75.16	348.31	200.5	34.73				
75.15	348.30	226.5	29.58				

75.17	348.32	249.0	25.46				
75.15	348.30	274.0	22.01				
75.16	348.31	275.0	21.72				
79.76	352.91	0.1	155.7				
79.78	352.93	0.1	154.6				
89.03	362.18	0.1	194.2				
89.17	362.32	0.1	193.5				

Table S6. Ion Self-diffusion Coefficients for [EMIM][Tf₂N], [HMIM][Tf₂N] and [OMIM][Tf₂N] at 0.1 MPa

[EMIM][Tf ₂ N]			[HMIM][Tf ₂ N]			[OMIM][Tf ₂ N]		
<i>T</i> / °C	<i>T</i> /K	10 ¹² <i>D</i> ₊ /m ² s ⁻¹	<i>T</i> / °C	<i>T</i> /K	10 ¹² <i>D</i> ₊ /m ² s ⁻¹	<i>T</i> / °C	<i>T</i> /K	10 ¹² <i>D</i> ₊ /m ² s ⁻¹
-4.88	268.27	13.95	20.15	293.30	13.32	25.00	298.15	12.28
-4.85	268.30	13.92	20.16	293.31	13.28	25.10	298.25	12.38
0.24	273.39	18.28	25.01	298.16	17.78	29.97	303.12	15.31
0.30	273.45	18.21	25.05	298.20	17.70	30.06	303.21	15.48
10.14	283.29	29.13	25.07	298.22	16.84	40.07	313.22	24.01
10.20	283.35	30.20	25.08	298.23	17.40	40.13	313.28	23.69
10.24	283.39	29.32	30.05	303.20	22.38	49.92	323.07	35.42
20.07	293.22	43.98	30.09	303.24	22.14	49.94	323.09	35.74
20.14	293.29	43.30	39.93	313.08	33.48	50.09	323.24	35.14
25.15	298.30	51.48	39.95	313.10	34.10	50.18	323.33	34.96
25.16	298.31	51.71	40.13	313.28	33.49	59.75	332.90	50.80
25.17	298.32	52.74	40.18	313.33	33.27	59.87	333.02	51.11
30.07	303.22	63.67	49.86	323.01	49.42	69.60	342.75	68.62
30.10	303.25	64.50	49.89	323.04	49.26	69.68	342.83	68.85
30.16	303.31	63.24	50.02	323.17	46.39	74.61	347.76	77.53
30.19	303.34	62.97	50.04	323.19	47.73	79.56	352.71	91.08
40.23	313.38	88.50	59.68	332.83	66.58	79.56	352.71	91.04
40.25	313.40	88.57	59.73	332.88	66.67	88.95	362.10	116.2
50.01	323.16	114.4	60.03	333.18	65.13	88.95	362.10	117.4
50.07	323.22	110.0	60.03	333.18	64.79			
50.09	323.24	111.8	60.05	333.20	64.76			
50.18	323.33	111.9	60.06	333.21	64.92			
50.20	323.35	115.2	70.01	343.16	86.81			
50.22	323.37	112.5	70.11	343.26	87.58			
60.45	333.60	151.7	70.26	343.41	92.14			
60.59	333.74	151.4	70.27	343.42	93.39			
70.65	343.80	189.8	74.69	347.84	101.3			
70.66	343.81	190.8	74.71	347.86	101.9			

80.46	353.61	231.6	79.37	352.52	111.4			
80.50	353.65	230.7	79.39	352.54	111.6			
88.94	362.09	282.9	90.86	364.01	154.3			
88.97	362.12	289.0	90.99	364.14	150.5			
89.08	362.23	291.4						
[EMIM][Tf ₂ N]			[HMIM][Tf ₂ N]			[OMIM][Tf ₂ N]		
<i>T</i> / °C	<i>T</i> /K	10 ¹² <i>D.</i> /m ² s ⁻¹	<i>T</i> / °C	<i>T</i> /K	10 ¹² <i>D.</i> /m ² s ⁻¹	<i>T</i> / °C	<i>T</i> /K	10 ¹² <i>D.</i> /m ² s ⁻¹
10.02	283.17	16.50	20.06	293.21	11.39	30.02	303.17	14.50
10.04	283.19	16.20	20.09	293.24	11.59	29.97	303.12	14.56
20.06	293.21	24.97	25.03	298.18	14.54	40.07	313.22	22.63
20.08	293.23	25.20	25.05	298.20	14.68	40.08	313.23	22.27
25.00	298.15	30.53	30.01	303.16	18.29	49.82	322.97	34.25
30.18	303.33	36.49	30.05	303.20	18.18	49.85	323.00	31.96
40.22	313.37	52.35	40.03	313.18	28.05	49.88	323.03	33.21
40.26	313.41	52.55	40.09	313.24	28.26	49.98	323.13	33.42
49.88	323.03	71.00	49.86	323.01	40.98	49.99	323.14	33.23
49.88	323.03	72.68	49.87	323.02	41.11	59.73	332.88	46.36
49.90	323.05	67.49	49.90	323.05	39.85	59.77	332.92	46.69
49.92	323.07	71.58	49.92	323.07	39.24	69.82	342.97	63.58
50.16	323.31	69.69	50.01	323.16	41.41	69.88	343.03	62.64
50.17	323.32	68.89	50.02	323.17	40.48	69.92	343.07	63.01
50.20	323.35	69.91	59.77	332.92	56.14	70.20	343.35	66.80
60.26	333.41	90.40	59.78	332.93	55.26	70.22	343.37	63.81
60.27	333.42	90.22	70.29	343.44	78.55	70.22	343.37	64.51
70.83	343.98	117.1	70.31	343.46	79.87	79.44	352.59	85.96
70.89	344.04	118.2	79.87	353.02	99.57	79.53	352.68	84.90
80.75	353.90	144.0	80.10	353.25	99.74	79.58	352.73	85.15
80.77	353.92	144.1	90.26	363.41	139.0	89.01	362.16	116.8
90.23	363.38	178.7	90.28	363.43	139.8	89.02	362.17	111.1
90.28	363.43	175.7				90.23	363.38	119.8
						90.26	363.41	120.8

Table S7. Velocity Correlation (f_{ij}), and Distinct Diffusion (D_{ij}^d) Coefficients, Laity Resistance Coefficients and Nernst-Einstein Δ

[EMIM][Tf ₂ N]												
T/K	p/MPa	f_{++}^a	f_{--}	f_{+-}	$D_{++}^d{}^b$	D_{--}^d	D_{+-}^d	Δ	r_{++}^c	r_{--}	r_{+-}	$r_{+-}^2/(r_{++}r_{--})$
273.15	0.1	-1.84		-1.09	-14.54		-8.61		36.1		214.7	
278.15	0.1	-2.30		-1.41	-18.13		-11.08		31.1		169.9	
283.15	0.1	-2.86	-3.43	-1.78	-22.42	-26.92	-13.97	0.237	26.3	153	137.1	
288.15	0.1	-3.52	-4.33	-2.22	-27.48	-33.87	-17.32	0.239	22.2	123	112.6	4.7
293.15	0.1	-4.29	-5.39	-2.71	-33.42	-41.97	-21.13	0.242	18.7	99.8	93.8	4.7
298.15	0.1	-5.19	-6.60	-3.28	-40.31	-51.26	-25.43	0.246	15.7	82.3	79.3	4.7
303.15	0.1	-6.24	-7.99	-3.91	-48.25	-61.84	-30.23	0.246	13.2	68.7	67.8	4.9
313.15	0.1	-8.79	-11.32	-5.38	-67.59	-86.99	-41.35	0.250	9.40	49.5	51.2	5.1
323.15	0.1	-12.05	-15.42	-7.14	-92.03	-117.7	-54.53	0.261	6.75	37.0	40.1	5.6
333.15	0.1	-16.09	-20.33	-9.20	-122.1	-154.2	-69.79	0.273	4.90	28.6	32.3	6.4
343.16	0.1	-20.99	-26.09	-11.56	-158.1	-196.6	-87.12	0.285	3.57	22.7	26.6	7.4
353.15	0.1	-26.78	-32.69	-14.22	-200.4	-244.7	-106.4	0.296	2.62	18.5	22.4	8.7
363.15	0.1	-33.50	-40.13	-17.18	-249.1	-298.4	-127.7	0.307	1.92	15.4	19.2	10
$u/\%$		9	4	1	9	4	1	0.05 ^e	24-43 ^d	8	1	

[BMIM][Tf ₂ N]												
<i>T</i> /K	<i>p</i> /MPa	<i>f</i> ₊₊ ^a	<i>f</i> ₋₋	<i>f</i> ₊₋	<i>D</i> ^d ₊₊ ^b	<i>D</i> ^d ₋₋	<i>D</i> ^d ₊₋	Δ	<i>r</i> ₊₊ ^c	<i>r</i> ₋₋	<i>r</i> ₊₋	<i>r</i> ₊₋ ² /(<i>r</i> ₊₊ <i>r</i> ₋₋)
243.15	0.1			-0.0358			-0.254				7057	
253.15	0.1			-0.107			-0.756				2471	
263.15	0.1			-0.257			-1.80				1076	
273.15	0.1			-0.528			-3.67				548	
283.15	0.1			-0.963			-6.66				314	
288.15	0.1	-2.52	-3.15	-1.26	-17.4	-21.7	-8.65	0.358	29.9	122.9	246	16
298.15	0.1	-3.93	-5.12	-2.02	-26.9	-35.1	-13.8	0.356	22.1	77.1	159	15
303.15	0.1	-4.82	-6.38	-2.50	-32.9	-43.6	-17.0	0.356	18.7	62.5	131	15
313.15	0.1	-7.06	-9.50	-3.67	-47.8	-64.4	-24.9	0.358	13.5	42.8	92.9	15
323.15	0.1	-9.96	-13.51	-5.15	-67.1	-91.0	-34.7	0.362	9.82	30.6	68.7	16
333.15	0.1	-13.61	-18.47	-6.97	-91.1	-124	-46.6	0.366	7.23	22.8	52.7	17
343.15	0.1	-18.10	-24.46	-9.15	-120.3	-163	-60.8	0.370	5.40	17.6	41.6	18
353.15	0.1	-23.49	-31.49	-11.69	-155.1	-208	-77.2	0.375	4.09	13.9	33.7	20
363.15	0.1	-29.82	-39.60	-14.61	-195.7	-260	-95.8	0.379	3.14	11.3	27.9	22
<i>u</i> /%		7-11	4	1	7-11	4	1	0.04 ^e	36-30 ^d	11 ^d	1	
298.15	0.1	-3.87	-5.13	-2.03	-26.5	-35.1	-13.9	0.349	158	24.0	78.1	13
298.15	12.5	-3.36	-4.39	-1.77	-23.2	-30.2	-12.2	0.346	180	27.4	92.9	13

298.15	25.0	-2.93	-3.76	-1.54	-20.3	-26.1	-10.7	0.342	206	31.2	110	12
298.15	37.5	-2.56	-3.23	-1.34	-17.8	-22.5	-9.35	0.339	235	35.4	130	12
298.15	50.0	-2.23	-2.78	-1.17	-15.7	-19.5	-8.20	0.337	268	40.1	152	12
298.15	75.0			-0.894			-6.33		347			
298.15	100.0			-0.687			-4.91		448			
298.15	125.0			-0.531			-3.82		575			
298.15	150.0			-0.412			-2.99		735			
298.15	175.0			-0.321			-2.35		936			
298.15	200.0			-0.252			-1.85		1187			
323.15	0.1	-9.97	-13.52	-5.13	-67.1	-91.0	-34.6	0.364	69.0	9.68	30.4	16
323.15	12.5	-8.84	-11.90	-4.58	-60.0	-80.7	-31.0	0.360	76.8	11.0	35.0	15
323.15	25.0	-7.85	-10.49	-4.08	-53.6	-71.6	-27.9	0.356	85.6	12.5	40.2	15
323.15	37.5	-6.98	-9.28	-3.65	-47.9	-63.7	-25.0	0.353	95.3	14.1	46.0	14
323.15	50.0	-6.22	-8.22	-3.26	-43.0	-56.7	-22.5	0.350	105	15.9	52.3	14
323.15	75.0	-4.96	-6.49	-2.62	-34.6	-45.3	-18.2	0.346	131	20.0	67.0	13
323.15	100.0	-3.98	-5.18	-2.11	-28.1	-36.5	-14.9	0.342	161	25.0	84.4	12
323.15	125.0	-3.22		-1.71	-22.9				197	30.8		
323.15	150.0	-2.62		-1.39	-18.8				240	37.6		
323.15	175.0	-2.14		-1.13	-15.5				292	45.4		

348.15	0.10	-21.05	-28.12	-10.15	-139.4	-186.3	-67.23	0.387	38.2	3.96	15.0	25
348.15	12.5	-18.97	-25.29	-9.21	-126.6	-168.8	-61.44	0.384	41.8	4.48	16.4	24
348.15	25.0	-17.11	-22.77	-8.36	-115.0	-153.0	-56.15	0.381	45.7	5.06	18.3	23
348.15	37.5	-15.46	-20.55	-7.59	-104.6	-139.0	-51.36	0.378	50.0	5.69	20.4	22
348.15	50.0	-14.00	-18.59	-6.91	-95.2	-126.5	-47.01	0.376	54.6	6.37	22.6	21
348.15	75.0	-11.52	-15.31	-5.74	-79.3	-105.3	-39.48	0.372	65.0	7.92	27.6	19
348.15	100.0	-9.53	-12.71	-4.78	-66.3	-88.3	-33.26	0.370	77.2	9.73	33.2	18
348.15	125.0	-7.94	-10.63	-4.01	-55.7	-74.6	-28.1	0.369	91.4	11.8	39.3	18
348.15	150.0	-6.644	-8.97	-3.37	-47.0	-63.5	-23.8	0.369	108	14.2	46.0	18
348.15	175.0	-5.594	-7.63	-2.84	-39.9	-54.4	-20.3	0.370	127	16.8	52.9	18
348.15	200.0	-4.734	-6.54	-2.41	-34.0	-47.0	-17.3	0.373	149	19.8	59.9	19
348.15	225.0	-4.030	-5.65	-2.04	-29.1	-40.8	-14.8	0.377	174	23.0	66.7	20
348.15	250.0	-3.45			-25.1				202	26.4		

[HMIM][Tf ₂ N]												
<i>T</i> /K	<i>p</i> /MPa	<i>f</i> ₊₊ ^a	<i>f</i> ₋₋	<i>f</i> ₊₋	<i>D</i> ₊₊ ^{d b}	<i>D</i> ₋₋ ^d	<i>D</i> ₊₋ ^d	Δ	<i>r</i> ₊₊ ^c	<i>r</i> ₋₋	<i>r</i> ₊₋	<i>r</i> ₊₋ ² /(<i>r</i> ₊₊ <i>r</i> ₋₋)
243.15	0.1			-0.019			-0.119				15894	
253.15	0.1			-0.060			-0.377				5221	
263.15	0.1			-0.153			-0.958				2138	
273.15	0.1			-0.331			-2.07				1029	
283.15	0.1			-0.637			-3.95				558.6	
293.15	0.1	-2.51	-3.06	-1.11	-15.43	-18.80	-6.86	0.412	29.4	92.9	332.9	41
298.15	0.1	-3.24	-3.89	-1.43	-19.89	-23.89	-8.78	0.412	22.2	75.9	264.5	42
303.15	0.1	-4.12	-4.90	-1.81	-25.18	-29.97	-11.05	0.412	17.2	62.2	213.6	43
313.15	0.1	-6.33	-7.51	-2.76	-38.45	-45.59	-16.78	0.413	11.2	42.0	145.3	45
323.15	0.1	-9.22	-11.04	-4.02	-55.60	-66.62	-24.26	0.416	7.99	28.8	103.7	47
333.15	0.1	-12.83	-15.69	-5.62	-76.88	-94.03	-33.69	0.418	6.14	20.1	76.98	48
343.15	0.1	-17.21	-21.63	-7.60	-102.4	-128.7	-45.23	0.421	5.00	14.2	59.06	49
353.15	0.1	-22.36	-29.03	-9.98	-132.2	-171.6	-59.01	0.424	4.25	10.2	46.59	50
363.15	0.1	-28.28	-38.07	-12.79	-166.1	-223.5	-75.13	0.427	3.75	7.37	37.63	51
<i>u</i> /%		6-10 ^d	4	1	6-10 ^d	4	1	0.03 ^e	50	20	1	

[OMIM][Tf ₂ N]												
<i>T</i> /K	<i>p</i> /MPa	<i>f</i> ₊₊ ^a	<i>f</i> ₋	<i>f</i> ₊	<i>D</i> ^d ₊₊ ^b	<i>D</i> ^d ₋₋	<i>D</i> ^d ₊₋	Δ	<i>r</i> ₊₊ ^c	<i>r</i> ₋	<i>r</i> ₊	<i>r</i> ₊₋ ² /(<i>r</i> ₊₊ <i>r</i> ₋)
273.15	0.1			-0.227			-1.28				1711	
283.15	0.1			-0.459			-2.58				884.4	
293.15	0.1			-0.836			-4.66				506.6	
298.15	0.1	-2.81		-1.09	-15.60		-6.07		12.5		395.6	
303.15	0.1	-3.58	-4.29	-1.40	-19.80	-23.74	-7.76	0.467	11.4	31.3	314.6	277
313.15	0.1	-5.58	-6.59	-2.20	-30.68	-36.25	-12.1	0.461	8.50	24.7	208.3	206
323.15	0.1	-8.31	-9.78	-3.28	-45.39	-53.43	-17.9	0.460	5.91	17.7	145.3	201
333.15	0.1	-11.90	-14.07	-4.67	-64.56	-76.32	-25.3	0.463	3.99	12.1	105.8	233
343.15	0.1	-16.47	-19.67	-6.42	-88.75	-106.0	-34.6	0.468	2.63	7.86	79.84	308
353.15	0.1	-22.13	-26.83	-8.55	-118.5	-143.6	-45.8	0.474	1.71	4.84	62.07	467
363.15	0.1	-28.98	-35.78	-11.11	-154.1	-190.2	-59.1	0.481	1.07	2.69	49.50	850
<i>u</i> /%		5	4	1	5	4	1	0.03 ^e	113-190 ^d	43-76 ^d	1	

Units: ^a *f*_{ij}: 10⁻¹⁵ m⁵/(mol·s). ^b *D*_{ij}^d: 10⁻¹² m²/s. ^c *r*_{ij}: 10¹² J·s·m⁻²·mol⁻¹

^d The uncertainties vary: the first entry is for the datum at the top of the column, the second is that for the datum at the bottom.

^e Actual uncertainty, not a percentage.

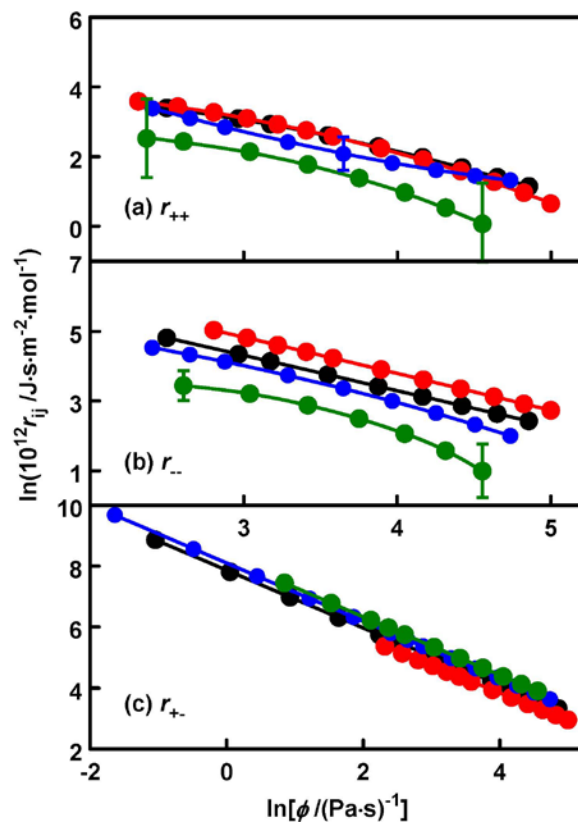


Fig. S1 Stokes-Einstein-Sutherland-type plots for the Laity resistance coefficients for [RMIM][Tf₂N] salts at 0.1 MPa. ϕ is the fluidity (reciprocal viscosity). Symbols as in Fig. 9. Note the difference between the scale of the x axis for the upper two panels and the lowest.