

Supplementary Information:

Does $[\text{Tf}_2\text{N}]^-$ Slither? Equivalence of Cation and
Anion Self-diffusion Activation Volumes in 1-
Ethyl-3-methylimidazolium
Bis(trifluoromethylsulfonyl)amide.

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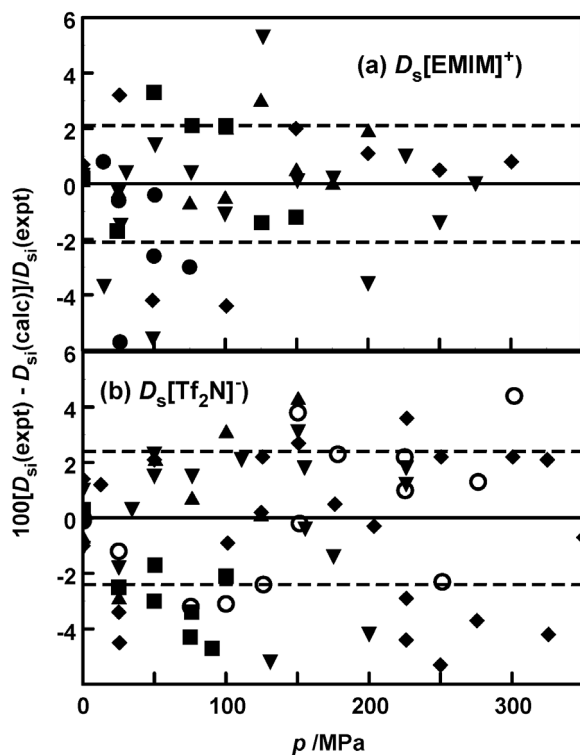
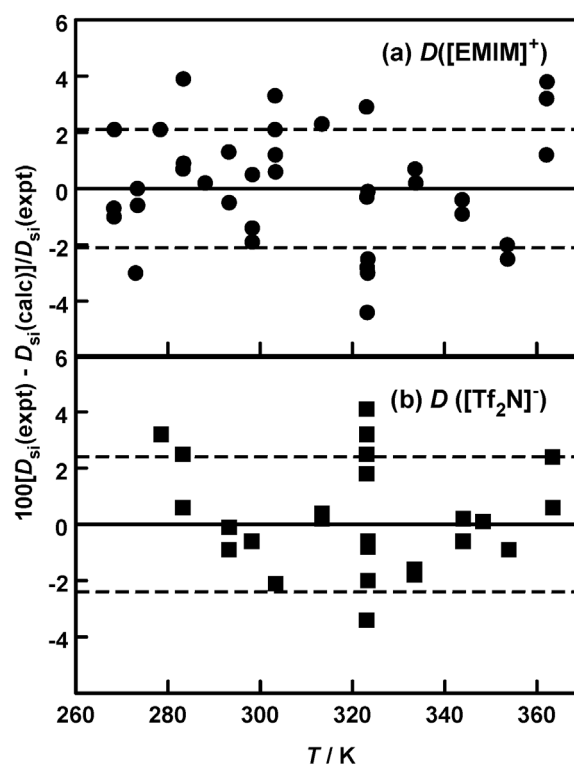


Fig. S1. Deviation plots for the fits of the high-pressure self-diffusion coefficients to the modified Vogel-Fulcher-Tammann equation, eqn 5: (a) cation, (b) anion. Symbols: ●, 288 K; ■, 298 K; ▲, 308 K; ▼, 323 K, ○, 338 K; ◆, 348 K. The dotted lines represent the standard deviations of the fits, 2.1 and 2.4% respectively.

Fig. S2. Deviation plots for the fits of the atmospheric-pressure self-diffusion coefficients to the modified Vogel-Fulcher-Tammann equation, eqn 5: (a) ●, cation, (b) ■, anion. The dotted lines represent the standard deviations of the fits, 2.1 and 2.4% respectively. N.B.: the high-pressure and atmospheric pressure data were fitted simultaneously.



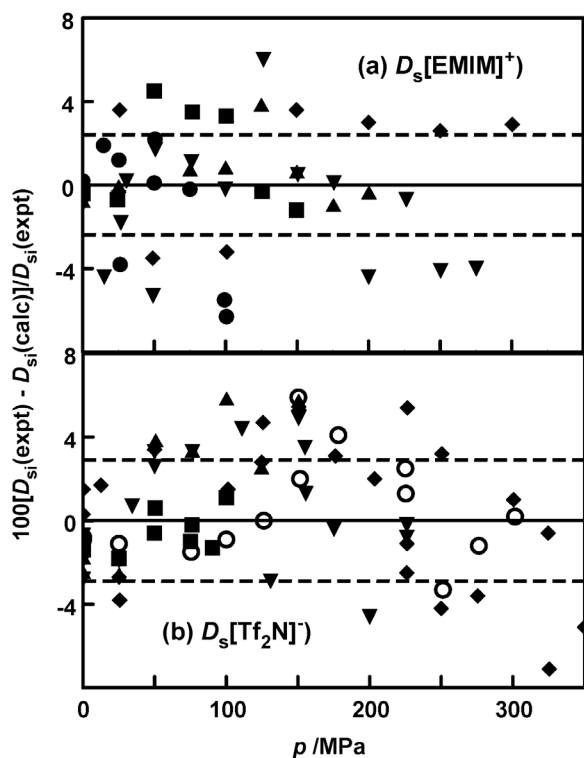


Fig. S3. Deviation plots for the density scaling fits of the high-pressure self-diffusion coefficients: (a) cation, (b) anion. Symbols: ●, 288 K; ■, 298 K; ▲, 308 K; ▼, 323 K, ○, 338 K; ◆, 348 K. The dotted lines represent the standard deviations of the fits, 2.4 and 2.9 % respectively.

Fig. S4. Deviation plots for the thermodynamic scaling fits of the atmospheric-pressure self-diffusion coefficients: (a) ●, cation, (b) ■, anion. The dotted lines represent the standard deviations of the fits, 2.4 and 2.9% respectively. N.B.: the high-pressure and atmospheric pressure data were fitted simultaneously.

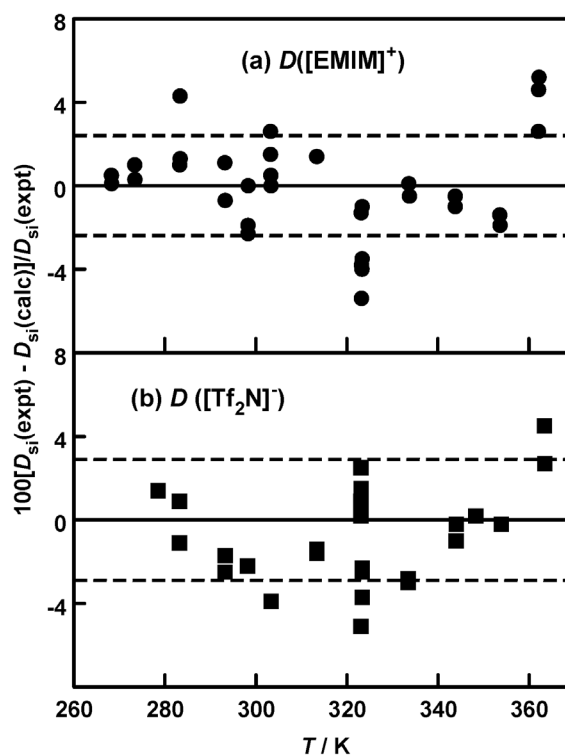


Table S1. Experimental Cation Self-Diffusion Coefficients D_{S^+} of [EMIM][Tf₂N] from $T = (268 \text{ to } 362)$ K at Pressures $p = (0.1 \text{ to } 351)$ MPa together with Calculated Densities ρ and Molar Volumes V .^a

T/K	p/MPa	$\rho/\text{g}\cdot\text{cm}^{-3}$	$V/\text{cm}^3\cdot\text{mol}^{-1}$	$10^{12} D_{S^+}/\text{m}^2 \text{ s}^{-1}$	T/K	p/MPa	$\rho/\text{g}\cdot\text{cm}^{-3}$	$V/\text{cm}^3\cdot\text{mol}^{-1}$	$10^{12} D_{S^+}/\text{m}^2 \text{ s}^{-1}$
Atm p probe measurements ^a					High pressure vessel measurements				
268.27	0.1	1.54972	252.50	13.95	288.19	75.0	1.57607	248.28	17.13
268.30	0.1	1.54969	252.51	13.92	298.33	0.10	1.51884	257.64	52.57
273.39	0.1	1.54440	253.37	18.28	298.33	0.10	1.51884	257.64	52.57
273.45	0.1	1.54435	253.38	18.21	298.34	24.3	1.53598	254.76	41.63
283.29	0.1	1.53419	255.06	29.13	298.33	50.0	1.55248	252.06	34.95
283.35	0.1	1.53413	255.07	30.20	298.34	76.7	1.56801	249.56	27.49
283.39	0.1	1.53410	255.08	29.32	298.37	100.3	1.58059	247.57	22.59
293.22	0.1	1.52404	256.76	43.98	298.35	125.5	1.59297	245.65	17.73
293.29	0.1	1.52397	256.77	43.30	298.36	149.5	1.60382	243.99	14.65
298.30	0.1	1.51887	257.63	51.48	308.04	0.1	1.50903	259.31	73.27
298.31	0.1	1.51886	257.63	51.71	308.19	0.1	1.50888	259.34	73.62
298.32	0.1	1.51885	257.64	52.74	308.24	0.1	1.50883	259.35	73.66
303.22	0.1	1.51390	258.48	63.67	308.20	25.2	1.52699	256.26	59.40
303.25	0.1	1.51387	258.48	64.50	308.30	75.1	1.55841	251.10	39.62
303.31	0.1	1.51380	258.50	63.24	308.31	100.0	1.57216	248.90	32.66
303.34	0.1	1.51377	258.50	62.97	308.17	100.6	1.57260	248.83	33.16
313.38	0.1	1.50367	260.24	88.50	308.31	125.0	1.58490	246.90	27.91
313.40	0.1	1.50365	260.24	88.57	308.32	149.8	1.59655	245.10	22.60
323.16	0.1	1.49392	261.94	114.4	308.30	175.3	1.60771	243.40	18.62
323.22	0.1	1.49386	261.95	110.0	308.31	200.2	1.61782	241.88	15.88
323.24	0.1	1.49384	261.95	111.8	322.88	0.1	1.49420	261.89	114.2

323.33	0.1	1.49375	261.97	111.9	323.19	0.1	1.49389	261.94	115.2
323.35	0.1	1.49373	261.97	115.2	323.20	15.0	1.50523	259.97	98.77
323.37	0.1	1.49371	261.97	112.5	323.18	25.2	1.51265	258.69	94.45
333.60	0.1	1.48359	263.76	151.7	323.18	26.7	1.51373	258.51	92.29
333.74	0.1	1.48346	263.78	151.4	323.21	30.5	1.51639	258.05	91.45
343.80	0.1	1.47359	265.55	189.8	323.17	49.2	1.52913	255.90	74.93
343.81	0.1	1.47358	265.55	190.8	323.13	50.8	1.53018	255.73	79.22
353.61	0.1	1.46406	267.28	231.6	323.18	76.0	1.54596	253.12	65.33
353.65	0.1	1.46402	267.29	230.7	323.21	99.8	1.55977	250.88	54.29
362.09	0.1	1.45588	268.78	282.9	323.19	126.4	1.57407	248.60	48.06
362.12	0.1	1.45585	268.79	289.0	323.22	150.5	1.58599	246.73	38.65
362.23	0.1	1.45575	268.80	291.4	323.18	175.7	1.59771	244.92	32.63
268.40	0.1	1.54958	252.53	14.44	323.23	200.0	1.60818	243.33	26.85
273.01	0.1	1.54480	253.31	17.41	323.18	226.3	1.61883	241.72	23.71
278.33	0.1	1.53930	254.21	23.65	323.24	250.2	1.62784	240.39	19.99
288.09	0.1	1.52927	255.88	35.50	323.17	275.2	1.63675	239.08	17.35
323.07	0.1	1.49401	261.92	117.8	348.14	0.1	1.46937	266.31	212.1
High pressure vessel measurements					348.15	0.1	1.46936	266.31	212.1
288.18	0.1	1.52918	255.90	35.61	348.14	25.9	1.48963	262.69	183.3
288.21	0.1	1.52915	255.90	35.66	348.13	49.0	1.50646	259.76	146.5
288.23	0.1	1.52913	255.90	35.69	348.14	100.8	1.54015	254.07	105.4
288.23	14.6	1.53935	254.21	31.26	348.17	149.5	1.56767	249.61	83.79
288.23	25.3	1.54651	253.03	27.84	348.17	200.0	1.59269	245.69	62.09
288.18	26.2	1.54714	252.93	26.22	348.13	250.0	1.61461	242.36	46.86
288.23	50.0	1.56189	250.54	21.68	348.14	300.4	1.63424	239.45	36.14
288.22	50.6	1.56225	250.48	22.01	348.15	351.2	1.65193	236.88	27.58

^a Entries in bold for 0.1 MPa have been reported previously.¹ Entries in normal type are new check measurements on the sealed NMR tube sample.

Table S2. Experimental Anion Self-Diffusion Coefficients D_s of [EMIM][Tf₂N] from $T = (278 \text{ to } 363) \text{ K}$ at Pressures $p = (0.1 \text{ to } 353) \text{ MPa}$ together with Calculated Densities ρ and Molar Volumes V .^a

T/K	p/MPa	$\rho/\text{g}\cdot\text{cm}^{-3}$	$V/\text{cm}^3\cdot\text{mol}^{-1}$	$10^{12} D_s/\text{m}^2 \text{ s}^{-1}$	T/K	p/MPa	$\rho/\text{g}\cdot\text{cm}^{-3}$	$V/\text{cm}^3\cdot\text{mol}^{-1}$	$10^{12} D_s/\text{m}^2 \text{ s}^{-1}$
Atm p probe measurements ^a					High pressure vessel measurements				
283.17	0.1	1.53432	255.04	16.50	323.21	76.3	253.09	1.54615	40.41
283.19	0.1	1.53429	255.04	16.20	323.16	111.0	249.89	1.56596	31.47
293.21	0.1	1.52404	256.76	24.97	323.14	131.0	248.22	1.57645	25.28
293.23	0.1	1.52402	256.76	25.20	323.09	150.4	246.72	1.58606	23.80
298.15	0.1	1.51903	257.61	30.53	323.20	155.0	246.39	1.58818	22.80
303.33	0.1	1.51378	258.50	36.49	323.13	155.4	246.36	1.58840	22.17
313.37	0.1	1.50368	260.24	52.35	323.10	175.2	244.95	1.59752	19.01
313.41	0.1	1.50364	260.24	52.55	323.11	200.1	243.31	1.60828	15.46
323.03	0.1	1.49405	261.91	71.00	323.11	226.0	241.74	1.61875	13.63
323.03	0.1	1.49405	261.91	72.68	323.13	226.0	241.74	1.61874	13.56
323.05	0.1	1.49402	261.92	67.49	338.14	0.1	264.55	1.47913	103.0
323.07	0.1	1.49401	261.92	71.58	338.15	0.1	264.56	1.47912	102.9
323.31	0.1	1.49377	261.96	69.69	338.28	0.1	264.58	1.47899	103.4
323.32	0.1	1.49375	261.96	68.89	338.19	25.0	261.17	1.49829	86.20
323.35	0.1	1.49373	261.97	69.91	338.25	75.4	255.31	1.53268	60.54
333.41	0.1	1.48378	263.73	90.40	338.25	100.0	252.84	1.54764	51.52
333.42	0.1	1.48376	263.73	90.22	338.23	126.2	250.45	1.56245	43.64
343.98	0.1	1.47342	265.58	117.1	338.24	150.3	248.44	1.57509	39.68
344.04	0.1	1.47336	265.59	118.2	338.24	151.4	248.35	1.57566	37.81
353.90	0.1	1.46378	267.33	144.0	338.24	178.2	246.30	1.58876	32.59
353.92	0.1	1.46376	267.33	144.1	338.32	225.0	243.12	1.60955	24.11

363.38	0.1	1.45464	269.01	178.7	338.27	225.3	243.10	1.60968	23.74
363.43	0.1	1.45460	269.02	175.7	338.32	251.3	241.52	1.62021	19.49
278.52	0.1	1.53911	254.25	13.18	338.29	276.3	240.10	1.62977	17.20
323.12	0.1	1.49395	261.93	72.18	338.31	301.6	238.77	1.63886	15.14
High pressure vessel measurements					348.22	0.1	266.33	1.46929	131.0
298.04	0.1	257.59	1.51914	30.64	348.27	0.1	266.34	1.46924	129.6
298.04	0.1	257.59	1.51913	30.64	348.30	0.1	266.34	1.46921	129.6
298.47	0.1	257.66	1.51870	31.15	348.32	0.1	266.34	1.46919	128.1
298.05	25.1	254.63	1.53678	23.78	348.24	12.5	264.54	1.47922	121.1
298.23	49.8	252.06	1.55245	19.10	348.28	25.1	262.82	1.48892	106.9
298.06	50.4	251.98	1.55296	19.09	348.20	25.6	262.74	1.48936	105.3
298.23	75.0	249.69	1.56719	15.04	348.26	50.0	259.65	1.50704	96.67
298.03	76.0	249.57	1.56792	14.90	348.16	101.3	254.02	1.54046	68.10
298.04	90.3	248.35	1.57566	12.96	348.22	124.7	251.80	1.55405	59.72
298.22	100.0	247.58	1.58056	12.29	348.22	125.6	251.72	1.55454	60.59
308.35	0.1	259.36	1.50874	44.05	348.23	150.8	249.52	1.56827	52.20
308.33	0.1	259.37	1.50872	44.32	348.16	176.2	247.46	1.58130	43.67
308.36	25.3	256.27	1.52694	34.95	348.16	203.6	245.44	1.59434	36.69
308.36	50.7	253.50	1.54364	29.77	348.20	226.0	243.90	1.60438	30.84
308.33	76.4	250.98	1.55911	23.70	348.23	226.1	243.90	1.60440	31.29
308.33	100.3	248.88	1.57230	19.95	348.18	226.5	243.87	1.60462	33.29
308.33	124.6	246.93	1.58469	15.86	348.21	250.0	242.36	1.61457	26.47
308.33	150.6	245.04	1.59692	13.41	348.17	250.5	242.33	1.61479	28.40
323.06	0.1	261.92	1.49402	70.46	348.15	275.5	240.83	1.62482	23.06
323.16	0.1	261.94	1.49392	69.19	348.16	300.5	239.44	1.63427	21.08
323.37	0.1	261.97	1.49371	70.23	348.14	324.6	238.18	1.64290	18.25
323.19	25.2	258.69	1.51266	57.05	348.16	325.4	238.14	1.64318	17.07

323.38	34.4	257.62	1.51894	54.74	348.15	350.0	236.94	1.65155	15.30
323.07	50.0	255.80	1.52974	49.17	348.16	353.1	236.79	1.65255	14.73
323.25	50.0	255.83	1.52958	49.26					

^a Entries in bold for 0.1 MPa have been reported previously.¹ Entries in normal type are new check measurements on the sealed NMR tube sample.

Reference

¹ K. R. Harris and M. Kanakubo, *Phys. Chem. Chem. Phys.*, 2015, **17**, 23977-23993.