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Supplementary Material

Effect of Modifying the Anion of an Ionic Liquid on the Outcome of an S_N2 Process

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Eyring Data: Acetonitrile[1]

Temperature / °C	[Nu] / mol L^{-1}	k_{obs} / 10^{-4} s^{-1}	k_2 / 10^{-4} L mol^{-1} s^{-1}
0.5	0.496	0.888	1.79
-0.2		0.965	1.95
0.2		0.937	1.89
9.6		1.86	3.76
10.2		2.02	4.07
8.8		1.69	3.41
19.5		3.67	7.40
19.6		3.88	7.82
19.9		3.82	7.70
29.8		7.61	15.3
29.5		7.39	14.9
29.9		7.52	15.2

Eyring Data: [Bmim][$N(CF_3SO_2)_2$] **3**

Mole Fraction of ionic liquid 3	Temperature / °C	[Nu] / mol L^{-1}	k_{obs} / 10^{-4} s^{-1}	k_2 / 10^{-4} L mol^{-1} s^{-1}
0.89	-5.0	0.508	0.745	1.47
			0.740	1.46
			0.760	1.50
	5.0		2.00	3.94
			1.90	3.73
			1.72	3.40
	15.0		4.20	8.27
			3.95	7.78
			3.71	7.31
	25.0		9.15	18.0
			9.61	18.9
			9.61	18.9

Eyring Data: [Bmim][N(CN)$_2$] **4**

Mole Fraction of ionic liquid 4	Temperature / °C	[Nu] / mol L^{-1}	k_{obs} / 10^{-4} s^{-1}	k_2 / 10^{-4} L mol^{-1} s^{-1}
0.92	-5.0	0.496	1.41	2.85
			2.12	4.27
			1.47	2.95
	5.0		4.13	8.32
			5.25	10.6
			3.67	7.38
	15.0		8.99	18.1
			8.01	16.1
			8.79	17.7
	25.0		27.0	54.3
			29.1	58.5
			17.6	35.4

Eyring Data: [Bmim][PF$_6$] **5**

Mole Fraction of ionic liquid 5	Temperature / °C	[Nu] / mol L^{-1}	k_{obs} / 10^{-4} s^{-1}	k_2 / 10^{-4} L mol^{-1} s^{-1}
0.90	-5.0	0.496	1.13	2.28
			1.79	3.61
			1.07	2.16
	5.0		2.18	4.40
			1.87	3.77
			2.68	5.40
	15.0		3.43	6.93
			3.24	6.54
			4.97	10.0
	25.0		5.60	11.3
			6.61	13.3
			6.53	13.2

Eyring Data: [Bmim][BF_4] **6**

Mole Fraction of ionic liquid 6	Temperature / °C	[Nu] / mol L^{-1}	k_{obs} / 10^{-4} s^{-1}	k_2 / 10^{-4} L mol^{-1} s^{-1}
0.93	-5.0	0.358	1.19	3.32
			0.933	2.61
			0.797	2.23
	2.0		1.73	4.83
			1.83	5.12
			1.71	4.77
	12.3		3.16	8.82
			3.11	8.70
			4.08	11.4
	21.9		7.88	22.0
			7.02	19.6
			9.05	25.3

Eyring Data: [Bmim]Br **7** in [Bmim][$N(CF_3SO_2)_2$] **3**

Mole Fraction of ionic liquid 7	Temperature / °C	[Nu] / mol L^{-1}	k_{obs} / 10^{-4} s^{-1}	k_2 / 10^{-4} L mol^{-1} s^{-1}
0.33	14.9	0.466	5.66	12.2
(0.89 IL overall)			6.12	13.2
			5.67	12.2
	20.5		8.30	17.8
			9.35	20.1
			8.66	18.6
	25.0		12.4	26.6
			12.5	26.8
			12.2	26.1
	30.1		18.2	39.1
			18.7	40.1
			18.8	40.3

References:

1. E. E. L. Tanner, H. M. Yau, R. R. Hawker, A. K. Croft, J. B. Harper, *Org. Biomol. Chem.* **2013**, *11*, 6170-6175.