

Supporting Information

Ionic-Liquid-Based Aqueous Biphasic Systems With Controlled pH: The Ionic Liquid Cation Effect

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Table S1. Experimental binodal mass fraction data for the system [1-C₂-3-C₁im]Cl (1) + K₂HPO₄ (2) at 298 K.

[1-C ₂ -3-C ₁ im]Cl									
(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01
36.90	6.44	19.85	18.03	13.49	24.81	9.91	29.05	7.34	32.52
33.42	8.24	18.83	19.30	13.01	25.49	9.64	29.45	7.17	32.74
30.40	9.74	18.23	19.71	12.70	25.70	9.37	29.82	6.81	33.40
28.68	10.95	17.43	20.68	12.23	26.30	9.09	30.14	6.67	33.59
27.30	12.11	16.89	21.05	11.81	26.88	8.85	30.50	6.40	33.99
25.51	12.81	16.09	22.05	11.55	27.02	8.61	30.85	6.05	34.62
23.67	14.65	15.39	22.93	11.16	27.53	8.35	31.06	5.78	35.07
22.71	15.39	14.73	23.67	10.81	27.99	8.07	31.57	5.47	35.46
21.79	16.10	14.36	23.92	10.48	28.37	7.87	31.80	5.01	36.37
20.61	17.51	13.81	24.62	10.17	28.74	7.51	32.29		

Table S2. Experimental binodal mass fraction data for the system [1-C₄-3-C₁im]Cl (1) + K₂HPO₄ (2) at 298 K.

[1-C ₄ -3-C ₁ im]Cl									
(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01
34.97	7.34	13.96	21.80	8.35	28.08	5.61	31.60	3.11	36.17
31.75	8.61	13.55	22.18	8.20	28.19	5.51	31.77	3.01	36.44
28.85	9.86	13.00	23.05	8.05	28.30	5.30	32.19	2.89	36.66
27.28	11.06	12.57	23.18	7.83	28.73	5.16	32.35	2.82	36.90
25.32	11.75	12.28	23.46	7.68	28.76	5.00	32.59	2.68	37.45
24.18	12.61	11.83	24.14	7.55	28.87	4.80	32.95	2.61	37.53
23.00	13.52	11.53	24.38	7.42	28.96	4.66	33.13	2.51	37.84
22.08	14.13	11.29	24.61	7.30	29.07	4.50	33.47	2.45	37.94
20.83	15.56	11.03	24.85	7.12	29.44	4.39	33.59	2.37	38.22
20.08	16.07	10.67	25.38	6.97	29.65	4.25	33.83	2.30	38.44
19.43	16.61	10.50	25.49	6.88	29.71	4.13	34.09	2.22	38.70
18.39	17.71	10.23	25.70	6.73	30.00	4.00	34.30	2.14	38.86
17.87	18.20	10.06	25.93	6.63	30.05	3.89	34.58	2.08	39.00
17.30	18.61	9.76	26.42	6.49	30.28	3.80	34.77	2.00	39.24
16.73	19.03	9.57	26.55	6.34	30.58	3.64	35.12	1.94	39.46
16.00	19.90	9.38	26.69	6.25	30.62	3.55	35.25	1.87	39.66
15.49	20.31	9.09	27.20	6.12	30.91	3.46	35.46	1.823	39.87
15.01	20.69	8.91	27.34	5.99	31.16	3.35	35.66	1.77	40.00
14.66	21.04	8.73	27.48	5.82	31.24	3.28	35.80	1.71	40.20
14.27	21.38	8.58	27.66	5.73	31.37	3.21	35.95	1.66	40.44

Table S3. Experimental binodal mass fraction data for the system [1-C₆-3-C₁im]Cl (1) + K₂HPO₄ (2) at 298 K.

[1-C ₆ -3-C ₁ im]Cl									
(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01
34.59	7.84	12.43	22.53	7.61	27.66	5.40	30.26	4.02	32.63
31.33	9.54	12.18	22.77	7.51	27.74	5.35	30.28	3.99	32.65
29.55	10.55	11.95	23.00	7.42	27.83	5.28	30.42	3.91	32.80
27.22	11.57	11.70	23.25	7.33	27.89	5.19	30.67	3.86	32.89
25.77	12.70	11.47	23.53	7.26	28.04	5.14	30.69	3.82	33.05
24.34	13.46	11.25	23.72	7.17	28.11	5.09	30.73	3.79	33.06
23.30	14.29	11.05	23.88	7.08	28.18	5.02	30.91	3.74	33.17
21.81	14.97	10.86	24.07	6.94	28.51	4.97	30.96	3.72	33.21
20.97	15.61	10.65	24.31	6.86	28.56	4.90	31.14	3.67	33.32
20.20	16.25	10.45	24.52	6.79	28.66	4.85	31.17	3.64	33.34
19.44	16.90	10.25	24.64	6.71	28.74	4.81	31.20	3.62	33.40
18.76	17.46	10.08	24.84	6.62	28.80	4.77	31.26	3.57	33.49
18.17	17.94	9.91	25.01	6.42	29.16	4.70	31.39	3.53	33.59
17.55	18.29	9.73	25.21	6.34	29.18	4.64	31.54	3.51	33.59
16.90	18.60	9.56	25.35	6.24	29.42	4.60	31.56	3.45	33.80
16.45	19.01	9.41	25.50	6.16	29.52	4.54	31.73	3.40	33.81
16.09	19.50	9.29	25.71	6.09	29.62	4.47	31.80	3.37	33.79
15.71	19.89	9.15	25.87	6.02	29.61	4.44	31.84	3.31	34.24
15.31	20.21	9.01	26.00	5.96	29.66	4.40	31.88	3.25	34.41
14.93	20.49	8.78	26.40	5.91	29.75	4.35	32.05	3.22	34.52
14.57	20.78	8.66	26.53	5.86	29.83	4.29	32.19	3.19	34.51
14.24	21.08	8.53	26.62	5.77	30.03	4.25	32.18	3.16	34.60
13.91	21.35	8.41	26.71	5.72	30.06	4.20	32.32	3.06	34.89
13.52	21.48	8.30	26.82	5.62	30.29	4.16	32.34	2.96	34.97
13.23	21.77	8.19	26.94	5.52	30.00	4.11	32.48	2.90	35.16
12.96	22.05	7.97	27.19	5.44	30.18	4.07	32.51	2.85	35.31
12.70	22.31	7.80	27.48						

Table S4. Experimental binodal mass fraction data for the system [1-C₂-3-C₁im]Cl (1) + K₂HPO₄/KH₂PO₄ (2) at 298 K.

[1-C ₂ -3-C ₁ im]Cl			
(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01
57.77	1.08	38.73	5.68
53.76	1.73	36.48	6.40
50.34	2.98	33.78	7.75
45.31	4.08	32.52	8.25
40.84	4.82		

Table S5. Experimental binodal mass fraction data for the system [1-C₄-3-C₁im]Cl (1) + K₂HPO₄/KH₂PO₄ (2) at 298 K.

[1-C ₄ -3-C ₁ im]Cl			
(100 w_1) ± 0.01	(100 w_2) ± 0.01	(100 w_1) ± 0.01	(100 w_2) ± 0.01
57.71	1.10	39.98	5.33
54.17	1.82	37.76	6.53
50.68	2.43	35.05	7.86
48.33	3.02	32.50	9.15
46.07	3.75	30.92	10.15
43.20	4.27	27.55	12.93
41.37	4.74		

Table S6. Experimental binodal mass fraction data for the system [1-C₆-3-C₁im]Cl (1)
+ K₂HPO₄/KH₂PO₄ (2) at 298 K.

[1-C ₆ -3-C ₁ im]Cl					
(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01
59.42	0.87	35.98	7.26	23.57	14.40
54.62	1.89	35.11	7.55	22.34	15.40
51.06	3.22	33.83	8.24	21.34	16.18
47.43	3.58	32.54	8.97	20.53	16.81
45.19	4.02	31.79	9.25	19.73	17.40
43.76	4.51	30.63	9.86	18.83	18.12
42.43	5.00	29.60	10.50	18.09	18.76
40.88	5.38	28.64	11.04	17.05	19.69
39.69	5.81	27.29	12.02	16.15	20.57
38.84	5.94	25.25	13.30	15.21	21.59
37.34	6.80	24.45	13.78	14.40	22.36

Table S7. Experimental binodal mass fraction data for the system [1-C₇-3-C₁im]Cl (1) + K₂HPO₄/KH₂PO₄ (2) at 298 K.

[1-C ₇ -3-C ₁ im]Cl			
(100 w_1) ± 0.01	(100 w_2) ± 0.01	(100 w_1) ± 0.01	(100 w_2) ± 0.01
56.53	3.19	41.15	7.71
53.31	4.12	39.75	8.34
50.72	4.56	38.02	9.13
47.90	5.44	36.24	10.11
46.61	5.81	34.42	11.19
45.60	6.08	32.01	12.68
43.94	6.82	29.86	14.14
42.84	7.14	24.65	18.29

Table S8 Experimental binodal mass fraction data for the system [1-C₈-3-C₁im]Cl (1) + K₂HPO₄/KH₂PO₄ (2) at 298 K.

[1-C ₈ -3-C ₁ im]Cl			
(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01
54.78	3.19	26.53	15.23
50.07	4.29	24.40	16.77
45.62	5.71	22.95	17.83
41.32	7.30	21.71	18.73
37.29	8.91	19.53	20.42
35.46	9.91	17.62	22.01
32.89	11.45	15.01	24.35
31.08	12.44	12.10	27.13
28.47	14.07		

Table S9. Experimental binodal mass fraction data for the system [1-C₇H₇-3-C₁im]Cl (1) + K₂HPO₄/KH₂PO₄ (2) at 298 K.

[1-C ₇ H ₇ -3-C ₁ im]Cl			
(100 w_1) ± 0.01	(100 w_2) ± 0.01	(100 w_1) ± 0.01	(100 w_2) ± 0.01
55.86	3.39	34.78	9.80
51.22	4.78	33.25	10.68
44.99	5.55	31.71	11.65
41.87	6.87	29.92	12.85
38.89	7.77	27.92	14.28
36.18	9.03	25.28	16.44

Table S10. Experimental binodal mass fraction data for the system [1-C₄-1-C₁pip]Cl (1) + K₂HPO₄/KH₂PO₄ (2) at 298 K.

[1-C ₄ -1-C ₁ pip]Cl	
(100 w_1) ± 0.01	(100 w_2) ± 0.01
57.23	1.17
50.03	2.21
44.50	3.22
40.23	4.29
34.53	6.58
28.00	10.61
21.27	16.43

Table S11. Experimental binodal mass fraction data for the system [1-C₄-1-C₁pyr]Cl (1) + K₂HPO₄/KH₂PO₄ (2) at 298 K.

[1-C ₄ -1-C ₁ pyr]Cl	
(100 w_1) ± 0.01	(100 w_2) ± 0.01
53.75	3.41
47.35	4.23
34.67	7.96
23.44	15.43

Table S12. Experimental binodal mass fraction data for the system [1-C₄-3-C₁py]Cl (1) + K₂HPO₄/KH₂PO₄ (2) at 298 K.

[1-C ₄ -3-C ₁ py]Cl					
(100 w_1) ± 0.01	(100 w_2) ± 0.01	(100 w_1) ± 0.01	(100 w_2) ± 0.01	(100 w_1) ± 0.01	(100 w_2) ± 0.01
56.59	0.80	28.43	8.14	17.16	16.88
49.22	1.83	26.52	9.26	16.34	17.71
42.57	2.61	24.47	10.60	14.84	19.28
39.39	3.33	22.65	11.92	13.69	20.66
37.00	4.22	20.93	13.29	12.67	21.69
34.80	5.05	20.11	14.15	10.34	24.85
32.48	6.11	19.18	14.86	8.15	27.33
30.42	7.11	18.43	15.53	6.13	30.03

Table S13. Experimental binodal mass fraction data for the system [1-C₄-2-C₁py]Cl (1) + K₂HPO₄/KH₂PO₄ (2) at 298 K.

[1-C ₄ -2-C ₁ py]Cl					
(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01	(100 w ₁) ± 0.01	(100 w ₂) ± 0.01
58.36	0.68	32.64	6.19	20.50	14.80
51.56	1.67	31.11	7.20	18.85	16.28
44.91	2.52	28.91	8.49	17.62	17.56
41.45	3.24	26.28	10.37	15.24	20.04
38.98	3.95	24.83	11.13	13.71	21.80
36.63	4.76	23.26	12.55	11.64	24.37
34.48	5.52	22.08	13.25	8.93	27.69

Table S14. Experimental binodal mass fraction data for the system [1-C₄-4-C₁py]Cl (1) + K₂HPO₄/KH₂PO₄ (2) at 298 K.

[1-C ₄ -4-C ₁ py]Cl					
(100 w_1) ± 0.01	(100 w_2) ± 0.01	(100 w_1) ± 0.01	(100 w_2) ± 0.01	(100 w_1) ± 0.01	(100 w_2) ± 0.01
57.84	0.77	31.17	6.82	21.75	12.59
52.99	1.30	29.42	7.61	20.30	14.07
45.61	2.29	27.48	8.71	19.07	14.97
40.70	3.52	25.81	9.64	15.02	19.98
37.81	4.16	24.93	10.24	10.35	24.90
35.78	4.96	24.02	10.89	8.01	27.51
33.02	5.92	22.63	12.21	6.03	30.09