

Supporting Information File

Imidazolium-based ionic liquids as adjuvants to form polyethylene glycol + salt buffer phase aqueous biphasic systems

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Table S1: Weight fraction data (w) for the systems composed of PEG (1) + K_2HPO_4/KH_2PO_4 pH 7 (2) + water.

PEG 1000		PEG 1000		PEG 1500		PEG 1500	
100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2
15.68	11.82	25.92	6.93	1.20	20.88	15.47	9.72
15.86	11.74	26.42	6.78	1.86	18.90	16.08	9.43
16.04	11.68	26.94	6.62	2.36	17.97	16.72	9.11
16.20	11.59	27.79	6.31	3.00	17.39	17.43	8.78
16.35	11.49	28.48	6.03	3.64	16.75	17.94	8.58
16.70	11.07	28.97	5.81	4.05	16.30	18.58	8.31
16.84	11.00	29.50	5.58	4.57	15.80	19.27	8.00
16.99	10.97	30.02	5.47	5.20	15.21	19.77	7.83
17.24	10.76	30.56	5.29	5.71	14.88	20.26	7.60
17.39	10.70	31.00	5.23	6.76	14.25	21.14	7.29
17.61	10.60	31.60	5.11	7.27	14.11	22.00	6.92
17.75	10.55	32.37	4.89	7.44	14.01	22.66	6.73
18.00	10.50	33.13	4.63	7.60	13.92	23.42	6.47
18.24	10.27	33.81	4.47	7.82	13.79	24.16	6.21
18.43	10.17	34.80	4.29	8.01	13.67	25.00	5.90
18.71	10.09	35.97	3.99	8.09	13.64	25.53	5.77
19.10	9.89	37.20	3.63	8.28	13.53	26.10	5.60
19.28	9.79	38.83	3.45	8.51	13.40	26.93	5.34
19.44	9.70	40.49	3.21	8.75	13.26	27.88	5.03
19.63	9.61	42.32	3.02	8.98	13.15	28.68	4.82
19.83	9.53	45.02	2.72	9.16	13.04	29.44	4.66
20.07	9.41	47.74	2.35	9.40	12.90	30.26	4.49
20.25	9.35	52.29	2.03	9.66	12.77	31.04	4.35
20.47	9.25	55.96	1.57	9.96	12.60	31.95	4.17
20.73	9.12	58.47	0.93	10.26	12.44	33.85	3.82
20.93	9.09			10.63	12.21	34.94	3.54
21.18	8.95			10.92	12.06	36.57	3.17
21.37	8.83			11.42	11.85	37.82	2.93
21.86	8.78			12.22	11.38	39.57	2.82
22.31	8.38			12.62	11.17	41.64	2.53
22.59	8.25			12.94	11.01	43.16	2.21
22.75	8.25			13.45	10.75	45.50	1.85

24.62	7.44		13.91	10.53
25.10	7.23		14.52	10.20
25.53	7.08		15.05	9.94

Table S2: Weight fraction data (w) for the systems composed of PEG (1) + K_2HPO_4/KH_2PO_4 pH 7 (2) + water.

PEG 2000		PEG 2000		PEG 2000		PEG 2000	
100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2
0.46	36.84	13.41	10.11	17.52	8.42	27.58	5.05
0.54	22.85	13.48	10.11	17.75	8.19	28.11	4.88
0.75	21.07	13.58	10.03	17.89	8.12	28.73	4.71
0.96	24.58	13.68	9.99	18.11	8.07	29.42	4.63
1.13	20.08	13.76	9.99	18.29	7.95	30.28	4.48
1.47	19.23	13.77	9.98	18.46	7.88	31.57	4.30
1.54	19.70	13.83	9.98	18.70	7.83	32.70	3.96
1.99	18.45	13.91	9.97	18.88	7.74	33.76	3.71
2.05	18.30	13.93	9.84	19.04	7.66	35.27	3.57
2.13	18.14	13.99	9.90	19.27	7.60	36.81	3.24
2.56	17.39	14.08	9.85	19.47	7.52	37.89	2.90
2.77	17.49	14.16	9.84	19.66	7.42	49.26	1.74
3.03	16.74	14.24	9.82	19.91	7.30		
3.53	16.30	14.29	9.66	20.25	7.23		
3.98	15.82	14.38	9.80	20.47	7.12		
4.47	15.53	14.51	9.74	20.68	7.02		
5.00	15.20	14.58	9.67	21.06	6.97		
5.41	14.67	14.66	9.65	21.35	6.83		
5.80	14.40	14.72	9.48	21.56	6.70		
6.19	14.15	14.77	9.63	21.75	6.69		
6.99	13.77	14.88	9.61	21.96	6.64		
7.30	13.50	15.01	9.53	22.24	6.47		
8.11	13.13	15.22	9.48	22.50	6.44		
8.78	12.79	15.26	9.27	22.71	6.40		
9.05	12.54	15.41	9.41	22.90	6.30		
9.36	12.33	15.56	9.29	23.04	6.28		
10.01	12.04	15.82	8.93	23.21	6.25		
10.26	11.84	16.01	8.89	23.61	6.21		
11.02	11.52	16.16	8.74	23.91	6.04		
11.26	11.34	16.28	8.73	24.22	5.94		
11.52	11.14	16.40	8.66	24.52	5.82		
11.79	10.97	16.57	8.72	24.93	5.80		
12.29	10.71	16.72	8.61	25.40	5.63		
12.55	10.57	16.85	8.57	25.72	5.54		
13.09	10.32	16.98	8.50	26.02	5.44		

13.27	10.19	17.11	8.44	26.57	5.42
13.28	10.17	17.23	8.41	27.17	5.24

Table S3: Weight fraction data (w) for the systems composed of PEG (1) + K_2HPO_4/KH_2PO_4 pH 7 (2) + water determined in the present work.

PEG 3350		PEG 3350		PEG 3350		PEG 3350	
100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2
0.45	37.19	7.70	12.11	11.46	10.33	19.69	7.00
0.60	19.56	7.76	12.05	11.62	10.29	20.33	6.94
0.96	17.89	7.84	12.01	11.79	10.17	20.90	6.75
1.72	17.20	7.89	11.96	11.90	10.10	21.44	6.56
2.11	16.47	7.96	11.93	12.03	10.05	22.24	6.41
2.54	16.10	8.02	11.84	12.18	9.98	23.00	6.15
3.04	15.61	8.10	11.80	12.28	9.87	23.77	5.95
3.40	15.19	8.22	11.81	12.37	9.79	24.43	5.67
3.68	14.92	8.24	11.69	12.47	9.72	25.33	5.50
3.93	14.73	8.33	11.70	12.57	9.73	26.06	5.23
4.24	14.49	8.39	11.62	12.76	9.59	26.80	4.99
4.27	14.36	8.50	11.59	13.02	9.63	28.00	4.82
4.84	14.07	8.56	11.53	13.22	9.64	29.68	4.56
5.11	13.88	8.64	11.51	13.31	9.60	30.88	4.26
5.32	13.70	8.72	11.44	13.48	9.39	32.17	4.02
5.65	13.48	8.81	11.43	13.49	9.57	33.86	3.72
5.95	13.25	8.97	11.51	13.71	9.40	35.47	3.48
6.06	13.09	9.07	11.45	13.83	9.30	37.26	3.09
6.17	12.96	9.17	11.41	14.10	9.30	39.50	2.85
6.82	12.55	9.24	11.33	14.34	9.17	41.47	2.44
6.83	12.54	9.35	11.29	14.50	9.07	46.26	2.12
6.88	12.52	9.47	11.17	14.83	9.11	19.69	7.00
6.93	12.47	9.70	11.01	15.04	8.77	20.33	6.94
6.98	12.46	9.81	10.95	15.26	8.69	20.90	6.75
7.03	12.42	9.92	10.90	15.41	8.58	21.44	6.56
7.08	12.39	9.98	10.83	15.64	8.53	22.24	6.41
7.15	12.37	10.08	10.79	15.89	8.44	23.00	6.15
7.16	12.36	10.19	10.75	16.16	8.43	23.77	5.95
7.21	12.36	10.33	10.79	16.41	8.35	24.43	5.67
7.26	12.31	10.47	10.66	16.71	8.20	25.33	5.50
7.33	12.30	10.64	10.68	16.97	8.16	26.06	5.23
7.40	12.27	10.72	10.59	17.53	8.11	26.80	4.99
7.44	12.17	10.79	10.51	17.63	7.81	28.00	4.82
7.46	12.28	10.86	10.47	18.01	7.65	29.68	4.56
7.50	12.22	10.96	10.47	18.42	7.47	30.88	4.26
7.57	12.19	11.20	10.41	18.83	7.32	32.17	4.02

7.64	12.15	11.34	10.37	19.21	7.18	33.86	3.72
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Table S4: Weight fraction data (w) for the systems composed of PEG (1) + K_2HPO_4/KH_2PO_4 pH 7 (2) + water.

PEG 4000		PEG 4000		PEG 6000		PEG 6000	
100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2
0.90	21.17	22.20	5.56	0.35	21.12	31.88	3.27
1.28	15.79	22.61	5.47	0.95	14.16	33.11	3.13
1.80	14.91	22.93	5.41	1.62	13.37	34.59	2.93
2.28	14.34	23.32	5.34	2.26	12.84	36.27	2.75
2.73	13.83	23.90	5.15	2.82	12.39	37.99	2.47
3.23	13.53	24.45	5.01	3.90	11.81	40.07	2.20
3.68	13.21	24.83	4.96	4.96	11.28	43.18	1.96
4.11	12.93	25.45	4.78	6.29	10.67	45.54	1.57
4.55	12.63	25.78	4.69	10.67	8.75	47.40	1.45
5.44	12.23	26.62	4.53	13.85	7.51	51.08	1.03
5.81	11.96	27.40	4.39	15.46	6.95		
6.63	11.59	28.04	4.23	16.60	6.58		
6.97	11.44	28.63	4.13	17.14	6.56		
7.71	11.10	29.39	3.93	17.64	6.42		
8.39	10.78	30.40	3.87	18.25	6.21		
8.95	10.49	31.40	3.53	18.85	6.02		
9.57	10.20	32.07	3.43	19.26	5.98		
10.18	9.92	32.67	3.37	19.92	5.82		
10.73	9.68	33.43	3.25	20.63	5.60		
11.23	9.45	34.88	3.14	21.32	5.41		
11.75	9.22	36.72	2.93	22.07	5.24		
12.55	8.93	38.32	2.64	22.48	5.12		
16.25	7.50	40.48	2.37	22.89	5.01		
16.68	7.27	41.93	2.08	23.27	4.94		
16.94	7.20	43.40	1.93	23.91	4.85		
17.29	7.06	45.41	1.76	24.38	4.74		
17.58	6.98			24.77	4.62		
17.90	6.89			25.25	4.56		
18.53	6.74			25.91	4.36		
19.11	6.45			26.38	4.29		
19.42	6.40			26.89	4.18		
19.85	6.25			27.72	4.06		
20.27	6.10			28.32	3.94		
20.50	6.03			28.91	3.78		
20.95	5.89			29.84	3.66		

21.27	5.85	30.51	3.52
21.70	5.74	31.22	3.37

Table S5: Weight fraction data (w) for the systems composed of PEG (1) + K_2HPO_4/KH_2PO_4 pH 7 (2) + water.

PEG 8000		PEG 8000	
100 w_1	100 w_2	100 w_1	100 w_2
0.83	21.20	18.35	5.82
0.87	13.24	18.94	5.69
1.21	12.97	19.67	5.52
1.64	12.50	20.43	5.39
2.49	11.70	21.15	5.21
3.47	11.16	21.62	5.10
4.51	10.64	22.24	4.97
5.85	10.06	22.84	4.87
7.39	9.45	24.10	4.56
9.11	8.82	24.74	4.48
9.94	8.46	26.01	4.31
11.18	8.05	27.47	4.02
11.31	7.98	28.74	3.75
12.12	7.69	29.37	3.63
12.77	7.47	31.35	3.33
13.43	7.27	33.22	3.11
13.99	7.07	34.59	2.93
14.76	6.81	35.42	2.79
15.64	6.50	36.89	2.63
16.33	6.31	39.09	2.40
16.93	6.23	42.88	2.18
17.53	6.03	45.89	1.91

Table S6: Weight fraction data (w) for the systems composed of PEG 1500 (1) + K_2HPO_4/KH_2PO_4 pH 7 (2) + water + 5 wt% of $[C_2mim][X]$ as adjuvant.

$[C_2mim][(CH_3O)_2PO_2]$		$[C_2mim][CH_3CO_2]$		$[C_2mim][CH_3CO_2]$		$[C_2mim][CH_3SO_4]$	
100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2
12.67	14.83	2.51	23.74	29.56	5.66	0.84	24.57
13.08	14.23	3.68	22.50	31.27	5.04	1.85	22.60
14.67	13.17	4.17	19.84	31.56	4.95	2.67	19.91
15.79	12.36	5.60	18.19	32.78	4.63	4.17	17.71
17.31	11.45	6.81	16.67	32.81	4.63	5.49	16.34
18.49	10.70	7.16	16.51	34.20	4.28	7.55	15.17
19.94	9.92	7.37	16.37	35.09	3.88	9.17	14.23
20.92	9.37	7.64	16.22	36.68	3.45	11.29	13.26
21.46	9.13	7.99	16.00	39.25	3.19	11.65	13.10
22.38	8.66	8.30	15.81	41.09	2.83	11.72	12.99
23.88	7.93	8.62	15.62	43.98	2.51	11.99	12.91
25.10	7.37	8.91	15.45	46.23	1.98	12.30	12.69
25.91	7.24	9.28	15.24			12.57	12.58
26.83	6.68	9.65	15.01			13.10	12.27
28.41	6.34	10.15	14.68			13.54	12.06
30.31	5.74	10.59	14.42			13.96	11.76
32.20	5.20	11.12	14.10			14.45	11.53
34.64	4.56	11.71	13.75			15.03	11.23
37.70	3.99	12.63	13.11			15.58	10.94
		13.06	12.90			16.16	10.68
		13.73	12.52			16.77	10.38
		14.45	12.12			17.54	9.99
		14.85	11.97			18.17	9.77
		15.79	11.43			19.13	9.30
		16.31	11.04			19.90	8.96
		17.20	10.46			20.71	8.65
		18.01	10.02			21.65	8.28
		18.87	9.57			25.71	6.48
		20.08	9.00			32.83	3.90
		21.11	8.56			40.05	2.18
		21.97	8.17			47.92	1.22
		23.10	7.78				
		24.11	7.27				
		24.89	7.11				

26.16	6.55
27.04	6.31
28.37	5.91

Table S7: Weight fraction data (w) for the systems composed of PEG 1500 (1) + K_2HPO_4/KH_2PO_4 pH 7 (2) + water + 5 wt% of $[C_2mim][X]$ as adjuvant.

$[C_2mim][SCN]$		$[C_2mim][SCN]$		$[C_2mim][CF_3SO_3]$	
100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2
0.96	24.52	16.99	8.10	2.43	14.24
1.30	17.69	17.24	8.09	3.10	13.51
1.64	16.37	17.84	7.81	3.78	13.00
2.39	15.23	18.17	7.73	5.01	12.27
10.81	10.21	18.52	7.65	5.57	11.82
10.95	10.14	18.93	7.50	7.20	11.13
11.11	10.06	19.26	7.45	8.69	10.52
11.21	10.03	19.80	7.23	10.32	9.87
11.33	10.01	20.17	7.16	13.13	8.94
11.46	9.98	20.76	6.92	14.16	8.53
11.66	9.87	21.43	6.63	15.35	8.06
11.81	9.84	21.82	6.56	15.73	7.61
12.01	9.74	22.28	6.42	16.46	7.63
12.13	9.73	22.73	6.33	16.96	7.19
12.42	9.68	23.46	6.02	17.64	7.18
12.64	9.54	24.01	5.92	17.80	6.94
12.76	9.51	24.58	5.81	18.59	6.69
12.97	9.40	25.21	5.66	19.71	6.34
13.13	9.36	25.92	5.49	20.49	6.15
13.30	9.34	26.70	5.28	21.56	5.83
13.54	9.25	27.36	5.19	22.45	5.62
13.81	9.13	28.25	4.97	23.54	5.34
13.98	9.11	29.17	4.71	24.69	5.05
14.28	8.97	29.88	4.61	26.48	4.69
14.46	8.95	30.87	4.37	27.97	4.40
14.76	8.82	31.94	4.18	29.73	4.00
14.98	8.77	32.85	4.02	31.42	3.65
15.19	8.73	33.98	3.76	33.03	3.37
15.51	8.61	36.31	3.66	34.21	3.24

15.89	8.42	37.90	3.21	36.45	2.81
16.15	8.37	39.27	2.96	38.12	2.61
16.37	8.36	41.35	2.74	39.51	2.46
16.66	8.29	43.00	2.49	41.76	2.38

Table S8: Weight fraction data (w) for the systems composed of PEG (1) + $C_6H_5K_3O_7/C_6H_8O_7$ pH 7 (2) + water.

PEG 2000		PEG 6000		PEG 10,000		PEG 20,000	
100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2
12.05	15.36	10.43	12.52	8.27	11.98	7.39	10.02
12.25	15.15	10.68	12.50	8.49	11.93	8.19	9.49
12.56	14.98	10.94	12.42	8.70	11.93	9.56	8.99
12.89	14.95	11.13	12.22	8.90	11.89	11.46	8.27
13.18	14.74	11.29	12.12	9.17	11.86	13.01	7.74
13.51	14.64	11.66	12.13	9.47	11.65	15.03	7.09
13.75	14.41	11.97	12.05	9.69	11.54	17.54	6.38
14.13	14.29	12.28	11.92	9.90	11.42	17.72	6.53
14.39	14.03	12.63	11.78	10.03	11.25	18.71	6.10
14.79	13.92	13.00	11.66	10.37	11.22	19.83	5.58
15.25	13.76	13.37	11.53	10.79	11.31	20.77	5.34
15.92	13.33	13.87	11.44	11.15	11.04	22.26	4.70
16.44	13.09	14.32	11.29	11.62	11.00	24.70	4.02
16.82	12.76	15.08	10.85	11.92	10.72	26.49	3.26
17.41	12.53	15.62	10.67	12.23	10.53	28.32	3.00
18.04	12.36	16.35	10.56	13.13	10.71	32.86	2.31
18.73	12.14	17.01	10.27	13.75	10.04	46.52	0.84
19.75	12.00	17.68	10.03	14.16	9.77		
20.82	11.24	18.69	9.94	14.79	9.59		
21.70	10.88	19.57	9.64	15.47	9.31		
22.66	10.46	20.50	9.30	16.35	9.27		
23.76	10.01	21.50	8.86	17.18	9.00		
24.49	9.45	23.42	8.00	17.94	8.65		
26.22	9.13	25.12	7.65	19.16	8.43		
28.07	8.70	27.11	7.21	20.30	8.09		
31.05	8.31	29.30	6.66	22.33	7.98		
35.88	6.62	32.24	6.00	24.14	7.43		
41.59	5.77	35.66	5.27	26.60	7.00		
44.28	4.29	41.46	4.57	35.64	5.11		
47.05	2.69	46.09	3.37				

Table S9: Weight fraction data (w) for the systems composed of PEG 2000 (1) + $C_6H_5K_3O_7/C_6H_8O_7$ pH 7 (2) + water + $[C_4mim][CF_3SO_3]$ as adjuvant at 5, 10 and 20 wt%.

w/o IL		$[C_4mim][CF_3SO_3]$ 5 wt%		$[C_4mim][CF_3SO_3]$ 10 wt%		$[C_4mim][CF_3SO_3]$ 20 wt%	
100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2
12.05	15.36	14.08	12.27	14.21	10.68	13.37	8.14
12.25	15.15	14.60	12.20	14.51	10.46	13.54	8.01
12.56	14.98	15.21	11.97	14.87	10.46	13.76	8.01
12.89	14.95	15.66	11.84	15.40	10.57	14.04	8.07
13.18	14.74	16.12	11.66	15.87	10.28	14.31	8.02
13.51	14.64	16.52	11.43	16.24	10.24	14.86	8.16
13.75	14.41	16.93	11.25	17.08	10.21	15.22	7.93
14.13	14.29	17.38	11.28	17.50	9.85	15.74	8.01
14.39	14.03	17.89	11.03	17.99	9.90	16.24	7.79
14.79	13.92	18.39	11.19	18.37	9.77	16.69	7.79
15.25	13.76	18.89	10.94	18.87	9.67	17.19	7.75
15.92	13.33	19.47	10.61	19.28	9.52	17.63	7.64
16.44	13.09	19.98	10.52	19.90	9.46	18.14	7.58
16.82	12.76	20.23	10.44	20.76	9.47	18.57	7.39
17.41	12.53	20.49	10.32	21.71	9.10	18.91	7.38
18.04	12.36	21.26	10.32	22.36	8.93	19.63	7.39
18.73	12.14	22.20	10.07	23.60	9.02	20.66	7.48
19.75	12.00	23.02	9.71	24.71	8.49	21.41	7.06
20.82	11.24	23.85	9.28	26.16	8.49	22.68	7.13
21.70	10.88	24.52	9.12	26.91	7.73	24.26	6.80
22.66	10.46	25.27	8.93	28.66	7.89	27.00	6.74
23.76	10.01	26.06	8.77	30.85	7.32	29.62	6.40
24.49	9.45	26.63	8.49	32.16	6.85	33.61	6.17
26.22	9.13	27.50	8.28	34.10	6.61	36.10	5.39
28.07	8.70	28.81	8.23	36.40	6.47	38.73	5.22
31.05	8.31	30.70	7.73	40.30	6.39	50.87	6.16
35.88	6.62	34.18	7.59	46.60	5.84	55.99	3.48
41.59	5.77	36.59	6.33	50.08	4.49		
44.28	4.29	43.15	6.24				
47.05	2.69	49.47	3.95				

Table S10: Weight fraction data (w) for the systems composed of PEG 2000 (1) + $C_6H_5K_3O_7/C_6H_8O_7$ pH 7 (2) + water + $[C_4mim] [(CH_3O)_2PO_2]$ as adjuvant at 5, 10 and 20 wt%.

[C₄mim] [(CH₃O)₂PO₂] 5 wt%		[C₄mim] [(CH₃O)₂PO₂] 10 wt%		[C₄mim] [(CH₃O)₂PO₂] 20 wt%	
100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2
10.15	19.58	12.97	19.49	13.07	23.50
10.82	18.33	13.42	19.29	13.43	23.33
11.10	18.29	13.73	18.99	13.77	23.23
11.42	18.11	14.07	19.11	14.53	22.70
11.80	17.86	14.76	18.53	14.82	22.57
12.07	17.99	15.28	18.42	15.56	22.18
12.56	17.58	15.70	18.03	16.12	21.80
12.92	17.54	16.30	17.82	17.38	21.19
13.67	17.33	17.10	17.42	18.03	20.90
14.32	16.78	18.02	16.89	18.77	20.23
15.12	16.57	18.38	16.74	19.40	19.96
15.86	16.08	19.29	16.44	19.81	19.66
16.61	15.47	19.93	16.06	20.79	19.24
17.50	15.14	20.56	15.72	21.78	18.84
18.66	14.69	21.89	14.88	22.97	18.01
19.76	13.96	23.00	14.59	24.14	17.44
20.62	13.55	23.87	13.95	25.43	16.75
21.36	13.53	25.30	13.51	26.61	16.11
23.19	12.75	26.31	12.83	27.51	15.72
24.59	12.15	27.69	12.72	30.08	14.57
26.34	11.23	29.00	11.75	31.85	13.83
27.94	10.60	30.13	11.44	33.45	13.44
29.16	10.02	31.21	11.07	35.63	12.61
31.93	10.22	33.70	10.17	38.28	11.70
35.87	8.18	35.69	10.17	42.60	10.37
40.13	6.93	37.67	9.02	46.50	9.95
44.19	5.41	42.44	7.41	50.29	7.71

Table S11: K_{IL} values determined for the imidazolium-based ILs of different PEG + salt buffer ABS.

PEG + Salt + IL based ABS	K_{IL}	IL partitioning
PEG 1500 + K_2HPO_4/KH_2PO_4 + [C ₂ mim][CH ₃ CO ₂]	3.44 ± 0.08	PEG-rich phase
PEG 1500 + K_2HPO_4/KH_2PO_4 + [C ₂ mim][CH ₃ SO ₄]	1.21 ± 0.01	PEG-rich phase
PEG 1500 + K_2HPO_4/KH_2PO_4 + [C ₂ mim][SCN]	6.20 ± 0.15	PEG-rich phase
PEG 1500 + K_2HPO_4/KH_2PO_4 + [C ₂ mim][CF ₃ SO ₃]	1.99 ± 0.15	PEG-rich phase
PEG 1500 + K_2HPO_4/KH_2PO_4 + [C ₂ mim][(CH ₃ O) ₂ PO ₂]	2.29 ± 0.07	PEG-rich phase
PEG 2000 + C ₆ H ₅ K ₃ O ₇ /C ₆ H ₈ O ₇ + [C ₄ mim][CF ₃ SO ₃]	3.11 ± 0.18	PEG-rich phase
PEG 2000 + C ₆ H ₅ K ₃ O ₇ /C ₆ H ₈ O ₇ + [C ₄ mim][(CH ₃ O) ₂ PO ₂]	3.17 ± 0.03	PEG-rich phase

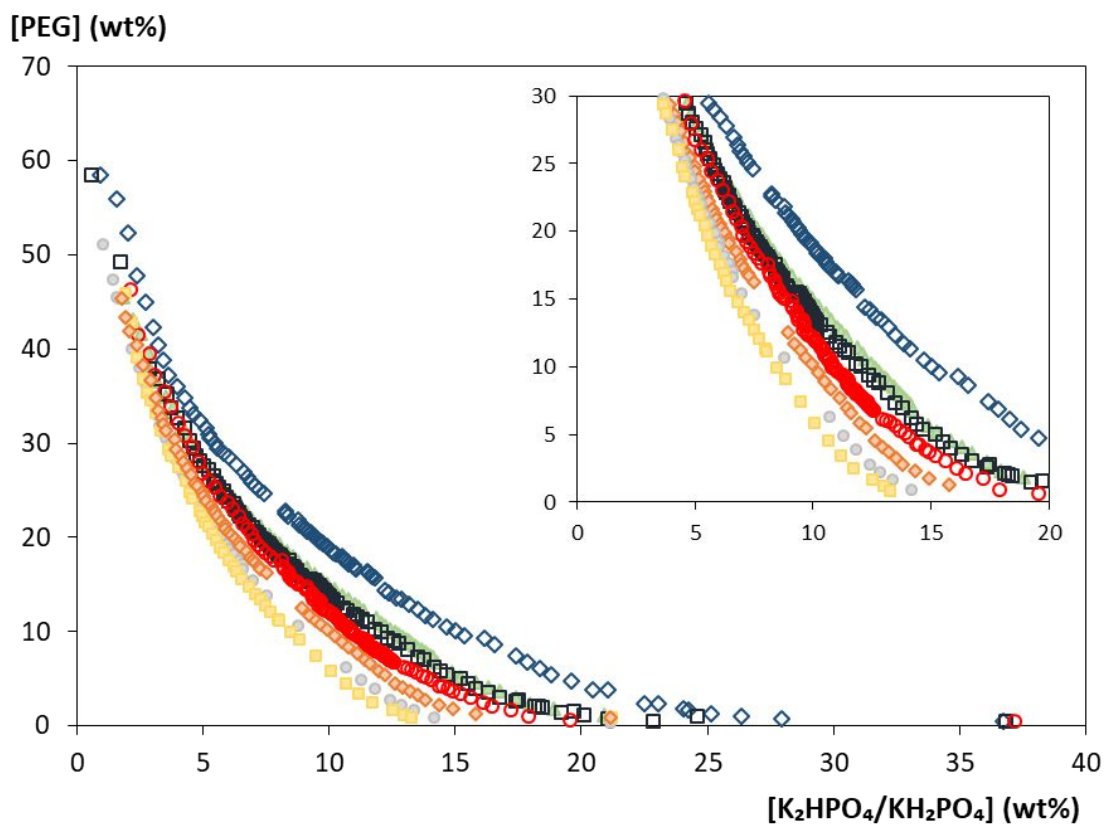


Figure S1: Phase diagrams for the systems composed of PEG (\diamond PEG 1000, \blacktriangle PEG 1500, \square PEG 2000, \circ PEG 3350, \diamond PEG 4000, \bullet PEG 6000, and \blacksquare PEG 8000) + $\text{K}_2\text{HPO}_4/\text{KH}_2\text{PO}_4$ (pH 7) + water, at 298 (± 1) K. Data regarding the systems of PEG 1500, PEG 4000, PEG 6000, and PEG 8000 were obtained from literature.

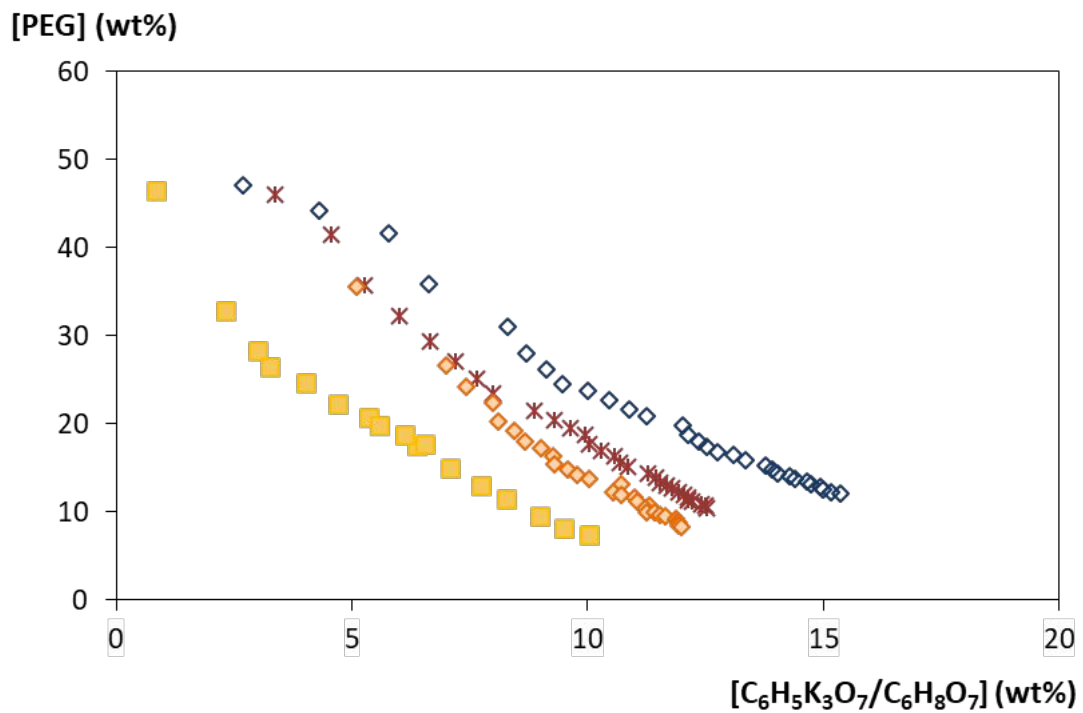


Figure S2: Phase diagrams for the ternary systems composed of PEG (\diamond PEG 2000, \times PEG 6000, \diamond PEG 10,000, and \square PEG 20,000) + C₆H₅K₃O₇/C₆H₈O₇ (pH 7) + water, at 298 (\pm 1) K.

¹³C NMR of ILs

The ILs structure was confirmed by ¹³C NMR (75 MHz, D₂O) (75.47 MHz). For each IL, the assignment and the chemical shift (δ /ppm) for each carbon (¹³C) was performed.

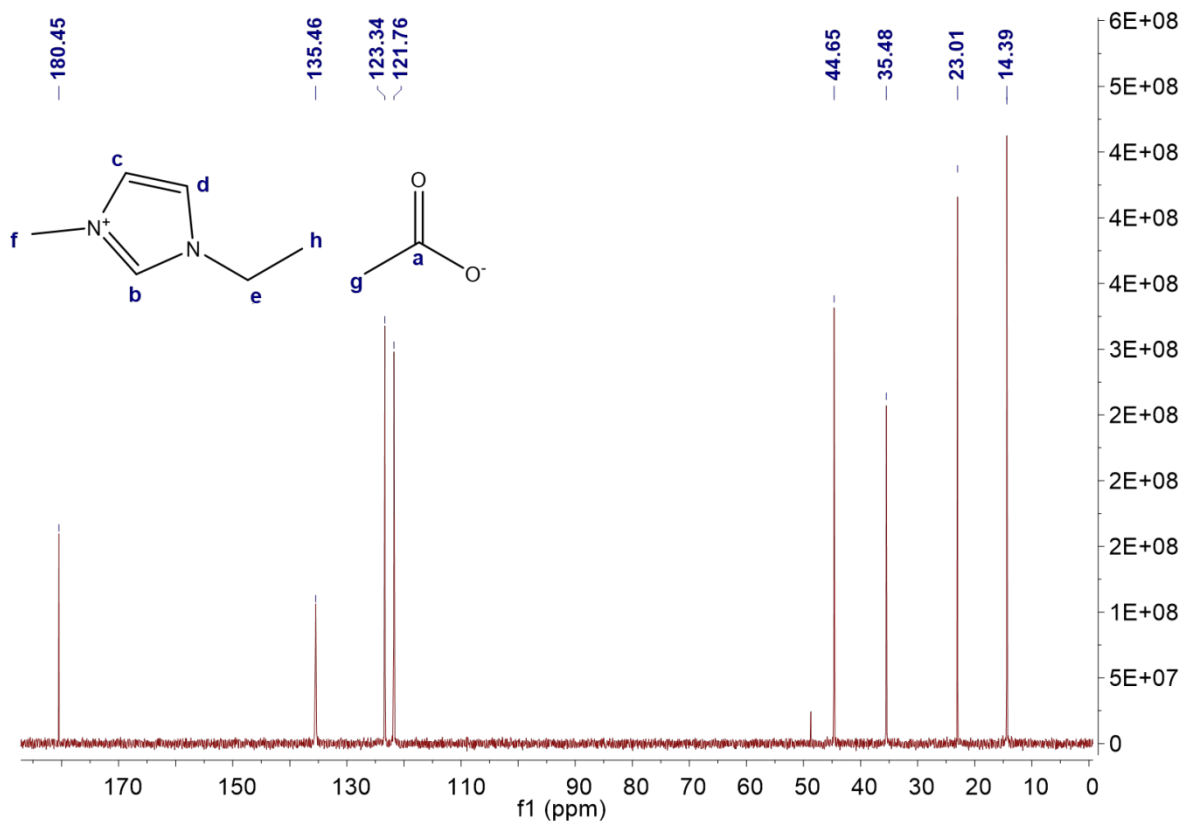


Table of chemical shifts for [C₂mim][CH₃CO₂]

¹³ C	Assignments	Chemical shift (ppm)
a	C 1-carbonyl	180.45
b	CH basic value	135.46
c	CH basic value	123.34
d	CH basic value	121.76
e	CH ₂ aliphatic	44.65
f	CH ₃ aliphatic	35.48
g	CH ₃ aliphatic	23.01
h	CH ₃ aliphatic	14.39

Figure S3: ¹³C NMR spectra and table of chemical shifts for [C₂mim][CH₃CO₂].

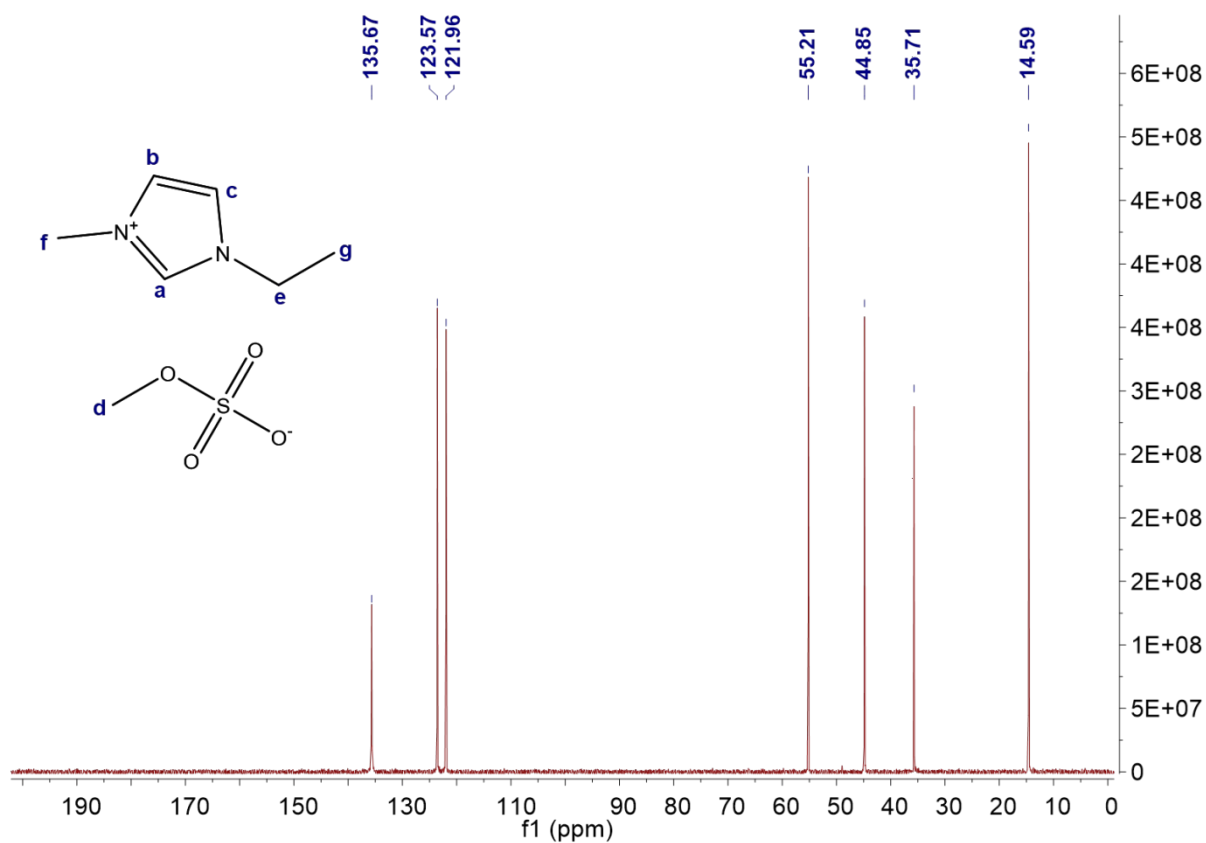


Table of chemical shifts for [C₂mim][CH₃SO₄]

¹³ C	Assignments	Chemical shift (ppm)
a	CH basic value	135.67
b	CH basic value	123.57
c	CH basic value	121.96
d	CH ₃ aliphatic	55.21
e	CH ₂ aliphatic	44.85
f	CH ₃ aliphatic	35.71
g	CH ₃ aliphatic	14.59

Figure S4: ¹³C NMR spectra and table of chemical shifts for [C₂mim][CH₃SO₄].

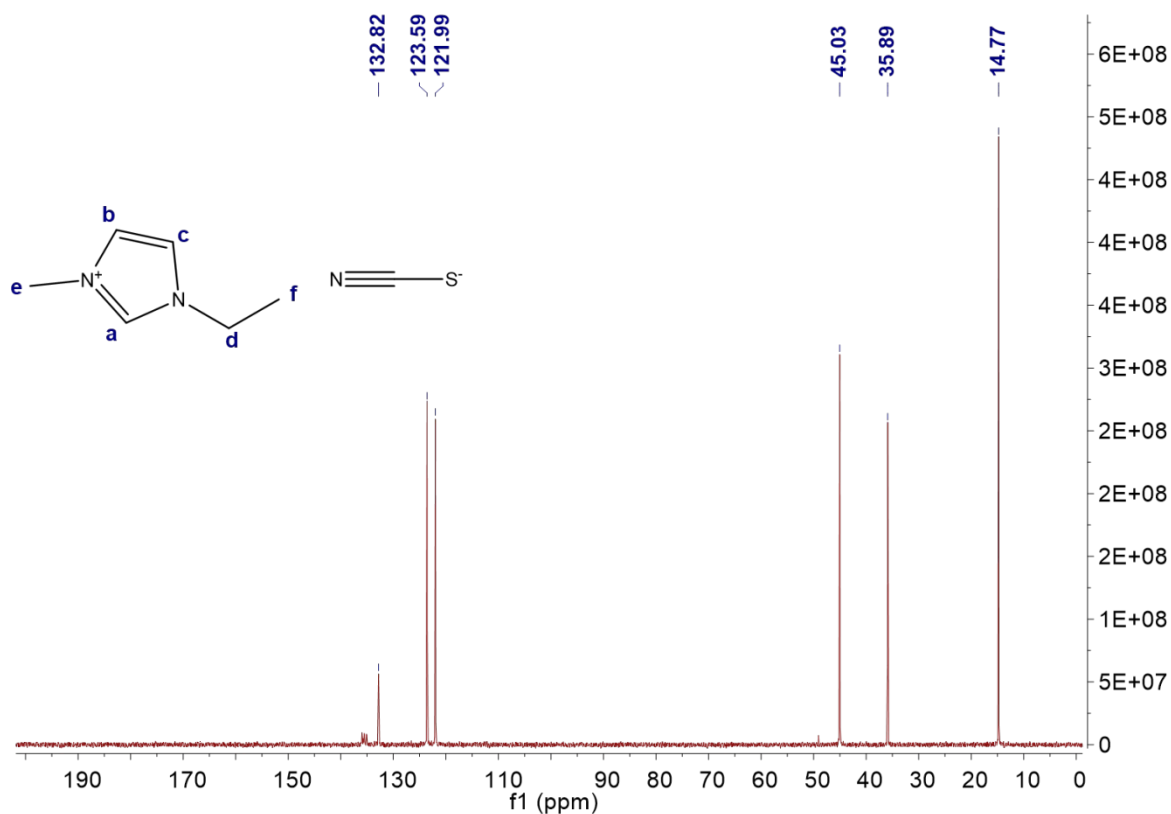


Table of chemical shifts for [C₂mim][SCN]

^{13}C	Assignments	Chemical shift (ppm)
a	CH basic value	132.82
b	CH basic value	123.59
c	CH basic value	121.99
d	CH ₂ aliphatic	45.03
e	CH ₃ aliphatic	35.89
f	CH ₃ aliphatic	14.77

Figure S5: ^{13}C NMR spectra and table of chemical shifts for [C₂mim][SCN].

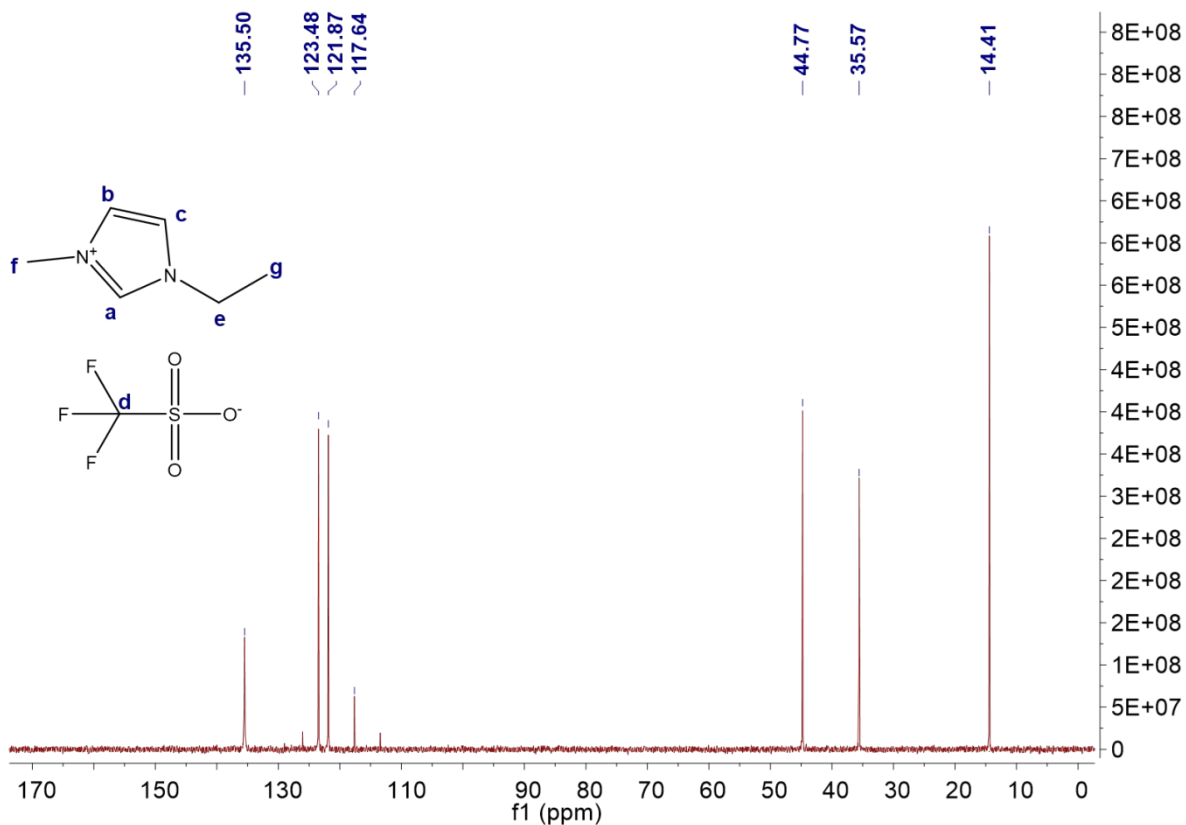


Table of chemical shifts for [C₂mim][CF₃SO₃]

¹³ C	Assignments	Chemical shift (ppm)
a	CH basic value	135.50
b	CH basic value	123.48
c	CH basic value	121.87
d	C aliphatic	117.64
e	CH ₂ aliphatic	44.77
f	CH ₃ aliphatic	35.57
g	CH ₃ aliphatic	14.41

Figure S6: ¹³C NMR spectra and table of chemical shifts for [C₂mim][CF₃SO₃].

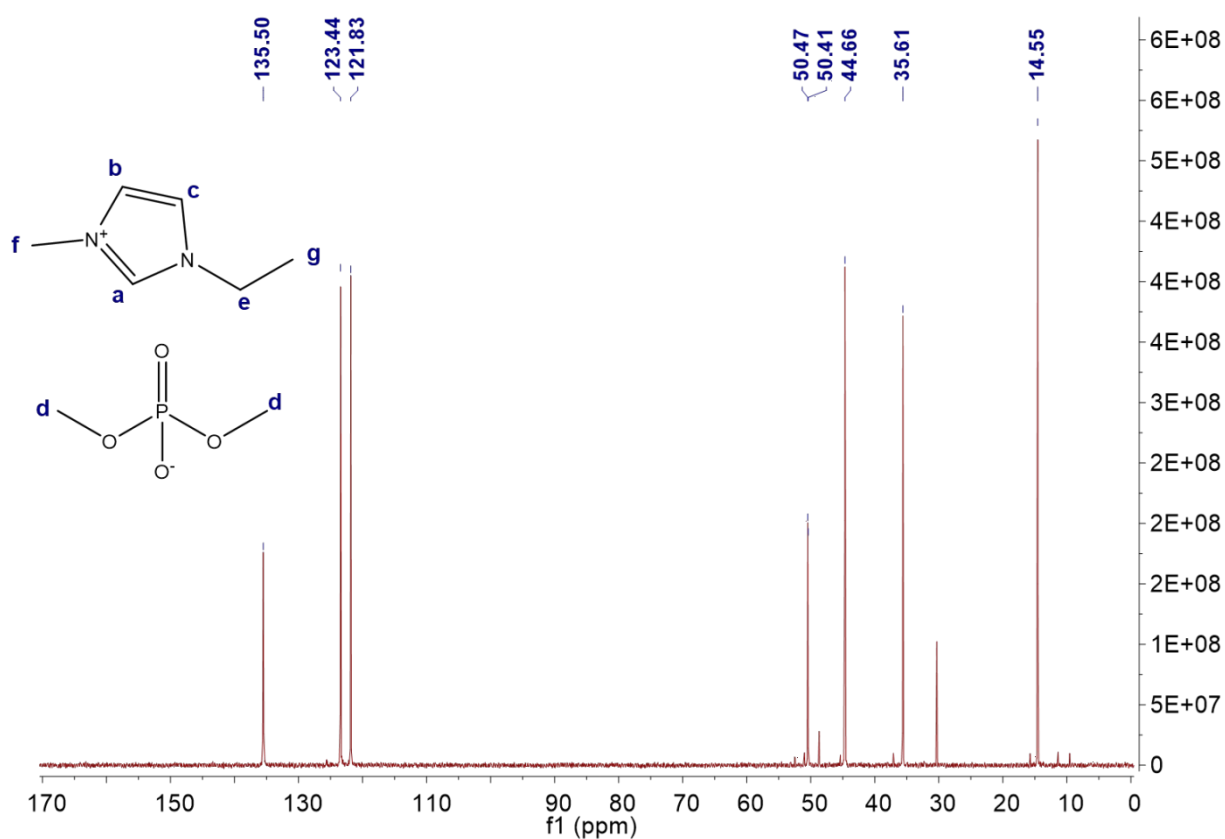


Table of chemical shifts for $[\text{C}_2\text{mim}][(\text{CH}_3\text{O})_2\text{PO}_2]$

^{13}C	Assignments	Chemical shift (ppm)
a	CH basic value	135.50
b	CH basic value	123.44
c	CH basic value	121.83
d	CH_3 aliphatic	50.47/50.41
e	CH_2 aliphatic	44.66
f	CH_3 aliphatic	35.61
g	CH_3 aliphatic	14.55

Figure S7: ^{13}C NMR spectra and table of chemical shifts for $[\text{C}_2\text{mim}][(\text{CH}_3\text{O})_2\text{PO}_2]$.

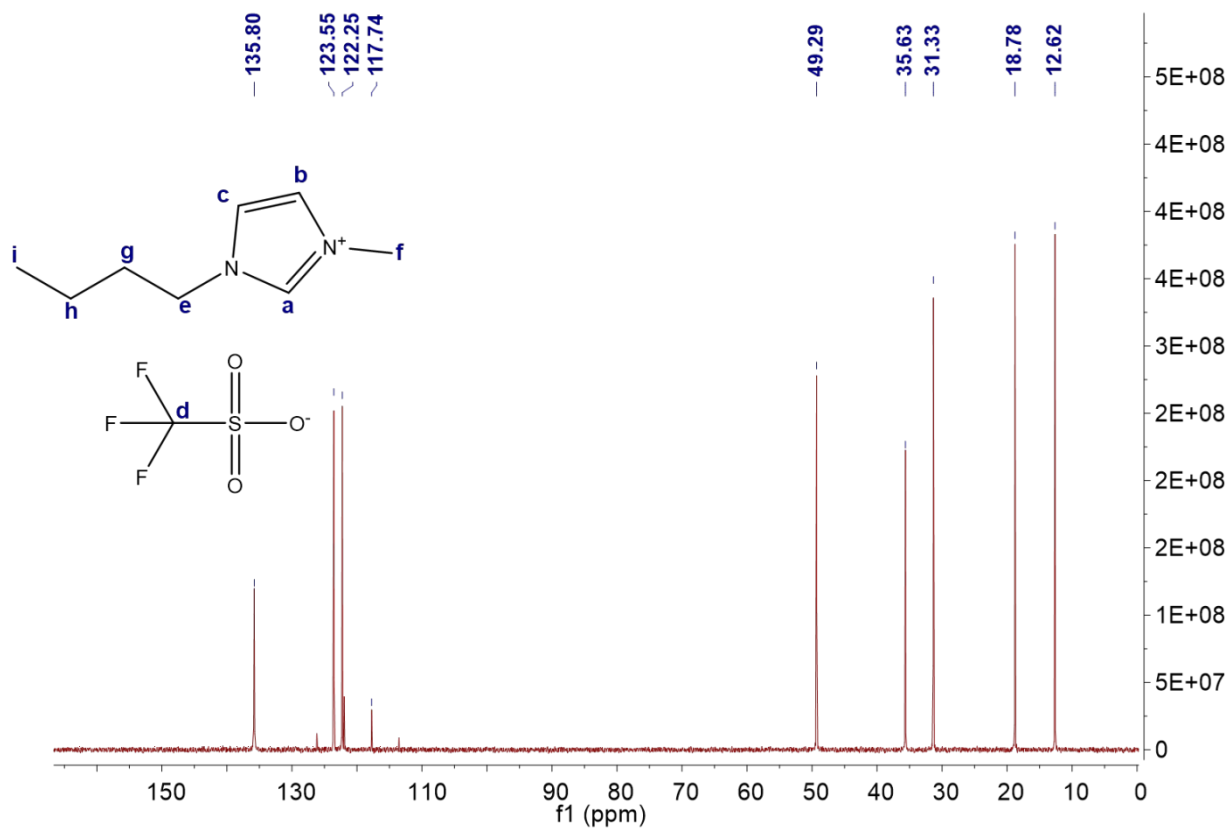


Table of chemical shifts for [C₄mim][CF₃SO₃]

¹³ C	Assignments	Chemical shift (ppm)
a	CH basic value	135.80
b	CH basic value	123.55
c	CH basic value	122.25
d	C aliphatic	117.74
e	CH ₂ aliphatic	49.29
f	CH ₃ aliphatic	35.63
g	CH ₂ aliphatic	31.33
h	CH ₂ aliphatic	18.78
i	CH ₃ aliphatic	12.62

Figure S8: ¹³C NMR spectra and table of chemical shifts for [C₄mim][CF₃SO₃].

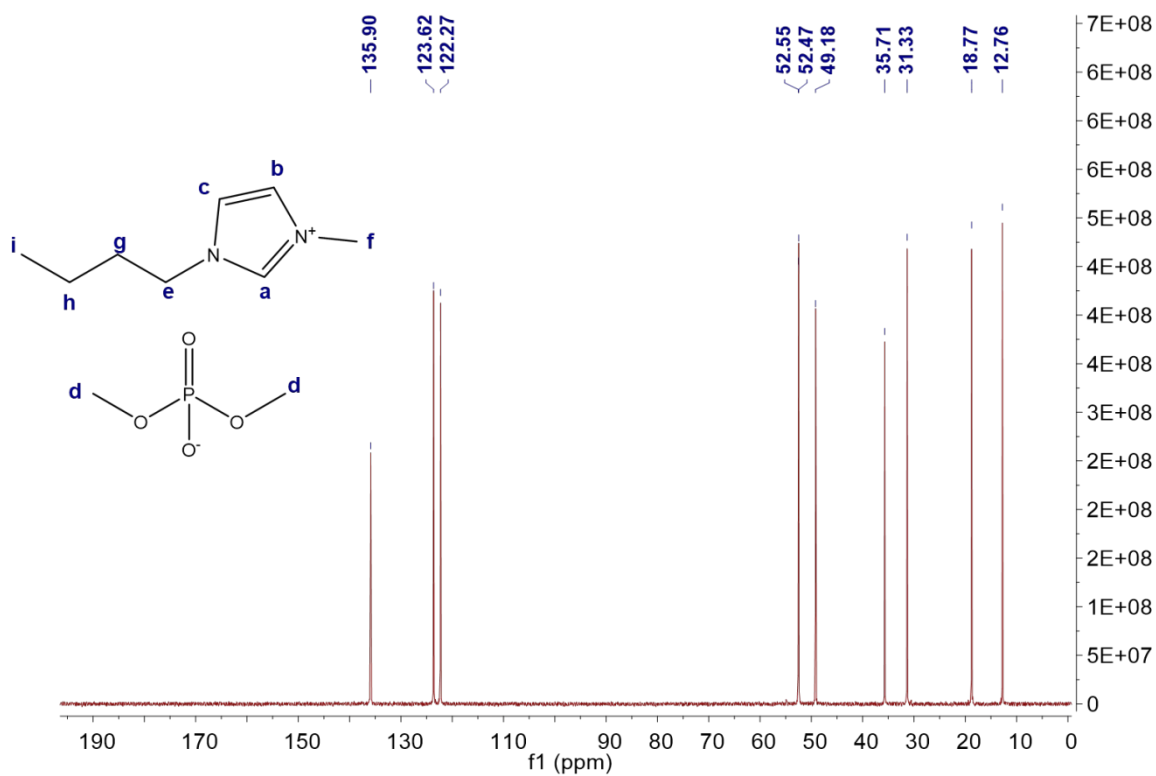


Table of chemical shifts for [C₄mim][(CH₃O)₂PO₂]

¹³ C	Assignments	Chemical shift (ppm)
a	CH basic value	135.90
b	CH basic value	123.62
c	CH basic value	122.27
d	CH ₃ aliphatic	52.55/52.47
e	CH ₂ aliphatic	49.18
f	CH ₃ aliphatic	35.71
g	CH ₂ aliphatic	31.33
h	CH ₂ aliphatic	18.77
i	CH ₃ aliphatic	12.76

Figure S9: ¹³C NMR spectra and table of chemical shifts for [C₄mim][(CH₃O)₂PO₂].