Supplementary data

Good's buffers as novel phase-forming components of ionic-liquid-based aqueous biphasic systems

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Table A.1 Experimental weight fraction data for the system composed of $[C_4mim][BF_4]$ (1) + GB (2) + H_2O (3) at 25ºC and atmospheric pressure.

Tricine		HEPES		TES	
100 w_1	100 w_2	100 w_1	100 w_2	100 w_1	100 w_2
21.560	10.583	24.352	23.739	13.877	46.473
25.271	7.652	32.757	16.959	23.400	33.077
25.271	7.652	34.596	16.445	29.177	22.676
33.507	5.681	37.042	15.358	38.685	17.332
40.428	4.715	39.415	14.606	48.371	12.709
44.018	4.102	44.691	13.271	55.942	9.469
49.002	3.408	47.292	11.976		
55.111	2.748	54.777	9.250		
58.571	2.310	60.306	7.346		
60.476	2.059	80.875	3.705		
61.843	1.876				
65.818	1.532				
67.614	1.397				
70.554	1.226				
73.482	0.997				

Table A.2 Experimental weight fraction data for the system composed of [C_4mim][CF_3SO_3] (1) + GB (2) + H_2O (3) at 25ºC and atmospheric pressure.

HEPES	
100 w_1	100 w_2
38.624	23.046
35.959	27.108
33.972	28.570
31.921	31.252
29.510	34.210
27.018	37.762
25.400	39.542
24.248	41.322
20.977	46.707
19.542	49.123
18.607	50.550
16.121	55.375

Table A.3 Critical point of each ABS composed of IL + GB + H_2O at 25ºC.

GB	*f*	*g*	R^2	Critical point / (wt %)		
				[GB]	**[IL]**	**[H_2O]**
$[C_4mim][BF_4]$ + GB ABS						
Tricine	0.929	41.290	0.987	3.87	44.89	51.24
HEPES	1.916	31.551	0.909	10.19	51.07	38.74
TES	1.834	9.948	0.884	17.00	41.12	41.88
$[C_4mim][CF_3SO_3]$ + GB ABS						
HEPES	2.059	1.635	0.997	22.35	44.40	33.25

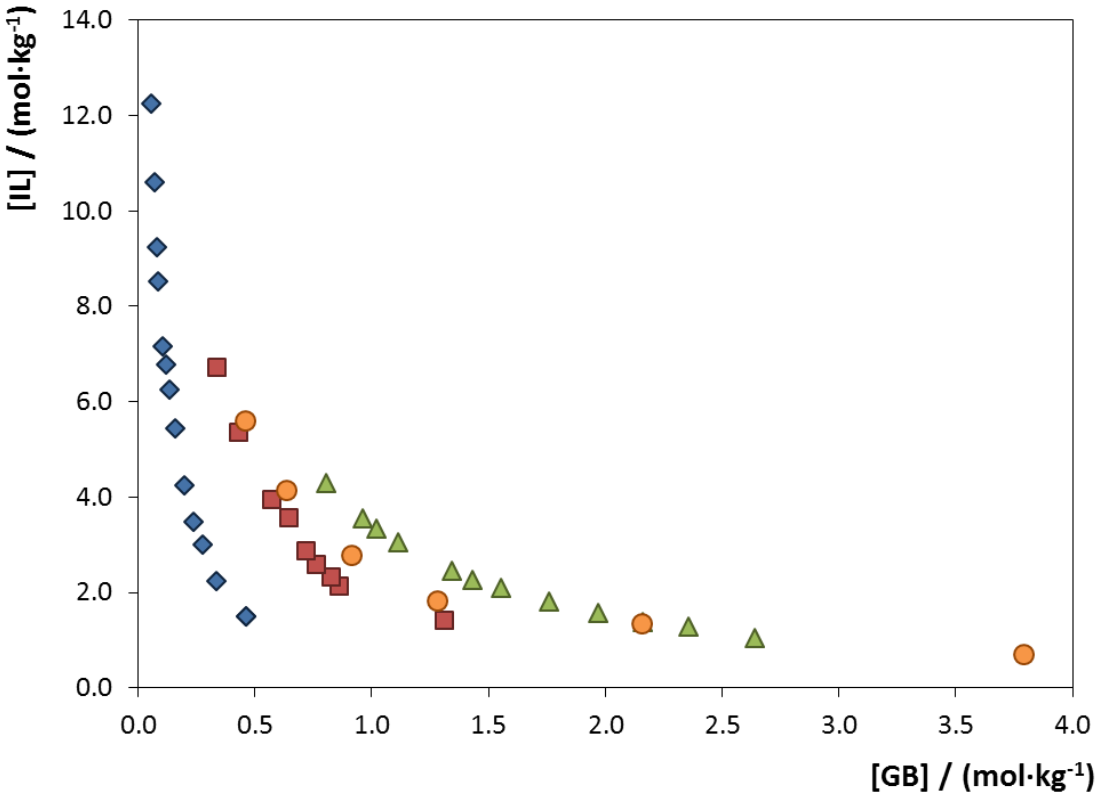

Fig. A.1 Phase diagrams in molality units at 25 ºC for the ABS composed of [C_4mim][BF_4] + Tricine + H_2O (◆); [C_4mim][BF_4] + HEPES + H_2O (■); [C_4mim][BF_4] + TES + H_2O (●); and [C_4mim][CF_3SO_3] + HEPES + H_2O (▲).

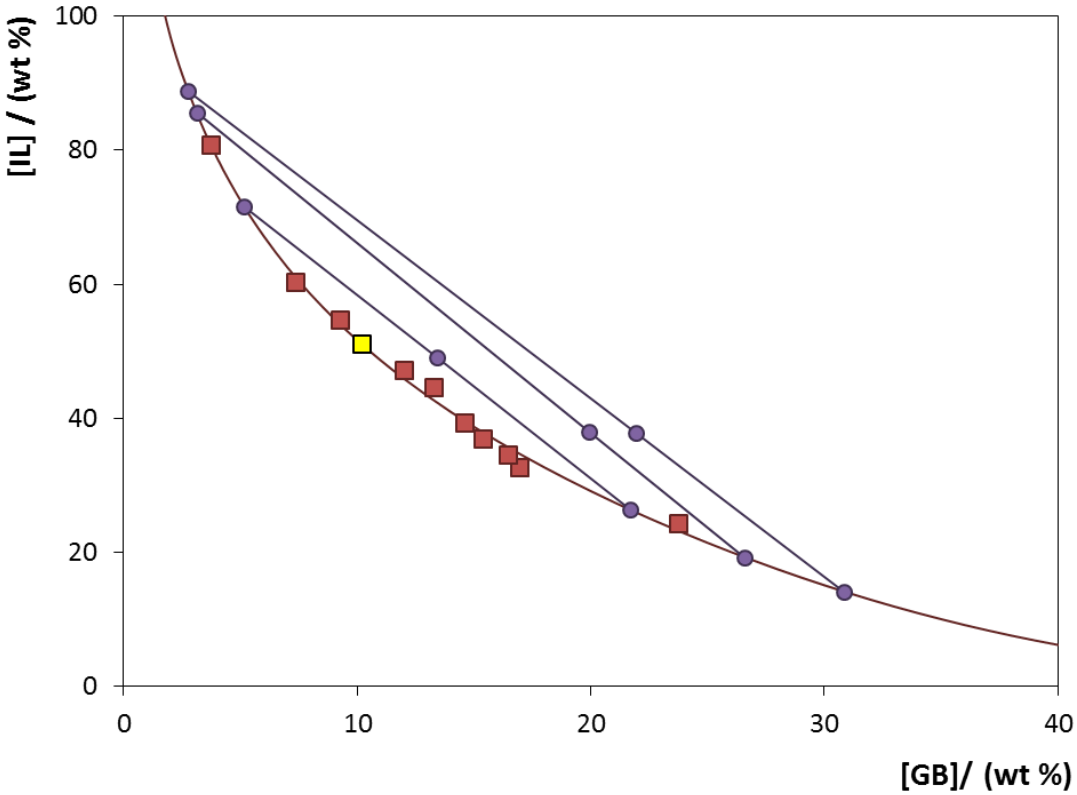

Fig. A.2 Phase diagram for the ternary system composed of $[C_4mim][BF_4]$ + HEPES + H_2O: binodal curve data (■); TL data (●); critical point (■); adjusted binodal data through Eq. (1) (–).

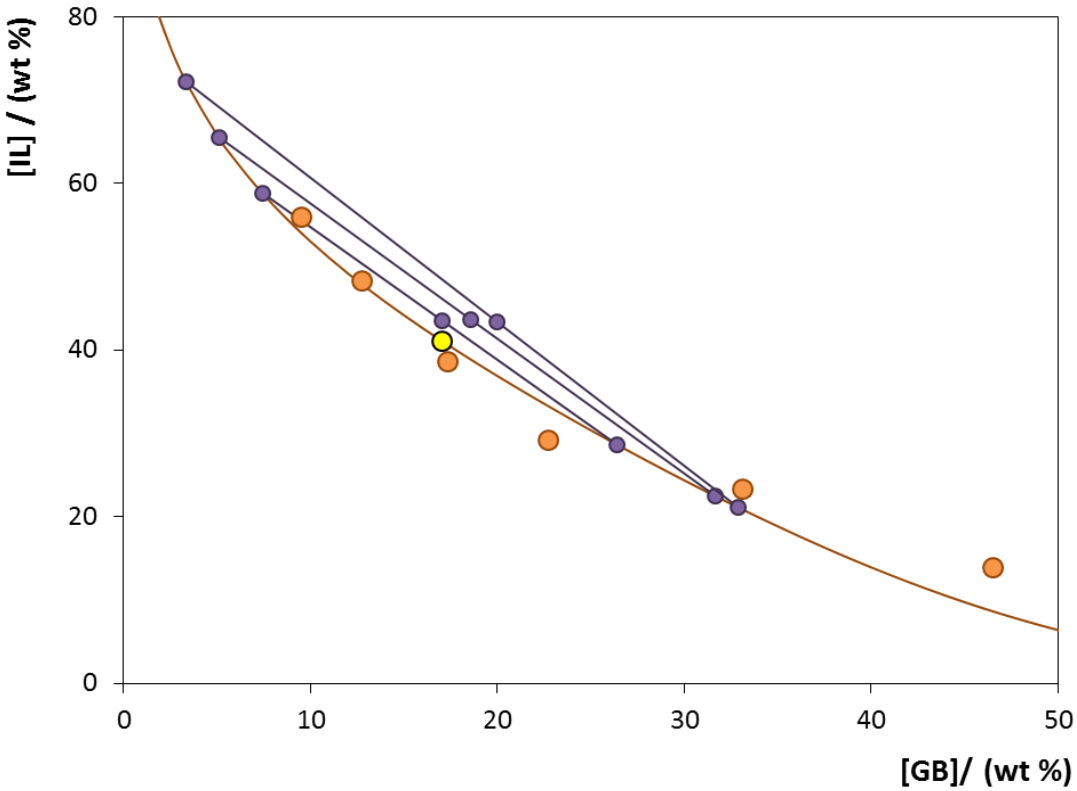

Fig. A.3 Phase diagram for the ternary system composed of $[C_4mim][BF_4]$ + TES + H_2O: binodal curve data (●); TL data (●); critical point (●); adjusted binodal data through Eq. (1) (–).

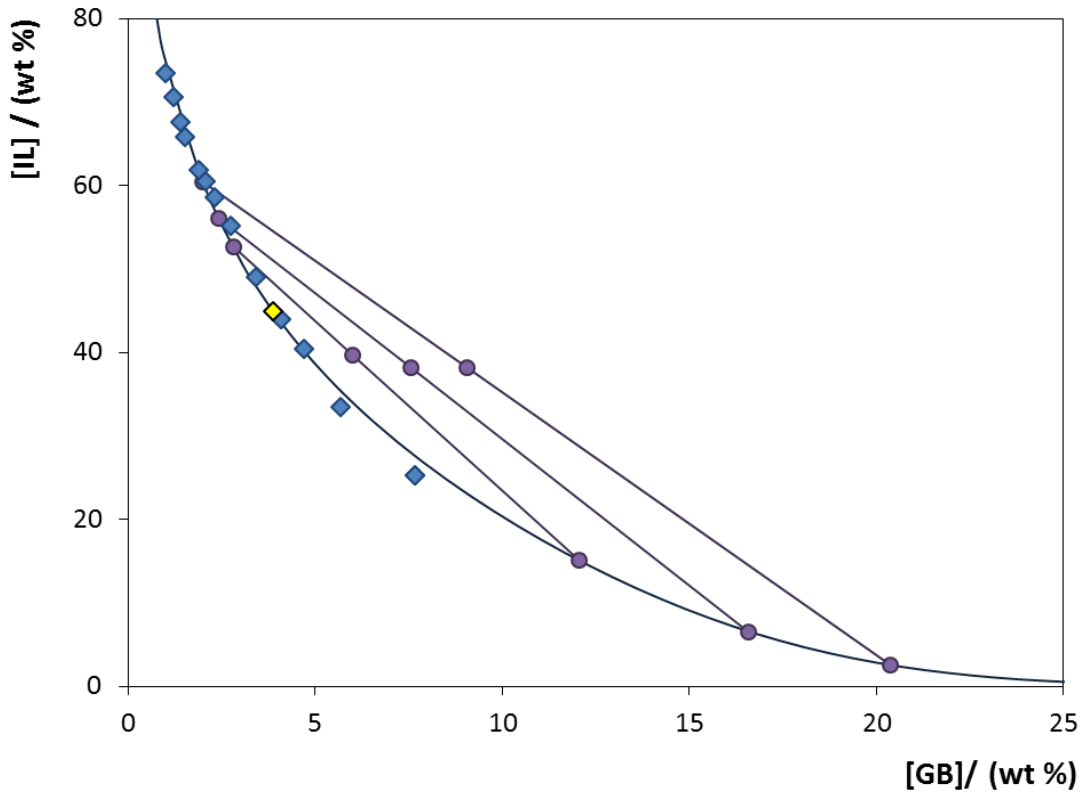

Fig. A.4 Phase diagram for the ternary system composed of $[C_4mim][BF_4]$ + Tricine + H_2O: binodal curve data (◆); TL data (●); critical point (◆); adjusted binodal data through Eq. (1) (–).

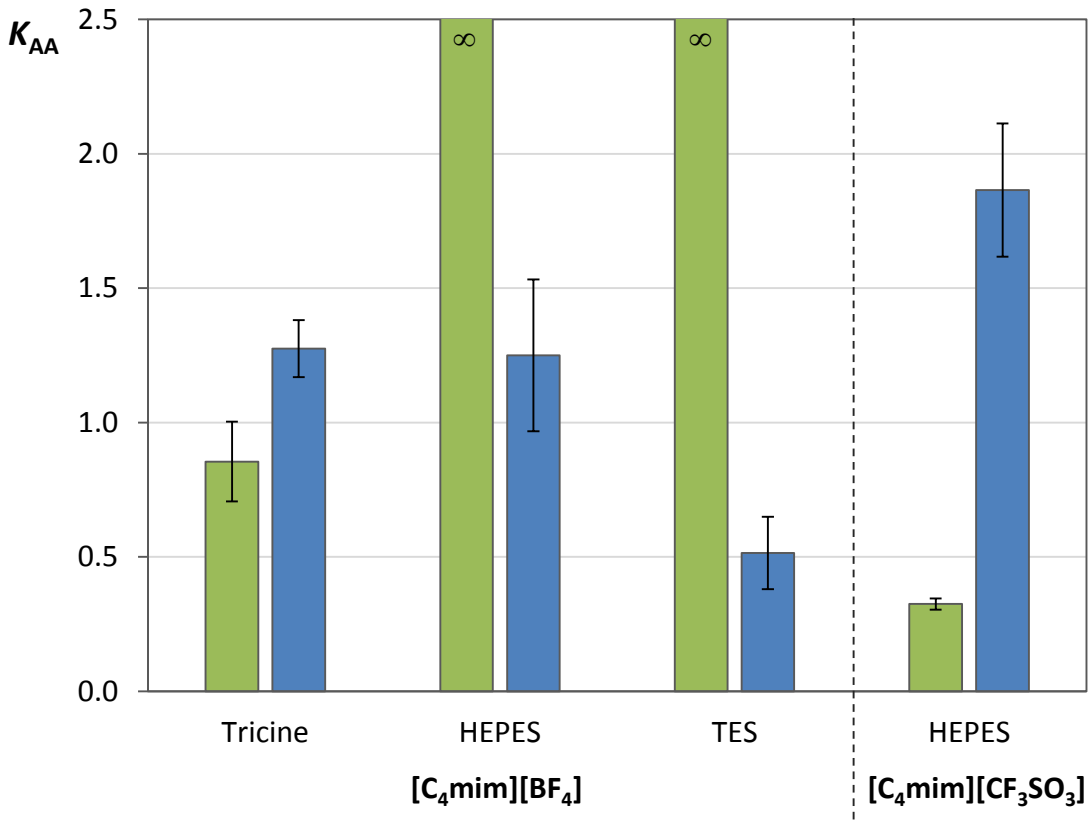

Fig. A.5 Partition coefficients of amino acids between the GB- and IL-rich aqueous phases at 25ºC: L-phenylalanine (green bars) and L-tryptophan (blue bars). The symbol ∞ corresponds to extractions where the complete extraction of L-phenylalanine was observed in a single-step for the GB-rich phase.

Table A.4 Partition coefficients and percentage extraction efficiencies of tryptophan (K_{Try} and EE_{Try}%) and phenylalanine (K_{Phe} and EE_{Phe}%) in IL + GB ABS, initial mixture compositions and respective TLs, TLLs and α, and pH values of the coexisting phases.

GB	Weight fraction percentage / (wt %)								TLL	α	K_{Try}	EE_{Try}%	K_{Phe}	EE_{Phe}%
	$[IL]_{IL}$	$[GB]_{IL}$	pH_{IL}	$[IL]_{M}$	$[GB]_{M}$	$[IL]_{GB}$	$[GB]_{GB}$	pH_{GB}						
[C_4mim][BF_4] + GB ABS														
Tricine	60.47	1.99	3.77	38.21	9.05	2.56	20.36	3.65	60.76	0.38	1.28 ± 0.11	68.3 ± 1.8	0.86 ± 0.15	57.9 ± 1.9
HEPES	71.60	5.16	5.00	49.07	13.39	26.38	21.68	5.21	48.14	0.50	1.25 ± 0.28	51.8 ± 1.0	∞	100.0 ± 0.2
TES	65.50	5.08	4.37	43.67	18.56	22.48	31.65	3.94	50.56	0.49	0.52 ± 0.13	37.0 ± 3.7	∞	100.0 ± 0.2
[C_4mim][CF_3SO_3] + GB ABS														
HEPES	69.49	10.19	5.21	51.14	20.96	28.18	34.44	5.15	47.90	0.56	1.87 ± 0.25	61.6 ± 1.1	0.33 ± 0.02	22.4 ± 1.1