Aqueous Biphasic Systems Composed of Ionic Liquids and Dextran: From the Understanding of Phase Formation to the Potential of Exopolysaccharide Recovery

Sara F. Carvalho[a‡], Alexandre M. S. Jorge[b‡], Isabel Boal-Palheiros[a], João A. P. Coutinho[a], Jorge F. B. Pereira[b*] and Mara G. Freire[a*]

[a]CICECO-Aveiro Institute of Materials, Chemistry Department, University of Aveiro, 3810-193 Aveiro, Portugal

[b]University of Coimbra, CERES, FCTUC, Department of Chemical Engineering, Rua Sílvio Lima, Pólo II - Pinhal de Marrocos, 3030-790 Coimbra, Portugal

*Corresponding authors

Jorge F. B. Pereira: jfbpereira@eq.uc.pt

Mara G. Freire: maragfreire@ua.pt

‡ Sara F. Carvalho and Alexandre M. S. Jorge contributed equally to this work.

Tables

Table S1. Experimental binodal points for the [C_4mim][C_1SO_4]-based ABS investigated. All values correspond to the molality of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

Molality (mol.kg^{-1})		**Molality (mol.kg^{-1})**	
[C_4mim][C_1SO_4]	**Dextran 40 kDa**	**[C_4mim][C_1SO_4]**	**Dextran 100 kDa**
2.27384	0.00854	2.12047	0.00292
2.27506	0.00804	2.27137	0.00249
2.39613	0.00743	2.37300	0.00220
2.52107	0.00655	2.51973	0.00195
2.66482	0.00582	2.60490	0.00176
2.77819	0.00520	2.74168	0.00158
2.93855	0.00461	2.77430	0.00146
3.01657	0.00422	2.84065	0.00133
3.05713	0.00393	2.85731	0.00123
3.13512	0.00359	2.90059	0.00115
3.20468	0.00327	2.93420	0.00109
3.23700	0.00307	2.98522	0.00102
3.28273	0.00285	3.00776	0.00097
3.29579	0.00266	3.02228	0.00092
3.34898	0.00247	3.04974	0.00087
3.36375	0.00232	3.05338	0.00084
3.39742	0.00214	3.07400	0.00080
3.43613	0.00201	3.10435	0.00075
3.51584	0.00186	3.12404	0.00071
3.51200	0.00176	3.14159	0.00068
3.57024	0.00164	3.23376	0.00065
3.57215	0.00154		
3.59718	0.00146		
3.63586	0.00136		
3.66502	0.00126		
3.81698	0.00116		
3.80594	0.00104		

Table S2. Experimental binodal points for the $[C_4mim][N(CN)_2]$-based ABS investigated. All values correspond to the molality of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

Molality (mol.kg^{-1})		Molality (mol.kg^{-1})		Molality (mol.kg^{-1})	
$[C_4mim][N(CN)_2]$	**Dextran 6 kDa**	**$[C_4mim][N(CN)_2]$**	**Dextran 40 kDa**	**$[C_4mim][N(CN)_2]$**	**Dextran 100 kDa**
0.94429	0.06874	1.33289	0.01146	1.10913	0.00477
0.95354	0.06558	1.38876	0.01073	1.17487	0.00452
0.96870	0.06268	1.54404	0.00987	1.23866	0.00429
0.98527	0.06005	1.61398	0.00932	1.27660	0.00394
1.00250	0.05807	1.65105	0.00883	1.31385	0.00363
1.04858	0.05472	1.69481	0.00844	1.48829	0.00323
1.05360	0.05257	1.78199	0.00773	1.58482	0.00295
1.06751	0.05064	1.88548	0.00663	1.65934	0.00270
1.10280	0.04811	2.08716	0.00550	1.73733	0.00250
1.11240	0.04645	2.23018	0.00472	1.80501	0.00232
1.12630	0.04508	2.35189	0.00414	1.85599	0.00217
1.13045	0.04351	2.46480	0.00364	1.87930	0.00200
1.16339	0.04154	2.53509	0.00329	1.96513	0.00184
1.16555	0.04026	2.60879	0.00300	2.04091	0.00170
1.17202	0.03912	2.65598	0.00278	2.10621	0.00158
1.17778	0.03807	2.72442	0.00258	2.16917	0.00148
1.20029	0.03666	2.75632	0.00241	2.21722	0.00139
1.20886	0.03576	2.80980	0.00223	2.25569	0.00130
1.21249	0.03483	2.83359	0.00209	2.30029	0.00123
1.21895	0.03408	2.87178	0.00197	2.34131	0.00117
1.24275	0.03283	2.91049	0.00184	2.37395	0.00111
1.24773	0.03209	2.93700	0.00175	2.41338	0.00104
1.25118	0.03143	2.95434	0.00168	2.45384	0.00098
1.25693	0.03076	2.96037	0.00160	2.48499	0.00093
1.25927	0.03009	2.97440	0.00153	2.51102	0.00087
1.26398	0.02946	2.99279	0.00147	2.52034	0.00083
1.26554	0.02889	3.01843	0.00142	2.56930	0.00078
1.28564	0.02808	3.03715	0.00132	2.56652	0.00075
1.30597	0.02684	3.07768	0.00123	2.59377	0.00072
1.31992	0.02550	3.10320	0.00115	2.60518	0.00069
1.33334	0.02434	3.13984	0.00107	2.62729	0.00066
1.34312	0.02337			2.63728	0.00063
1.35911	0.02241			2.65961	0.00060
1.38354	0.02135			2.69172	0.00057
1.40078	0.02010			2.70681	0.00055
1.41596	0.01907			2.71123	0.00053
1.43024	0.01821			2.73195	0.00051
				2.74454	0.00049
				2.74335	0.00047
				2.76824	0.00045
				2.78583	0.00044
				2.78932	0.00042

Table S3. Experimental binodal points for the [C_4mim][C_2SO_4]-based ABS investigated. All values correspond to the molality of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

Molality (mol.kg^{-1})		Molality (mol.kg^{-1})		Molality (mol.kg^{-1})	
[C_4mim][C_2SO_4]	**Dextran 6 kDa**	**[C_4mim][C_2SO_4]**	**Dextran 40 kDa**	**[C_4mim][C_2SO_4]**	**Dextran 100 kDa**
3.22026	0.03492	1.98687	0.00703	1.27588	0.00425
3.29308	0.03252	2.03104	0.00656	1.36013	0.00383
3.34144	0.03052	2.07718	0.00615	1.39874	0.00359
3.49240	0.02769	2.15501	0.00571	1.50102	0.00323
3.58099	0.02572	2.18306	0.00538	1.53829	0.00297
3.65267	0.02410	2.23622	0.00505	1.67530	0.00260
3.82366	0.02145	2.26193	0.00478	1.74247	0.00235
3.88221	0.02010	2.32246	0.00443	1.77961	0.00212
4.04526	0.01796	2.37036	0.00413	1.82986	0.00199
4.13026	0.01630	2.41544	0.00385	1.91239	0.00183
4.23751	0.01503	2.46216	0.00361	1.93701	0.00169
4.34007	0.01365	2.49130	0.00340	1.99368	0.00156
4.40790	0.01269	2.52673	0.00320	2.04178	0.00144
4.48165	0.01195	2.56295	0.00302	2.05662	0.00137
4.54581	0.01124	2.57924	0.00286	2.14059	0.00123
4.67745	0.01023	2.60996	0.00273	2.16096	0.00113
4.78388	0.00924	2.62571	0.00262	2.20547	0.00103
4.96919	0.00856	2.65045	0.00247	2.23500	0.00096
5.09987	0.00774	2.68055	0.00233	2.26159	0.00089
		2.69826	0.00221	2.28786	0.00083
		2.72471	0.00210	2.30833	0.00079
		2.74311	0.00200	2.32516	0.00074
		2.76971	0.00190	2.34118	0.00070
		2.79034	0.00183	2.36251	0.00066
		2.81507	0.00176	2.38138	0.00063
		2.81261	0.00169	2.39472	0.00060
		2.82694	0.00163	2.40461	0.00057
		2.84488	0.00155	2.41299	0.00055
		2.87008	0.00148	2.41786	0.00053
		2.87514	0.00143	2.43947	0.00051
		2.90089	0.00137		
		2.90440	0.00132		
		2.93493	0.00126		
		2.92637	0.00121		
		2.93782	0.00117		

Table S4. Experimental binodal points for the $[C_2mim][CF_3SO_3]$-based ABS investigated. All values correspond to the molality of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

Molality (mol.kg^{-1})		Molality (mol.kg^{-1})		Molality (mol.kg^{-1})	
$[C_2mim][CF_3SO_3]$	**Dextran 6 kDa**	**$[C_2mim][CF_3SO_3]$**	**Dextran 40 kDa**	**$[C_2mim][CF_3SO_3]$**	**Dextran 100 kDa**
1.52958	0.04594	0.77283	0.01253	0.67284	0.00515
1.56776	0.04190	0.82374	0.01117	0.81619	0.00410
1.70125	0.03780	0.89044	0.00981	0.90852	0.00333
1.80487	0.03331	0.95712	0.00904	1.00968	0.00290
1.86396	0.03106	1.01016	0.00832	1.07003	0.00257
1.90426	0.02927	1.10921	0.00753	1.14268	0.00230
1.96498	0.02671	1.16726	0.00668	1.20446	0.00207
2.01300	0.02527	1.22476	0.00607	1.25447	0.00189
2.04888	0.02408	1.28830	0.00545	1.28569	0.00176
2.09754	0.02286	1.35548	0.00500	1.32270	0.00162
2.10593	0.02199	1.38469	0.00460	1.37026	0.00148
2.15371	0.02070	1.41981	0.00422	1.40701	0.00139
2.19231	0.02002	1.44772	0.00388	1.43847	0.00130
2.21638	0.01926	1.50263	0.00355	1.46369	0.00122
2.23346	0.01871	1.52695	0.00328	1.47200	0.00116
2.25273	0.01798	1.56880	0.00302	1.49609	0.00111
2.28329	0.01710	1.59384	0.00278	1.51017	0.00106
2.31386	0.01644	1.62901	0.00256	1.53049	0.00101
2.33720	0.01566	1.65978	0.00238	1.55189	0.00096
2.36489	0.01510	1.67817	0.00225	1.55950	0.00092
2.38122	0.01460	1.70524	0.00210	1.58117	0.00088
2.40540	0.01413	1.73671	0.00194	1.59055	0.00084
2.40799	0.01379	1.75948	0.00180	1.60401	0.00081
2.43963	0.01323	1.78282	0.00169	1.61576	0.00077
2.47201	0.01269	1.78857	0.00160	1.62962	0.00075
2.48518	0.01221	1.81341	0.00153	1.63427	0.00073
		1.82436	0.00145	1.64097	0.00070
		1.83865	0.00138		
		1.84950	0.00131		
		1.86305	0.00124		
		1.88681	0.00117		
		1.89225	0.00112		
		1.90408	0.00106		
		1.91290	0.00101		
		1.92087	0.00097		
		1.93068	0.00093		

Table S5. Experimental binodal points for the $[C_6mim][N(CN)_2]$-based ABS investigated. All values correspond to the molality of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

Molality (mol.kg^{-1})		Molality (mol.kg^{-1})		Molality (mol.kg^{-1})	
$[C_6mim][N(CN)_2]$	**Dextran 6 kDa**	**$[C_6mim][N(CN)_2]$**	**Dextran 40 kDa**	**$[C_6mim][N(CN)_2]$**	**Dextran 100 kDa**
0.49086	0.09330	0.53455	0.01384	0.36294	0.00574
0.57315	0.07940	0.64506	0.00925	0.49389	0.00419
0.79753	0.06618	0.81101	0.00656	0.60844	0.00321
0.85059	0.05888	0.85918	0.00537	0.72595	0.00262
0.88484	0.05276	0.98532	0.00467	0.76773	0.00222
1.00169	0.04700	0.99225	0.00405	0.83135	0.00198
1.13121	0.04205	1.00947	0.00364	0.90127	0.00179
1.25750	0.03668	1.08165	0.00337	0.94611	0.00161
1.43545	0.03197	1.13334	0.00315	0.98198	0.00148
1.54869	0.02860	1.17893	0.00295	1.04293	0.00136
1.62840	0.02610	1.21851	0.00278	1.06939	0.00126
1.70034	0.02390	1.28872	0.00246	1.11747	0.00117
1.77654	0.02192	1.32370	0.00229	1.14078	0.00111
1.90967	0.01963	1.37395	0.00211	1.18882	0.00103
1.94806	0.01844	1.39052	0.00196	1.25320	0.00097
1.98309	0.01735	1.45305	0.00186	1.32601	0.00089
2.03596	0.01627	1.48677	0.00175	1.34533	0.00082
2.08828	0.01535	1.52043	0.00164	1.37977	0.00076
2.14013	0.01432	1.56261	0.00153	1.41291	0.00071
2.20897	0.01334	1.56523	0.00143	1.43712	0.00066
2.26588	0.01252	1.57430	0.00134	1.48192	0.00061
2.32959	0.01180	1.58376	0.00126	1.49918	0.00056
2.36477	0.01089	1.65753	0.00117	1.54705	0.00051
2.44308	0.01013	1.62907	0.00110	1.55670	0.00046
2.49100	0.00951	1.66699	0.00102	1.58764	0.00042
2.54342	0.00898			1.62976	0.00038
2.57823	0.00849				
2.64527	0.00800				
2.67886	0.00761				
2.76766	0.00710				
2.83425	0.00640				

Table S6. Experimental binodal points for the [C_4mim][CF_3SO_3]-based ABS investigated. All values correspond to the molality of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

Molality (mol.kg^{-1})		Molality (mol.kg^{-1})	
[C_4mim][CF_3SO_3]	**Dextran 6 kDa**	**[C_4mim][CF_3SO_3]**	**Dextran 100 kDa**
0.4206	0.0852	0.39841	0.00452
0.4689	0.0765	0.40718	0.00411
0.5255	0.0680	0.45509	0.00374
0.5783	0.0616	0.49446	0.00341
0.6213	0.0565	0.53026	0.00312
0.6503	0.0517	0.56425	0.00287
0.7274	0.0456	0.58912	0.00268
0.8049	0.0404	0.64034	0.00249
0.9104	0.0361	0.66001	0.00232
1.0051	0.0324	0.70132	0.00216
1.0592	0.0296	0.71853	0.00203
1.1345	0.0272	0.75368	0.00191
1.1915	0.0252	0.78449	0.00181
1.2404	0.0237	0.81328	0.00171
1.2851	0.0223	0.82600	0.00163
1.3687	0.0205	0.84130	0.00157
1.4227	0.0191	0.86886	0.00149
1.4620	0.0179	0.88314	0.00144
1.4932	0.0170	0.90391	0.00137
1.5368	0.0162	0.90870	0.00132
1.5781	0.0153	0.92981	0.00128
1.6007	0.0146	0.94014	0.00124
1.6341	0.0139	0.95685	0.00119
1.6675	0.0133	0.97231	0.00115
		0.97506	0.00112
		0.98891	0.00108
		0.99063	0.00105
		1.00172	0.00102
		1.01487	0.00099
		1.02535	0.00097
		1.02710	0.00094
		1.04104	0.00091
		1.04458	0.00088
		1.06034	0.00085
		1.07004	0.00083
		1.07305	0.00080
		1.07691	0.00078
		1.08814	0.00076
		1.10246	0.00073
		1.10806	0.00072
		1.11740	0.00069
		1.11847	0.00068
		1.12866	0.00066
		1.13109	0.00064
		1.13290	0.00063
		1.14521	0.00061
		1.14974	0.00060
		1.15441	0.00058

Table S6. Experimental binodal points for the [C_4mim][CF_3SO_3]-based ABS investigated. All values correspond to the molality of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g. (*continued*)

Molality (mol.kg^{-1})		**Molality (mol.kg^{-1})**	
[C_4mim][CF_3SO_3]	**Dextran 6 kDa**	**Dextran 6 kDa**	**[C_4mim][CF_3SO_3]**
		1.15878	0.00057
		1.16683	0.00055
		1.17535	0.00052
		1.18704	0.00049
		1.19127	0.00047
		1.20208	0.00045

Table S7. Experimental binodal points for the [C_4mim][BF_4]-based ABS investigated. All values correspond to the molality of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

Molality (mol.kg^{-1})		Molality (mol.kg^{-1})		Molality (mol.kg^{-1})	
[C_4mim][BF_4]	**Dextran 6 kDa**	**[C_4mim][BF_4]**	**Dextran 40 kDa**	**[C_4mim][BF_4]**	**Dextran 100 kDa**
0.48796	0.07362	0.36983	0.01520	0.23930	0.00590
0.61944	0.05819	0.41500	0.01320	0.28562	0.00518
0.74821	0.04664	0.48558	0.01160	0.33585	0.00462
0.82769	0.03945	0.52722	0.01008	0.36910	0.00417
0.93807	0.03358	0.57050	0.00897	0.40708	0.00377
1.04415	0.02999	0.58812	0.00799	0.43440	0.00337
1.17001	0.02603	0.69488	0.00721	0.45922	0.00308
1.21273	0.02326	0.71740	0.00657	0.51711	0.00273
1.34280	0.02067	0.75231	0.00590	0.55979	0.00245
1.38432	0.01912	0.77068	0.00556	0.60683	0.00223
1.47422	0.01739	0.77870	0.00520	0.60973	0.00208
1.54477	0.01592	0.80515	0.00503	0.63610	0.00189
1.59033	0.01476	0.85836	0.00492	0.68985	0.00171
		0.87699	0.00472	0.70762	0.00157
		0.88301	0.00450	0.72669	0.00146
		0.89230	0.00429	0.76331	0.00135
		0.90389	0.00411	0.77152	0.00127
		1.12059	0.00379	0.78158	0.00119
		1.12168	0.00365	0.81200	0.00112
		1.12781	0.00353	0.82099	0.00108
		1.14354	0.00345	0.82951	0.00103
		1.17399	0.00331	0.84367	0.00097
		1.16538	0.00320	0.85489	0.00092
		1.20253	0.00305	0.85353	0.00088
		1.18896	0.00294	0.86794	0.00083
		1.20113	0.00282	0.88564	0.00080
		1.23774	0.00268	0.88893	0.00077
		1.24604	0.00257	0.90106	0.00074
		1.24847	0.00247	0.90526	0.00070
		1.25799	0.00237	0.91340	0.00068
		1.26130	0.00229	0.92391	0.00065
		1.27177	0.00221	0.92447	0.00062
		1.28738	0.00215	0.92854	0.00059
		1.29085	0.00208	0.93022	0.00057
		1.30896	0.00199	0.94124	0.00054
		1.30848	0.00193	0.94586	0.00052
		1.31188	0.00187	0.95016	0.00051
		1.31802	0.00180	0.94919	0.00049
		1.32317	0.00174	0.95794	0.00047
				0.96348	0.00045

Table S8. Experimental binodal points for the [C_4mim][C_1SO_4]-based ABS investigated. All values correspond to the weight percentage (wt%) of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

wt%		wt%	
[C_4mim][C_1SO_4]	**Dextran 40 kDa**	**[C_4mim][C_1SO_4]**	**Dextran 100 kDa**
25.46	36.27	22.58	34.67
24.34	36.29	19.96	36.25
22.92	37.49	18.01	37.27
20.77	38.69	16.32	38.68
18.87	40.01	14.96	39.47
17.21	41.02	13.67	40.70
15.57	42.38	12.74	40.98
14.45	43.02	11.78	41.56
13.58	43.35	10.98	41.70
12.55	43.97	10.34	42.07
11.56	44.51	9.79	42.35
10.95	44.76	9.28	42.77
10.22	45.11	8.85	42.95
9.62	45.21	8.43	43.07
8.99	45.60	8.02	43.29
8.49	45.71	7.71	43.32
7.89	45.96	7.37	43.49
7.46	46.24	7.00	43.73
6.93	46.81	6.66	43.88
6.58	46.78	6.36	44.02
6.16	47.19	6.08	44.74
5.80	47.21		
5.50	47.38		
5.14	47.65		
4.79	47.85		
4.42	48.86		
3.98	48.79		

Table S9. Experimental binodal points for the [C_4mim][$N(CN)_2$]-based ABS investigated. All values correspond to the weight percentage (wt%) of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

wt%		wt%		wt%	
[C_4mim][$N(CN)_2$]	**Dextran 6 kDa**	**[C_4mim][$N(CN)_2$]**	**Dextran 40 kDa**	**[C_4mim][$N(CN)_2$]**	**Dextran 100 kDa**
29.20	16.24	31.43	21.48	32.31	18.54
28.24	16.37	30.04	22.18	31.12	19.43
27.33	16.59	28.30	24.07	30.02	20.27
26.49	16.82	27.15	24.88	28.27	20.76
25.84	17.07	26.10	25.31	26.61	21.24
24.72	17.71	25.23	25.81	24.43	23.40
23.98	17.78	23.63	26.78	22.79	24.55
23.30	17.97	20.96	27.90	21.26	25.41
22.40	18.46	18.03	29.99	20.00	26.29
21.79	18.59	15.89	31.40	18.80	27.03
21.29	18.78	14.21	32.56	17.84	27.59
20.70	18.83	12.72	33.60	16.68	27.84
19.95	19.28	11.62	34.23	15.53	28.74
19.46	19.31	10.73	34.87	14.53	29.52
19.01	19.39	10.02	35.28	13.64	30.18
18.59	19.47	9.36	35.87	12.89	30.81
18.03	19.77	8.80	36.13	12.19	31.28
17.67	19.88	8.19	36.58	11.54	31.65
17.28	19.93	7.73	36.77	10.97	32.07
16.98	20.01	7.31	37.09	10.47	32.46
16.46	20.32	6.85	37.40	10.01	32.76
16.15	20.39	6.54	37.61	9.45	33.13
15.87	20.43	6.28	37.75	8.95	33.50
15.58	20.51	6.03	37.80	8.47	33.78
15.29	20.54	5.77	37.91	8.04	34.01
15.02	20.60	5.56	38.05	7.66	34.09
14.77	20.62	5.36	38.26	7.27	34.53
14.42	20.88	5.01	38.40	6.99	34.50
13.87	21.14	4.68	38.72	6.70	34.74
13.27	21.32	4.39	38.91	6.42	34.84
12.74	21.49	4.12	39.19	6.18	35.03
12.30	21.61			5.93	35.12
11.85	21.81			5.67	35.31
11.35	22.12			5.42	35.59
10.76	22.33			5.20	35.72
10.27	22.52			5.02	35.75
9.85	22.69			4.83	35.93
				4.64	36.03
				4.50	36.02
				4.35	36.23
				4.21	36.38
				4.04	36.41

Table S10. Experimental binodal points for the [C_4mim][C_2SO_4]-based ABS investigated. All values correspond to the weight percentage (wt%) of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

wt%		wt%		wt%	
[C_4mim][C_2SO_4]	**Dextran 6 kDa**	**[C_4mim][C_2SO_4]**	**Dextran 40 kDa**	**[C_4mim][C_2SO_4]**	**Dextran 100 kDa**
17.32	45.98	28.87	28.22	29.84	25.22
16.33	46.54	26.84	29.22	27.71	26.44
15.48	46.90	24.49	31.77	26.44	26.99
14.25	48.00	23.50	33.28	24.40	28.41
13.37	48.63	21.94	34.43	22.88	28.91
12.63	49.12	20.80	34.93	20.66	30.69
11.40	50.27	19.75	35.44	19.01	31.53
10.76	50.65	18.59	36.29	17.51	31.99
9.73	51.67	17.71	36.59	16.60	32.60
8.91	52.19	16.80	37.15	15.47	33.58
8.27	52.83	16.05	37.42	14.43	33.86
7.57	53.43	15.06	38.04	13.47	34.51
7.07	53.81	14.19	38.52	12.60	35.05
6.69	54.23	13.36	38.97	12.08	35.22
6.32	54.58	12.60	39.42	10.91	36.14
5.78	55.29	11.96	39.71	10.12	36.35
5.25	55.84	11.33	40.04	9.37	36.83
4.89	56.78	10.79	40.39	8.74	37.14
4.44	57.41	10.27	40.54	8.19	37.41
		9.85	40.82	7.70	37.68
		9.47	40.97	7.31	37.89
		8.98	41.20	6.92	38.07
		8.53	41.47	6.57	38.23
		8.13	41.63	6.22	38.44
		7.76	41.87	5.93	38.63
		7.40	42.03	5.67	38.76
		7.07	42.27	5.43	38.86
		6.81	42.45	5.21	38.94
		6.57	42.66	5.01	38.99
		6.33	42.64	4.84	39.20
		6.10	42.77		
		5.85	42.92		
		5.61	43.14		
		5.41	43.18		
		5.19	43.40		

Table S11. Experimental binodal points for the $[C_2mim][CF_3SO_3]$-based ABS investigated. All values correspond to the weight percentage (wt%) of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

wt%		wt%		wt%	
$[C_2mim][CF_3SO_3]$	**Dextran 6 kDa**	**$[C_2mim][CF_3SO_3]$**	**Dextran 40 kDa**	**$[C_2mim][CF_3SO_3]$**	**Dextran 100 kDa**
21.61	28.47	33.38	16.74	34.01	14.90
20.09	28.98	30.88	17.65	29.09	17.52
18.49	30.69	28.19	18.81	24.98	19.12
16.66	31.96	26.56	19.94	22.51	20.81
15.71	32.66	24.96	20.82	20.47	21.78
14.94	33.13	23.15	22.40	18.68	22.92
13.81	33.83	21.09	23.30	17.15	23.86
13.16	34.38	19.53	24.17	15.87	24.61
12.63	34.78	17.90	25.11	14.98	25.07
12.06	35.31	16.66	26.08	13.92	25.61
11.66	35.40	15.53	26.49	12.91	26.29
11.05	35.92	14.43	26.98	12.17	26.80
10.72	36.33	13.45	27.36	11.47	27.24
10.36	36.58	12.42	28.11	10.89	27.58
10.09	36.76	11.59	28.44	10.42	27.70
9.74	36.96	10.77	28.99	10.00	28.02
9.31	37.27	10.01	29.32	9.56	28.21
8.98	37.58	9.28	29.77	9.18	28.48
8.59	37.82	8.70	30.16	8.79	28.77
8.31	38.10	8.27	30.40	8.43	28.87
8.05	38.26	7.75	30.74	8.06	29.15
7.81	38.50	7.18	31.13	7.75	29.27
7.64	38.52	6.71	31.41	7.45	29.45
7.36	38.83	6.33	31.69	7.18	29.60
7.07	39.15	6.03	31.76	6.95	29.78
6.83	39.27	5.76	32.06	6.76	29.84
		5.48	32.19	6.55	29.92
		5.24	32.36		
		4.98	32.49		
		4.74	32.65		
		4.48	32.93		
		4.29	32.99		
		4.07	33.13		
		3.89	33.24		
		3.73	33.33		
		3.60	33.44		

Table S12. Experimental binodal points for the $[C_6mim][N(CN)_2]$-based ABS investigated. All values correspond to the weight percentage (wt%) of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

wt%		wt%		wt%	
$[C_6mim][N(CN)_2]$	**Dextran 6 kDa**	**$[C_6mim][N(CN)_2]$**	**Dextran 40 kDa**	**$[C_6mim][N(CN)_2]$**	**Dextran 100 kDa**
35.89	10.28	36.89	7.79	37.38	6.57
32.27	11.80	33.34	8.90	30.34	10.35
28.42	15.69	30.42	9.80	23.40	10.87
26.11	16.56	27.66	10.30	20.81	12.72
24.04	17.11	24.34	12.24	18.55	13.81
22.00	18.94	22.26	13.02	17.39	14.35
20.15	20.88	20.42	14.06	16.26	15.49
18.04	22.68	18.81	15.24	15.31	16.73
16.10	25.09	17.45	16.44	14.45	17.45
14.65	26.54	16.27	17.18	13.70	18.32
13.54	27.53	14.77	17.78	12.74	18.62
12.54	28.40	13.38	18.79	11.93	18.87
11.62	29.30	12.25	19.65	11.17	19.51
10.53	30.82	11.33	20.53	10.34	20.20
9.96	31.25	10.44	21.62	9.63	20.92
9.43	31.63	9.72	22.62	8.99	21.54
8.90	32.20	9.04	23.98	8.39	22.32
8.43	32.76	8.25	24.87	7.77	23.70
7.91	33.30	7.66	24.63	7.13	24.51
7.41	34.01	7.12	25.11	6.57	25.10
6.99	34.58	6.62	25.78	6.09	25.41
6.61	35.21	6.16	26.56	5.63	26.03
6.13	35.56	5.79	26.95	5.17	26.73
5.73	36.31	5.42	27.22	4.73	27.12
5.40	36.76	5.05	28.40	4.38	27.09
5.11	37.24			4.08	27.82
4.85	37.56				
4.58	38.16				
4.36	38.46				
4.09	39.24				
3.70	39.81				

Table S13. Experimental binodal points for the [C_4mim][CF_3SO_3]-based ABS investigated. All values correspond to the weight percentage (wt%) of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

wt%		wt%	
[C_4mim][CF_3SO_3]	**Dextran 6 kDa**	**[C_4mim][CF_3SO_3]**	**Dextran 100 kDa**
33.83	10.81	35.86	9.60
31.45	11.91	34.09	9.81
28.97	13.16	31.12	10.30
27.00	14.29	29.13	10.51
25.30	15.19	27.21	11.60
23.67	15.79	25.43	12.48
21.50	17.33	23.76	13.26
19.53	18.83	22.33	13.99
17.80	20.79	21.16	14.52
16.26	22.47	19.93	15.58
15.08	23.39	18.85	15.99
14.03	24.65	17.73	16.82
13.12	25.57	16.89	17.16
12.43	26.34	16.06	17.85
11.78	27.03	15.30	18.44
10.96	28.29	14.60	18.99
10.27	29.08	14.03	19.23
9.72	29.65	13.54	19.52
9.27	30.09	12.96	20.03
8.84	30.70	12.55	20.29
8.40	31.27	12.08	20.67
8.07	31.58	11.69	20.76
7.71	32.02	11.31	21.14
7.37	32.47	11.01	21.32
		10.62	21.62
		10.32	21.89
		10.06	21.94
		9.76	22.18
		9.51	22.21
		9.24	22.41
		9.02	22.64
		8.80	22.82
		8.61	22.85
		8.34	23.08
		8.11	23.14
		7.87	23.41
		7.64	23.58
		7.42	23.63
		7.24	23.69
		7.02	23.88
		6.84	24.12
		6.68	24.21
		6.50	24.36
		6.34	24.38
		6.18	24.55
		6.05	24.59
		5.92	24.62
		5.78	24.82

Table S13. Experimental binodal points for the [C_4mim][CF_3SO_3]-based ABS investigated. All values correspond to the weight percentage (wt%) of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g. (*continued*)

wt%		wt%	
[C_4mim][CF_3SO_3]	**Dextran 6 kDa**	**[C_4mim][CF_3SO_3]**	**Dextran 100 kDa**
		5.66	24.89
		5.52	24.97
		5.37	25.04
		5.17	25.17
		4.92	25.31
		4.71	25.50

Table S14. Experimental binodal points for the [C_4mim][BF_4]-based ABS investigated. All values correspond to the weight percentage (wt%) of each phase-forming compound indicated. All experimental data were determined at 298 K and 1 atm with an uncertainty of $\pm 10^{-4}$ g.

wt%		wt%		wt%	
[C4mim][BF4]	**Dextran 6 kDa**	**[C4mim][BF4]**	**Dextran 40 kDa**	**[C4mim][BF4]**	**Dextran 100 kDa**
35.85	10.03	37.81	7.71	37.11	5.13
30.64	9.93	34.56	8.58	34.13	6.06
25.88	12.28	31.70	9.89	31.58	7.06
21.87	14.47	28.74	10.65	29.42	7.70
19.14	15.76	26.41	11.42	27.39	8.43
16.77	17.49	24.21	11.73	25.20	8.94
15.25	19.09	22.39	13.57	23.53	9.40
13.51	20.91	20.80	13.95	21.44	10.46
12.25	21.51	19.09	14.53	19.67	11.23
11.03	23.28	18.20	14.84	18.27	12.06
10.29	23.83	17.23	14.97	17.24	12.11
9.45	24.99	16.74	15.40	15.88	12.57
8.72	25.88	16.44	16.25	14.57	13.49
		15.89	16.54	13.59	13.79
		15.26	16.64	12.73	14.11
		14.65	16.78	11.89	14.71
		14.12	16.96	11.24	14.85
		13.18	20.21	10.67	15.01
		12.75	20.23	10.10	15.51
		12.38	20.31	9.72	15.65
		12.14	20.54	9.32	15.79
		11.70	20.97	8.84	16.01
		11.35	20.85	8.38	16.19
		10.89	21.37	8.09	16.17
		10.53	21.18	7.70	16.40
		10.13	21.35	7.38	16.68
		9.69	21.86	7.11	16.73
		9.33	21.97	6.86	16.92
		8.99	22.01	6.58	16.99
		8.67	22.14	6.32	17.11
		8.38	22.18	6.09	17.28
		8.14	22.33	5.82	17.28
		7.91	22.54	5.58	17.35
		7.67	22.59	5.38	17.37
		7.38	22.83	5.16	17.54
		7.17	22.82	4.99	17.61
		6.95	22.87	4.82	17.68
		6.71	22.95	4.66	17.66
		6.51	23.02	4.49	17.80
				4.35	17.88

Table S15. Equations of linear regression and coefficient of determination (R^2) for the correlation between the minimal equal weight percentages of IL and Dextran required to induce phase separation and the hydrogen-bond basicity (β) of the anions in the tested $[C_4mim]^+$-based ILs.

Commented [JC1]: Pode ficar assim mas se eu fosse revisor pediria as curvas para os 3 dextranos e não apenas esta…

Commented [MM2R1]: Isso. E dar cor nesta figura para ser idêntica às anetruires. deixar apenas as linhas e pontos com cores diferentes para os diferentes dextrano. Colocar as eqs e R2 em SI, e finromar em texto. Aqui so levara a questões desnecessárias de ym R2 de 0.94 e etc

Commented [AJ3R1]: feito

	Equation of linear regression	R^2
Dextran 6 kDa	([IL]=[Dextran]) = 168.46 (β) – 76.24	0.9973
Dextran 40 kDa	([IL]=[Dextran]) = 81.62 (β) – 28.19	0.9407
Dextran 100 kDa	([IL]=[Dextran]) = 83.82 (β) – 31.04	0.9654

Figures

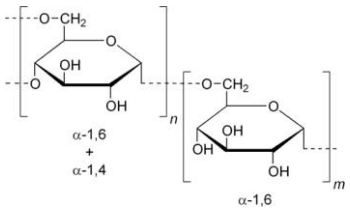

Figure S1. Chemical structure of dextran.

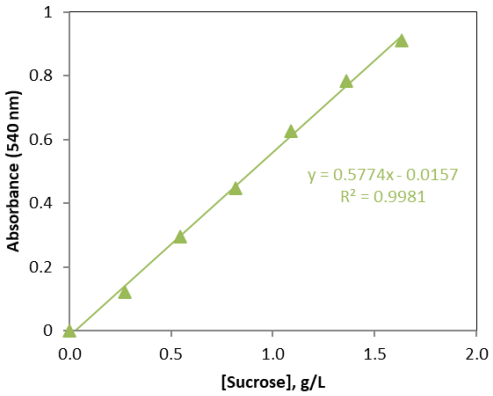

Figure S2. Calibration curve of sucrose in water.