Table 1 Solute descriptor values for all the probe molecules used in this analysis

Probe molecule	E	S	A	B	L
1,2-Dichlorobenzene	0.872	0.78	0	0.04	4.518
Phenol	0.805	0.89	0.6	0.31	3.766
Octylaldehyde	0.16	0.65	0	0.45	4.36
Valeradehyde	0.163	0.65	0	0.45	2.851
o-Xylene	0.663	0.56	0	0.16	3.939
p-Xylene	0.613	0.52	0	0.16	3.839
m-Xylene	0.623	0.52	0	0.16	3.839
Cyclohexanol	0.46	0.54	0.32	0.57	3.758
Nitrobenzene	0.871	1.11	0	0.28	4.511
N,N-Dimethylformamide	0.367	1.31	0	0.74	3.173
2-Pentanone	0.143	0.68	0	0.51	2.755
1-Nitropropane	0.242	0.95	0	0.31	2.894
Toluene	0.601	0.52	0	0.14	3.325
Benzaldehyde	0.82	1	0	0.39	4.008
Pyridine	0.794	0.87	0	0.62	3.003
Aniline	0.955	0.96	0.26	0.53	3.993
Butanol	0.224	0.42	0.37	0.48	2.601
Acetic acid	0.265	0.65	0.61	0.44	1.75
1-Octanol	0.199	0.42	0.37	0.48	4.619
Acetophenone	0.818	1.01	0	0.49	4.501
2-Choloraniline	1.033	0.92	0.25	0.31	4.674
Pyrrole	0.613	0.73	0.41	0.29	2.865
Benzonitrile	0.742	1.11	0	0.33	4.039
Propionitrile	0.162	0.9	0.02	0.36	2.082
1-Chlorohexane	0.201	0.4	0	0.1	3.777
p-Cresol	0.82	0.87	0.57	0.31	4.312
Ethylphenyl ether	0.681	0.7	0	0.32	4.242
Naphthalene	1.34	0.92	0	0.2	5.161
2-propanol	0.212	0.36	0.3	0.14	2.786
Cyclohexanone	0.403	0.86	0	0.56	3.792

Cross correlation matrix for solute descriptors on the following tricationic IL columns:

A3 :70 ^{0}C, 100 ^{0}C
B1: 70 ^{0}C, 100 ^{0}C
B2: 70 ^{0}C, 100 ^{0}C
C4: 70 ^{0}C
D3: 70 ^{0}C, 100 ^{0}C
D5: 70 ^{0}C, 100 ^{0}C n = 29

	E	S	A	B	V
E	1.00				
S	0.43	1.00			
A	0.00	-0.16	1.00		
B	-0.30	0.31	0.14	1.00	
V	0.64	0.15	-0.18	-0.29	1.00

B3: 70 ^{0}C, 100 ^{0}C
C1: 70 ^{0}C
C3: 70 ^{0}C, 100 ^{0}C n = 28

	E	S	A	B	V
E	1.00				
S	0.42	1.00			
A	0.10	-0.13	1.00		
B	-0.29	0.33	0.12	1.00	
V	0.63	0.11	0.03	-0.28	1.00

C1: 100 ^{0}C n = 25

	E	S	A	B	V
E	1.00				
S	0.37	1.00			
A	0.04	-0.23	1.00		
B	-0.39	0.22	0.07	1.00	
V	0.63	0.07	-0.02	-0.33	1.00

C2: 70 ^{0}C, 100 ^{0}C n = 27

	E	S	A	B	V
E	1.00				
S	0.43	1.00			
A	-0.01	-0.17	1.00		
B	-0.24	0.35	0.12	1.00	
V	0.70	0.17	-0.14	-0.26	1.00

C4: 100 ^{0}C n = 25

	E	S	A	B	V
E	1.00				
S	0.57	1.00			
A	0.13	0.01	1.00		
B	-0.23	0.23	0.15	1.00	
V	0.55	0.21	0.06	-0.22	1.00

D2: 70 ^{0}C, 100 ^{0}C n = 28

	E	S	A	B	V
E	1.00				
S	0.39	1.00			
A	-0.02	-0.20	1.00		
B	-0.39	0.25	0.11	1.00	
V	0.66	0.16	-0.18	-0.30	1.00

D1: 70^{0}C n = 28

	E	S	A	B	V
E	1.00				
S	0.43	1.00			
A	-0.06	-0.22	1.00		
B	-0.30	0.32	0.19	1.00	
V	0.64	0.14	-0.21	-0.29	1.00

D1: 100 ^{0}C n = 26

	E	S	A	B	V
E	1.00				
S	0.38	1.00			
A	-0.13	-0.28	1.00		
B	-0.36	0.27	0.18	1.00	
V	0.64	0.14	-0.24	-0.27	1.00