

Supporting Information to

Self-assembly of cationic surfactant in choline chloride-*based* Deep Eutectic Solvents: Structural solvation and Dynamics

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Table S1: ¹H-NMR values of the prepared neat DESs.

Value (ppm)	Assign to
Ethaline	
3.361	-CH ₂ groups of both EG
5.092	-OH peak of EG
3.685	Individual peak of -CH ₃ protons of choline (Ch ⁺) cation
4.015	-CH ₂ groups of Ch ⁺ cation
4.548	Terminal -CH ₂ group of Ch ⁺ cation
5.447	-OH peak of Ch ⁺ cation
ChCl: DEG	
3.282	Individual peak of -CH ₃ protons of choline (Ch ⁺) cation
3.540 - 3.605	-CH ₂ groups of DEG (near to alcohol)
3.639 - 3.662	-CH ₂ groups of DEG (near to ether)
4.005	-CH ₂ groups of Ch ⁺ cation
4.343	Terminal -CH ₂ group of Ch ⁺ cation
5.065	-OH peak of DEG
5.358	-OH peak of Ch ⁺ cation
ChCl: TEG	
3.282	Individual peak of -CH ₃ protons of choline (Ch ⁺) cation
3.551- 3.563	-CH ₂ groups of TEG
3.592	-CH ₂ groups of TEG
3.651	-CH ₂ groups of TEG (near to alcohol)
4.005	-CH ₂ groups of Ch ⁺ cation
4.343	Terminal -CH ₂ group of Ch ⁺ cation
5.065	-OH peak of Ch ⁺ cation
5.358	-OH peak of TEG alcohol
Glyceline	
3.101	Individual peak of -CH ₃ protons of choline (Ch ⁺) cation
3.383 - 3.439	-CH ₂ groups of Glycerol
3.561	-CH ₂ groups of Glycerol
3.877	-CH ₂ groups of Ch ⁺ cation
4.357	Terminal -CH ₂ group of Ch ⁺ cation
4.837	-OH peak of Glycerol
4.927	-OH peak of Glycerol
5.171	-OH peak of Ch ⁺ cation

Table S2: Surface tension (γ) value of examined DESs in pure (Neat) and in the presence of various amounts of water.

(a) Ethaline:

[DTAB] (mM)	γ (mN/m)			
	0 wt% water	30 wt% water	50 wt% water	90 wt% water
0	51.2	37.3	38.4	52.4
0.98	45.0	36.8	42.9	44.8
1.92	40.3	34.9	37.8	41.2
2.83	39.8	35.2	36.4	39.8
3.70	38.4	34.2	35.4	39.5
4.54	37.0	33.5	34.6	39.2
5.35	36.1	33.0	34.6	39.0
6.14	35.4	32.6	34.6	39.5
6.89	34.4	32.3	34.6	39.7
7.62	34.1	31.9	34.6	39.8
8.33	33.3	31.6	34.6	39.9
9.01	32.9	31.3	-	39.6
9.67	32.6	31.3	-	39.9
10.31	32.2	31.3	-	40.1
10.93	32.1	31.3	-	39.9
12.12	32.2	31.3	-	39.9
13.23	32.1	31.3	-	-
14.28	32.1	-	-	-
16.21	32.3	-	-	-
18.75	32.3	-	-	-

(b) ChCl: DEG:

[DTAB] (mM)	γ (mN/m)			
	0 wt% water	30 wt% water	50 wt% water	90 wt% water
0	50.7	50.3	49.5	58.7
0.98	49.0	44.6	42.8	48.4
1.92	48.6	42.3	40.7	43.5
2.83	47.1	40.6	38.9	41.1
3.70	46.4	38.9	38.1	39.7
4.55	46.3	37.9	36.9	38.5
5.36	46.0	37.4	36.0	37.9
6.14	45.7	36.5	35.2	37.4
6.90	45.3	35.5	35.4	39.0
7.63	44.8	35.1	35.6	38.9
8.33	44.5	34.6	36.0	39.3
9.68	43.8	33.4	35.8	39.7
10.94	43.7	34.1	35.8	39.6
12.12	42.6	34.1	35.9	39.5
13.24	42.8	34.4	36.3	39.7
14.29	42.3	34.4	36.4	39.6
15.28	41.9	34.4	36.4	39.8
16.21	42.0	34.5	36.4	39.6
17.11	41.6	34.9	36.2	-
17.95	41.6	-	-	-
18.75	41.7	-	-	-
20.24	41.5	-	-	-
20.93	41.4	-	-	-
21.59	41.4	-	-	-
22.22	41.3	-	-	-

(c) ChCl: TEG:

[DTAB] (mM)	γ (mN/m)
	30 wt% water
0	48.0
0.98	43.2
1.92	41.5
2.83	40.8
3.70	39.8
4.55	38.7
5.36	38.1
6.14	37.3
6.90	36.8
7.63	36.6
8.33	36.0
9.02	36.3
9.68	36.3
10.94	36.3
12.12	36.4
13.24	36.3
14.29	36.3
15.28	36.3
16.22	36.3

[DTAB] (mM)	γ (mN/m)		
	0 wt% water	50 wt% water	90 wt% water
0	47.1	44.9	57.3
1.61	46.6	28.4	47
3.13	46.1	27.1	45.2
4.55	45.4	25.4	43.3
5.88	45.1	25.4	39.9
7.14	44.9	26	39.5
8.33	44.3	26.4	38.8
9.46	44.2	27	37.5
10.53	44.1	27.5	37.6
11.54	44.1	28	38
12.50	44.0	28.4	38.1
13.41	43.8	28.7	39.3
14.29	43.6	29.1	39.6
15.90	43.2	29.6	40
17.39	43.7	29.9	40
18.75	43.8	30.1	40
20.00	43.6	30.3	39.9
21.15	43.5	30.4	40.1
22.22	43.8	30.6	-

(d) Glyceline:

[DTAB] (mM)	γ (mN/m)			
	0 wt% water	30 wt% water	50 wt% water	90 wt% water
0	67.5	54.5	59.6	61.1
0.98	44.5	45.8	46	47.9
1.92	49.2	41.6	41.1	44.8
2.83	47.3	39.2	38.5	40.9
3.70	45.7	37.6	36.8	39.6
4.55	44.8	36.5	36.9	38.4
5.36	43.9	35.8	36.9	38.4
6.14	42.8	34.9	37.2	39.3
6.90	42.3	35.1	37.1	39.2
7.63	41.7	35.1	37.1	39.6
8.33	41.3	35.0	37.1	39.9
9.02	41.0	35.2	37.1	40.1
9.68	40.9	35.1	37.0	40.1
10.32	40.9	34.8	-	40.0
10.94	40.7	35.3	-	40.0
12.12	39.7	35.2	-	39.9
13.24	39.9	-	-	-
14.29	39.7	-	-	-
15.28	39.6	-	-	-
16.22	39.7	-	-	-