

Supporting Information

Influence of temperature and polar organic solvents (Isopropanol and 1,4-dioxane) on the micellization of cationic gemini surfactant (14-4-14)

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Table S1. Critical micelle concentration (cmc), degree of dissociation (α) and various thermodynamic parameters of 14-4-14 in different vol % of DO-water at different temperatures by conductometry (Cond.) tensiometry (ST) and calorimetry (μ cal)

% of DO (v/v)	Temperature/ (K)	cmc (mM)			α	$-\Delta G_m^0 /$	$-\Delta G_{m, tail}^0 /$	$\Delta G_{trans}^0 /$	$-\Delta H_m^0 /$	$\Delta S_m^0 /$
		Cond.	ST	μ cal		kJ mol ⁻¹	kJ mol ⁻¹	kJ mol ⁻¹	kJ mol ⁻¹	J K ⁻¹ mol ⁻¹
10	298	0.342	0.377	-	0.33	69.1	34.5	5.14	42.2	90.30
	303	0.383	-	0.41	0.34	69.0	34.5	4.80	43.2	84.98
	308	0.450	-	-	0.35	68.6	34.3	5.43	44.2	78.83
	313	0.510	-	-	0.36	68.3	34.2	4.60	45.3	73.45
	318	0.566	-	-	0.37	68.2	34.1	4.29	46.4	68.55
	323	0.620	-	-	0.38	68.1	34.1	3.91	47.4	63.96
20	298	0.885	0.86	0.90	0.34	62.5	31.3	11.7	47.8	49.27
	303	1.036	-	1.02	0.35	62.1	31.0	11.7	48.0	46.51
	308	1.20	-	1.19	0.35	62.3	31.1	11.7	50.6	37.70
	313	1.39	-	1.41	0.36	61.8	30.9	11.1	51.9	31.91
	318	1.54	-	1.65	0.37	61.7	30.8	10.8	53.1	27.09
	323	1.80	-	2.08	0.38	61.1	30.6	10.9	54.3	21.33
30	298	1.97	1.89	-	0.34	57.3	28.7	16.9	48.2	30.71
	303	2.23	-	2.47	0.35	57.1	28.5	16.7	49.4	25.39
	308	2.58	-	-	0.36	56.7	28.3	17.3	50.6	19.74
	313	3.03	-	-	0.37	56.1	28.1	16.8	51.8	13.89
	318	3.43	-	-	0.38	55.8	27.9	16.7	53.0	8.86
	323	3.94	-	-	0.40	54.8	27.4	17.2	53.7	3.57
40	298	3.47	3.38	-	0.36	52.5	26.3	21.7	49.8	9.20
	303	4.44	-	4.40	0.38	51.1	25.5	22.7	50.6	1.70
	308	5.10	-	-	0.40	50.2	25.1	23.8	51.3	-3.57
	313	5.98	-	-	0.41	49.7	24.8	23.3	52.5	-9.07
	318	6.84	-	-	0.42	49.2	24.6	23.3	53.7	-14.08
	323	7.30	-	-	0.45	48.2	24.1	23.8	53.9	-17.40

Table S2. Surface tension of solution (γ_{sol}), molar volume (V_{m}) and Gordon parameter (G) for IP-water and DO-water at 298 K

% (v/v)	γ_{sol} mNm ⁻¹	V_{m} dm ³ mol ⁻¹	G J m ⁻³
IP-Water			
0	71.1	18.1	2.71
2	57.4	19.2	1.83
5	48.0	21.0	1.74
7	43.2	22.2	1.54
10	38.2	23.9	1.32
15	34.8	26.9	1.16
DO-Water			
10	56.3	24.8	1.93
20	52.0	31.6	1.64
30	46.3	38.3	1.37
40	42.8	45.1	1.20

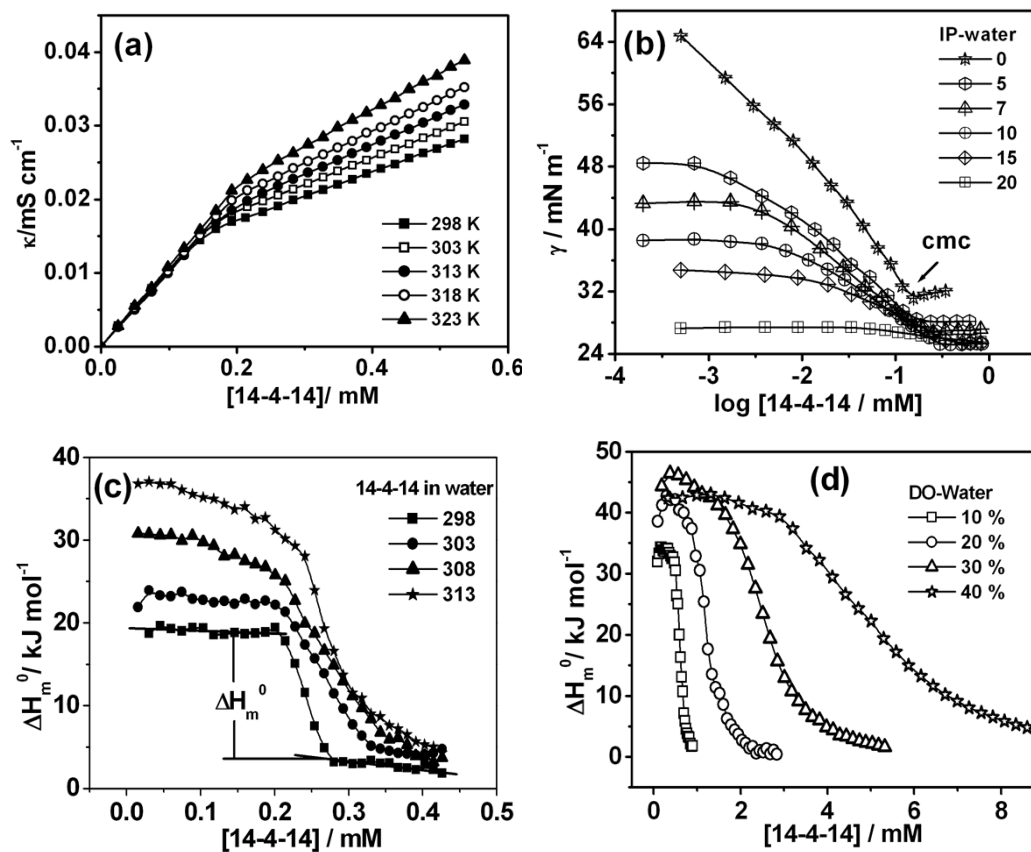


Figure S1. (a) Conductometric profile of 14-4-14 in water at different temperatures. (b) Tensiometric profile of 14-4-14 in different vol % of IP at 298 K. (c) Microcalorimetric profile of 14-4-14 in water at different temperatures. (d) Microcalorimetric profile of 14-4-14 in different vol % of DO at 303 K.

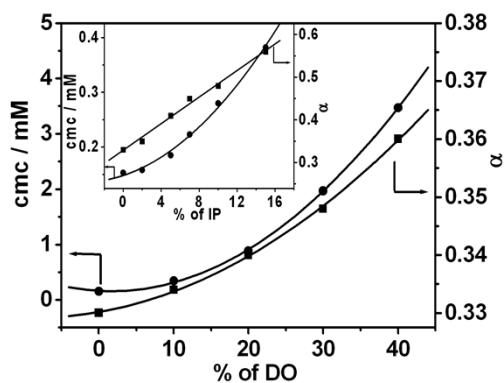


Figure S2. Variation of cmc and α of 14-4-14 with vol % of DO

Inset. Variation of cmc and α of 14-4-14 with vol % of IP.

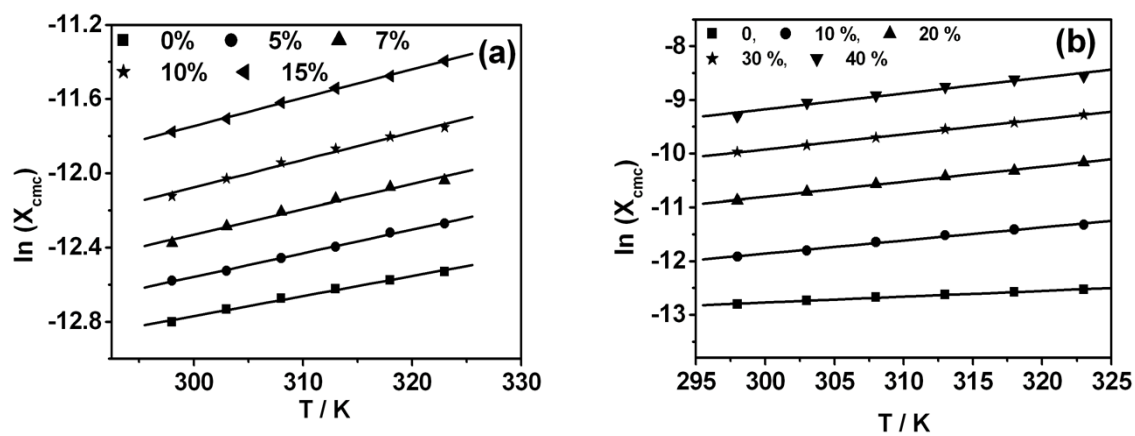


Figure S3. (a) Variation of $\ln(X_{\text{cmc}})$ with T for different vol % of IP. Variation of $\ln(X_{\text{cmc}})$ with T for different vol % of DO.

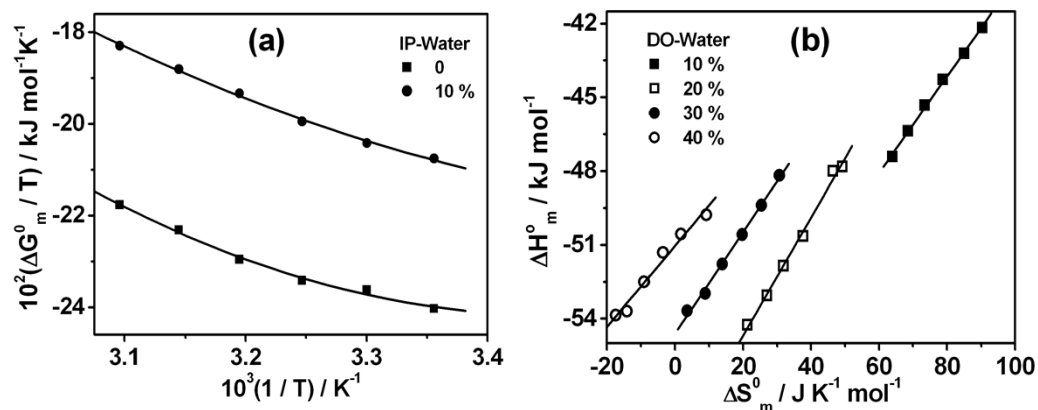


Figure S4. (a) Plots of $(\Delta G_m^0 / T)$ vs. $(1/T)$ of 14-4-14 in water (■) and 15 % IP (●). (b) Plots of enthalpy vs. entropy for different vol % of DO.

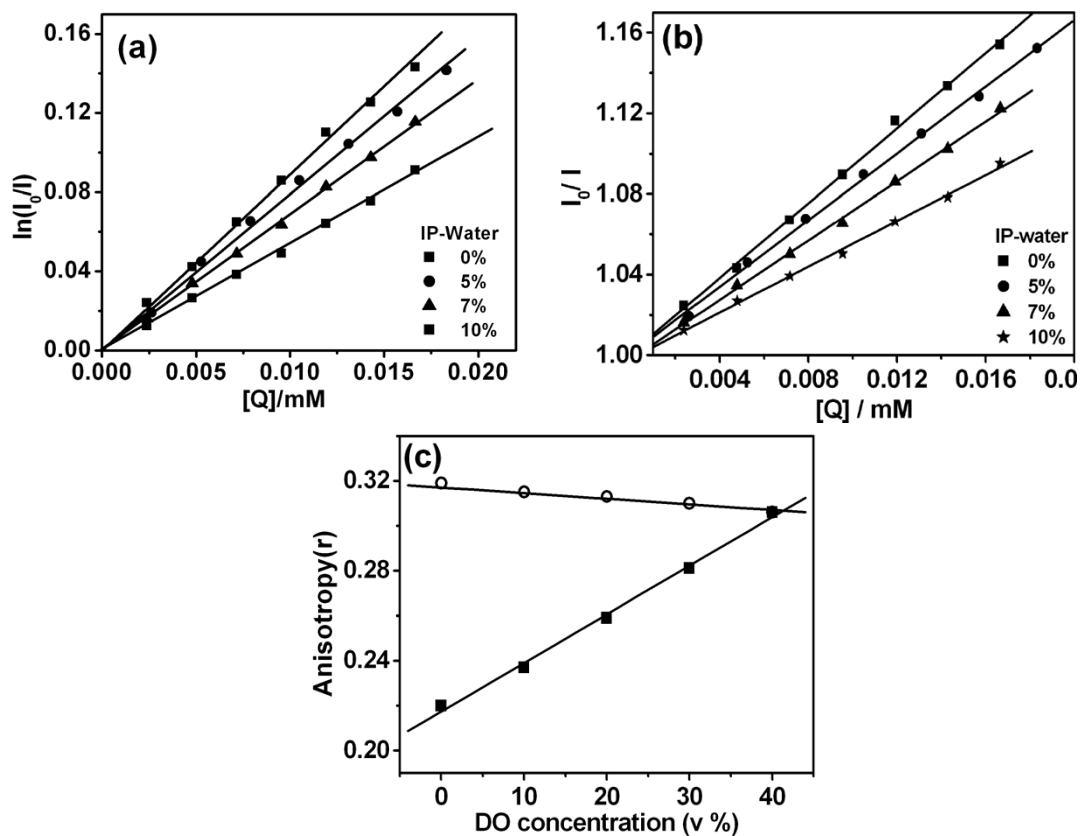


Figure S5. (a) Plots of $\ln(I_0 / I)$ vs $[Q]$ for 14-4-14 in IP-water media. (b) Stern-Volmer Plots for 14-4-14 in IP-water media. (c) Fluorescence anisotropy of curcumin in 40 mM micellar solution of 14-4-14 (○) and in homogeneous medium (■) at different DO concentrations at 298 K.

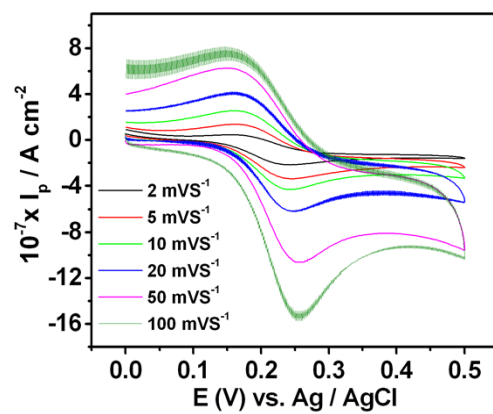


Figure S6. Cyclic voltammograms of 1 mM ferrocene in micellar solution of 14-4-14 in presence of supporting electrolyte, KCl (100 mM).