

Electronic Supplementary Information

Multi stimuli response of a single surfactant presenting a rich self-assembly behavior

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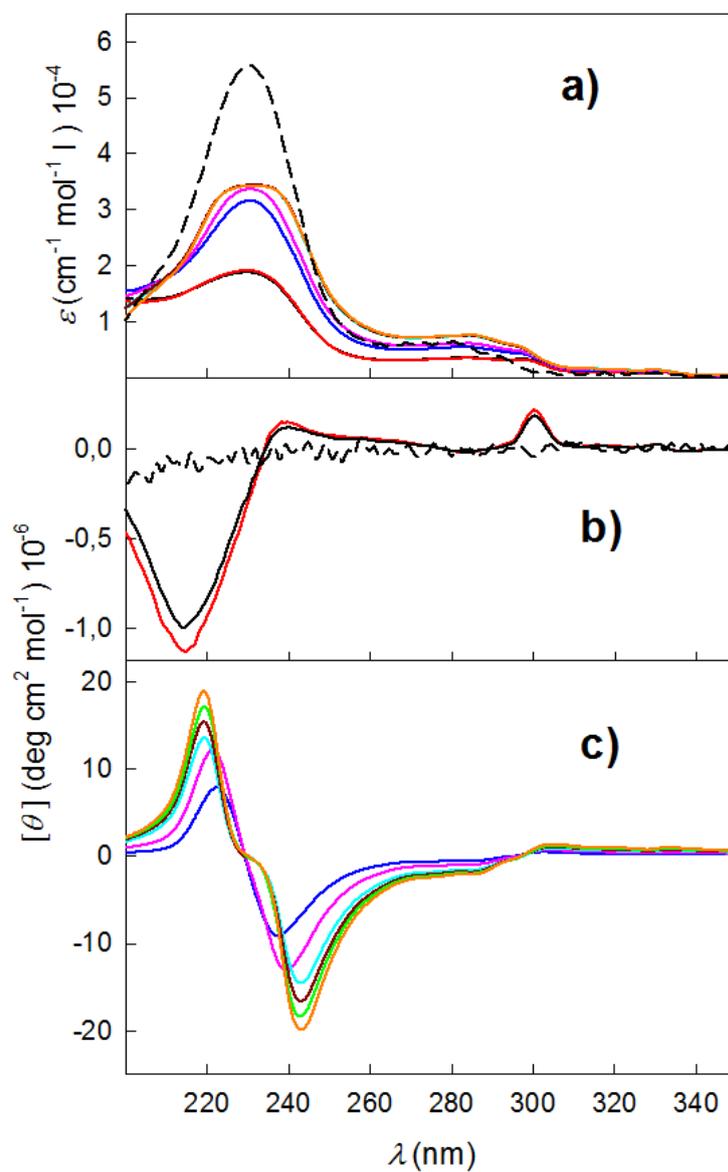


Fig. S1 UV absorption (a) and CD spectra (b,c) for 1.0mMHNapHC in sodium carbonate/bicarbonate buffer at pH 8.5 (black), 9.0 (red), 9.5 (blue), 9.9 (pink), 10.5 (cyan), 10.8 (brown), 11.0 (green), 12.3 (orange). Dotted line (a,b) is related to HNapHC 1mM in methanol.

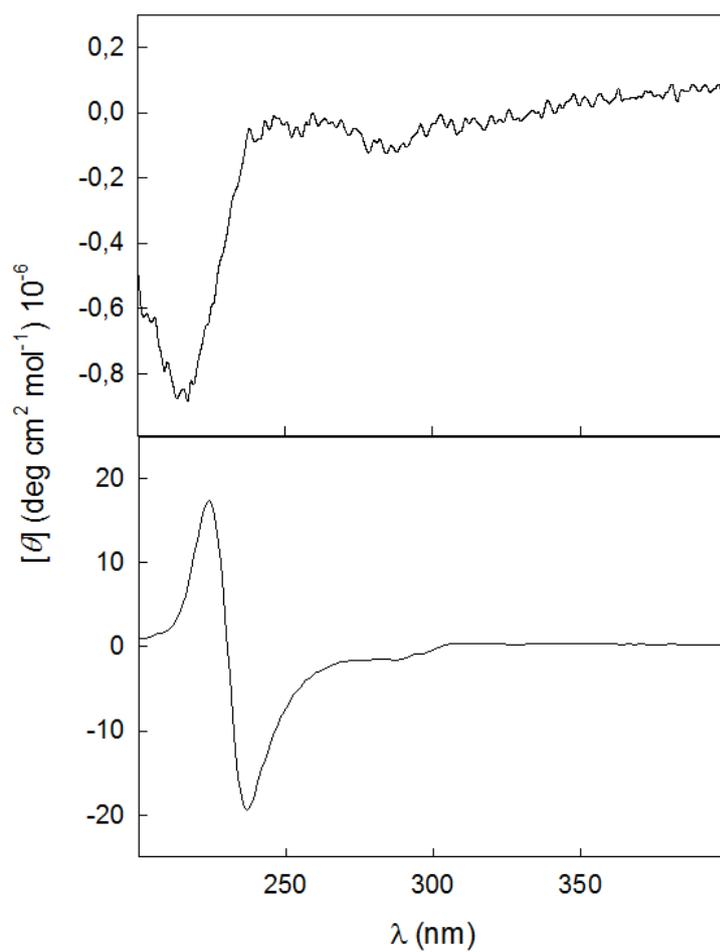


Fig. S2 CD spectra for 1.0mM HNapHC in potassium carbonate/bicarbonate buffer at pH 8.6 (upper panel) and 12.0 (lower panel).

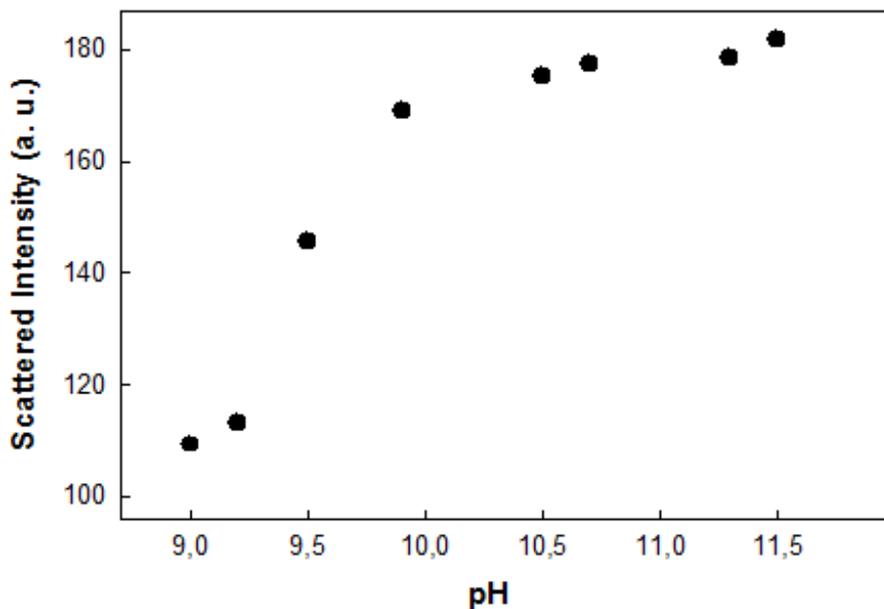


Fig. S3 Scattered intensity at 90° (a) for HNaphC 1.0 mM as a function of pH.

Table S1: Cryo-TEM image analysis. *N* is the number of events measured.

pH	Time after preparation	Single wall tube Diameter [nm]	Multi wall tube inner diameter [nm]	Multi wall tube wall to wall distance [nm]	Ratio of No. of single wall to No. multi wall tubules
8.7	(1hr)	61 ± 4 (N = 72)	---	---	All single wall
	(24hr)	64 ± 6 (N = 135)			
10.6	(1hr)	73 ± 9 (N = 41)	60 ± 10	10 ± 2 (N = 35)	76/354
11.6	(1hr)	84 ± 20 (N = 32)	55 ± 5	15 ± 2 (N = 24)	331/601
12.3	(1hr)	78 ± 13 (N = 42)	58 ± 6	16 ± 2 (N = 42)	230/383
	(24hr)	73 ± 8 (N = 42)			All single wall

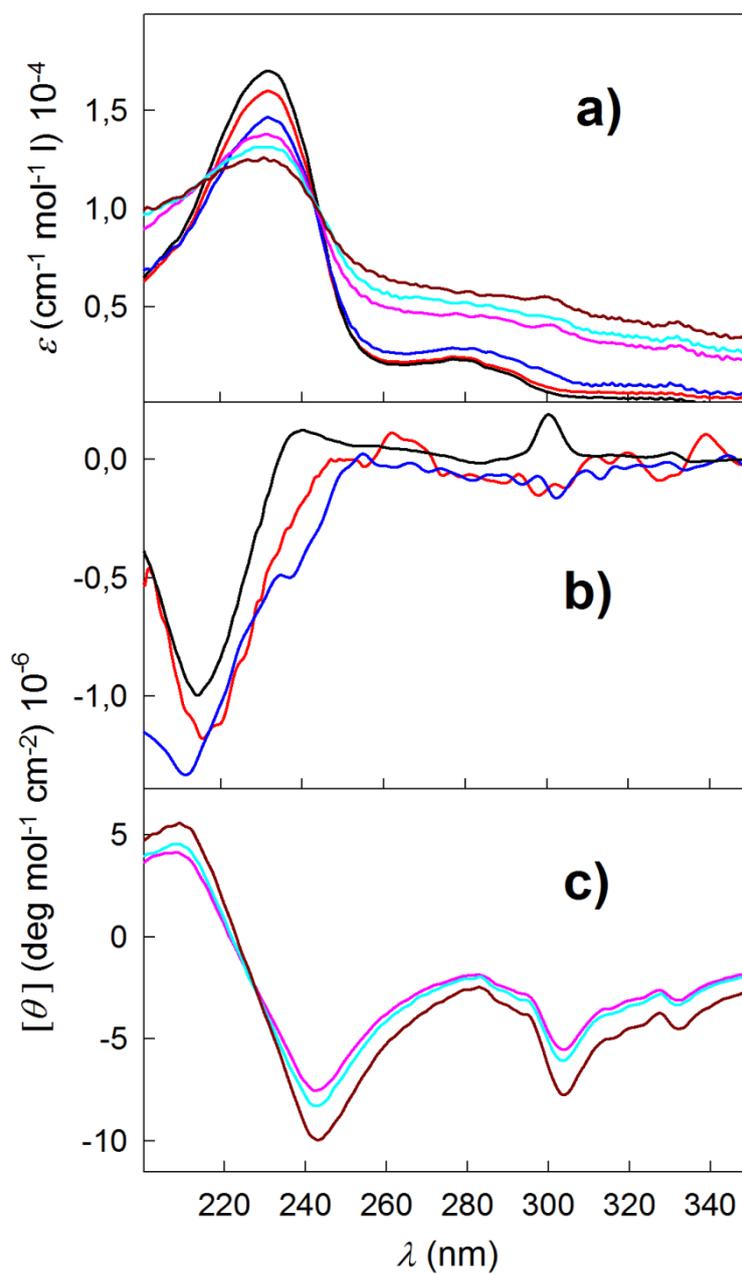


Fig. S4 UV absorption (a) and CD spectra (b,c) for 1.0mMHNapHC in buffer at pH 8.5 without added salt (black) and with NaCl 3 mM (red), 5 mM (blue), 10 mM (pink), 20 mM (cyan) and 40mM (brown).

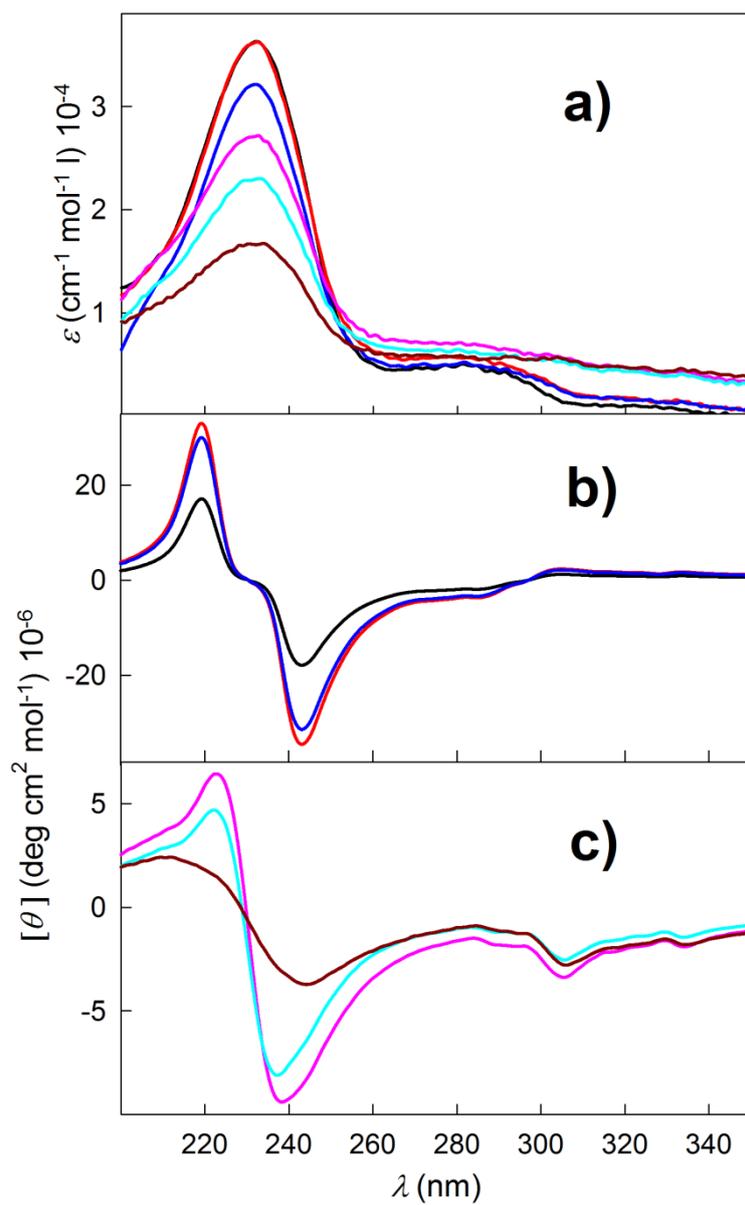


Fig. S5 UV absorption (a) and CD spectra (b,c) for 1.0mMHNapHC in buffer at pH 12.3 without added salt (black) and with NaCl 3 mM (red), 5 mM (blue), 10 mM (pink), 15mM (cyan) and 30mM (brown).

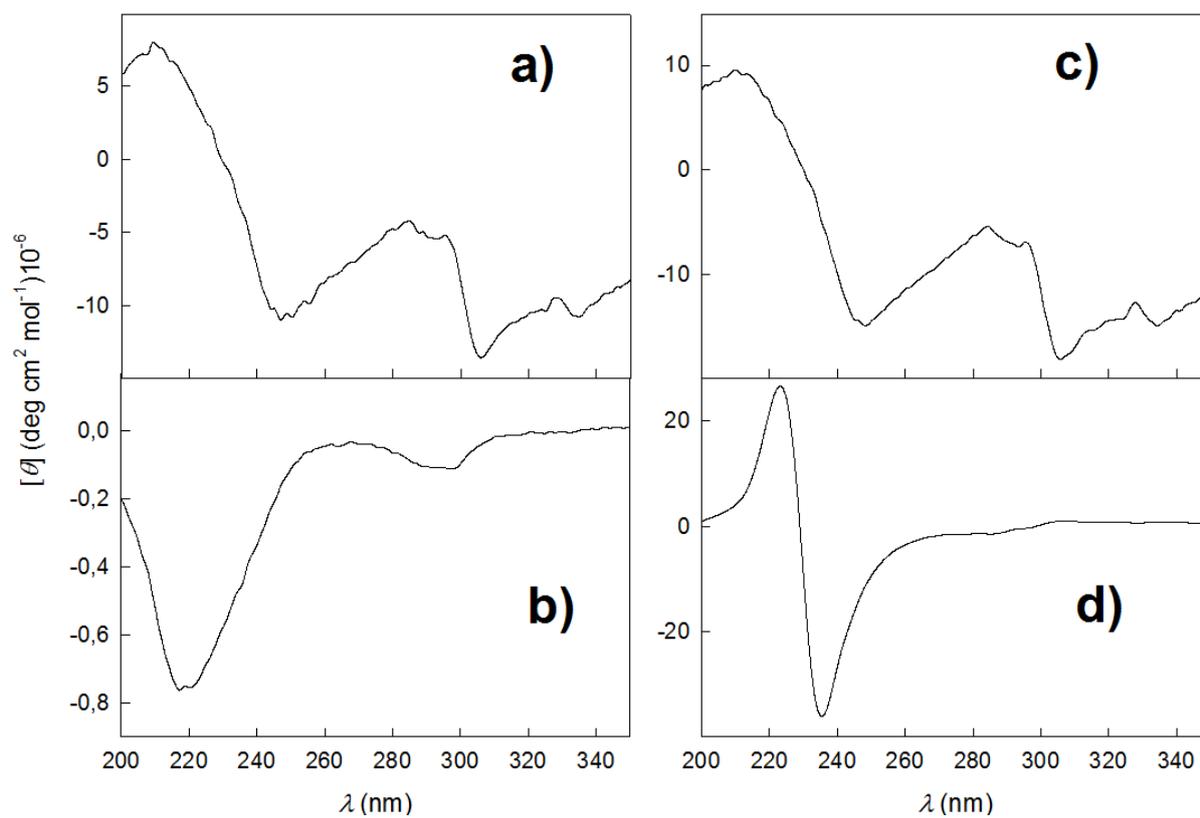


Fig. S6 CD spectra for 1.0mMHNapHC in buffer at pH 8.5 (a,b) and 12.3 (c,d) in 100 mMNaCl after sample preparation (a,c) and after centrifugation/ re-dispersion of precipitates in buffer at initial pHs (b,d) and no added electrolyte.

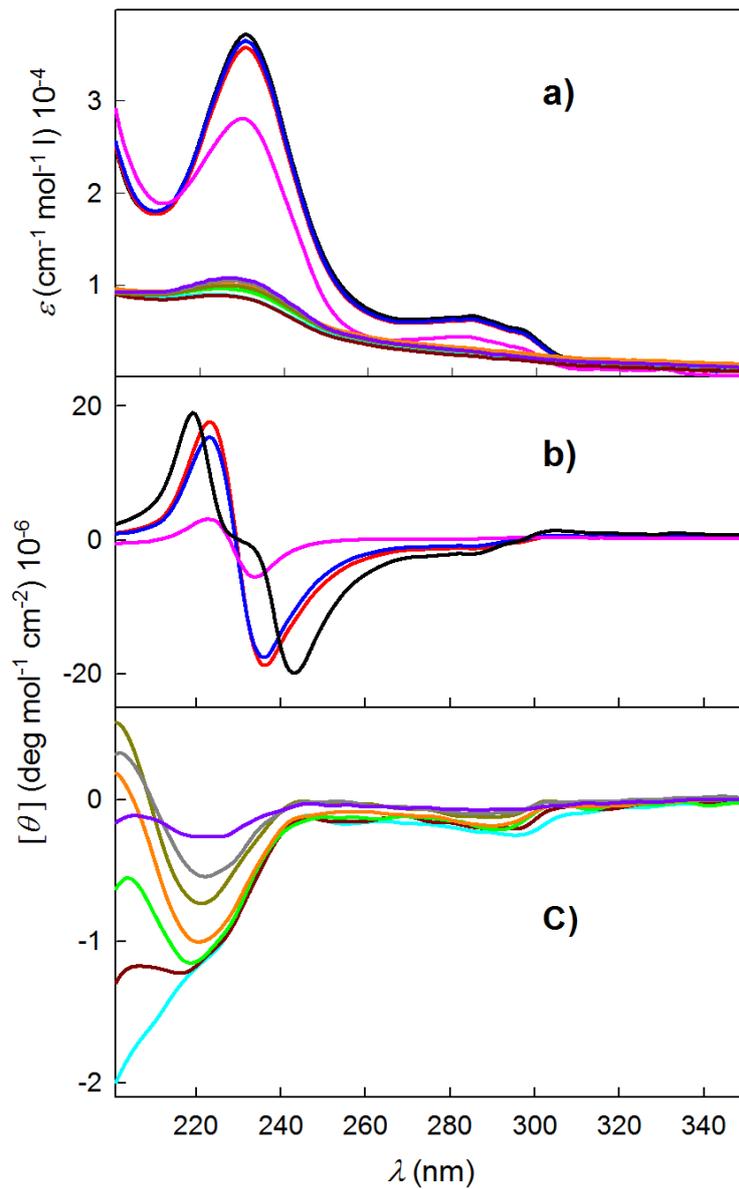


Fig. S7 UV absorption (a) and CD spectra (b,c) for 1.0mMHNapHC in buffer at temperature of 20 (black), 25 (red), 30 (blue), 35 (pink), 40 (cyan), 45 (brown), 50 (green), 55 (orange), 60 (ocher), 70 (grey) and 80°C (violet).

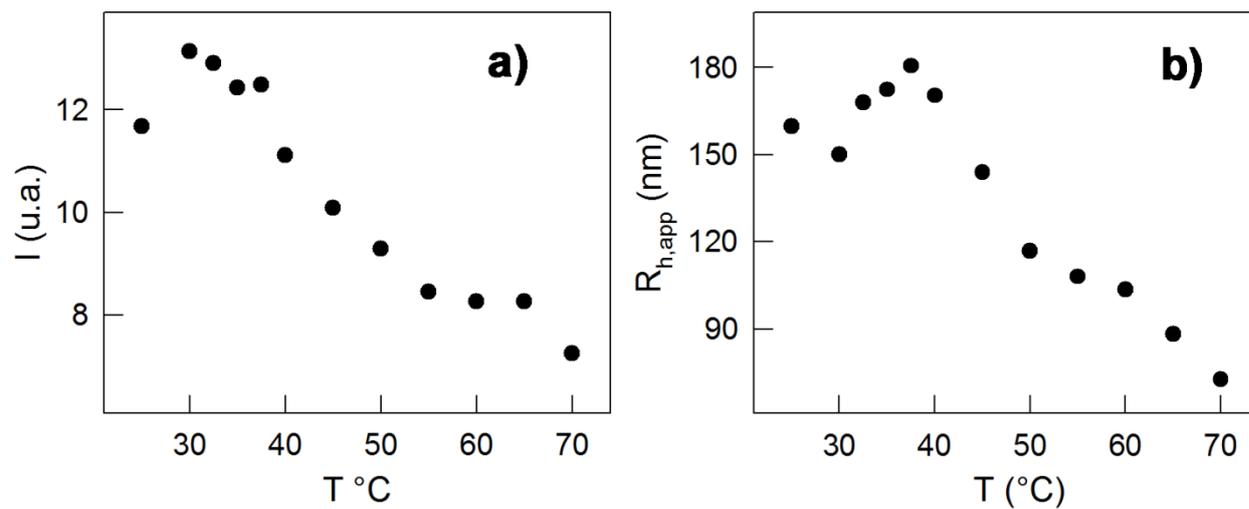


Fig. S8 Scattered intensity at 90° (a) and apparent hydrodynamic radius (b) as a function of temperature for HNaphC 1.0 mM in buffer pH 12.3.