

## Supplementary Information

# Impact of wormlike micelles on nano and macroscopic structure of TEMPO-oxidized cellulose nanofibrils hydrogels

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Figure ES1 – Surface tension dependence on CAPOX concentration in NaCl 1wt% solutions.

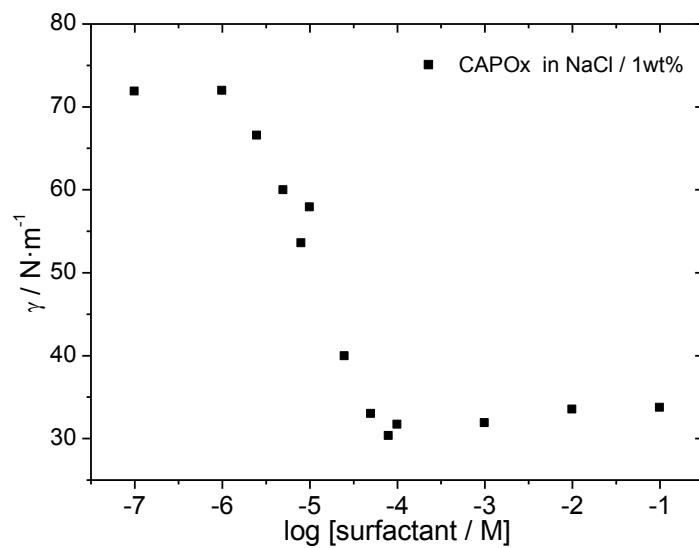


Table ESI 1A Fitting parameters for CAPB 20, 40 and 60 mM in NaCl 1wt% in 100 %  
D<sub>2</sub>O

Concentration Surfactant	20 mM	40 mM	60 mM
CAPB			
Scale ( $\alpha n [\Delta\rho]^2$ )	1.22	2.48	3.75
R / Å	24±1	24 (fixed)	24 (fixed)
$\sigma$ / %	15 ±1	15 (fixed)	15 (fixed)
Interactions (hard-spheres)			
$\phi_{HS}$ / %	0	1.3 ±0.1	2.4 ±0.1
R <sub>HS</sub> / Å	N/A	36 ± 1	32 ± 1

Table ESI 1B Fitting parameters for CAPOx 20, 40 and 60 mM in NaCl 1wt% in 100  
% D<sub>2</sub>O

Concentration Surfactant	20 mM	40 mM	60 mM
CAPOx			
Scale ( $\alpha n [\Delta\rho]^2$ )	1.32	2.64	4.16
R / Å	23±1	23 (fixed)	23 (fixed)
$\sigma$ / %	17 ±1	17 (fixed)	17 (fixed)
Interactions (hard-spheres)			
$\phi_{HS}$ / %	0	0	2.9 ±0.1
R <sub>HS</sub> / Å	N/A	N/AN/A	31 ± 1

Table ESI 1C Fitting parameters for SLS 20, 40 and 60 mM in NaCl 1wt% in 100 %  
D<sub>2</sub>O

Concentration Surfactant	20 mM	40 mM	60 mM
SLS			
Scale ( $\alpha n [\Delta\rho]^2$ )	2.24	1.78	1.62
R / Å	19±1	19±1	19±1
Interactions (Hayter – mean sphere approximation)			
Charge / e	54 (fixed)	54 (fixed)	54±2
Vol. frac / %	0.23±0.01	0.62±0.01	1.05±0.01
Dielectric constant	77.936 (fixed)	77.936 (fixed)	77.936 (fixed)
Salt concentration / M	0.173 (fixed)	0.173 (fixed)	0.173 (fixed)
Temperature / K	298.16 (fixed)	298.16 (fixed)	298.16 (fixed)

Table ESI 2A Fitting parameters for CAPB/SDS 20/20, 40/40 and 60/60 mM in NaCl  
1wt% in 100 % D<sub>2</sub>O

Concentration Surfactant	20 mM	40 mM	60 mM
CAPB/SDS			
Scale ( $\alpha n [\Delta\rho]^2$ )	0.05	0.10	0.17
R / Å	18±1	18 (fixed)	18 (fixed)
$\sigma$ / %	19 ±1	19 ±1 (fixed)	19 ±1 (fixed)
Interactions (Random Phase Approximation)			
$V_{RPA}$	16.2±1	45 ±1	82 ±0.1
$R_c$ / Å	49 ±1	50 ± 1	46 ± 1

Table ESI 2B Fitting parameters for CAPOx/SDS 20/20, 40/40 and 60/60 mM in  
NaCl 1wt% in 100 % D<sub>2</sub>O

Concentration Surfactant	20 mM	40 mM	60 mM
CAPOx/SDS			
Scale ( $\alpha n [\Delta\rho]^2$ )	0.05	0.10	0.15
R / Å	18±1	18 (fixed)	18 ±1 (fixed)
$\sigma$ / %	19 ±1	19 ±1 (fixed)	19 ±1 (fixed)
Interactions (Random Phase Approximation)			
$V_{RPA}/\pm 1b$	64 ±0.1	95 ±0.1	145 ±0.1
$R_c / \pm 0.1 \text{ Å}$	32 ± 1	35 ± 1	37 ± 1

Table ESI 2C Fitting parameters for CAPB/SLS 20/20, 40/40 and 60/60 mM in NaCl  
1wt% in 100 % D<sub>2</sub>O

Concentration Surfactant	20 mM	40 mM	60 mM
CAPB/SLS			
Scale ( $\alpha n [\Delta\rho]^2$ )	2.69	2.18	1.54
R / Å	22 (fixed)	22 (fixed)	22 ±1
Interactions (charged-spheres)			
Charge / e	76 (fixed)	76 (fixed)	76±1
Vol. frac / %	0.8±0.1	1.5±0.1	2.2±0.1
Dielectric constant	77.936 (fixed)	77.936 (fixed)	77.936 (fixed)
Salt concentration / M	0.173 (fixed)	0.173 (fixed)	0.173 (fixed)
Temperature / K	298.16 (fixed)	298.16 (fixed)	298.16 (fixed)

Table ESI 3A Fitting parameters for the OCNF contribution in CAPB/SDS 20/20, 40/40 and 60/60 mM in OCNF 1wt%/NaCl 1wt% in 15wt% D<sub>2</sub>O / 75wt% H<sub>2</sub>O

Concentration Surfactant	20 mM	40 mM	60 mM
CAPB			
Scale ( $\propto n [\Delta\rho]^2$ )	0.0098	0.0085	0.0068
R / Å	53±1	53 (fixed)	53 (fixed)
$\epsilon$	0.24 ±0.02	0.24 (fixed)	0.24 (fixed)
Interactions (Random Phase Approximation)			
$V_{RPA}$	-1.9±0.1	-1.9 (fixed)	-1.9 (fixed)
$R_c$ / Å	65±1	65 (fixed)	65 (fixed)