Electronic Supplementary Material (ESI) for Soft Matter

Viscoelasticity of anionic wormlike micelles: effects of ionic strength and small hydrophobic molecules

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Supplementary Material

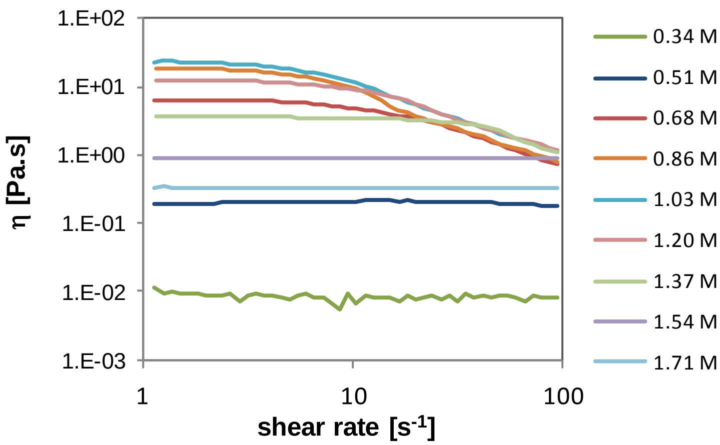

Figure S1. Flow curves of aqueous solutions of SLES at 10% in the presence of increasing concentrations of NaCl.

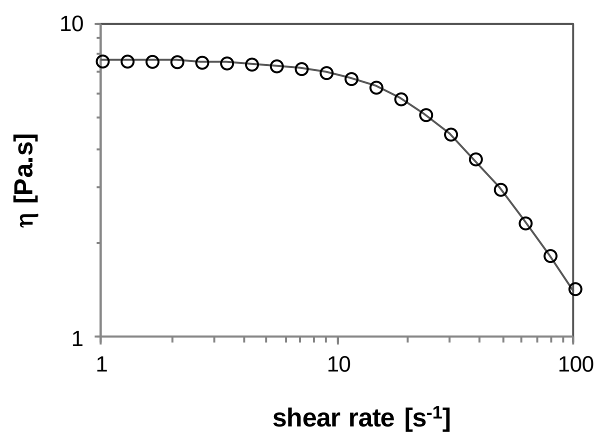

Figure S2. Example of fitting of an experimental flow curve of SLES 10% in the presence of 0.5% vanillin to the model of Carreau. Fitting parameters were zero-shear viscosity, η_0 (7.7 Pa.s), critical shear rate, $\dot{\gamma}$ (27 s^{-1}), and shear thinning index, n (-1).

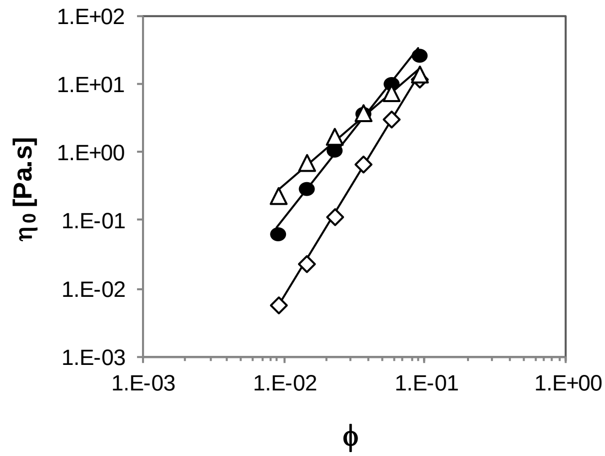

Figure S3. Variation of the zero-shear viscosity with the surfactant volume fraction at three different concentrations of sodium ion: 1.07 M (◊), 1.31 M (●) and 1.53 M (Δ). The lines show fits to a power law. The scaling exponents n in $\eta_0 \sim \phi^n$: 3.4, 2.7 and 1.8, respectively.

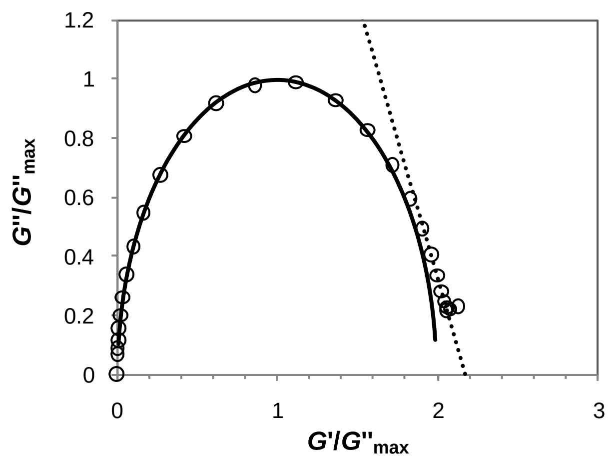

Figure S4. Procedure to extract $\bar{\zeta} = \tau_{br}/\tau_R$ from experimental Cole-Cole plots. The linear region where the experimental values (circles) deviate from the semi-circle defined by the Maxwell model (bold line) is fitted to a linear regression. At higher frequencies an upturn of G'' as a function of G' is observed when Rouse-like motion is present. These data points are not included in the linear fit. G'_0 is the value where this linear function crosses the abscissa G'/G'_{max}. The

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diameter of the fitted semicircle DFS equals $2/G'_0$, and by using this value $\bar{\zeta}$ can be read out from Figure 2 in Turner and Cates (reference 31 in manuscript).

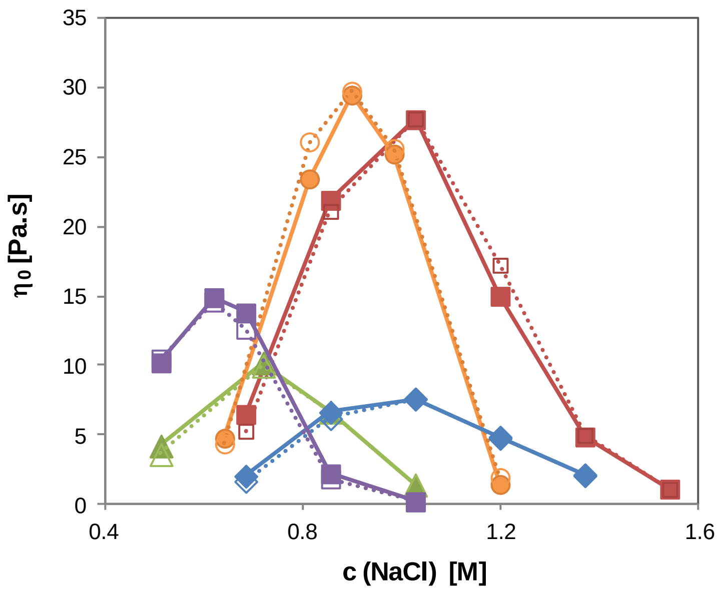

Figure S5. Comparison of zero-shear viscosity values from flow curves (full symbols) and obtained from oscillatory rheology measurements according to Equation 3 (open symbols). Values are shown for aqueous solutions of pure SLES (red), and of SLES in the presence of vanillin (blue), citronellol (violet), limonene (orange) and linalol (green).