Supporting Information

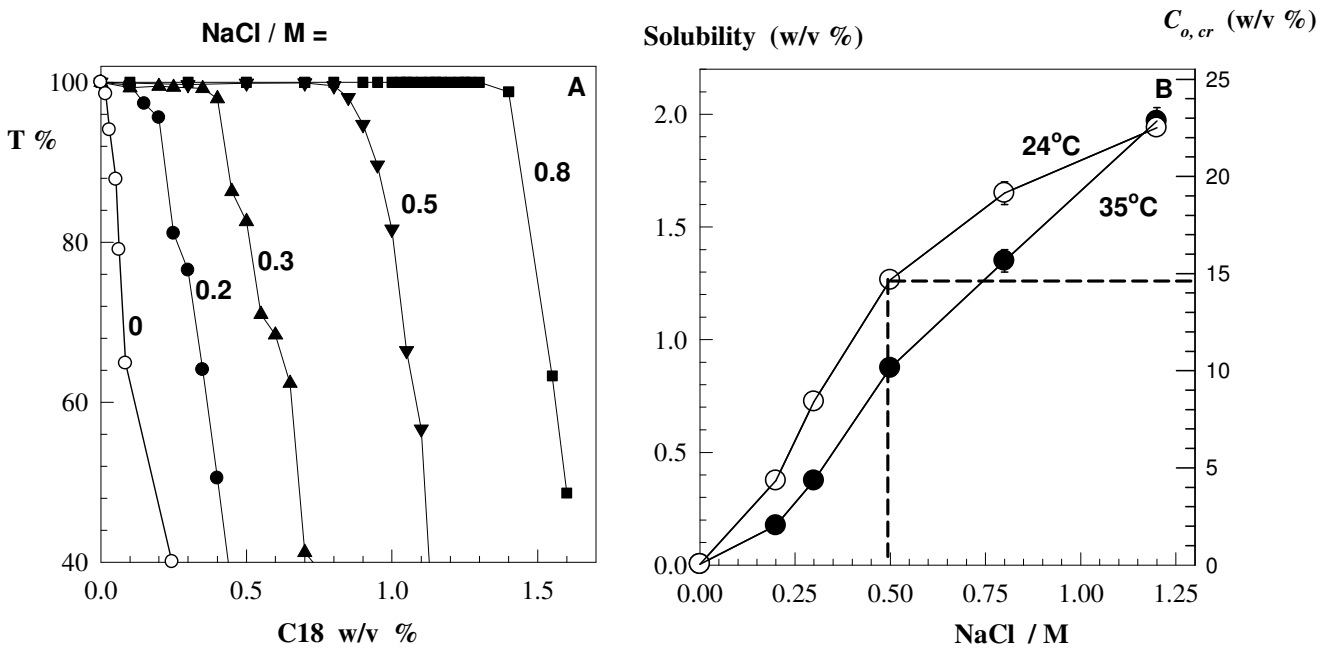

Figure S1. (A): Transmittance (*T* %) at 500 nm of aqueous SDS – NaCl solutions plotted against the added amount of C18. SDS = 7 w/v %. Temperature = 35°C. NaCl concentrations are indicated. **(B):** Solubility of C18 in SDS - NaCl solutions at both 24 and 35°C, and the corresponding critical monomer concentration $C_{0,cr}$ for the gel preparation in a homogeneous solution plotted against NaCl concentration. The dashed lines indicate the salt concentration used in the experiments and the corresponding monomer concentration.

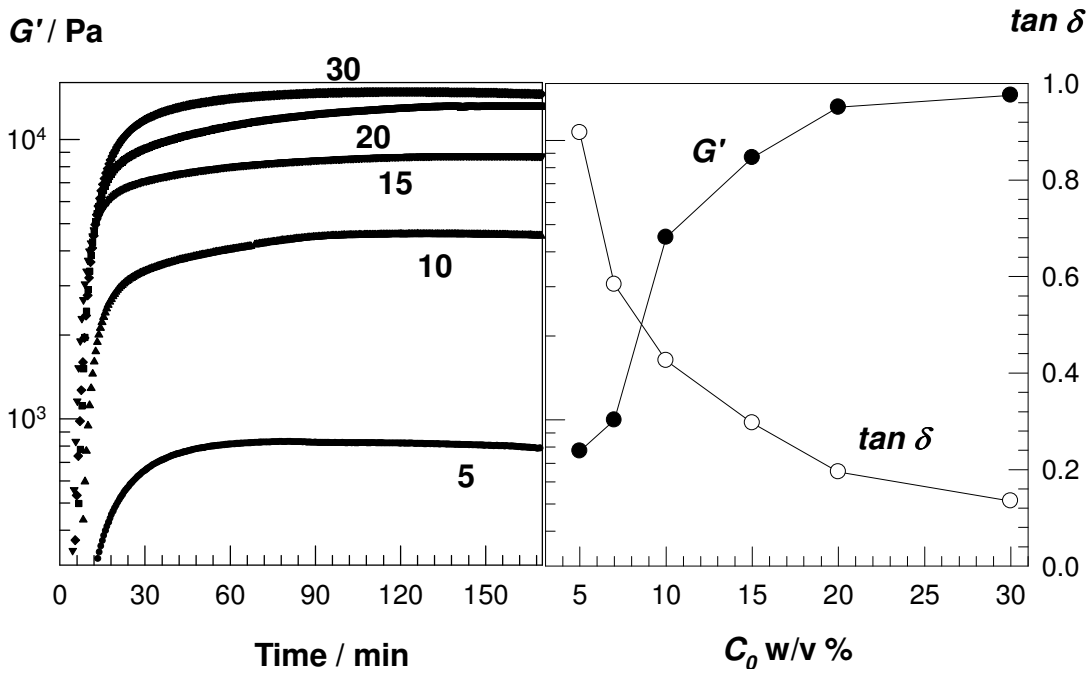

Figure S2. (A): Elastic modulus *G'* during the micellar copolymerization of AAm and C18 (2 mol %) shown as a function of the reaction time. The initial monomer concentration C_0 (in w/v %) indicated. **(B):** Limiting values of *G'* and the loss factor *tan* δ plotted against C_o. As the monomer concentration C_0 is increased from 5 to 15 %, *G'* also increases from 0.8 to 9 kPa while the loss factor *tan* δ decreases from 0.9 to 0.3 indicating increasing elasticity of the physical gels.

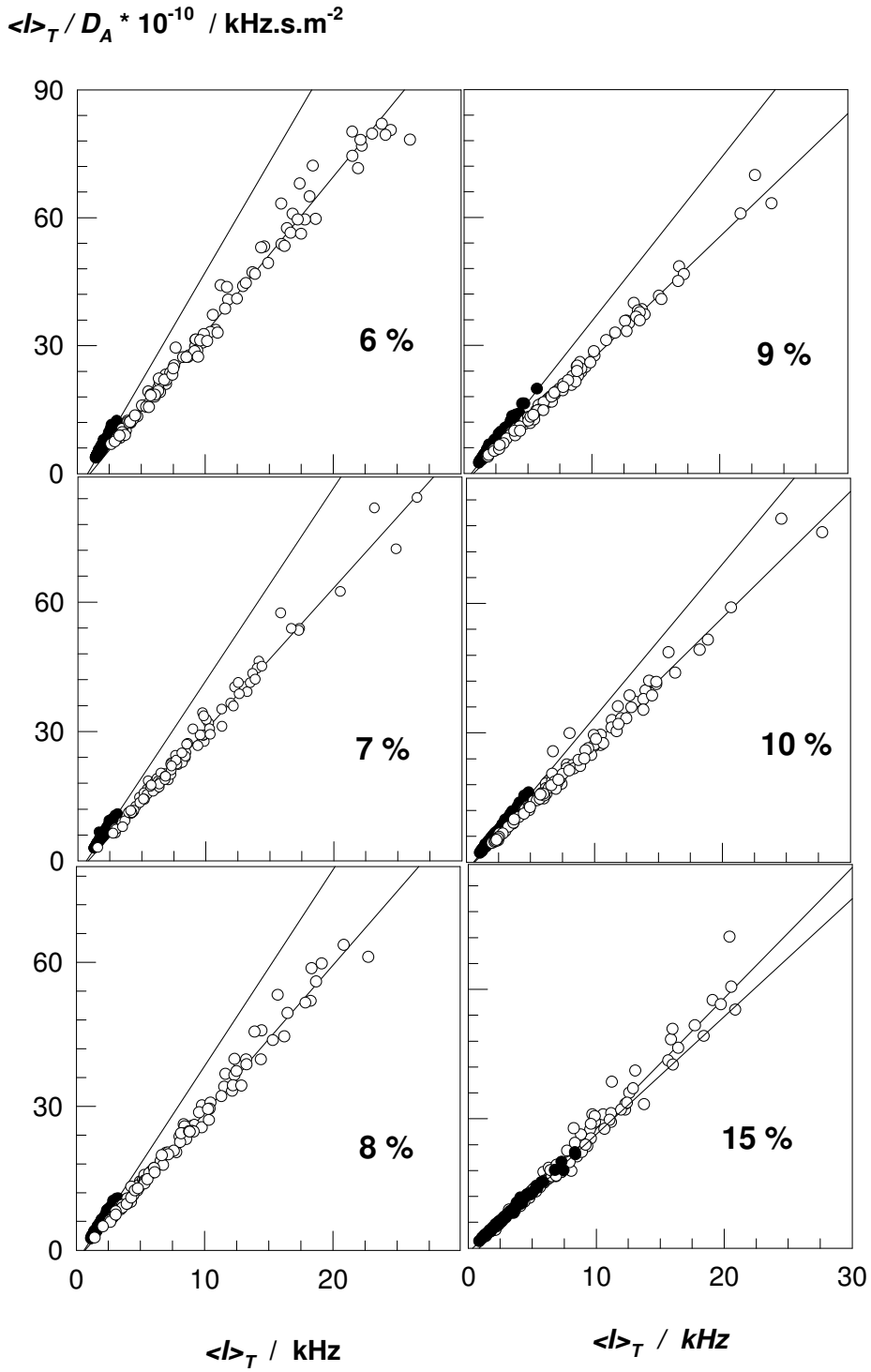

Figure S3. Decomposition plots according to eq 3 for the physical gels formed at various initial monomer concentrations C_0 indicated. $\theta = 90^{o}$. The gels with (●) and without SDS (○).

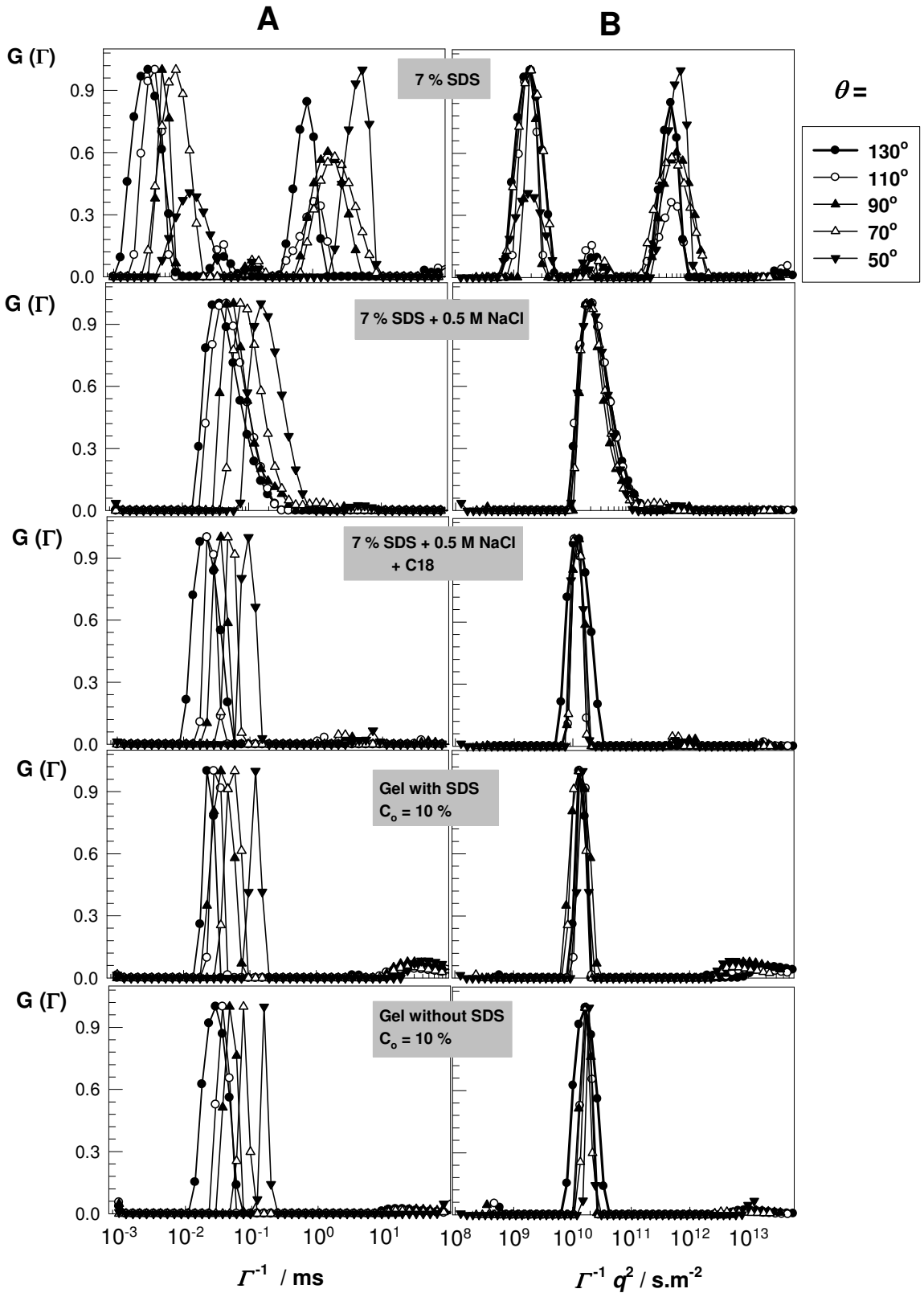

Figure S4. $G(\Gamma)$ vs Γ^{1} (A) and $\Gamma^{1}q^{2}$ plots (B) at various angles θ for surfactant solutions and gels indicated.

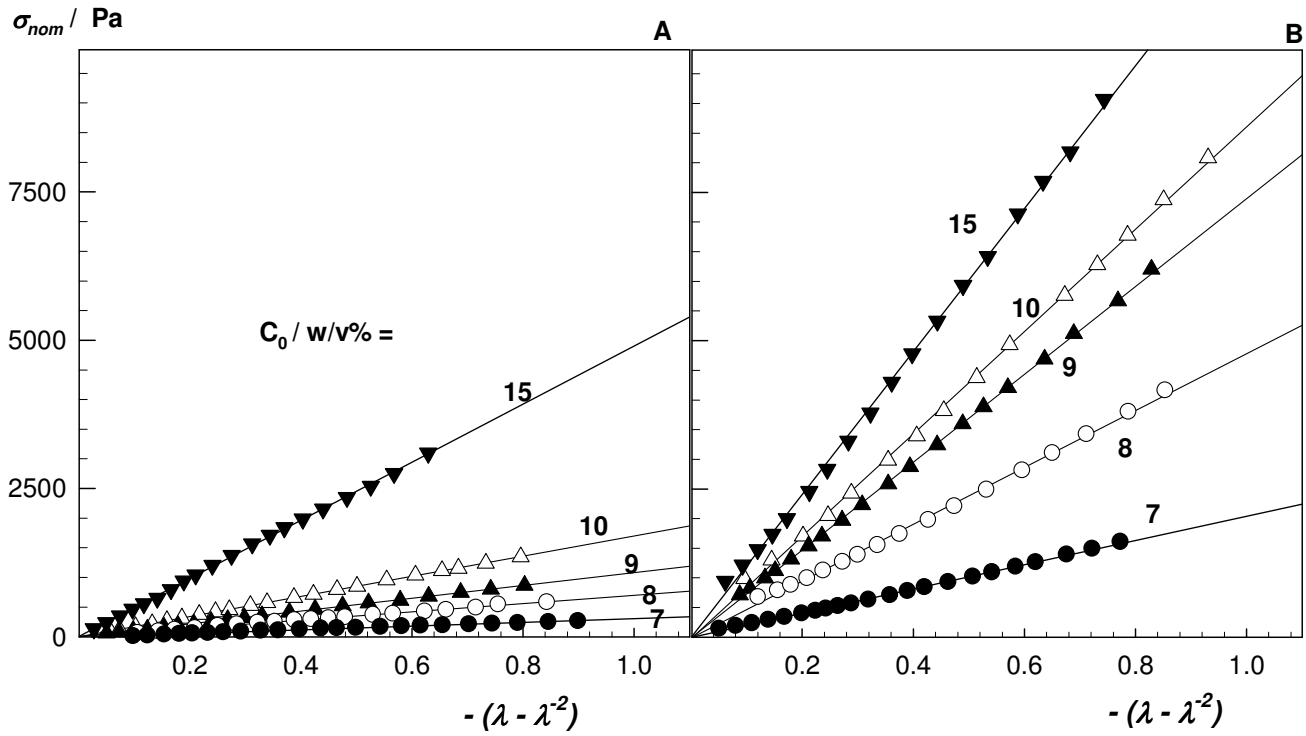

Figure S5. Typical stress-strain data of the physical gels with **(A)** and without SDS **(B)** as the dependence of σ_{nom} on $-(\lambda-\lambda^{-2})$.

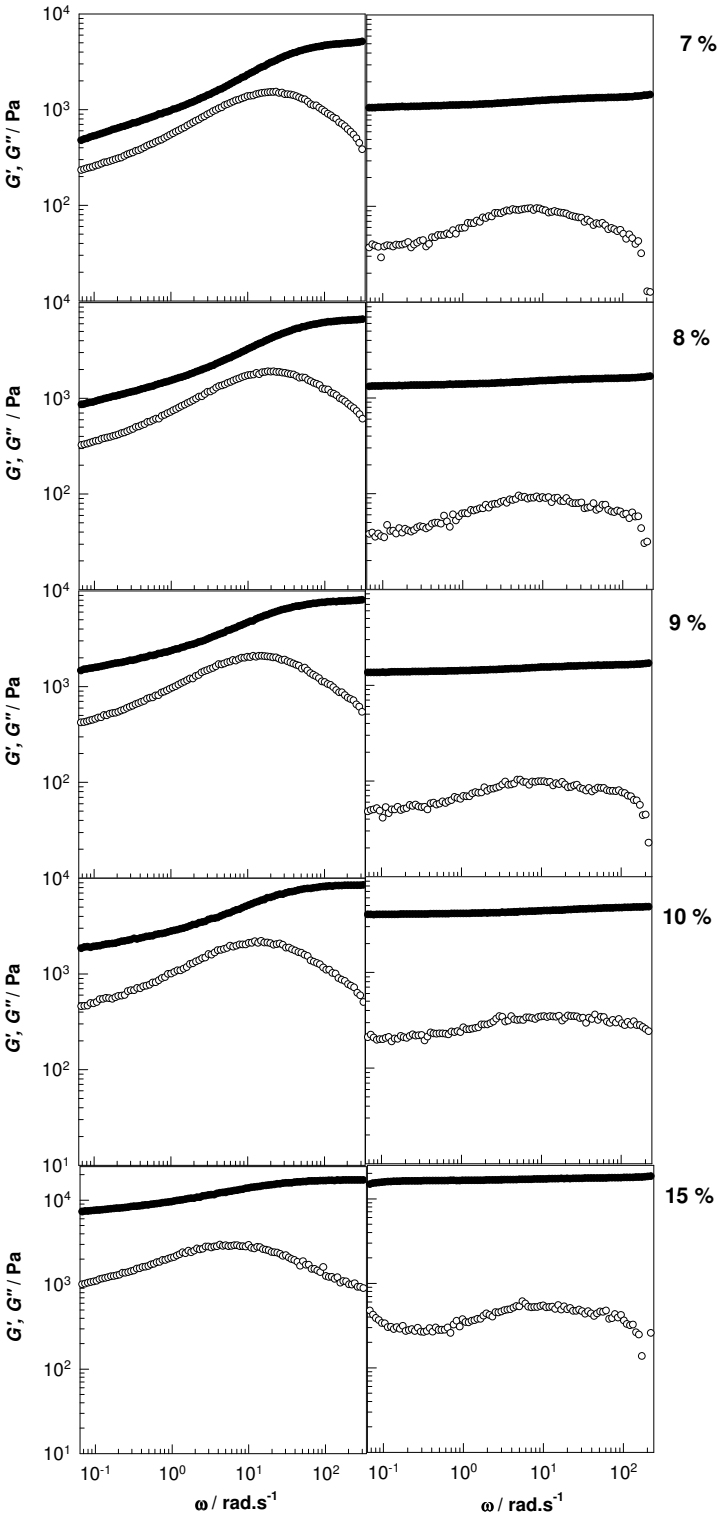

Figure S6: *G'* (filled symbols) and *G''* (open symbols) of gels with (left panel) and without SDS (right panel) shown as a function of angular frequency ω. The initial monomer concentrations C_0 are indicated.