Electronic Supplementary Material (ESI) for Soft Matter

Supplementary Information

Thermally Responsive Vesicles Based on a Mixture of Cationic Surfactant and Organic Derivative below CMC

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SANS Analysis Model

Since the SANS experiments were performed in dilute solutions of particles, the interparticle interactions are negligible. Therefore, the scattering intensity can be simplified as

$$I(q) = nP(q) + b$$

where n is the number of density of particles, $P(q)$ is the intraparticle interference (called the form factor), and b is the residual incoherent scattering. Here we used vesicular form factor averaged over a Schulz distribution of core radius. The Schulz width parameter is given as $z = 1/p^2 - 1$, where p is the polydispersity ($= \sigma_r/r$). The form factor for the vesicular structures is given as[1]

$$P(q) = \frac{1}{V_s}\left[\frac{3V_c(\rho_c - \rho_s)j_1(qr_c)}{qr_c} + \frac{3V_s(\rho_s - \rho_{solv})j_1(qr_s)}{qr_s}\right]$$

where r_c and t are the core radius and shell thickness of vesicles, respectively. ρ_c, ρ_s, and ρ_{solv} are scattering length densities of the core, shell, and solvent, respectively. $j_1 = (sinx - xconx)/x^2$, $r_s = r_c + t$, $V_s = (\frac{4\pi}{3})r_s^3$, $V_c = \left(\frac{4\pi}{3}\right) < r_c^3 >$, and $< r_c^3 > = \frac{(z+3)(z+2)}{(z+1)^2} < r_c >$.

DLS measurements of the 5mS/DTAB mixture solution with 4.5mM/6.25mM and 11mM/12.5mM

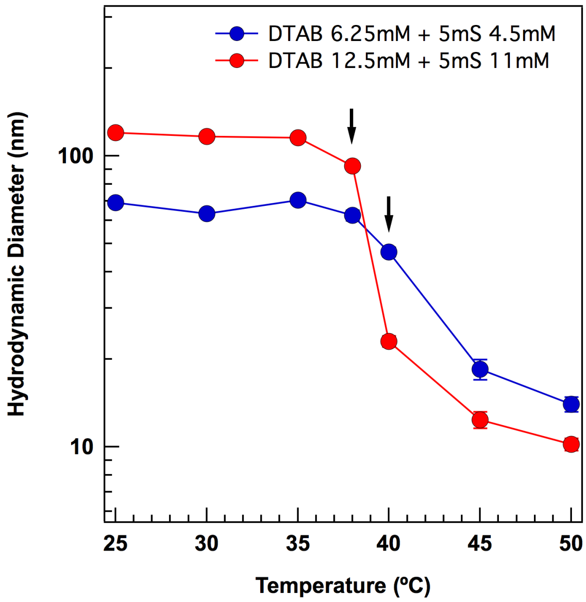

Figure S1. DLS measurements of the 5mS/DTAB mixture solution at varying temperature.

Reference

1 A. Guiner, G. Fournet, "*Small Angle Scattering of X-Rays*", John Wiley and Sons, New York 1995.