Supplementary Information

Enzyme-Triggered Model Self-Assembly in Surfactant/Cyclodextrin Systems

Experimental Section

Chemicals and Preparetion. TDPS (tetradecyl dimethyl ammonium propane sulfonate), CTAB (cetyl trimethyl ammonium bromide), SDS (sodium dodecyl sulfate), TritonX100 (polyoxyethylene octyl phenyl ether), and Amylase (source Aspergillus oryzae) were purchased from Sigma-Aldrich and used as received. DEAB (dodecyl triethyl ammonium bromide) was prepared by reactions of 1-bromododecane with triethylamine, followed by recrystallizing five times from ethanol/acetone. ^{1}H NMR: δ 3.32 (q, 6H), 3.18 (t, 2H), 1.69 (m, 2H), 1.30 (m, 27H), 0.90 (t, 3H) ppm. Elementary analysis: found N 3.90%, C 60.95%, H 11.60%, calculated N 4.00%, C 61.70%, H 11.51%. β-Cyclodextrin (β-CD) was purchased from Sinopharm Chemical Reagent Co. with a water content of 14%. A pH 6.8 phosphate buffer was used to prepare all the solutions. All experiments are carried out at 37 °C if not specified. After a 24-hour incubation with Amylase, the solutions were heated to boil to denaturalize the Amylase, ceasing any further degradation.

Surface Tension. Surface tension γ measurements were conducted using the drop volume method (Myers, D. *Surfaces, Interfaces, and Colloids*, 2nd ed.; Wiley: New York, 1999).

Dynamic Light Scattering (DLS). A commercialized spectrometer (Brookhaven Instruments Corporation, Holtsville, NY) equipped with a 100 mW solid-state laser (GXC-III, CNI, Changchun, China) operating at 532 nm was used to conduct dynamic light scattering experiments. Photon correlation measurements in self-beating mode were carried out at multiple scattering angles by using a BI-TurboCo Digital Correlator. The temperature was held at 37 °C by an external thermostat.

The normalized first-order electric field time correlation function $g^{(1)}(\tau)$ is related to the line width distribution $G(\Gamma)$ and the line width Γ by

$$g^{(1)}(\tau) = \int_0^\infty G(\Gamma) \exp(-\Gamma \tau)\, d\Gamma$$

By using a Laplace inversion program, CONTIN, the above equation can be solved to obtain $G(\Gamma)$ and Γ, where Γ is related to diffusion coefficient D and scattering vector q by $\Gamma = Dq^2$. Apparent hydrodynamic radius $R_{h,\,app}$ can be obtained according to the Stokes-Einstein equation

$$R_{h,\,app} = k_B T/(6\pi\eta D)$$

where $k_{B,}$ T, and η are the Boltzmann constant, absolute temperature, and viscosity of the solvent, respectively.

Cryo-TEM. A small drop of sample was placed on a 400 mesh copper grid, and a thin film was produced by blotting off the redundant liquid with filter paper. This thin film was then quickly dipped into liquid ethane, which was cooled by liquid nitrogen. Observation of the cryo-sample was carried out at -183 °C.