Electronic Supporting Information

Vesicles Composed of One Simple Single-Tailed Surfactant

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Experimental details

RGS-Mediated Formation of Vesicles

The RGS was obtained by corroding a plate glass surface using hydrofluoric acid. Glass microscope slides with a length, width, and thickness of 5.5, 2.5, and 0.1 cm were immersed in hydrofluoric acid (Tianjin FuYu Chemical Co., Ltd., China) for 3 min. The resulting corroded glass plates were washed thoroughly with Milli-Q ultrapure water (Millipore, China) and ethanol (Tianjin Dengke Chemical Reagent Co., Ltd., China), and then dried at 80°C. In whole experimental processes, DTAB solutions maintained their natural pH value of 6.0 ± 0.2.

DTAB (Nanjing Robiot Co., Ltd., China) micelle solution (20 mmol/L) was prepared by dissolving the surfactant in ultrapure water. A corroded glass plate was immersed in 50 mL of the micelle solution, in a well-sealed plastic tube. The sample was shaken in a thermostatic water bath shaker (Jiangsu Medical Instrument Factory, China) for a given time, at 25 ± 0.5°C. The vesicle formation in the aqueous solution was examined before and after the removal of the corroded glass plates. Each experiment had been done by two people one after another. Each experiment of the vesicle formation with the mediation of RGS was repeated three times with different three RGS at least.

Characterization of Samples

The morphology of the corroded glass surface was observed using a Nanoscope IIIa Multimode atomic force microscope (AFM, Digital Instruments, USA) and a JEOL JSM-6700F field emission scanning electron microscope (SEM, JEOL, Japan). Observations of the vesicle morphology were performed using a JEM-1011 transmission electron microscopy (TEM, JEOL, Japan). The freeze−fracture (FF) and negative−staining (NS, with uranyl acetate ethanol solution) techniques were used to prepare the TEM samples. Fracturing and replication were carried out in a Balzers BAF-400D high-vacuum freeze-etching system (Leica, Germany). Dynamic light scattering (DLS) measurements were performed using a BI-200SM DLS instrument (Brookhaven, England). All DLS measurements were made at the scattering angle of 90 ° at 25 ºC, and the intensity of the function $\Gamma \cdot G(\Gamma)$ was analyzed by the method of CONTIN. Steady-state fluorescence measurements were performed using an F-7000 fluorescence spectrophotometer (Hitachi, Japan) at 25.0 ± 0.2°C, using 1×10^{-7} mol/L pyrene as the fluorescence probe. The fluorescence emission spectrum of pyrene was obtained after excitation at 335 nm.

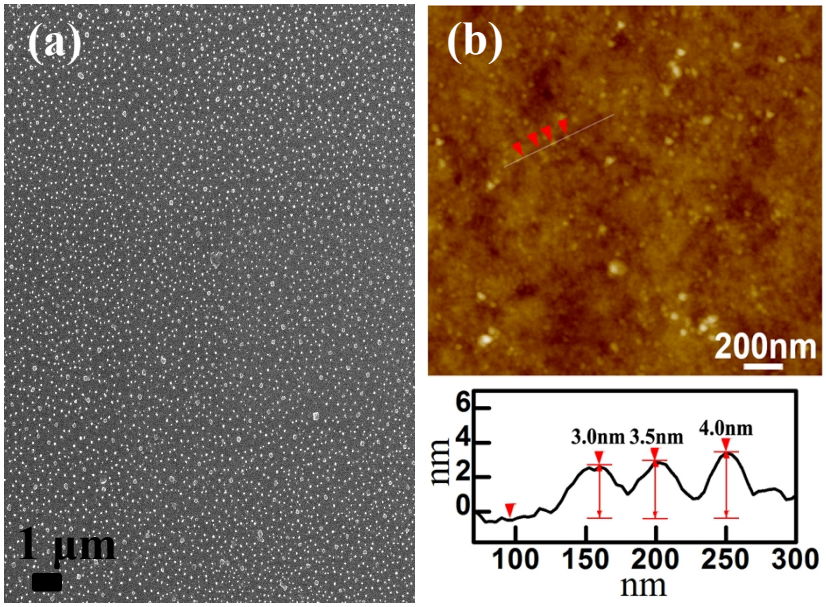

Figure S1. (a) SEM and (b) AFM images of the corroded glass plate surface.

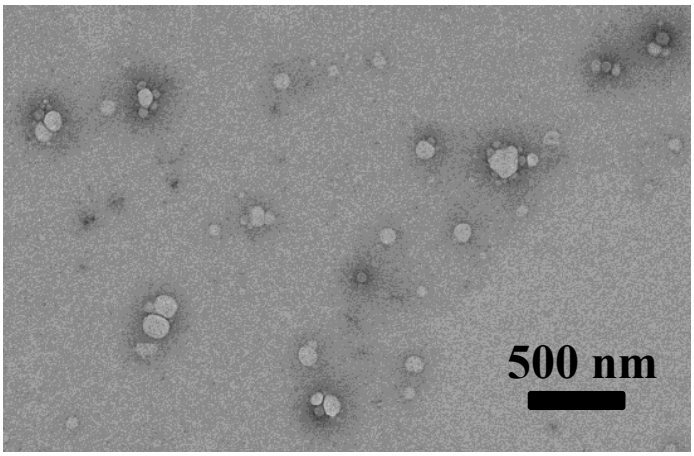

Figure S2. Negative-stain TEM image of DTAB vesicles at 20 days after the removal of RGS.

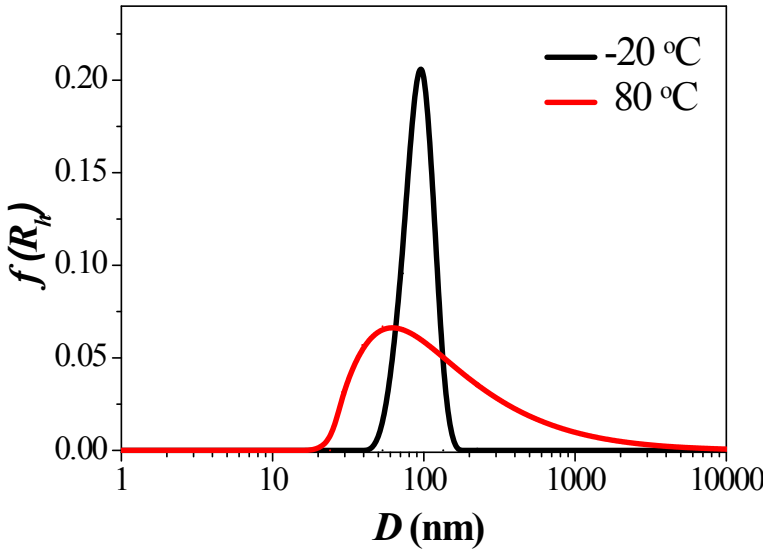

Figure S3. Hydrodynamic diameter distributions for DTAB vesicle systems after thermal treatment at 80°C for 2 h, and freezing at –20°C for 2 h and subsequent thawing.

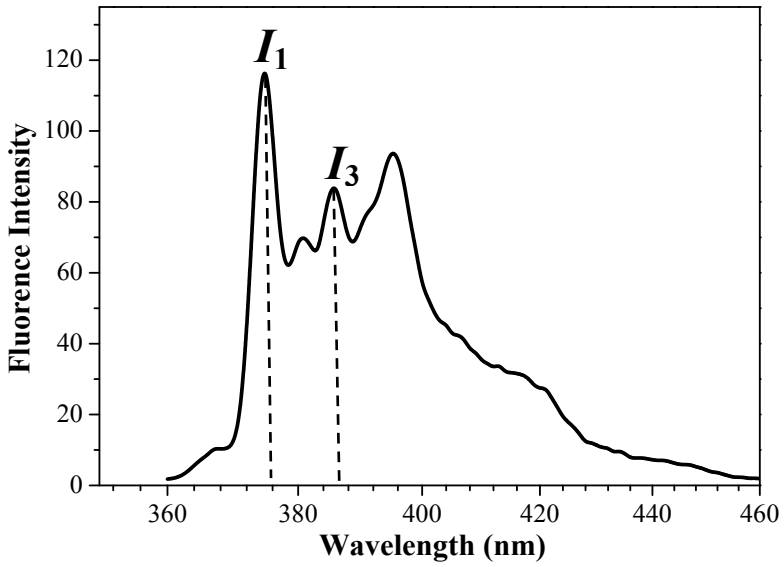

Figure S4. Fluorescence spectra of pyrene in DTAB vesicle solutions.

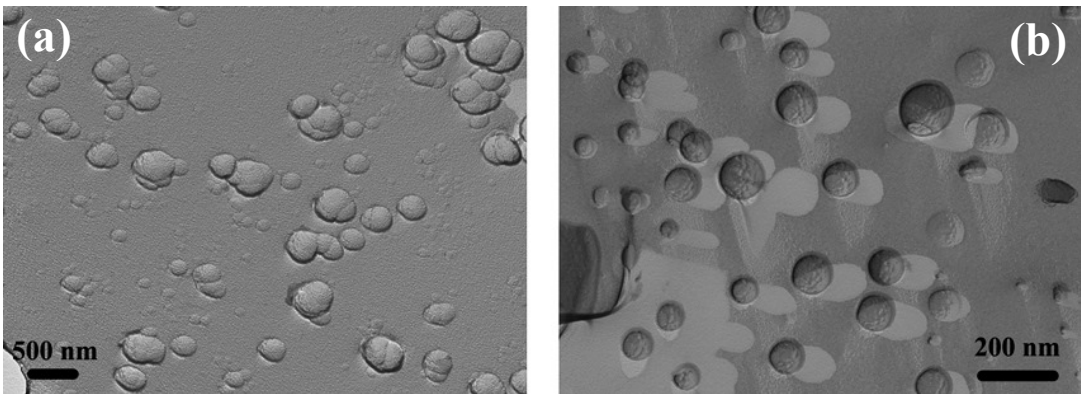

Figure S5. Freeze-fracture TEM images of (a) CTAB and (b) LSB solutions under the mediation of RGS for 9 d, showing vesicles formed. Scale bar: 200 nm.