Supporting material

Synthesis of Bolaamphiphiles

Materials:

Hydroquinone, 1, 6-hexanediol are from Beijing chemical. Co., 1, 10-decanediol, 6-bromohexanoic acid, 11-bromoundecanoic acid, 4, 4'-biphenol, 1, 6-dibromohexane and 1, 10-dibromodecane are from ACROS and used as received. Sodium dodecyl sulfate (SDS, 98%) was from Sigma Co. and used as received.

Characterization:

^{1}H NMR spectra were recorded with a varian-300 MHz spectrometer $CDCl_3$ or D_2O was used as the solvent and TMS (for $CDCl_3$) or HDO for (D_2O) was used as the internal standard. Elemental analysis was carried out on Elemental Vario EL.

Synthesis of Ia, Ib, and Ic: See the following references:

Yun Yan, Jianbin Huang*, Zichen Li, Xiaoli Zhao, Buyao Zhu, Jiming Ma "Surface Properties of Cationic Bolaamphiphiles and Their Mixed Systems with Oppositely Charged Conventional Surfactant", *Colloids and Surfaces A* **2003**, *215*, 263-275;

Yun Yan, Jianbin Huang*, Zichen Li, Feng Han, Jiming Ma "Aggregates Transition Depending on the Concentration in the Cationic Bolaamphiphile/SDS Mixtures", *Langmuir* **2003**, *19*, 972-974.

Synthesis of IIa (Disodium phenyl-1, 4-bis(oxyhexanoate)):

20 ml distilled water was added into a 100 ml flask under the nitrogen atmosphere, and then added 4.2 g (0.022 mol) 6-bromide hexylic acid and 1.1 g (0.01 mol) hydroquinone and 1.8 g (0.45 mol) NaOH at room temperature. The mixture was then

heated to 80 □. After reacted 12 h at this temperature, the product was cooled and adjust the pH to 1 with 37% HCl. Solvents were removed by filtering and the solid product was dissolved in NaOH, and neutralized with HCl again and collected the solids. The final product was recrystallized in ethanol to get white solids 1.22 g. Yields: 36%. Melting Point: 168-172 □. ^{1}H NMR (200MHz, D_2O, HDO), δ, ppm: 6.82 (4H, s), 3.90 (4H, t, -CH_2O-), 2.2 (4H, t, -CH_2-COOH), 1.70 (4H, m, -$\underline{CH_2}CH_2$O-) 1.3-1.6 (8H, m, -(CH_2)-). Anal. Calcd for ($C_{18}H_{26}O_6$): C: 63.91%, H: 7.69%. Found: C: 63.75%, H: 7.56%. Finally, the product was neutralized with NaOH to get **IIa.**

Synthesis of IIb (Disodium phenyl-1,4-bis(oxyundecanoate)):

It was prepared by the same procedure as that for **IIa**. **IIb** precipitated directly from the reaction mixture. The solids were recrystallized with ethanol/water (v/v=10/1) to get white solid product. Yields: 30%. ^{1}H NMR (200MHz, D_2O, HDO), δ, ppm: 6.82 (4H, s), 3.90 (4H, t, -CH_2O-), 2.2 (4H, t, -CH_2-COOH), 1.70 (4H, m, -$\underline{CH_2}CH_2$O-) 1.3-1.6 (28H, m, -(CH_2)-). Anal. Calcd for ($C_{28}H_{44}O_6Na_2$ 1.5H_2O): C: 61.20%, H: 8.56%. Found: C: 61.91%, H: 8.67%.