

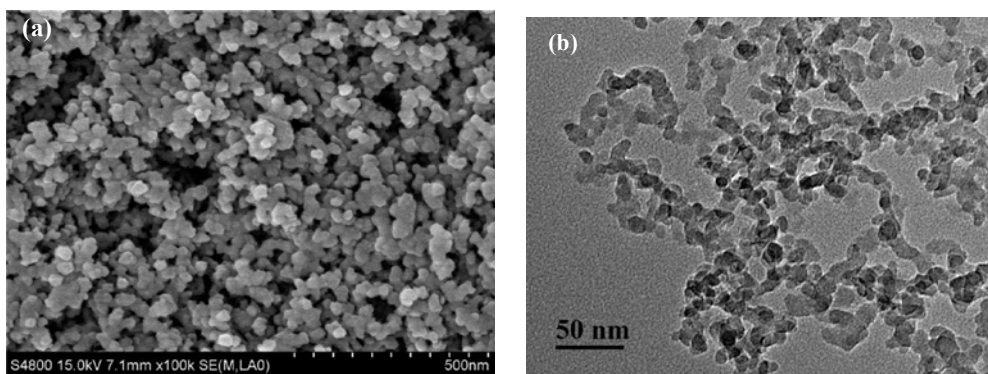
# Supporting Information

## **pH-responsive Pickering Emulsions Stabilized by Silica Nanoparticles in Combination with a Conventional Zwitterionic Surfactant**

Kaihong Liu,<sup>1</sup> Jianzhong Jiang,<sup>1</sup> Zhenggang Cui<sup>1,\*</sup> and Bernard P. Binks<sup>2,\*</sup>

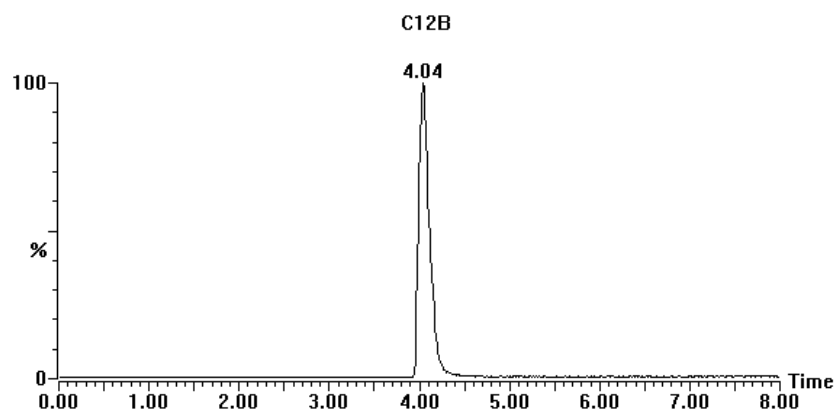
<sup>1</sup> *The Key Laboratory of Food Colloids and Biotechnology, Ministry of Education,  
School of Chemical and Material Engineering, Jiangnan University,  
1800 Lihu Road, Wuxi, Jiangsu 214122, P.R. China*

<sup>2</sup> *School of Mathematics and Physical Sciences, University of Hull,  
Hull. HU6 7RX. U.K.*

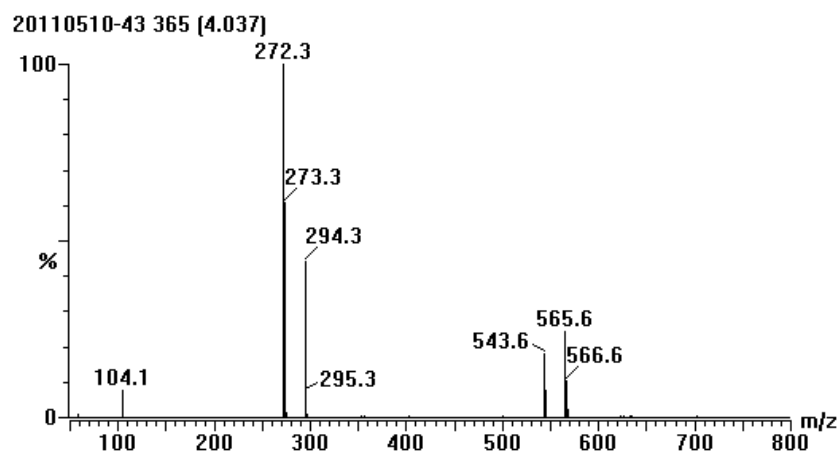


**Figure S1.** (a) SEM and (b) TEM images of powdered silica nanoparticles of HL-200 with a BET surface area of  $200 \pm 20 \text{ m}^2 \text{ g}^{-1}$ .

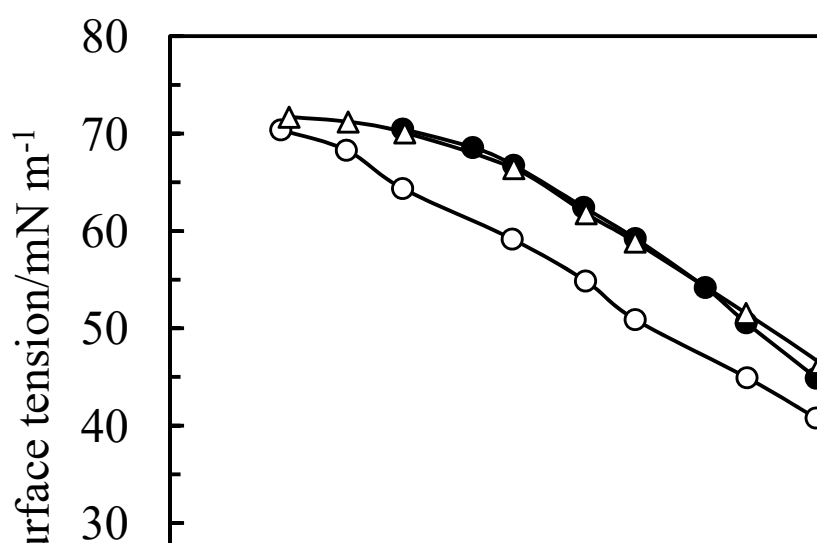
(a)



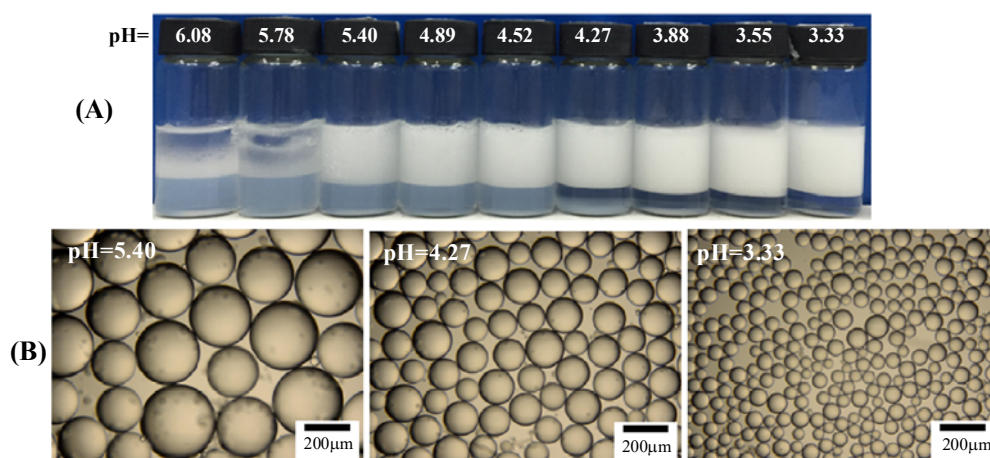
(b)



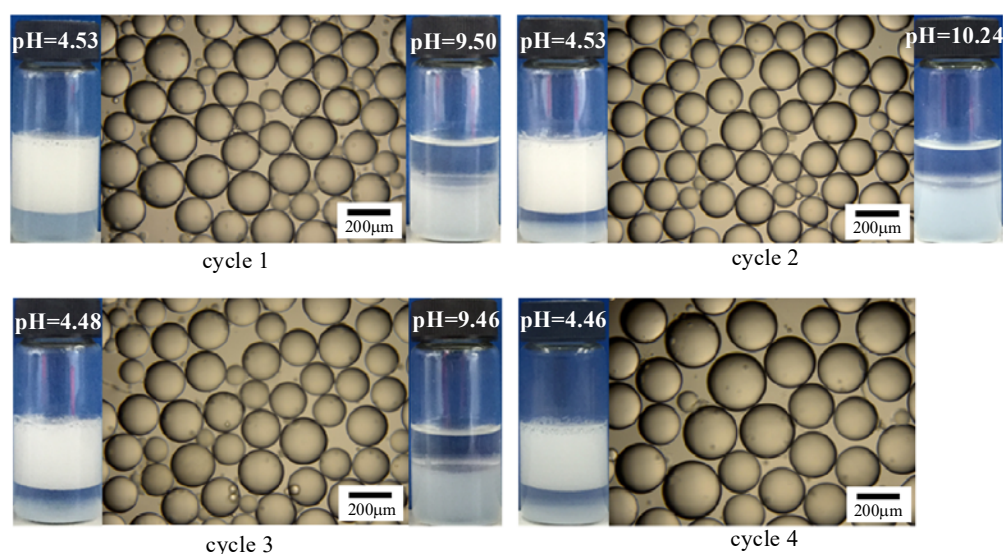
(c)



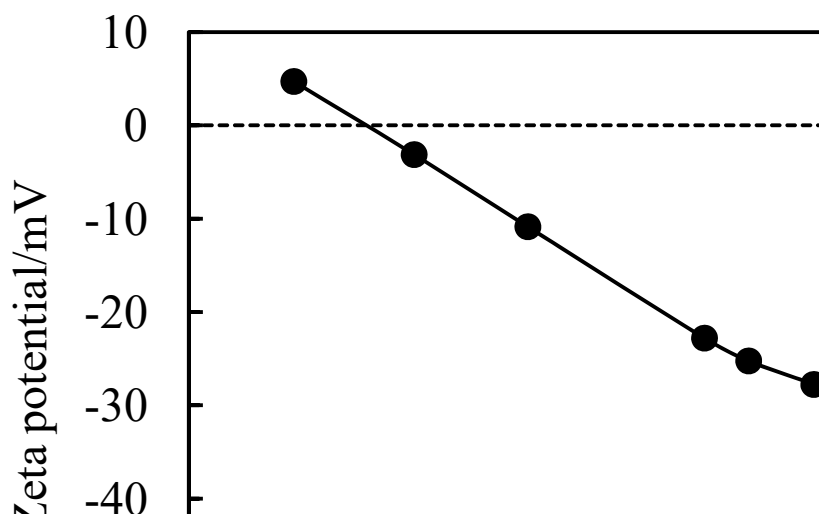
**Figure S2.** (a) HPLC analysis, (b) mass spectrum and (c) surface tension of aqueous solutions of dodecyl dimethyl carboxyl betaine (C<sub>12</sub>B) as a function of concentration at different pH.



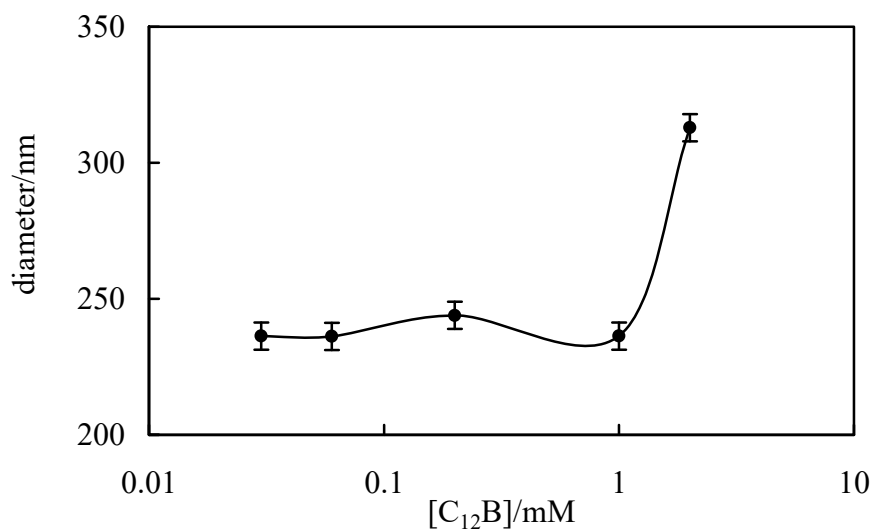
**Figure S3.** (A) Photographs and (B) micrographs of *n*-decane-in-water (7 mL/7 mL) batch emulsions stabilized by a mixture of 0.5 wt.% silica nanoparticles and 0.2 mM C<sub>12</sub>B at different pH shown in the vessels (vessel 1 is pure water), taken 24 h after preparation.



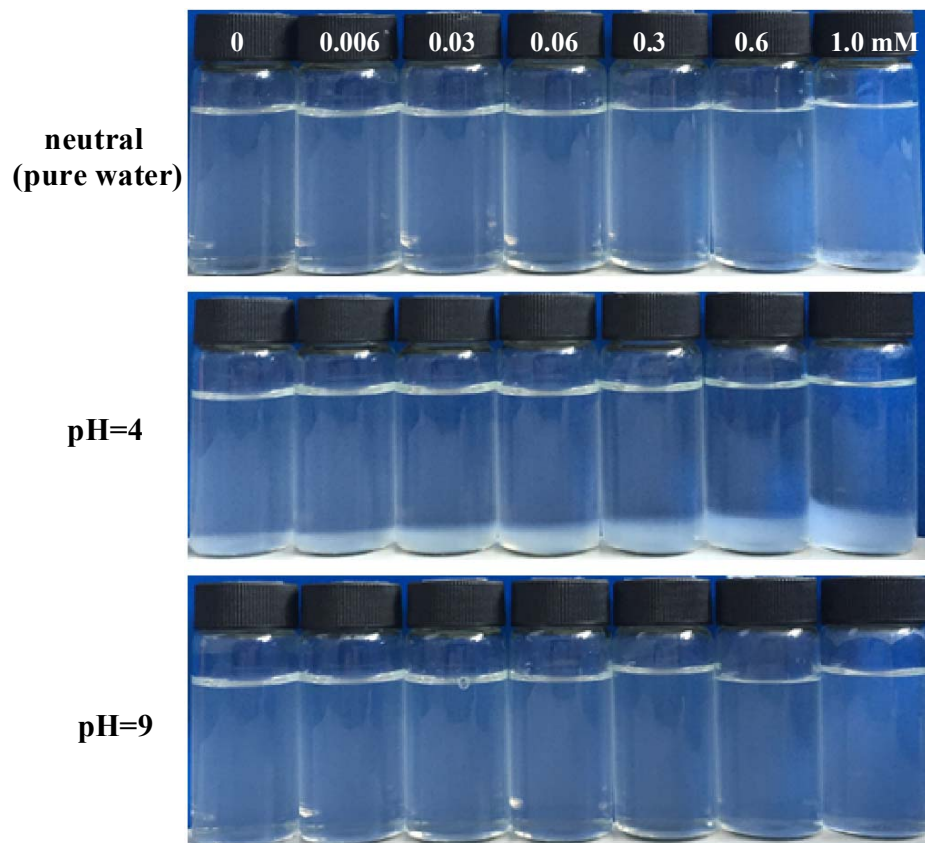
**Figure S4.** Photographs and micrographs (low pH only) of *n*-decane-in-water emulsions stabilized by 0.5 wt.% silica nanoparticles and 0.2 mM C<sub>12</sub>B following pH alternation by adding 0.1 M HCl and 0.1 M NaOH respectively, taken 24 h after preparation.



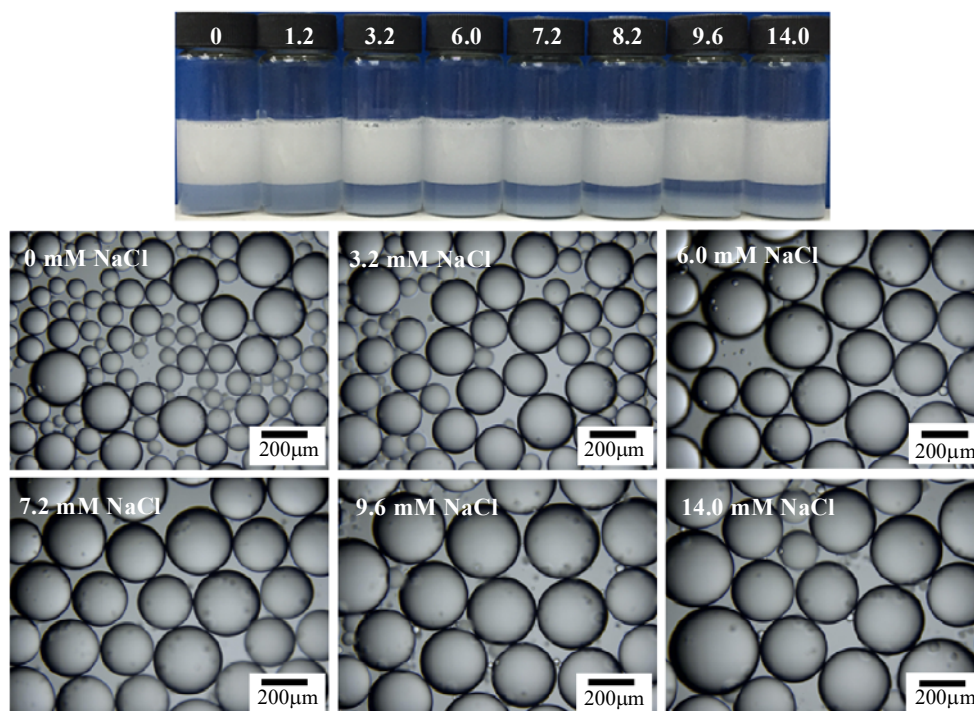
**Figure S5.** Zeta potential of 0.1 wt.% silica nanoparticles dispersed in water of different pH, measured 24 h after dispersion at 25 °C.



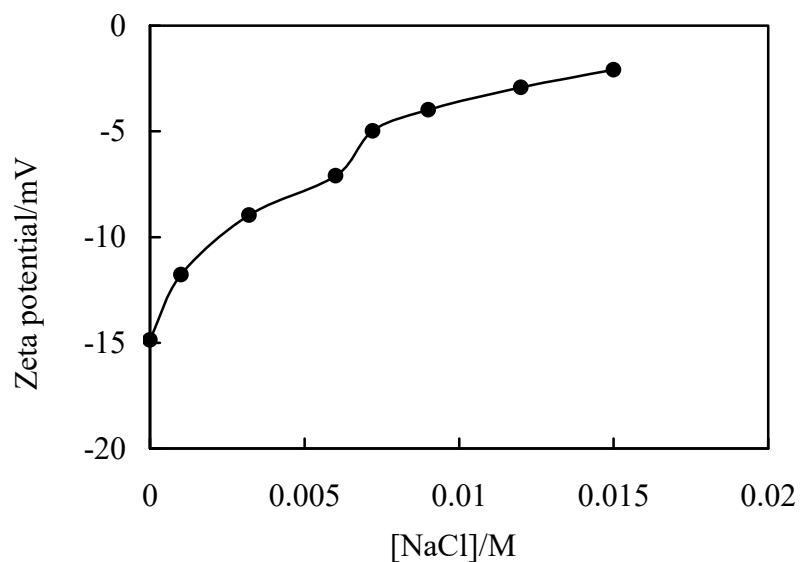
**Figure S6.** Average diameter of silica nanoparticles (0.1 wt.%) dispersed in aqueous solutions of C<sub>12</sub>B at different concentrations (neutral pH) measured 24 h after dispersion at 25 °C. ( $d = 236 \pm 5$  nm in pure water).



**Figure S7.** Photographs of vessels containing 0.1 wt.% silica nanoparticles dispersed in aqueous solutions of C<sub>12</sub>B at different pH as a function of C<sub>12</sub>B concentration (given), taken 24 h after dispersion at room temperature.



**Figure S8.** Photographs and micrographs of *n*-decane-in-water emulsions stabilized by 0.5 wt.% silica nanoparticles in combination with 0.06 mM C<sub>12</sub>B at pH = 4.4 in the presence of NaCl of different concentration given, taken 24 h after preparation.



**Figure S9.** Effect of NaCl concentration on the zeta potential of 0.1 wt.% silica nanoparticles dispersed in water of pH = 4.4 at 25 °C.