

Responsive aqueous foams stabilised by silica nanoparticles hydrophobised *in situ* with a conventional surfactant

Yue Zhu,^a Xiaomei Pei,^a Jiangzhong Jiang,^a Zhenggang Cui^{a*} and Bernard P. Binks^{b*}

^a*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

^b*Department of Chemistry, University of Hull, Hull. HU6 7RX. UK*

*Corresponding authors: *cui Zhenggang@hotmail.com; b.p.binks@hull.ac.uk*

Supporting information

Table of Contents

1. Figure S1.....	SI-2
2. Figure S2.....	SI-2
3. Figure S3.....	SI-3
4. Figure S4.....	SI-3
5. Figure S5.....	SI-4
6. Figure S6.....	SI-4
7. Figure S7.....	SI-5
8. Figure S8.....	SI-5

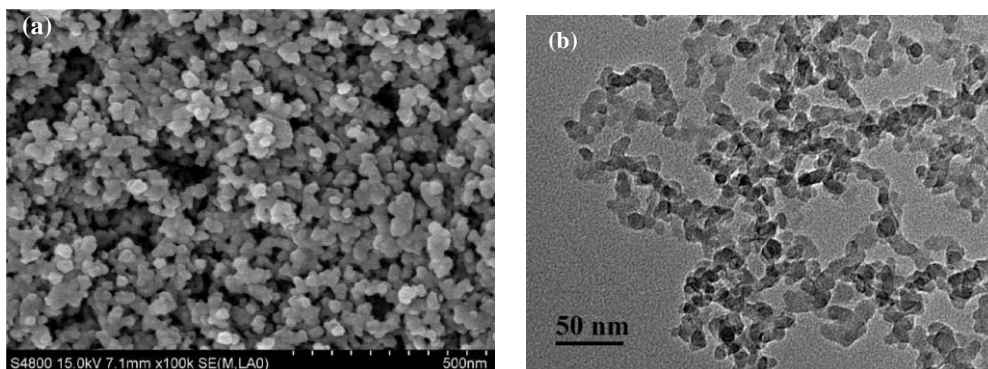


Figure S1. (a) SEM image and (b) TEM image of powdered silica nanoparticles of HL-200 with a BET surface area of $200 \pm 20 \text{ m}^2 \text{ g}^{-1}$.

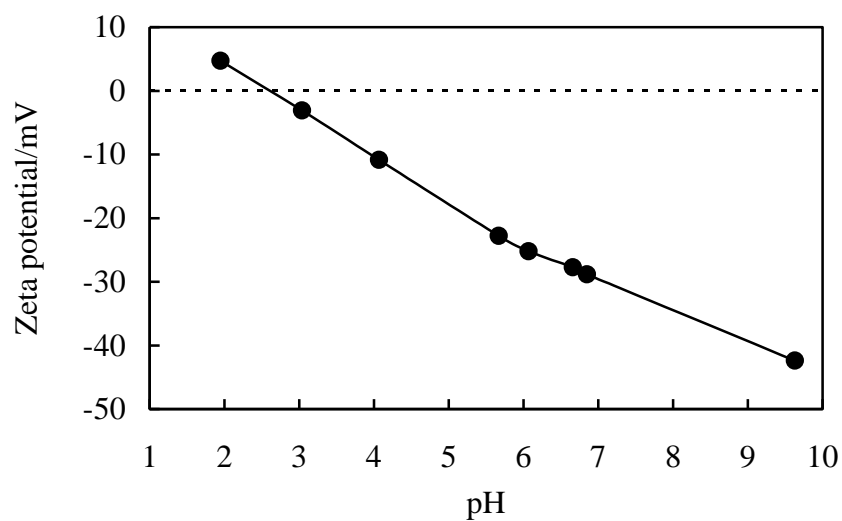


Figure S2. Zeta potentials of 0.1 wt.% silica nanoparticles dispersed in water of different pH, measured 24 hr. after dispersion at 25 °C.

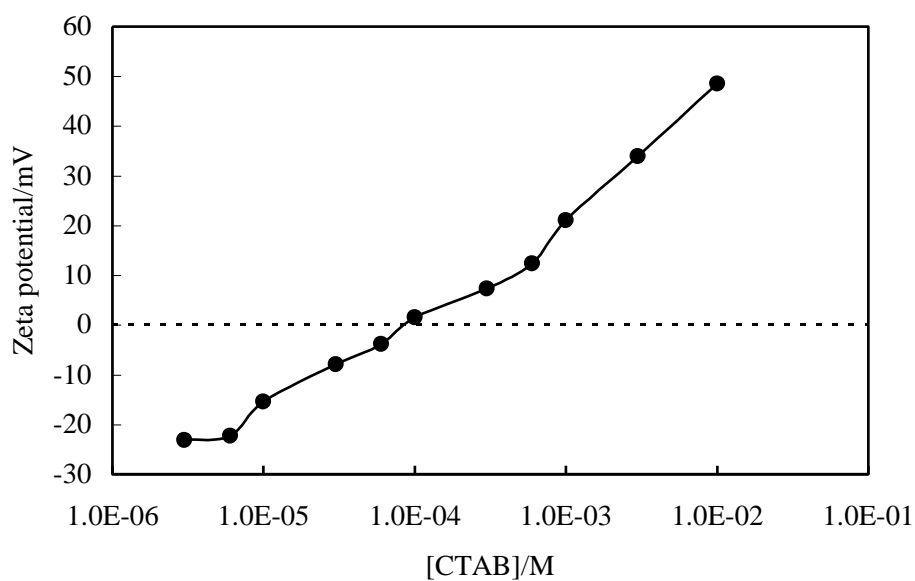


Figure S3. Zeta potential of 0.1 wt.% silica nanoparticles dispersed in aqueous CTAB solutions as a function of surfactant concentration at 25 °C.

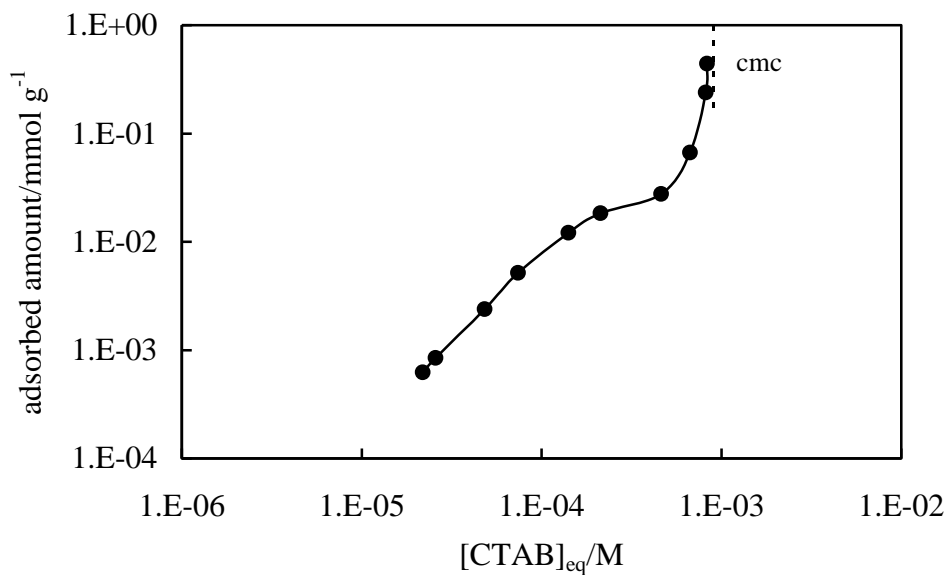


Figure S4. Adsorption isotherm of CTAB at the silica nanoparticle-water interface at 25 °C.

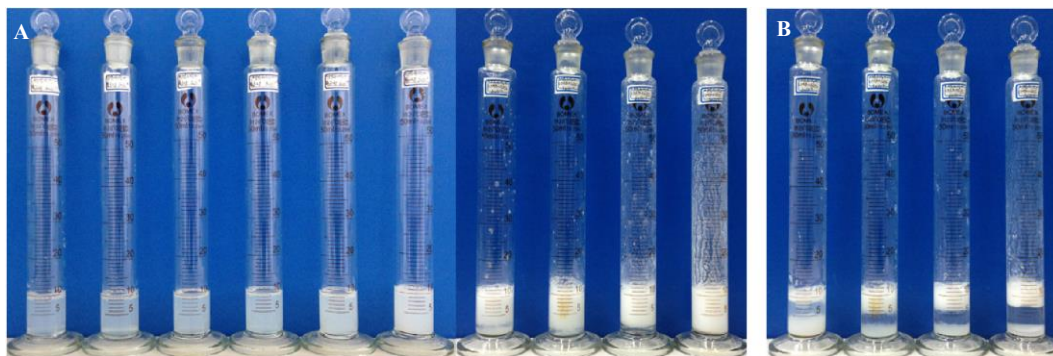


Figure S5. Photos of vessels containing 10 cm³ of a dispersion of 0.5 wt.% silica nanoparticles in an equimolar mixture of aqueous CTAB and SDS at different individual concentrations immediately (A) and 1 hr (B) after shaking. CTAB or SDS concentration (from left to right): 0.06, 0.1, 0.2, 0.3, 0.6, 1, 2, 3, 6 and 10 mM (A); 2, 3, 6 and 10 mM (B). No foam was produced at concentrations ≤ 1 mM.



Figure S6. Photos of vessels containing 10 cm³ aqueous solution of an equimolar mixture of CTAB and SDS at different individual concentrations taken immediately (A) and 24 hr after shaking (B). CTAB or SDS concentration (from left to right): 0.01, 0.03, 0.06, 0.1, 0.3, 0.6, 1, 3, 6 and 10 mM (A); 6 and 10 mM (B). No foam was produced at concentrations ≤ 3 mM.

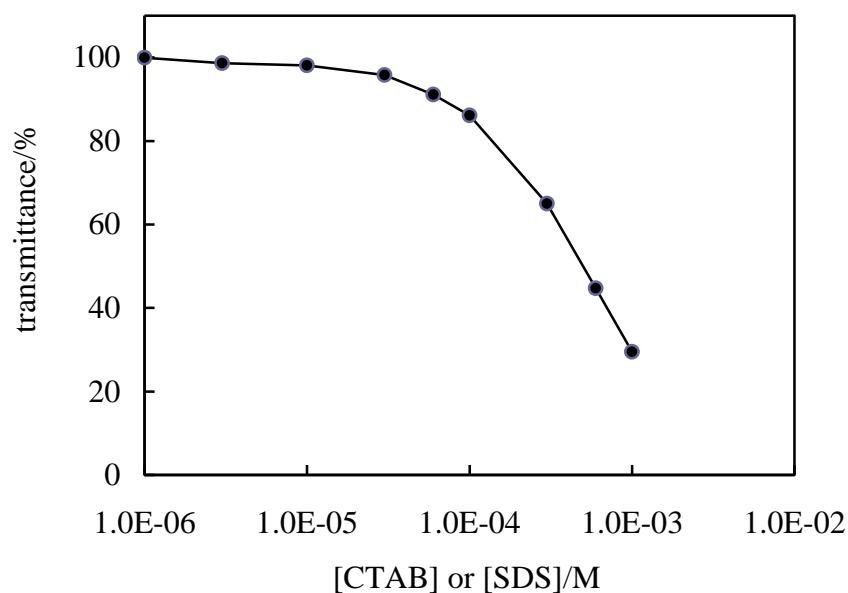


Figure S7. Transmittance of aqueous solutions of an equimolar mixture of CTAB and SDS at 25 °C measured at 600 nm, with pure water as reference.

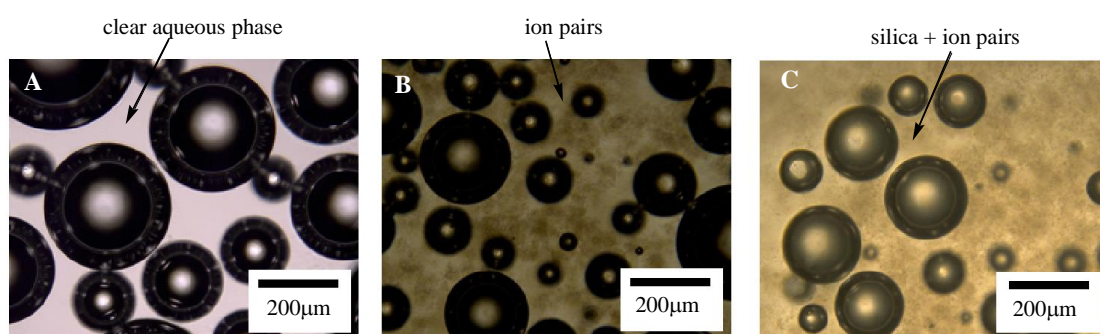


Figure S8. Micrograph of foams stabilized by 0.5 wt.% silica nanoparticles + CTAB at 0.2 mM (A), CTAB/SDS mixture at 10 mM (B) and 0.5 wt.% silica nanoparticles + CTAB/SDS mixture at 10 mM, respectively.