

Silica Nanoparticles Catalyse the Formation of Silica Nanocapsules in a Surfactant-Free Emulsion System

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Table S1 Recipes for the preparation of silica nanocapsules, where the weight of the aqueous solution of silica nanoparticles is 10 g.

Run	SiO ₂ [g]	PEOS [g]	Oil phase [g]	pH	Mean diameter of silica capsules [nm] ^[a]
1	0.12	0.4	toluene 0.4	9.0	310 ± 18 (particle-free capsules)
2	0	0.4	toluene 0.4	9.0	-
3	0.015	0.4	toluene 0.4	9.0	-
4	0.03	0.4	toluene 0.4	9.0	-
5	0.06	0.4	toluene 0.4	9.0	412 ± 36 (particle-free capsules)
6	0.18	0.4	toluene 0.4	9.0	378 ± 52 (particle-free capsules)
7	0.12	0.4	toluene 0.4	1.7	1230 ± 110 (particle-free capsules)
8	0.12	0.4	toluene 0.4	2.3	1960 ± 200 (colloidosmes)
9	0.12	0.4	toluene 0.4	3.0	2560 ± 140 (colloidosomes)
10	0.12	0.4	toluene 0.4	4.3	-
11	0.12	0.4	toluene 0.4	5.2	-
12	0.12	0.4	toluene 0.4	7.0	-
13	0.12	0.4	toluene 0.4	8.3	-
14	0.12	0.4	toluene 0.4	9.6	246 ± 15 (particle-free capsules)
15	0.12	0.4	toluene 0.4	10.1	-
16	0.12	0.4	hexadecane 0.4	9.0	563 ± 65 (particle-free capsules)

^[a]The mean capsule diameter is obtained by averaging diameters of 1000 capsules estimated from FE-SEM images.

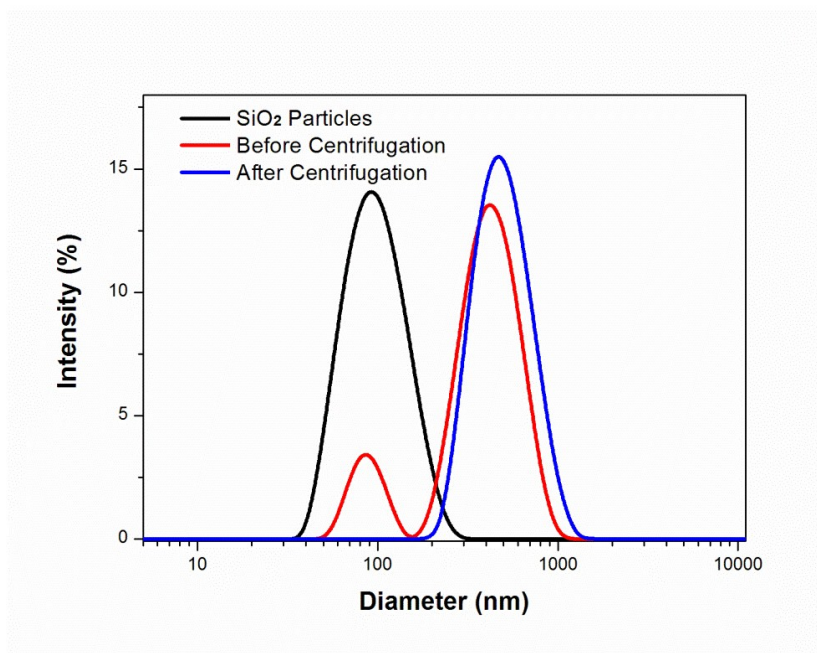


Fig. S1 Hydrodynamic diameter distributions of silica nanoparticles and nanocapsules before and after centrifugation as measured by dynamic light scattering in water (*cf.* Table S1, Run 1).

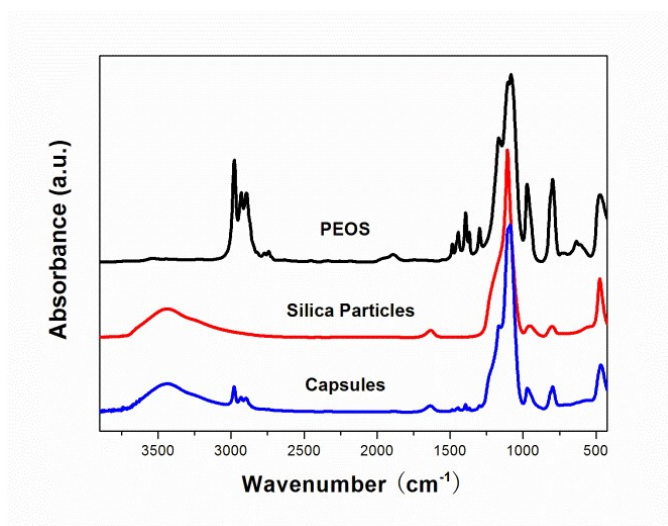


Fig. S2 FT-IR spectra of PEOS, silica nanoparticles, and dried silica nanocapsules (*cf.* Table S1, Run 1).

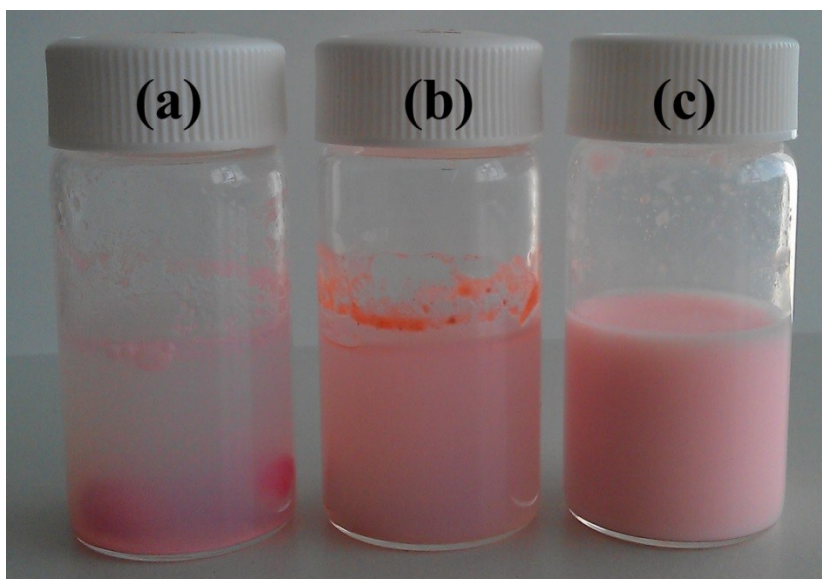


Fig. S3 Photographs of resulted emulsions after 3 days of sol-gel reaction prepared with (a) no, (b) moderate- (output 2.5), and (c) strong-intensity (output 5.0) ultrasonic emulsification (*cf.* Table S1, Run 1).

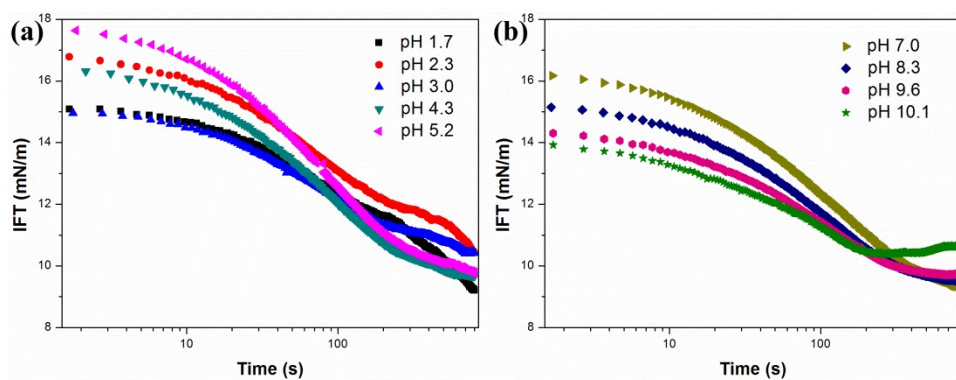


Fig. S4 IFT between a toluene solution of PEOS (weight ratio of PEOS to toluene is 1:1) and an aqueous phase containing 1.2 wt.-% silica nanoparticles at different pH: (a) under acidic conditions and (b) under neutral and alkaline conditions.

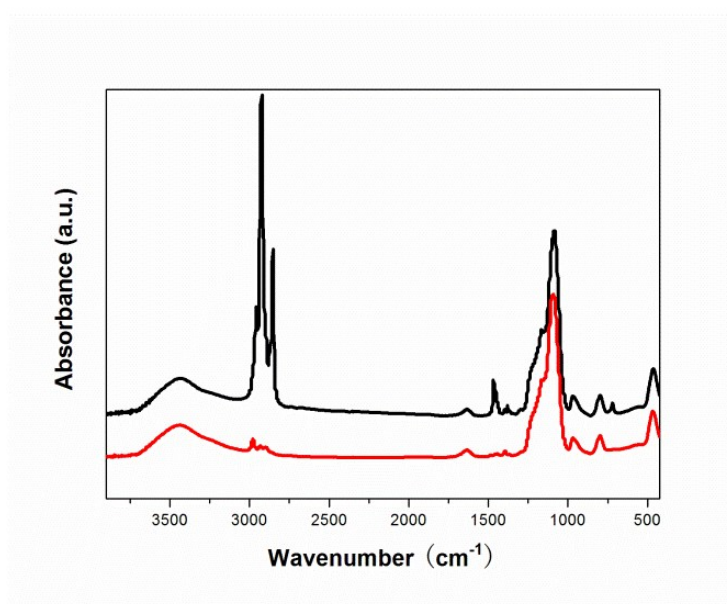


Fig. S5 FT-IR spectra of air-dried silica nanocapsules containing hexadecane (up) and after the evaporation of hexadecane (down) (*cf.* Table S1, Run 16).