

Synthesis of dendritic mesoporous silica nanoparticle by ultrasonic assisted microchannel continuous flow reaction

Chunpeng Zhang¹, Xiujun Wang^{2, 3 *}, Jian Zhang^{2, 3}, Shengzhen Hou^{2, 3}, Qingqing Tang^{2, 3}, Ming Duan^{1*}, Shenwen Fang¹

1. School of Chemistry and Chemical Engineering, Southwest Petroleum University, Chengdu, Sichuan, China;
2. State Key Laboratory of Offshore Oil and Gas Exploitation, Beijing, China;
3. CNOOC Research Institute Company, Ltd., Beijing, China;

Corresponding Author 1

E-mail: swpua124@126.com (Ming Duan)

Telephone number: +8602883037346

Fax number: +8602883037346

Corresponding Author 2

E-mail: wangxj89@cnooc.com.cn (Xiujun Wang)

Telephone number: +86-010-84523535

Fax number: +86-010-84523535

Table of Content

Figure S1 (a) Physical drawing of the dispersion chip; (b) Physical drawing of the mixing chip	2
Figure S2 Physical drawing of 316L stainless steel reaction coil (left inner diameter 1 mm, length 1 m, 3 m, 10 m), 10 m inner diameter 0.65 mm, 10 m inner diameter 2 mm.....	2
Figure S3 TEM images of reaction products obtained at different total flow rates and material ratios	3
Figure S4 TEM images of products obtained at different reaction conditions (a) without ultrasound assistance, (b) coil inner diameter of 2 mm	4
Figure S5 TEM images of products obtained at different reaction coil lengths (a) 1 m, (b) 3 m.....	4
Figure S6 TEM images of products prepared under different catalytic systems (a) 0.4 mol urea + different NaOH concentrations, (b) 0.4 mol urea + different HCl concentrations	5

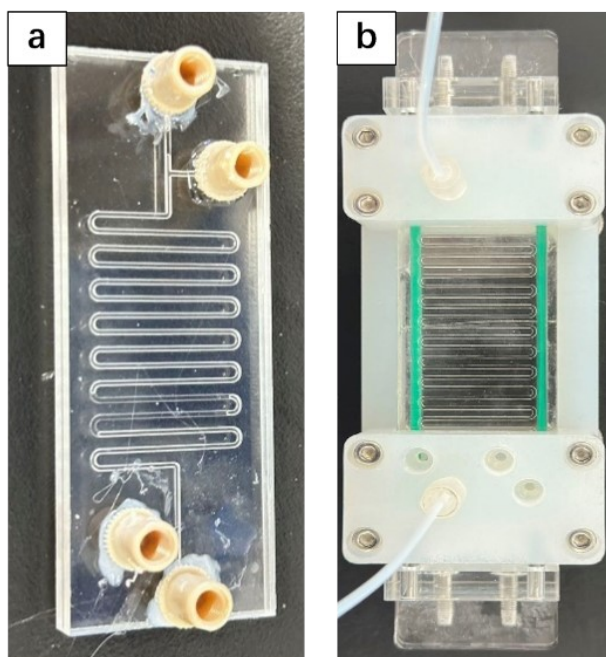


Figure S1 (a) Physical drawing of the dispersion chip; (b) Physical drawing of the mixing chip



Figure S2 Physical drawing of 316L stainless steel reaction coil (left inner diameter 1 mm, length 1 m, 3 m, 10 m), 10 m inner diameter 0.65 mm, 10 m inner diameter 2 mm

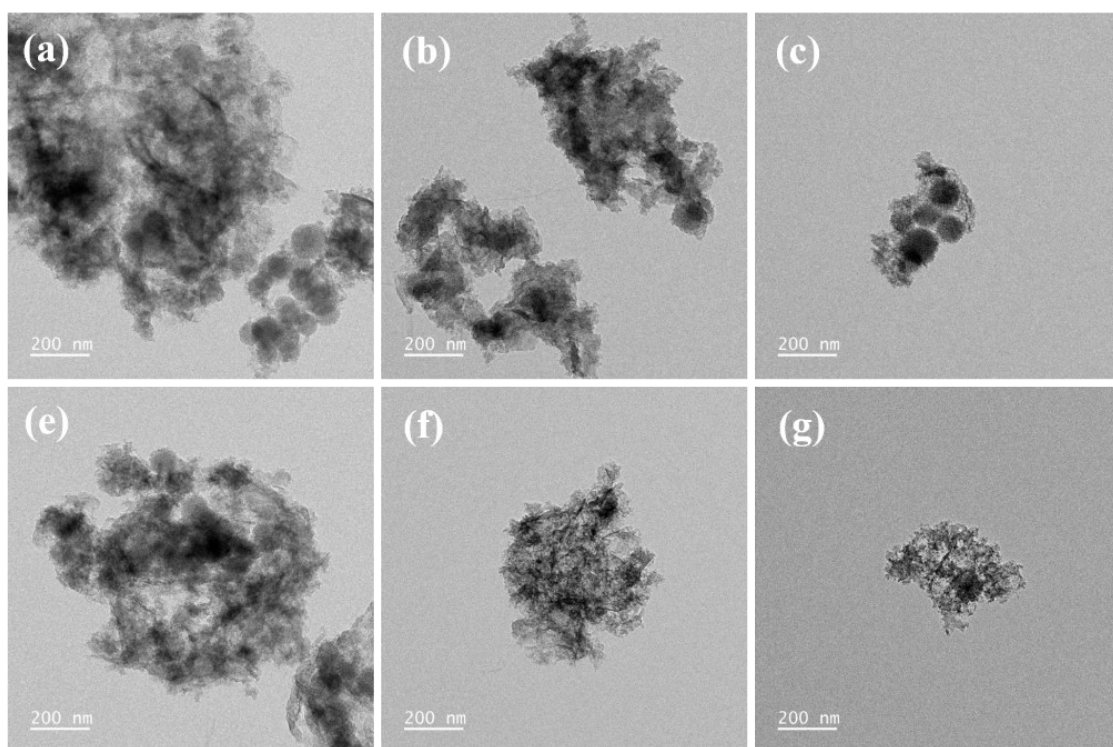


Figure S3 TEM images of reaction products obtained at different total flow rates and material ratios

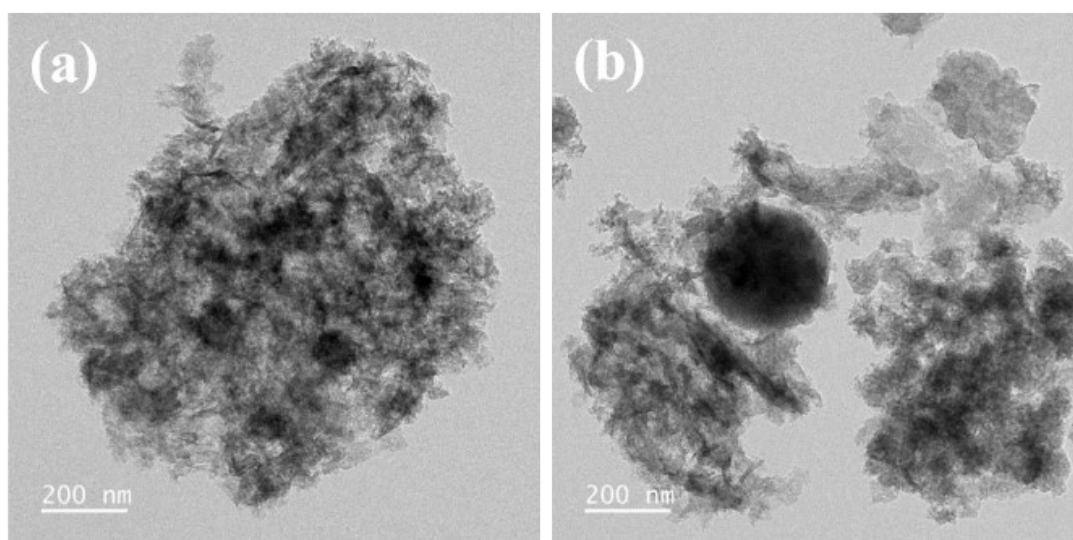


Figure S4 TEM images of products obtained at different reaction conditions (a) without ultrasound assistance, (b) coil inner diameter of 2 mm

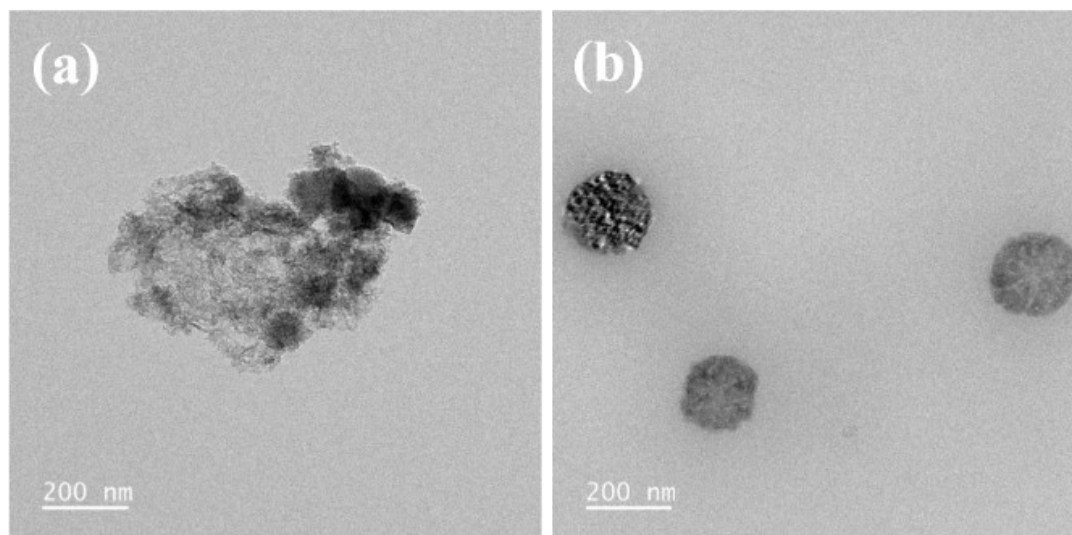


Figure S5 TEM images of products obtained at different reaction coil lengths (a) 1 m, (b) 3 m

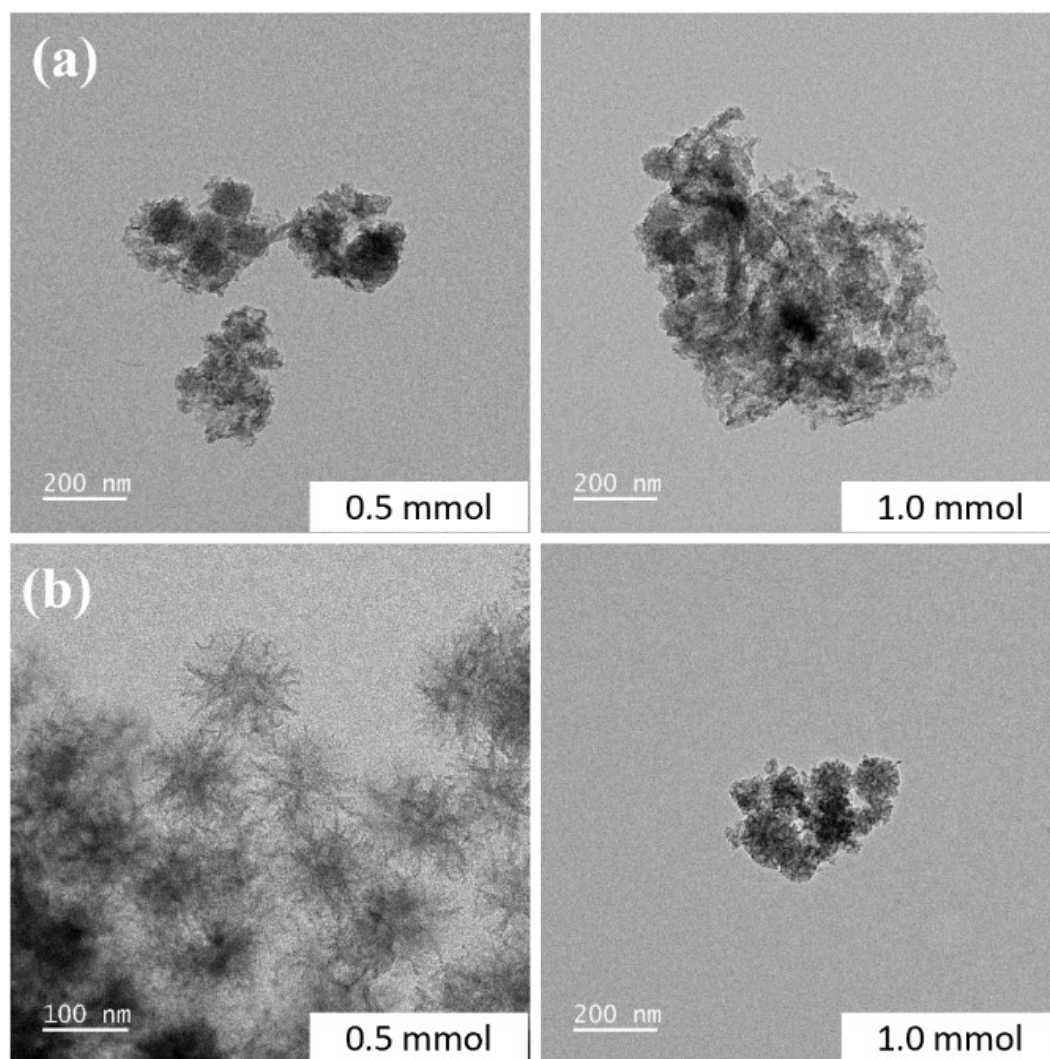


Figure S6 TEM images of products prepared under different catalytic systems (a) 0.4 mol urea + different NaOH concentrations, (b) 0.4 mol urea + different HCl concentrations