Raspberry-like silica hollow spheres: hierarchical structures by dual latex-surfactant templating route

Xiaofeng Wu[†,‡*]，*Yajun Tian*[†], *Yanbin Cui*[†,‡], *Lianqi Wei*[†,‡], *Qi Wang*[†,‡] *Yunfa Chen*[†]

[†] Institute of Process Engineering of Chinese Academy of Sciences, Beijing, 100080, China.

[‡] Graduate University of Chinese Academy of Sciences, Beijing, 100049, China.

*Corresponding author: wxftsjc@home.ipe.ac.cn

1. Preparation of monodispersive PS particles

The monodisperse PS colloidal particles were synthesized according to the reported procedure [1]: 10 g of styrene was added to a mixture composed of 95 g of absolute ethanol and 5g of distilled water. 2 g of PVP was then dissolved in the above system. It was stirred by a magnetic bar and purged with bubbling nitrogen for 30 min. After that the reaction system was heated to 70℃ using an oil bath. When that

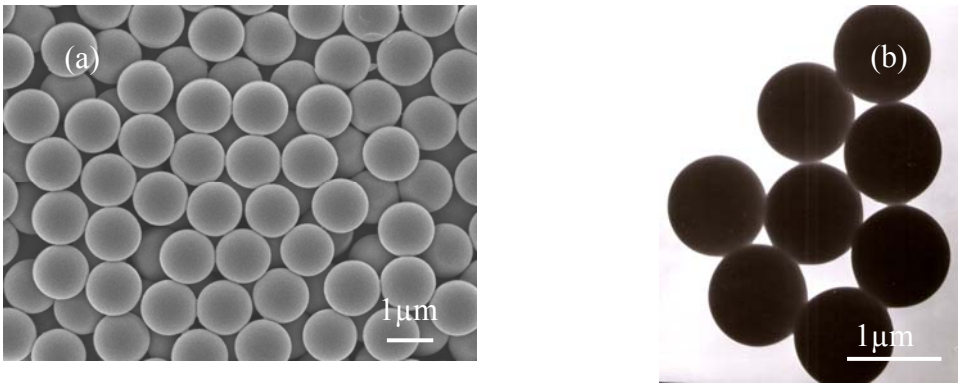

Figure 1S. SEM (a) and TEOS(b) images of as-obtained monodispersive polystyrene (PS) colloidal particles

temperature was reached, 0.1 g of AIBN was added to the system to initiate the polymerization of styrene. The whole reaction lasted for 12 h under bubbling nitrogen. PS particles were obtained by

centrifuge at 6000 rpm, washed twice with absolute ethanol and then dried in a vacuum oven at 50℃ for subsequent use. The as-obtained products(average size〈d〉= 1μm; dispersity δ=10%) are shown in Figure1S.

2. The small-angle XRD pattern of the bionic hollow silica spheres

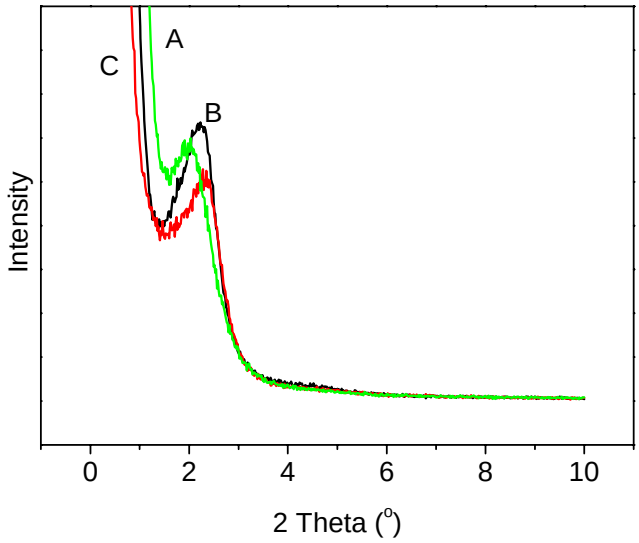

Figure 2S. Small-angle XRD patterns of the sample as shown in Figure 1A-C

3. Porosity of mesoporous hollow silica spheres obtained at extreme pH value

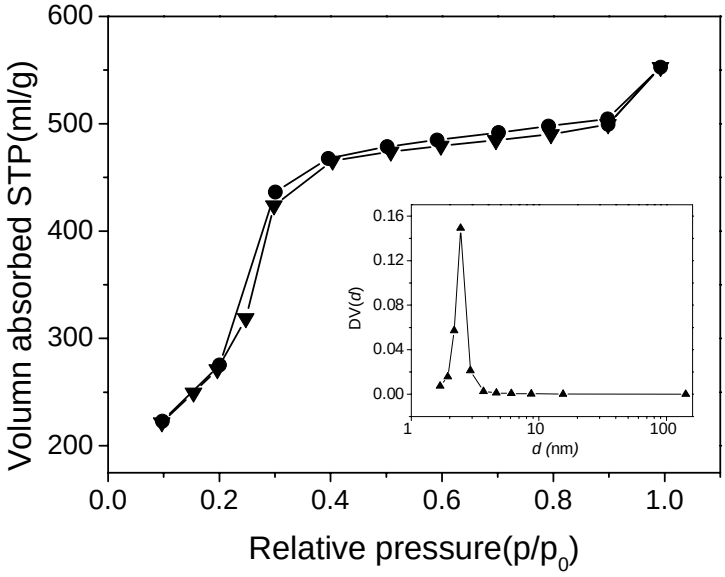

Figure 3S. N_2 adsorption-desorption isotherm and pore distribution curves of mesoporous hollow spheres obtained at pH value of 13

Reference

[1] Lami,E.B.; Lang, J. J. Colloid Interface Sci 1998, 197, 293-308.