Electronic Supplementary Material (ESI) for CrystEngComm

Supporting information

Silica/Ultrasmall Ag Composite Microspheres: Facile Synthesis, Characterization and Antibacterial and Catalytic Performance

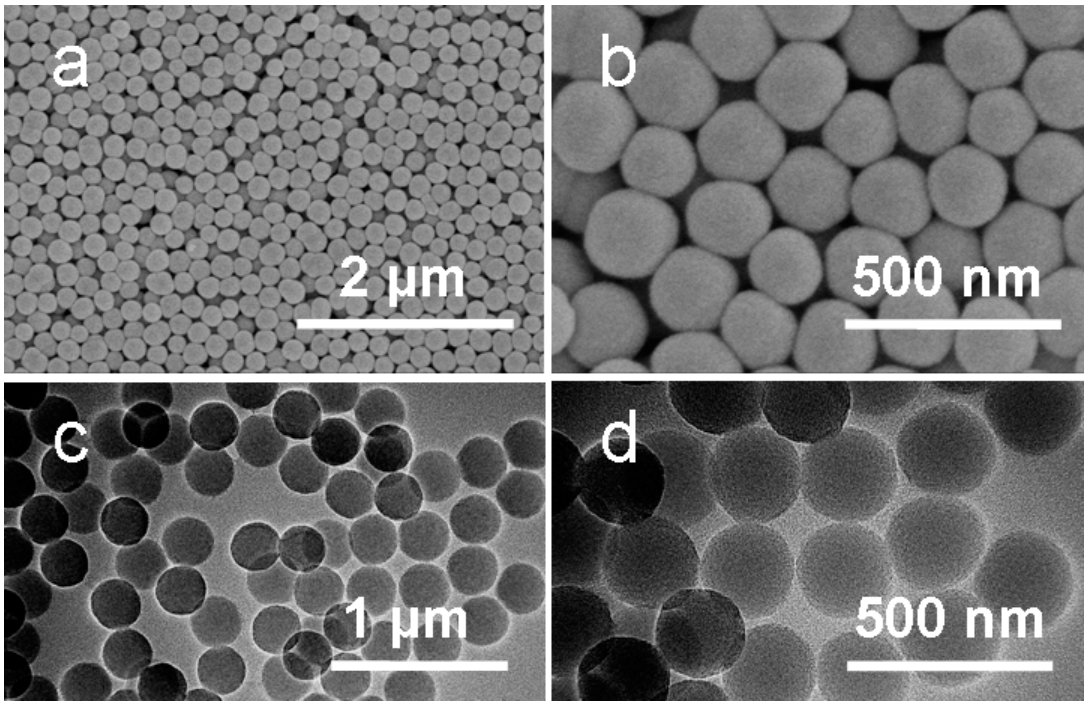

Fig. S1. SEM (a, b) and TEM (c,d) images of silica microspheres with 200 nm in diameters.

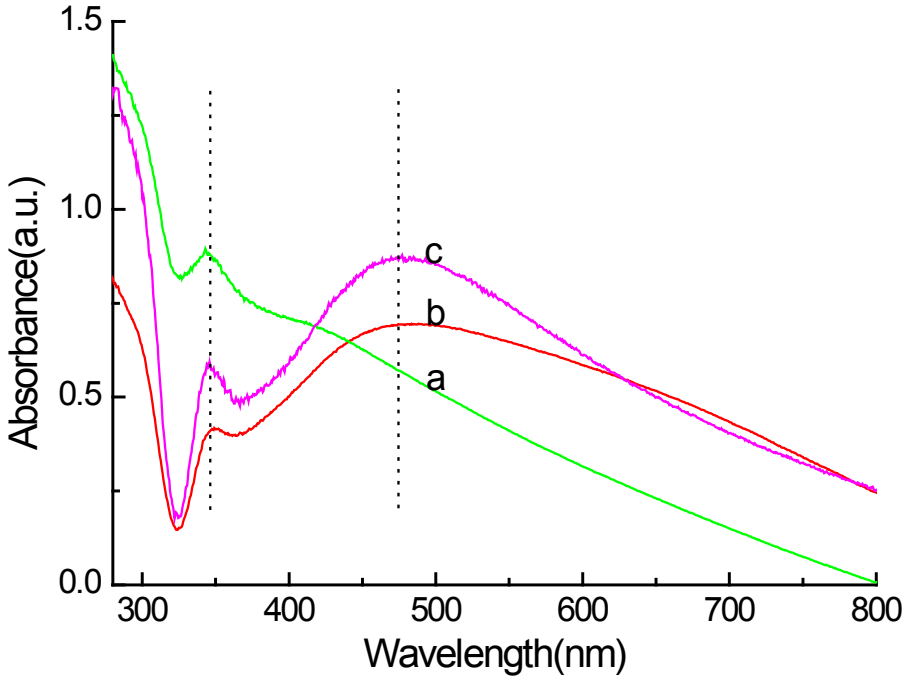

Fig. S2. UV-vis absorption spectra of the as-prepared SiO_2/Ag composite microspheres obtained from different amount of silica and $[Ag(NH_3)_2]^+$ at 180 ^oC for 24 hour: (a) 0.5 g silica microspheres and 0.5 mmol $[Ag(NH_3)_2]^+$; (b) 0.5 g silica microspheres and 1.0 mmol $[Ag(NH_3)_2]^+$ 4 h ; (c) 0.25 g silica microspheres and 1.0 mmol $[Ag(NH_3)_2]^+$, respectively.

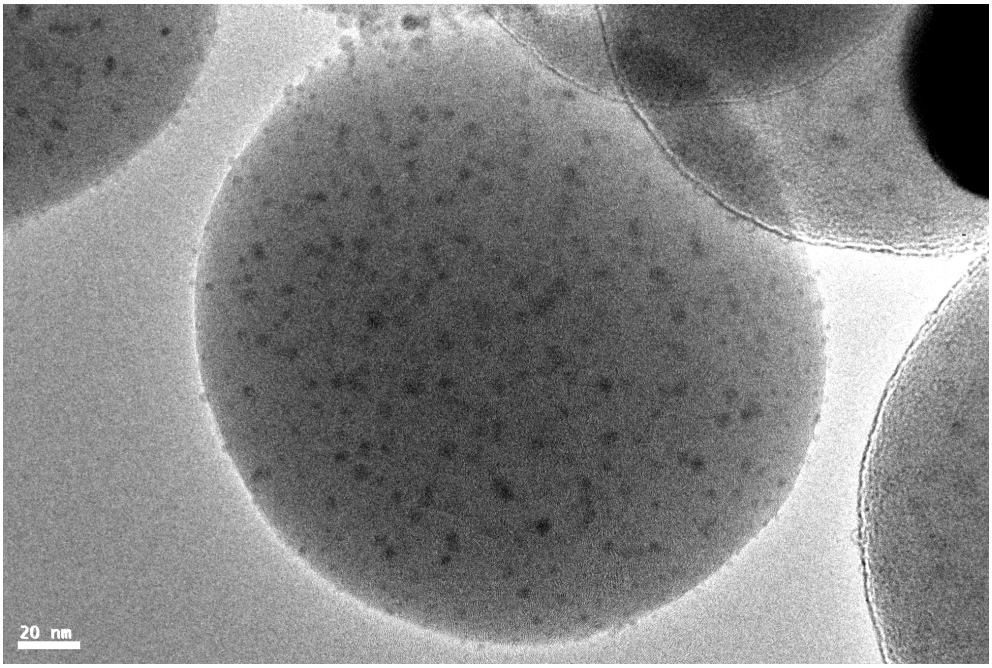

Fig. S3. TEM image of the as-prepared SiO_2/Ag composite microspheres obtained from 0.5 mmol $[Ag(NH_3)_2]^+$ in presence of 0.5 g silica at 180 ^oC for 24 hour.

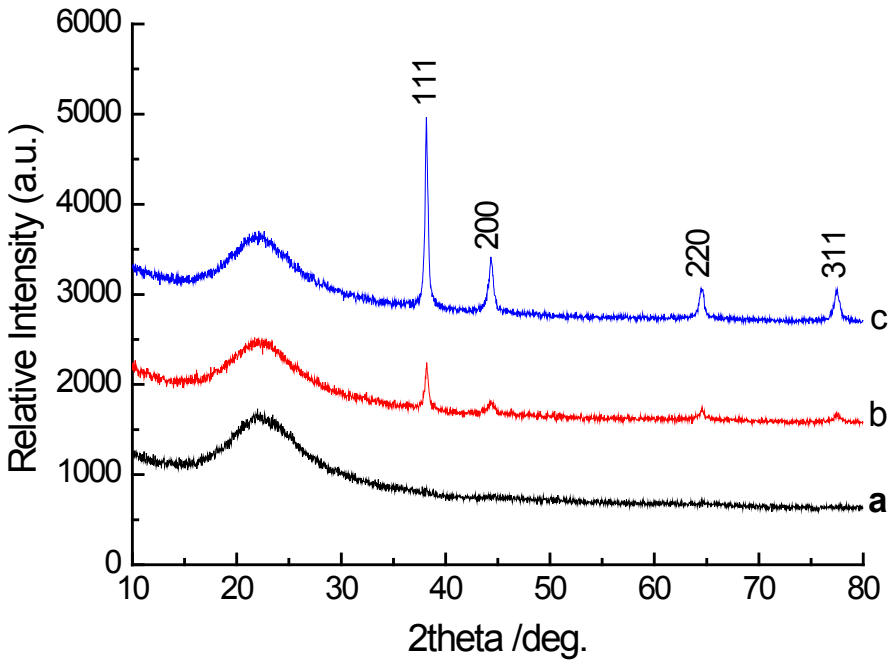

Fig. S4. XRD patterns of the as-prepared samples from reaction of 0.5 g silica microspheres and 1 mmol $[Ag(NH_3)_2]^+$ at 140 ^oC (a), (b) 160 ^oC and 180 ^oC for 24 h; respectively.

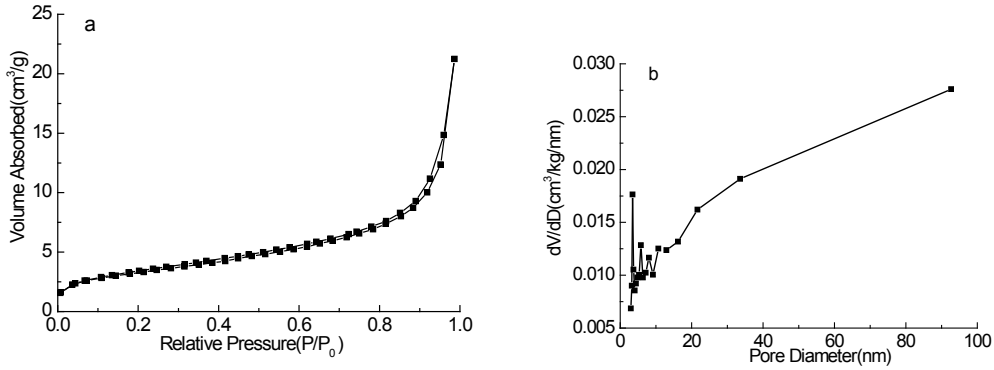

Fig. S5 Nitrogen adsorption-desorption isotherms (a) and pore-size distribution curves (b) of the as-synthesized SiO_2 /Ag composite microspheres.

Table S1 Element composition of the as-prepared SiO_2/Ag microspheres from XPS analyses.

Name	Atomic%
Si2p	31.16
C1s	9.52
Ag3d	2.16
O1s	57.17
Total	100

Table S2. The MICs and MBCs of samples against (E. Coli) pathogenic organisms

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6
MIC(μg/ml)	80	200	50	500	200	80
MBC(μg /ml)	80	500	80	500	500	80

* **Smaple 1**: the SiO_2/Ag microspheres obtained from 1 mmol $[Ag(NH_3)_2]$ at in presence of 0.5 g silica microspheres at 180 ^oC for 24 h;

Sample 2: the SiO_2/Ag microspheres obtained from 0.5 mmol $[Ag(NH_3)_2]$ at in presence of 0.5 g silica microspheres at 180 ^oC for 24 h;

Sample 3: the SiO_2/Ag microspheres obtained from 1 mmol $[Ag(NH_3)_2]$ at in presence of 0.25 g silica microspheres at 180 ^oC for 24 h;

Smaple 4: the SiO_2/Ag microspheres obtained from 0.5 mmol $[Ag(NH_3)_2]$ at in presence of 0.5 g silica microspheres at 160 ^oC for 24 h;

Sample 5: the SiO_2/Ag microspheres obtained from 1 mmol $[Ag(NH_3)_2]$ at in presence of 0.5 g silica microspheres at 160 ^oC for 24 h;

Sample 6: the SiO_2/Ag microspheres obtained from 1 mmol $[Ag(NH_3)_2]$ at in presence of 0.25 g silica microspheres at 160 ^oC for 24 h.