Electronic Supplementary Information

Novel preparation and near-infrared photoluminescence of uniform core-shell silver sulfide nanoparticle@mesoporous silica nanospheres

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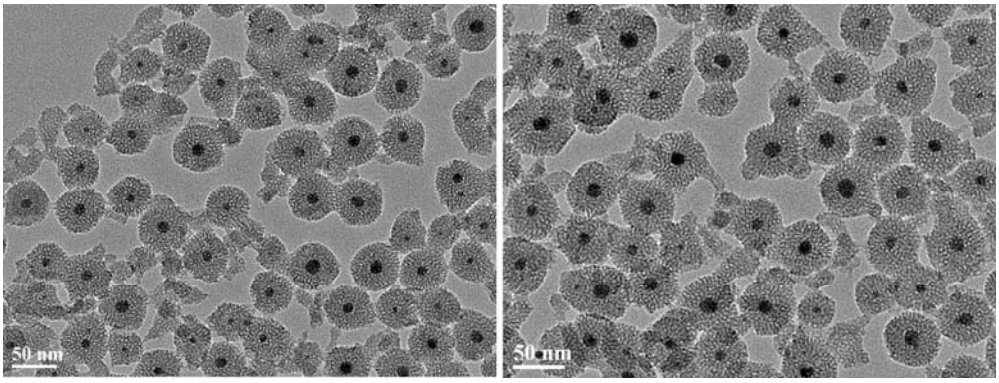

Fig. S1 Low-magnification TEM images of the Ag_2S@MSN nanospheres.

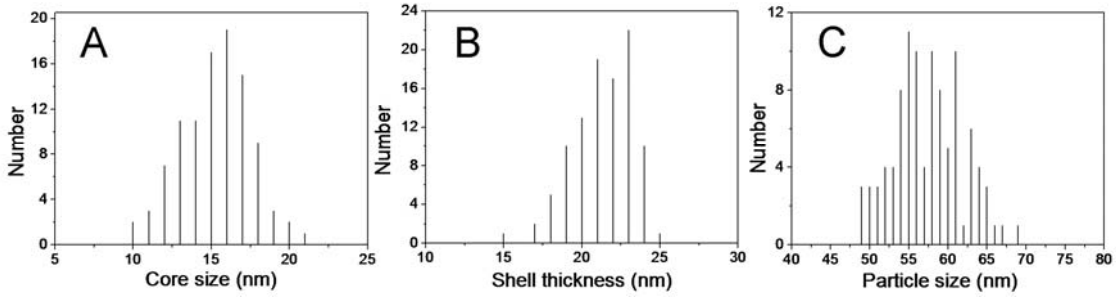

Fig. S2 The size distributions of (A) the core size, (B) the shell thickness, and (C) the particle size of the core-shell Ag_2S@MSN nanospheres.

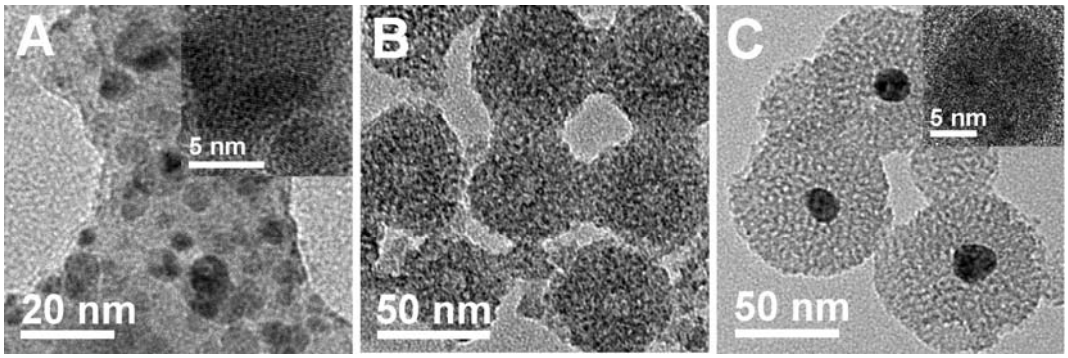

Fig. S3 TEM images of (A) the Ag_2S nanocrystals, (B) the mesoporous silica nanospheres (MSNs) obtained after the removal of the Ag_2S cores from the Ag_2S@MSN nanospheres, (C) the Ag@MSN nanospheres obtained without adding of sodium sulfide.

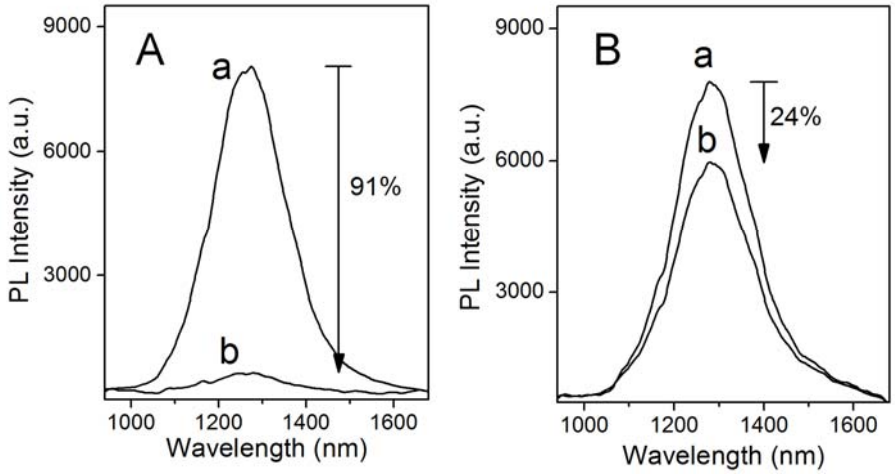

Fig. S4 Emission spectra of (A) the Ag_2S nanocrystals and (B) the core-shell Ag_2S@MSN mesoporous silica nanospheres (a) just after the synthesis (fresh), and (b) after storing it in ethanol for 30 days.

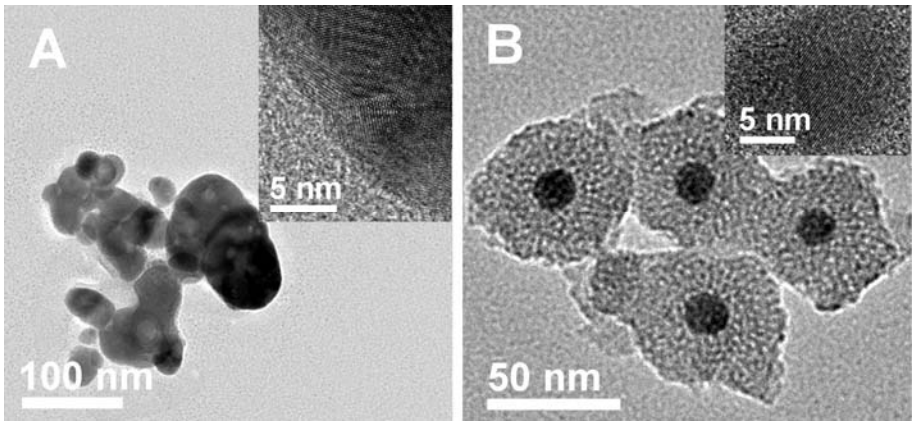

Fig. S5 TEM images of (A) the Ag_2S nanocrystals and (B) the core-shell Ag_2S@MSN mesoporous silica nanospheres after storing in ethanol for 30 days.

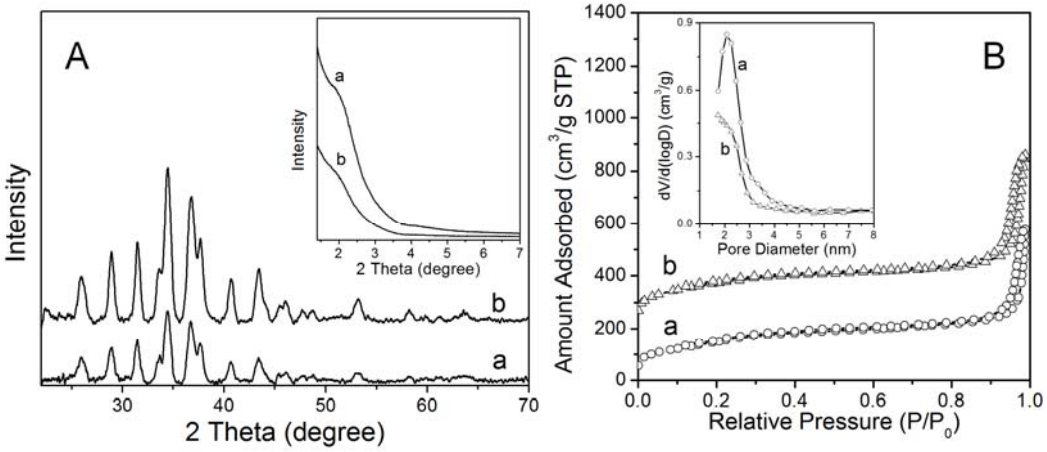

Fig. S6 (A) Wide-angle and small-angle (inset) XRD patterns, (B) nitrogen sorption isotherms and pore size distributions (inset) of the core-shell Ag_2S@MSN nanospheres with different shell thickness of about (a) 15 and (b) 10 nm. For clarity, the isotherms of (b) are offset by 200 cm^3/g.

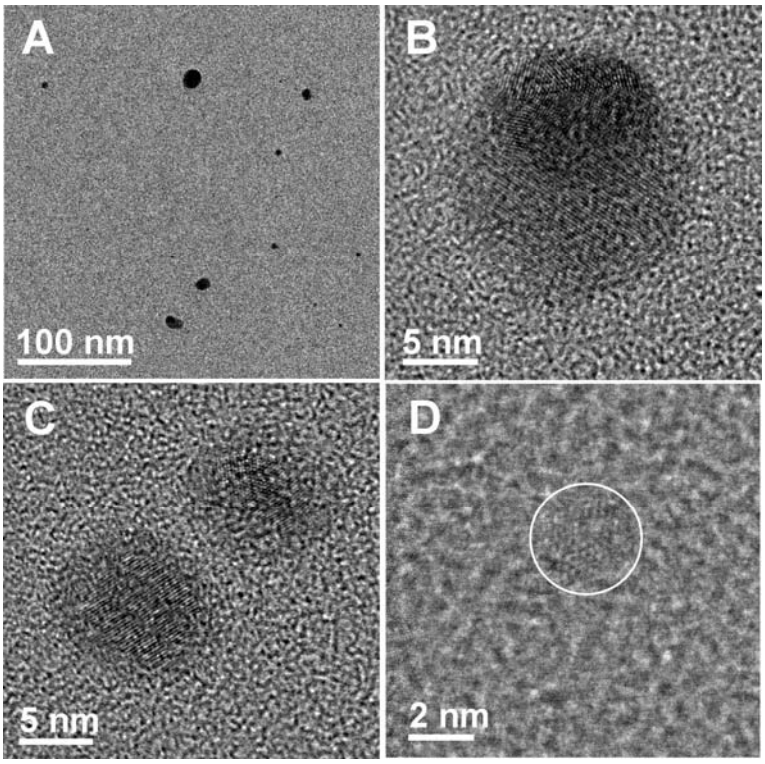

Fig. S7 (A) TEM and (B, C, D) HRTEM images of the Ag_2S nanocrystals obtained before addition of TEOS (Scheme 1, route II, G).

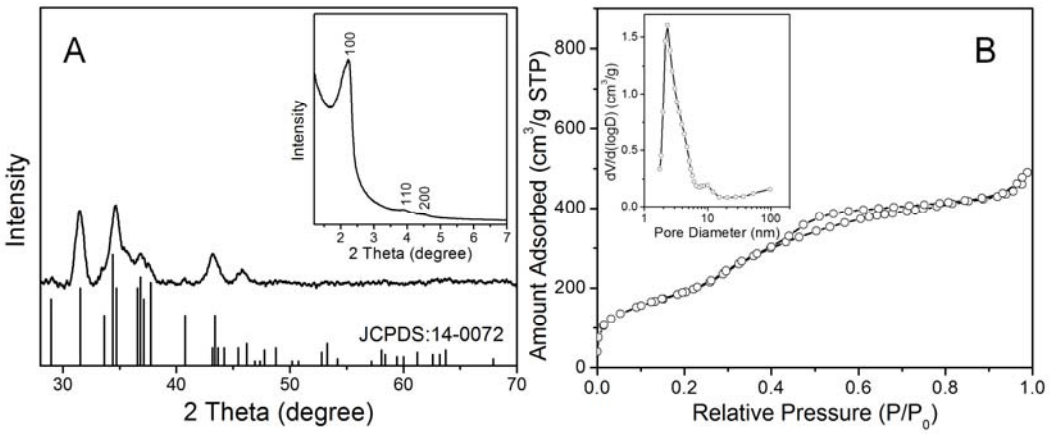

Fig. S8 (A) Wide-angle and small-angle (inset) XRD patterns, (B) nitrogen sorption isotherms and the pore size distribution (inset) of the core-shell Ag_2S@MSN composites obtained when Na_2S was added before TEOS.