Electronic Supplementary Information

Synthesis of AgBiS₂ microspheres by templating method and their catalytic polymerization of alkylsilanes

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Synthesis of AgBiS₂ microsphere: A modified process based on Ref.5 and Ref.1 was described as follows: Reaction mixtures of 0.1 mmol of PEG, 5 mmol of AgNO₃ and 5 mmol of Bi(NO₃)₃.5H₂O were dissolved in 30 mL of EG. The mixture experienced 10 min. of supersonic (20 kHz) agitation in a pulverizer at a power of 400 W to ensure that all of the reagents were dispersed homogeneously in the solution and left to rest at 35°C for 3 h. Then 20 mmol of thiourea was added to the above solution, which was then hydrothermally treated at 180 °C for 20 h in a Teflon-lined autoclave. The black product was collected and cleaned with hot water and absolute alcohol three times to remove the remaining PEG and then dried at 60 °C. Similarly, AgBiS₂-Bi₂S₃ microspheres were generated under the same conditions, except that the mole weight of AgNO₃ and Bi(NO₃)₃-5H₂O was 3.33 and 6.67 mmol, respectively.

Characterizations: XRD experiments were conducted on a D/max-3B diffractometer with Cu K α radiation. SEM was carried out in a SEM (JSM-6700F, 5.0 kV) instrument. TTIR measurements were performed on a Nicolet 8700 instrument. XPS measurement was performed on a PHI5500ESCA analyzer. The main parameters were as follows: Mg Ka, 200 W, vacuum ~10⁻⁷ Pa.



Fig. SI-1 SEM image of AgBiS₂ microspheres



Fig. SI-2 TEM images of AgBiS₂ microspheres dispersed in ethanol via ultrasonic treatment (Transmission electron microscopy imagines were taken on a Hitachi H-800, 150 kv).



Fig. SI-3 TEM images of the products prepared by refluxing $AgBiS_2$ with $C_{18}H_{37}SiH_3$ in the presence of small amounts of water dispersed in ethanol via ultrasonic treatment



Fig. SI-4 SEM images of the as-prepared samples by refluxing the mixture of $AgBiS_2-Bi_2S_3$ microspheres with $C_{18}H_{37}SiH_3$ in the presence of small amounts of water



Fig. SI-5 TEM images of the mixtures of $AgBiS_2$ - Bi_2S_3 microspheres dispersed in ethanol via ultrasonic treatment



Fig. SI-6 SEM images of the as-prepared products by refluxing Bi_2S_3 microspheres incorporated with (a-c) and without (d) PVP-capped silver nanorods and $C_{18}H_{37}SiH_3$ in the presence of small amounts of water



Fig. SI-7 TEM images of the products prepared by refluxing Bi_2S_3 with $C_{18}H_{37}SiH_3$ in the presence of small amounts of water dispersed in ethanol via ultrasonic treatment



Fig. SI-8 O1s XPS spectra of as-synthesized products prepared by refluxing $AgBiS_2$ with $C_{18}H_{37}SiH_3$ in the presence of small amounts of water