Supplementary Material (ESI) for Journal of Materials Chemistry A

Tailoring AgI nanoparticles for assembly of the AgI/BiOI hierarchical hybrids with their size-dependent photocatalytic activities

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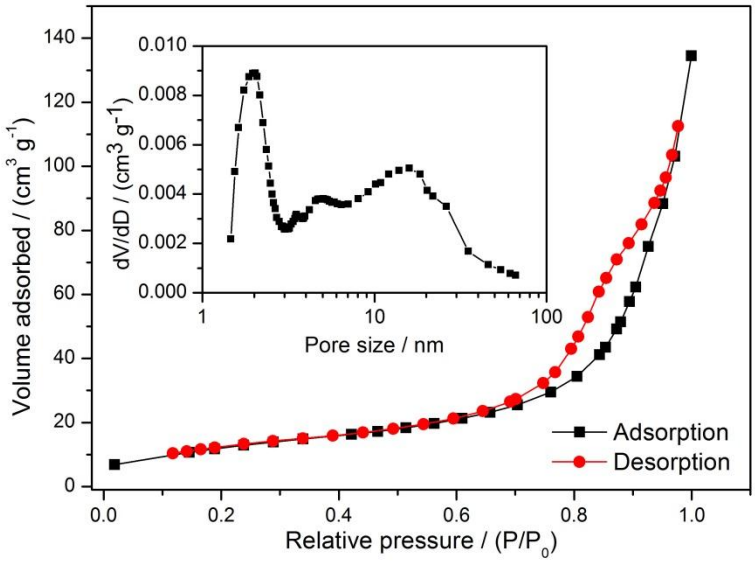

Fig. S1 N_2 adsorption/desorption properties of the BiOI hierarchical microspheres and the corresponding pore size distribution.

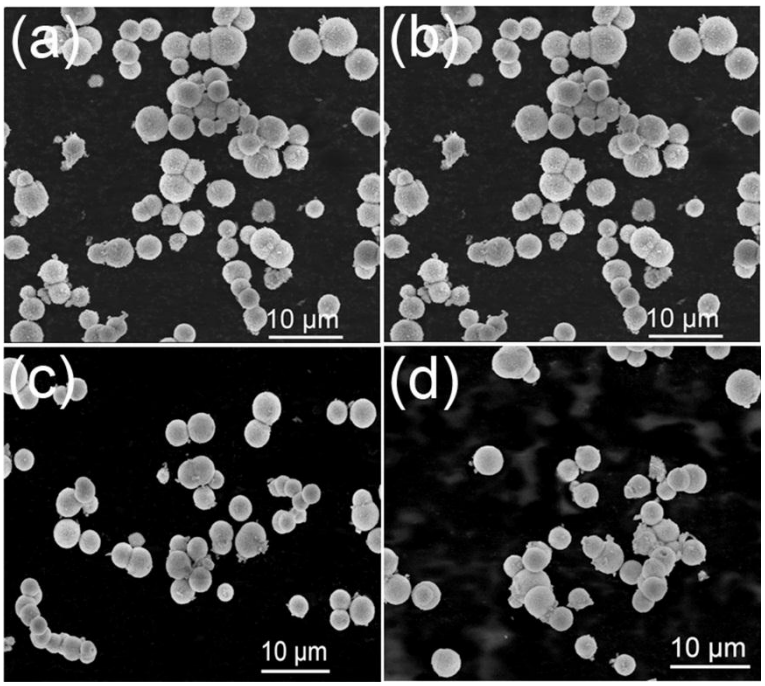

Fig. S2 The low magnification SEM images of the AgI/BiOI hybrids prepared by ion exchange reactions with different concentrations of PVP in EG: (a) 0, (b) 0.5, (c) 1.0 and (d) 2.0 g L^{-1}.

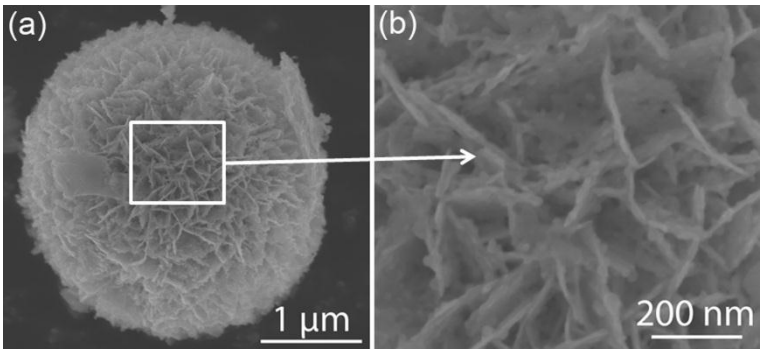

Fig. S3 SEM images of the AgI/BiOI hybrid that were prepared by ion exchange reaction with PVP concentration of 3.0 g L^{-1} in EG. The mean sizes of AgI NPs are measured to be 17 ± 4 nm.

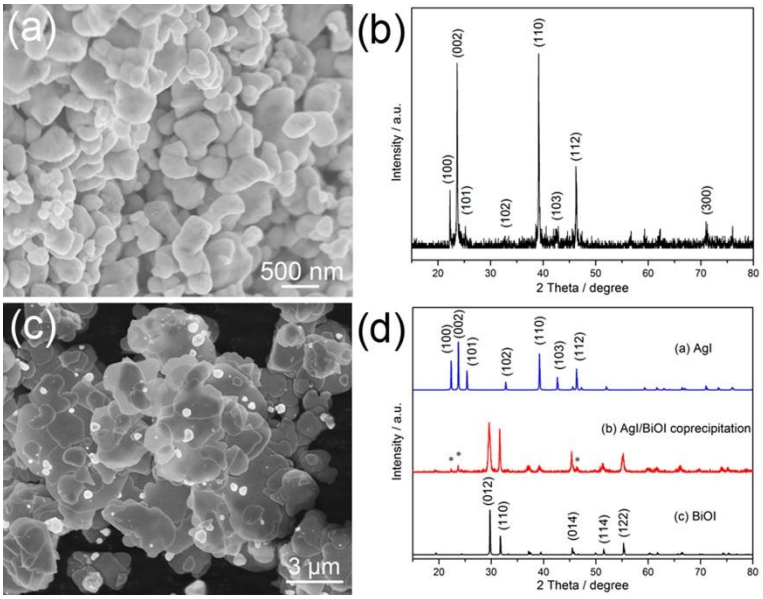

Fig. S4 (a) SEM image and (b) XRD pattern of the bulk AgI prepared by direct precipitation of $AgNO_3$ and KI solutions. (c) SEM image and (d) XRD pattern of the AgI/BiOI composites prepared by co-precipitation.

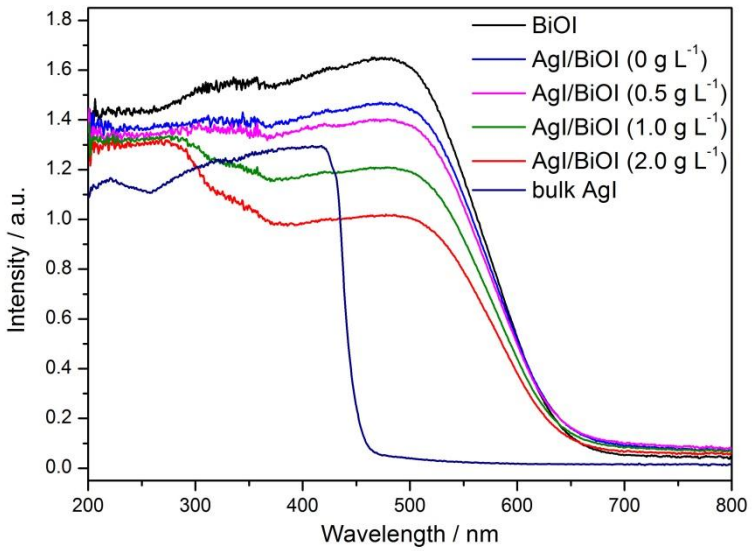

Fig. S5 UV–Vis diffuse reflectance spectra of BiOI microspheres, the AgI/BiOI hybrids and bulk AgI.

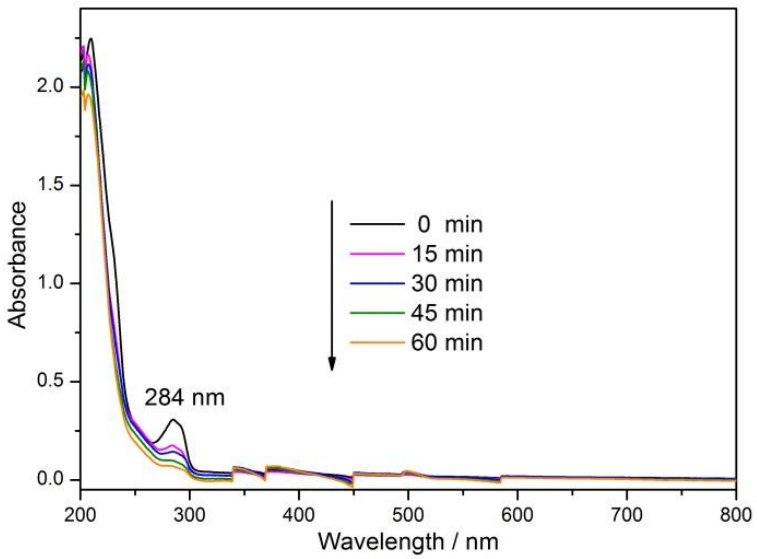

Fig. S6 The time-dependent absorption spectra of the 2,4-DCP solution in the presence of the AgI/BiOI hybrid prepared by ion exchange with PVP concentration of 2.0 g L^{-1} under visible light irradiation.

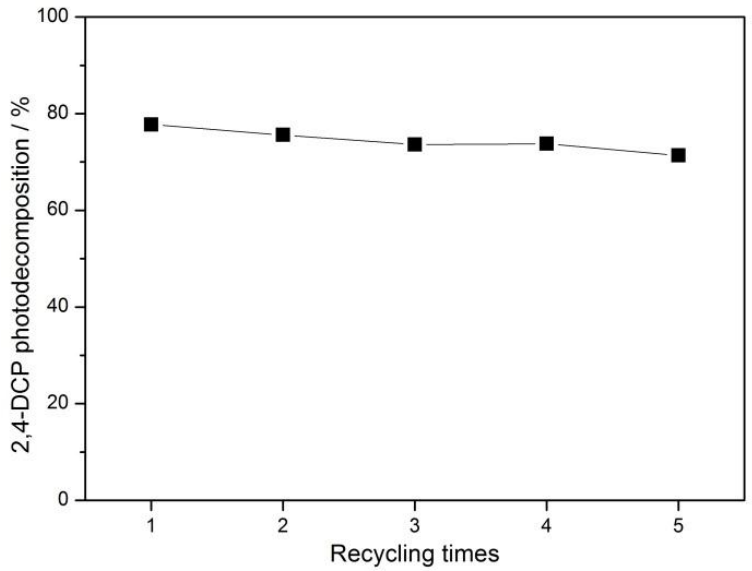

Fig. S7 The recycling 2,4-DCP photodecomposition experiments under visible light irradiation for 1 h over the AgI/BiOI hybrid sample prepared with PVP concentration of 2.0 g L^{-1}, which shows no obvious decrease in the activity.

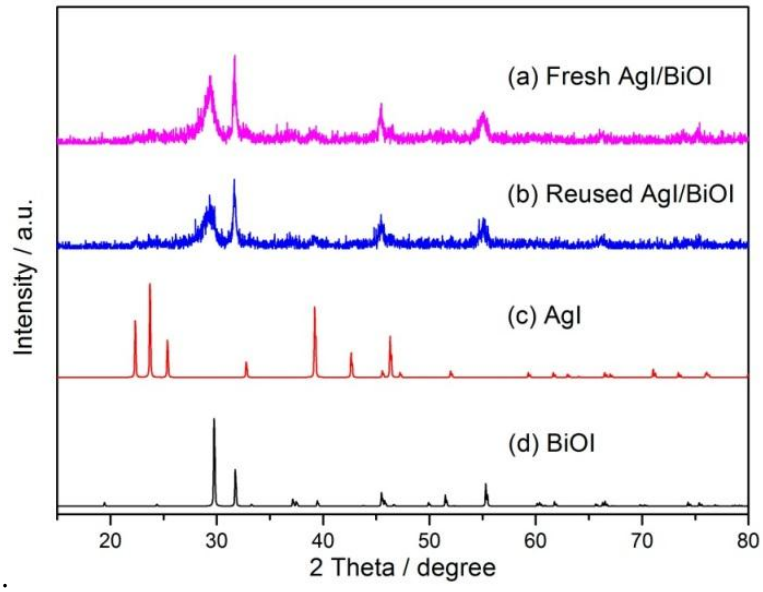

Fig. S8 XRD patterns of (a) the fresh prepared and (b) used AgI/BiOI hybrid samples after the recycling photocatalytic experiments; standard diffraction patterns for (c) AgI (JCPDS No. 09-0374) and (d) BiOI (JCPDS No. 73-2062).