

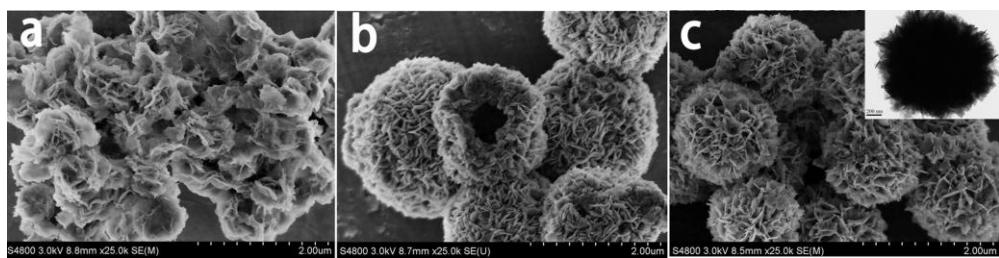
## Supporting Information

### Controllable synthesis of hollow/flower-like BiOI microspheres and highly efficient adsorption and photocatalytic activity

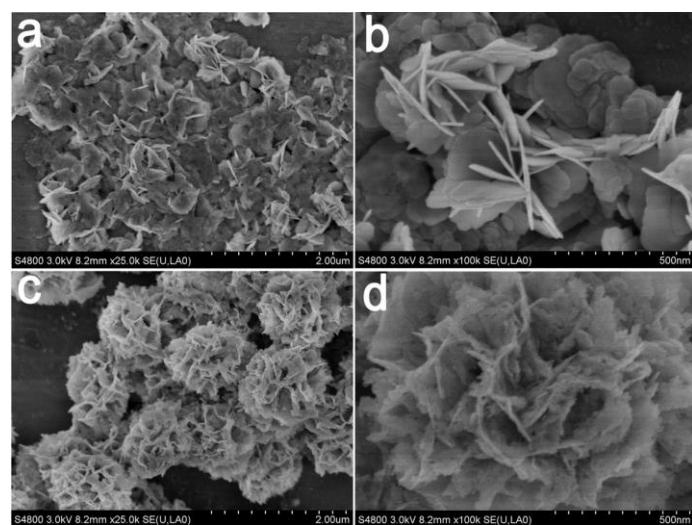
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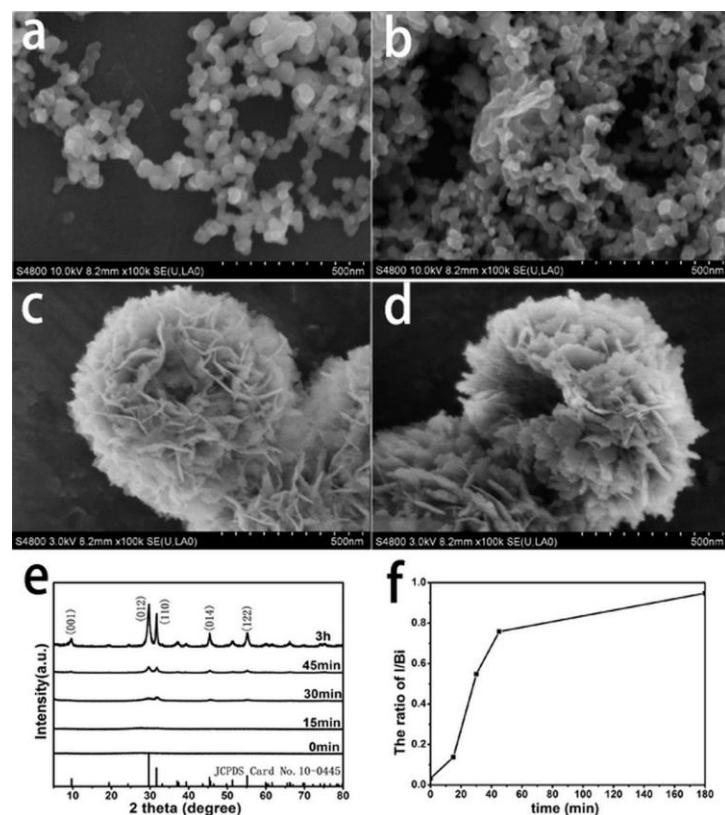
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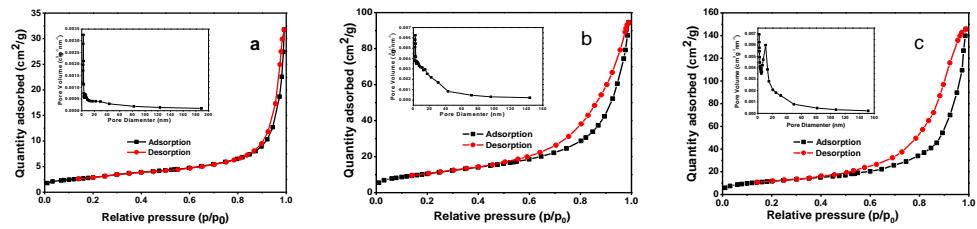
**Fig. S1** The influence of the reactants concentration on the morphology of the BiOI: (a) 1ml Bi source and 0.0338g NaI, (b) 6ml Bi source and 0.2025g NaI and (c) 8ml Bi source and 0.2700g NaI.



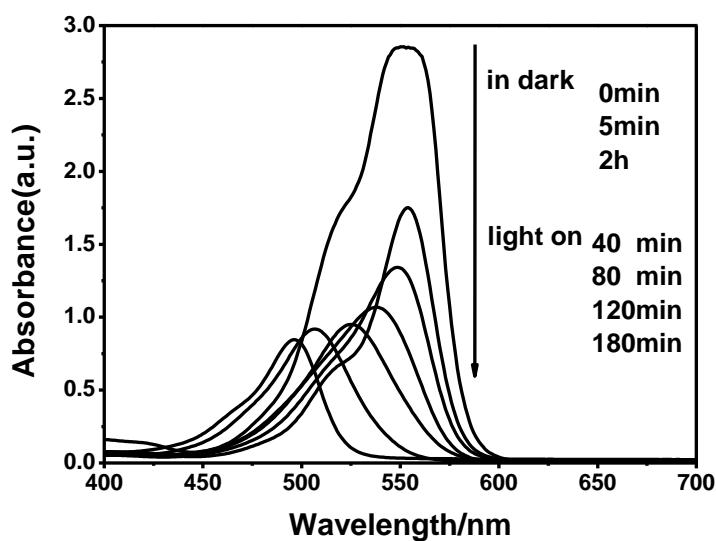
**Fig. S2** The influence of assistant agents on the morphology of the BiOI: (a, b) with PVP only existed, (c, d) with citric acid only existed.



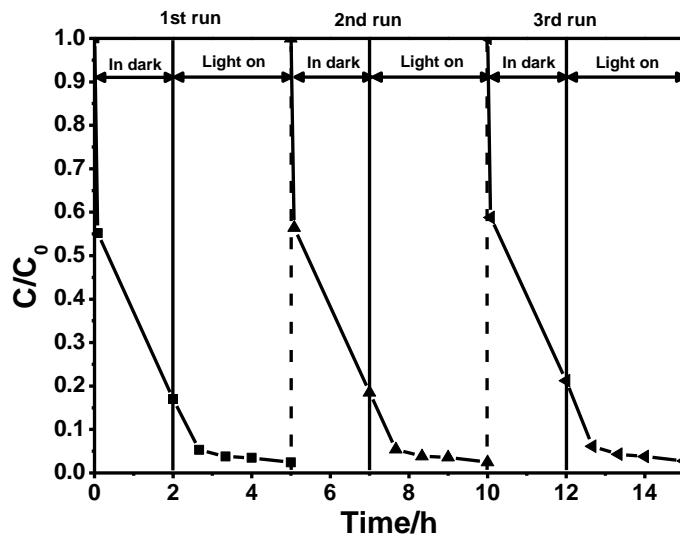
**Fig. S3** FESEM images of the hollow microspheres: (a) 0 min, (b) 15 min, (c) 30 min and (d) 45 min; XRD patterns (e) and EDS patterns (f) of products at different reaction stages.



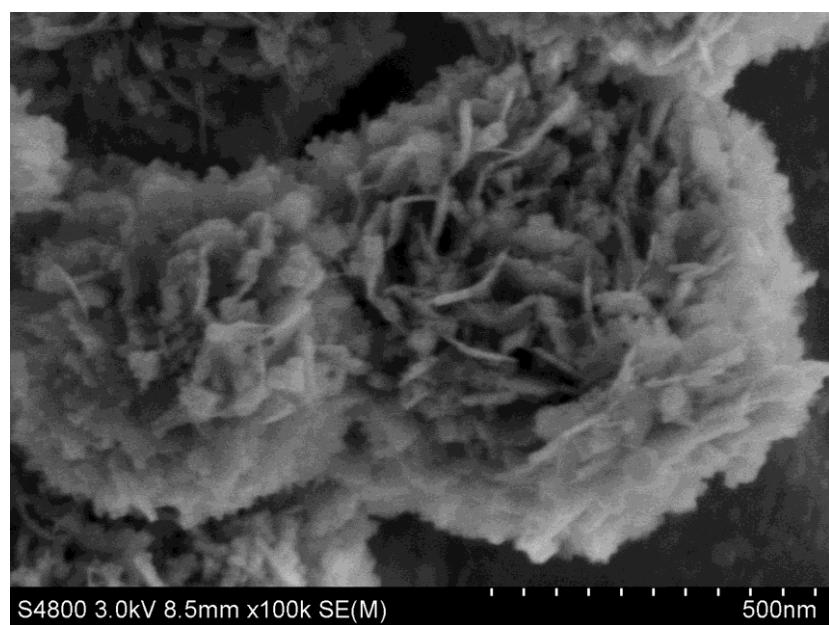
**Fig. S4** Typical N<sub>2</sub> gas adsorption-desorption isotherm of the BiOI samples in different morphological structure: (a) the nanoplates; (b) the flower-like microspheres; and (c) the hollow microspheres. Insets: the corresponding pore-size distribution.



**Fig. S5** The adsorption spectra of an aqueous solution of RhB in the presence of the hollow microspheres.



**Fig. S6** Recycling test of the photodegradation of RhB on the flower-like microspheres under visible-light irradiation.



**Fig. S7** FESEM images of the flower-like microspheres after the photocatalytic reaction.