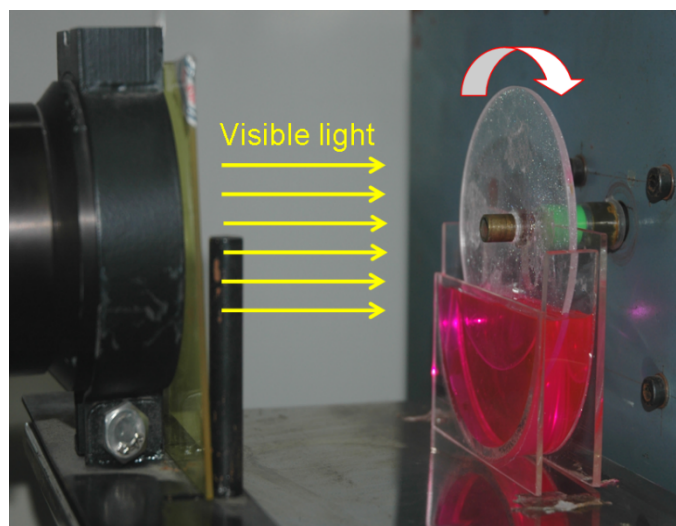


# **BiOBr Visible-Light Photocatalytic Film in Rotating Disk Reactor for Organics Degradation**

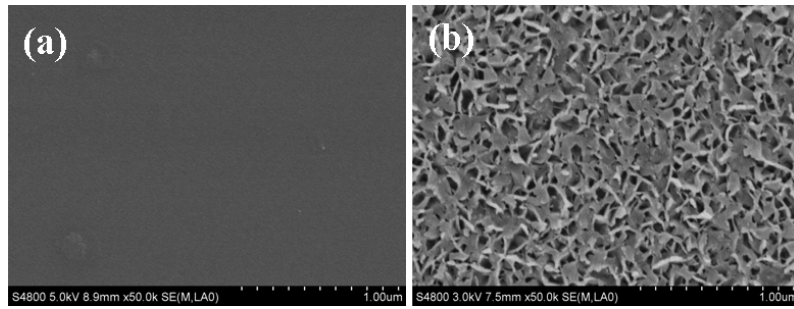
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*The Education Ministry Key Lab of Resource Chemistry, Shanghai Key Laboratory of  
Rare Earth Functional Materials, Shanghai Normal University, Shanghai 200234, China*

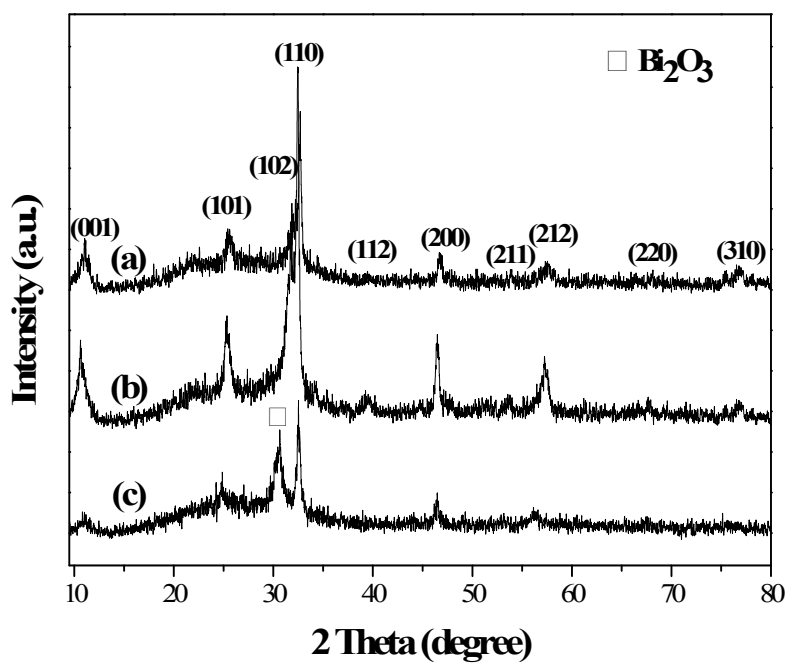
## **Supporting Information**



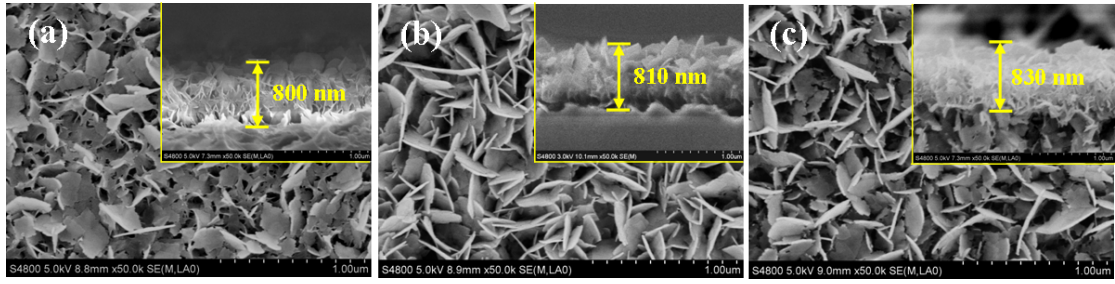
**Fig. S1** Photo of self-designed photocatalytic reactor containing rotating disk.



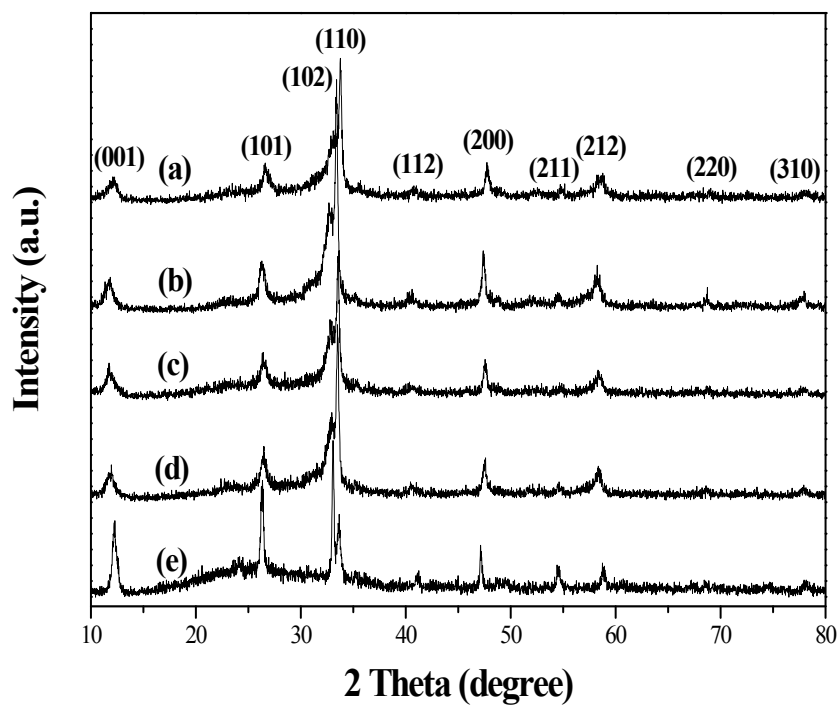
**Fig. S2** FESEM morphology of the surface of (a) untreated and (b) treated soda glass substrate.



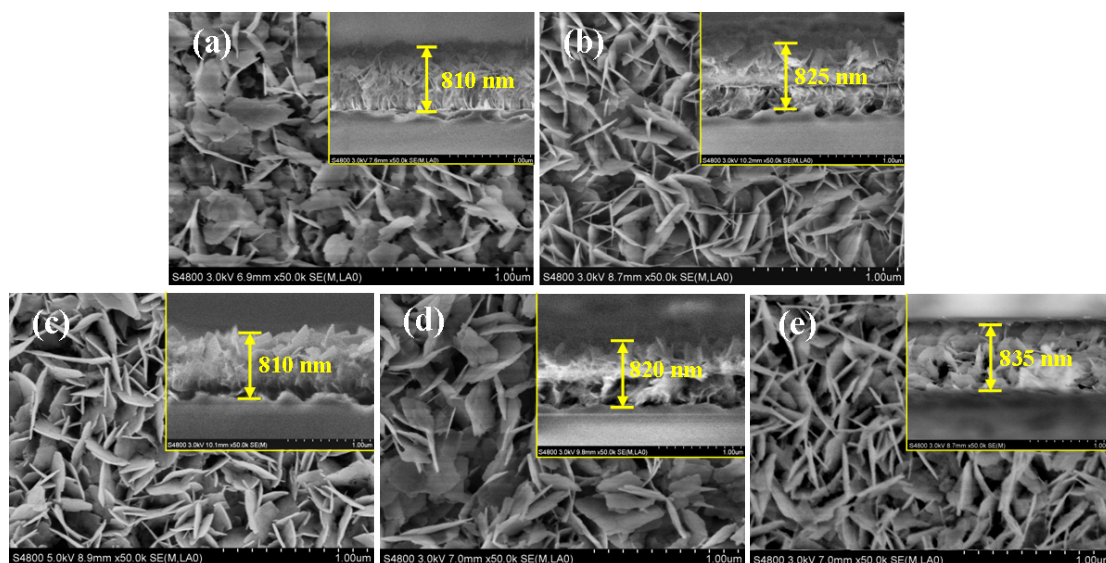
**Fig. S3** XRD patterns of BiOBr films obtained at different calcination temperature: (a) BOB-8-350, (b) BOB-8-400 and (c) BOB-8-450.



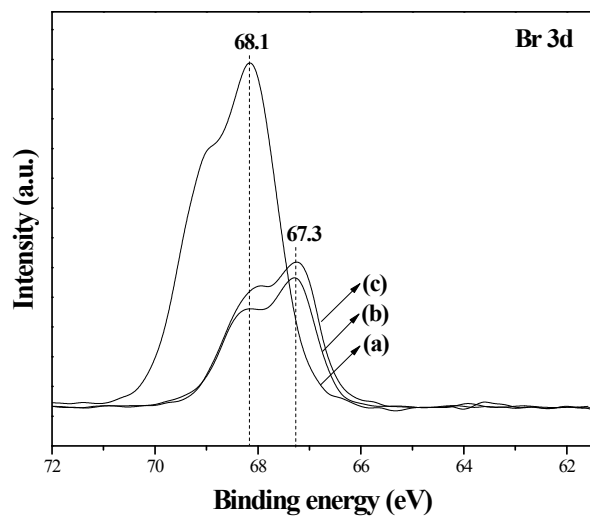
**Fig. S4** FESEM morphologies of BiOBr films obtained at different calcination temperature: (a) BOB-8-350, (b) BOB-8-400 and (c) BOB-8-450.



**Fig. S5** XRD patterns of BiOBr films obtained at different solvothermal time: (a) BOB-4-400, (b) BOB-6-400, (c) BOB-8-400, (d) BOB-10-400 and (e) BOB-12-400.

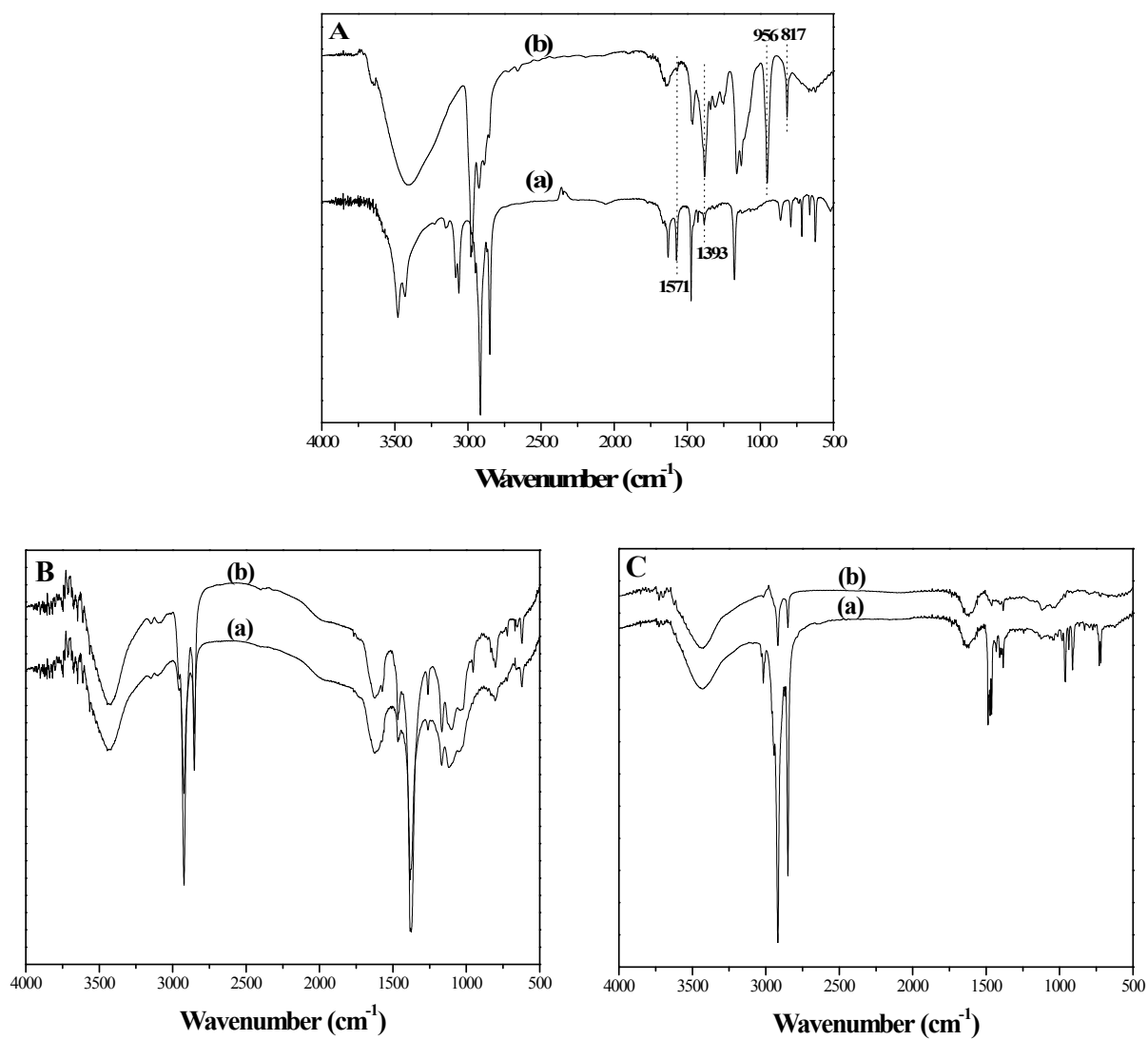


**Fig. S6** FESEM morphologies and the attached cross section images of different films: (a) BOB-4-400, (b) BOB-6-400, (c) BOB-8-400, (d) BOB-10-400, and (e) BOB-12-400.

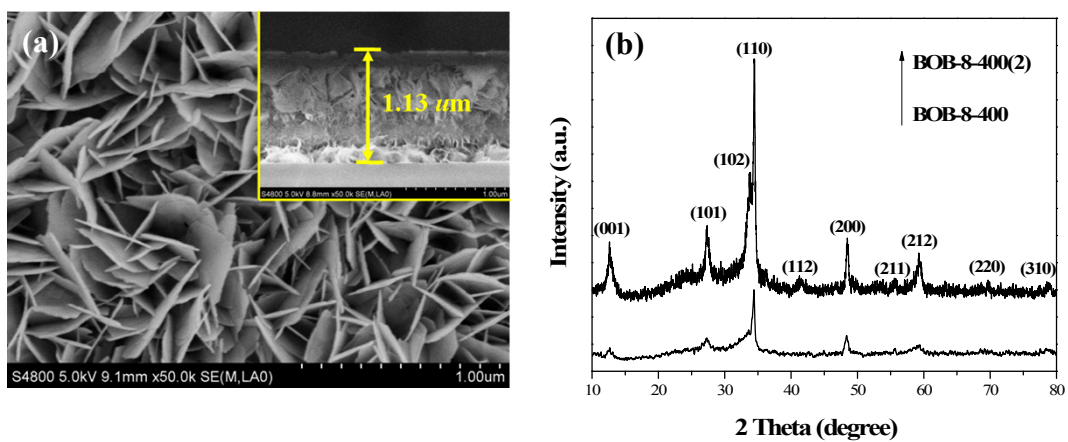


**Fig. S7** XPS spectra of (a) solid [C<sub>16</sub>mim]Br, (b) [C<sub>16</sub>mim]Br dissolved in isopropanol and (c) [C<sub>16</sub>mim]Br isopropanol solution dip-coated on the glass substrate.

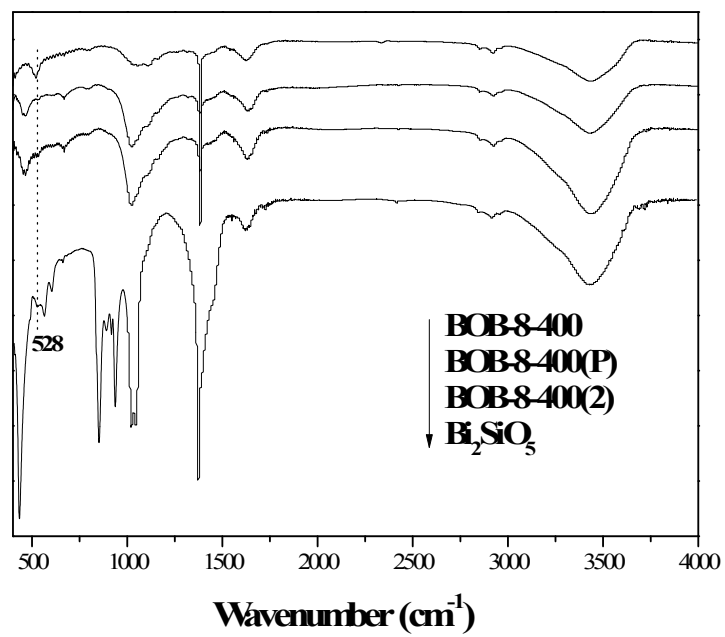




**Fig. S8** FTIR spectra of A. (a) solid  $[\text{C}_{16}\text{mim}]\text{Br}$  and (b)  $[\text{C}_{16}\text{mim}]\text{Br}$  dissolved in isopropanol; B. (a) solid  $[\text{C}_{16}\text{mim}]\text{NO}_3$  and NaBr, (b)  $[\text{C}_{16}\text{mim}]\text{NO}_3$  and NaBr dissolved in isopropanol; C. (a) solid CTAB and (b) CTAB dissolved in isopropanol.



**Fig. S9** (a) FESEM morphology of BOB-8-400(2) with insert of cross section and (b) XRD patterns of BOB-8-400 and BOB-8-400(2) samples.



**Fig. S10** FTIR spectra of different samples.

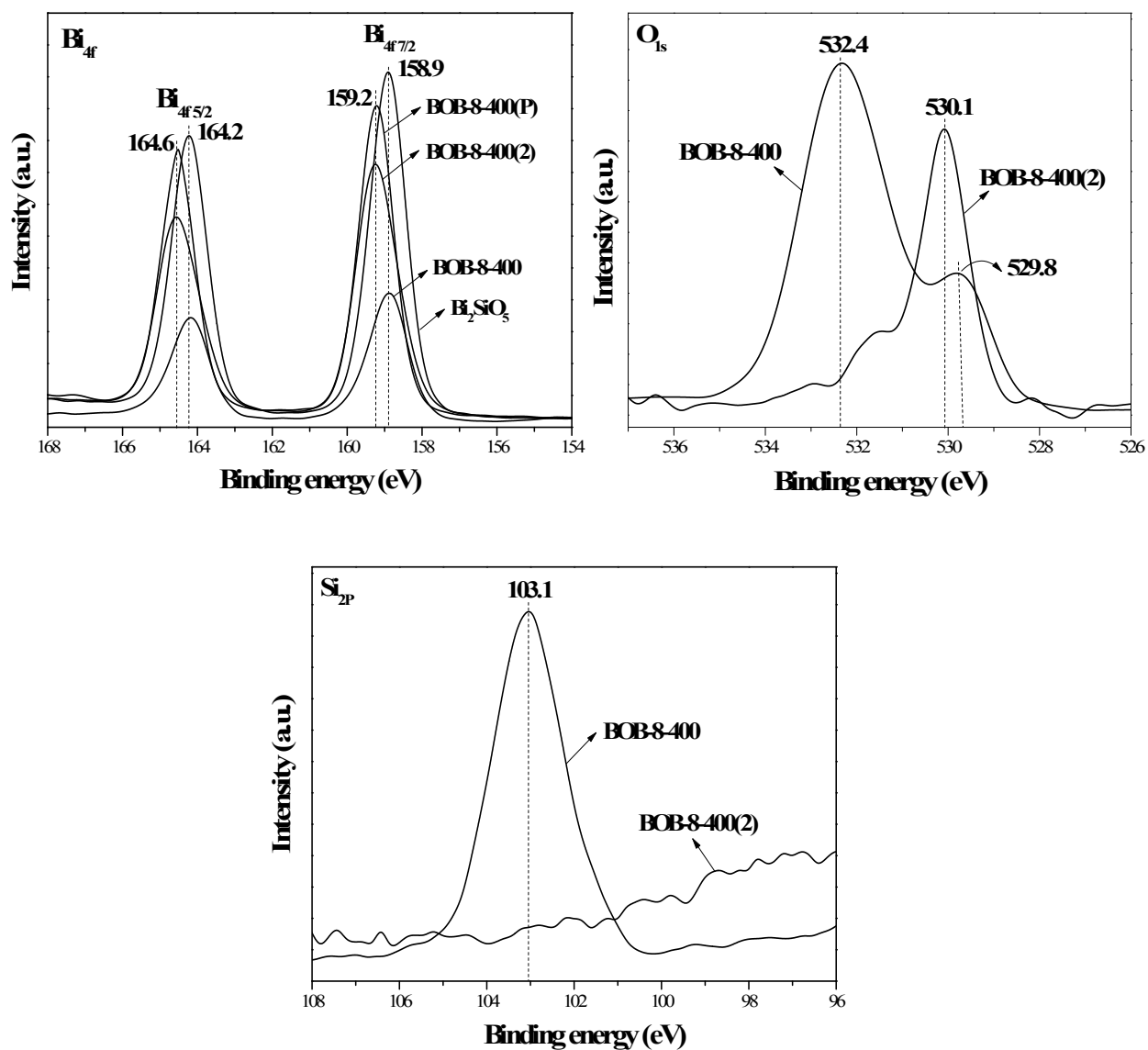


Fig. S11 XPS spectra of different samples.

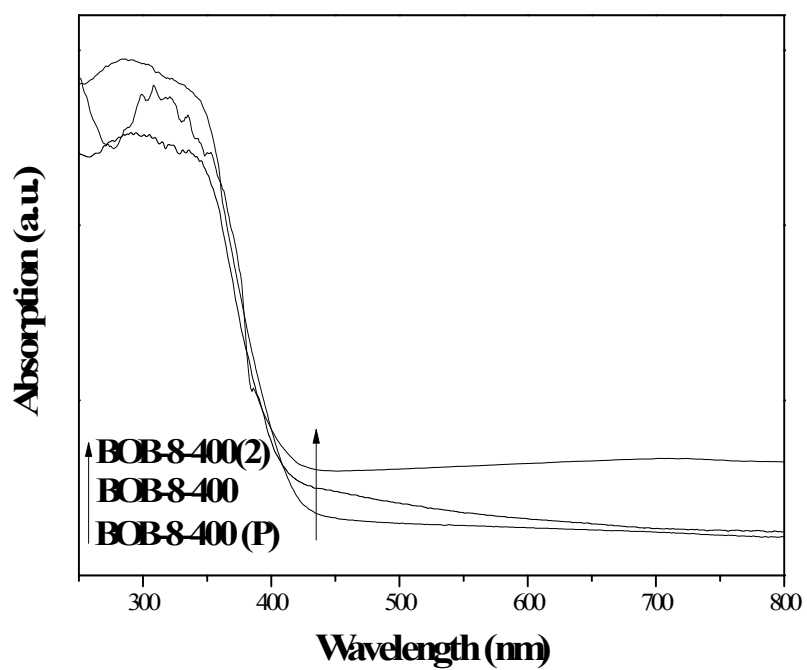
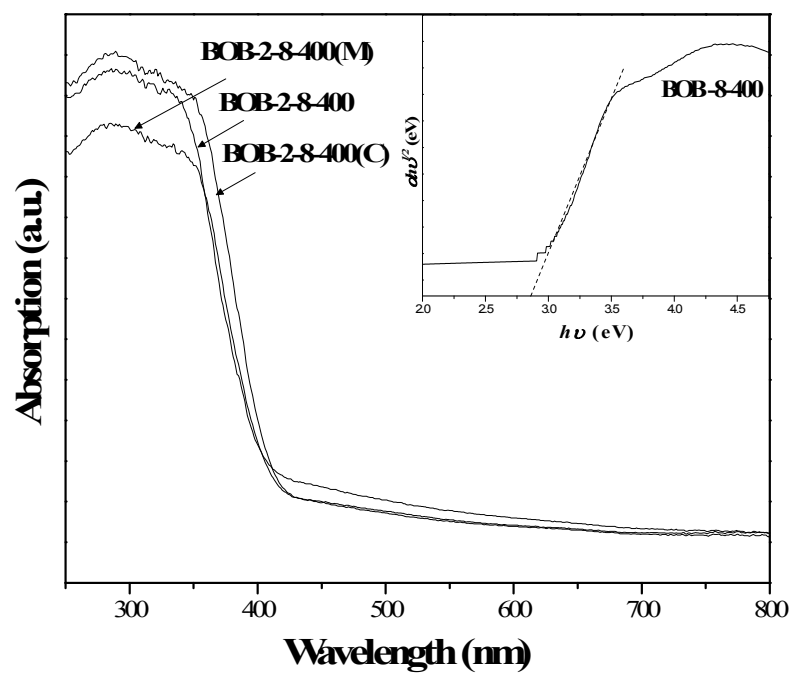
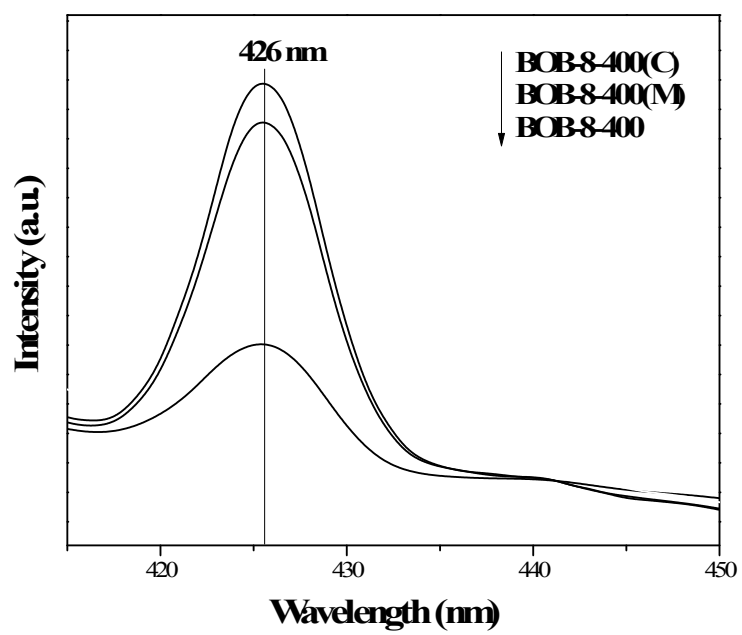
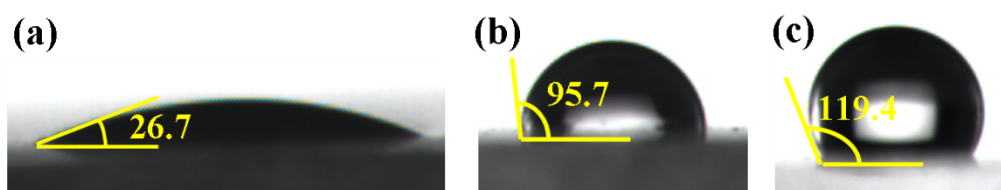


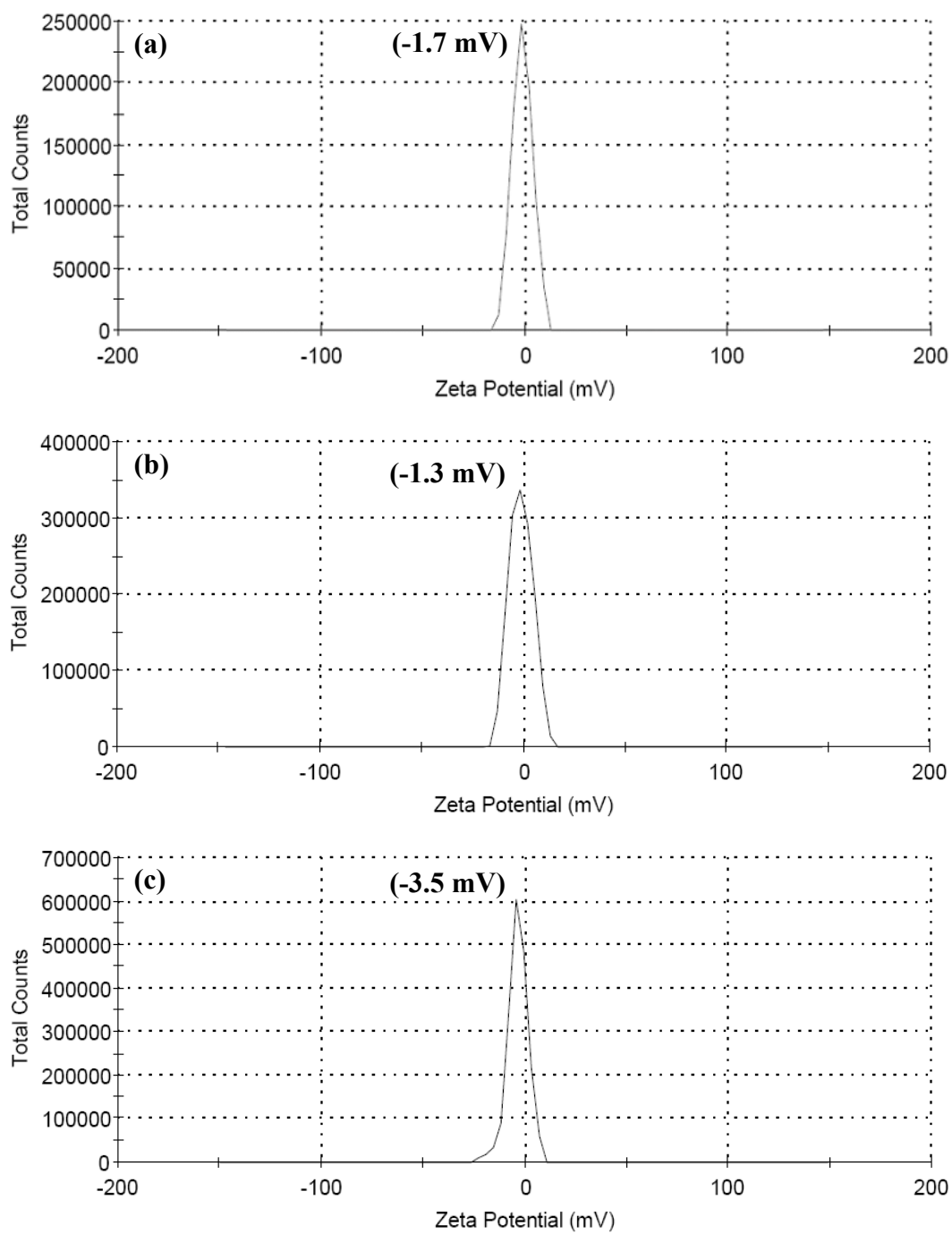
Fig. S12 UV-vis DRS spectra of different samples.



**Fig. S13** PL spectra of different samples. Excitation wavelength = 400 nm.

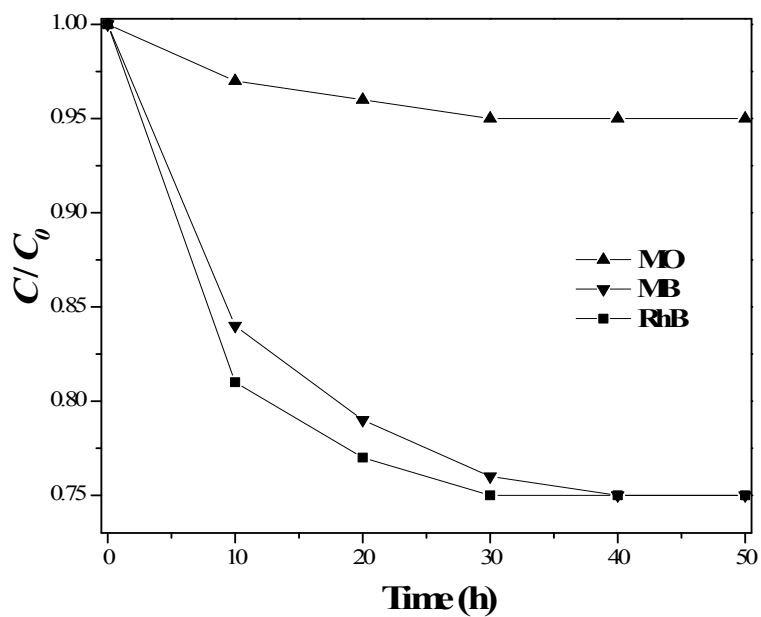


**Fig. S14** Images of water droplet on (a) BOB-8-400, (b) BOB-8-400(M) and (c) BOB-8-400(C) films with contact angle.

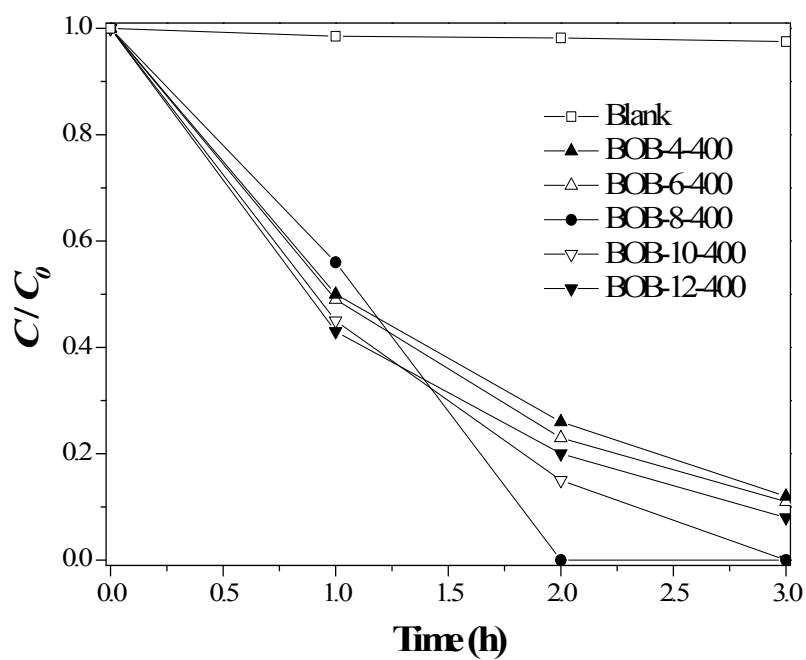


**Fig. S15** Surface Zeta potential measurements of (a) BOB-8-400, (b) BOB-8-400(M) and (c) BOB-8-400(C) films.

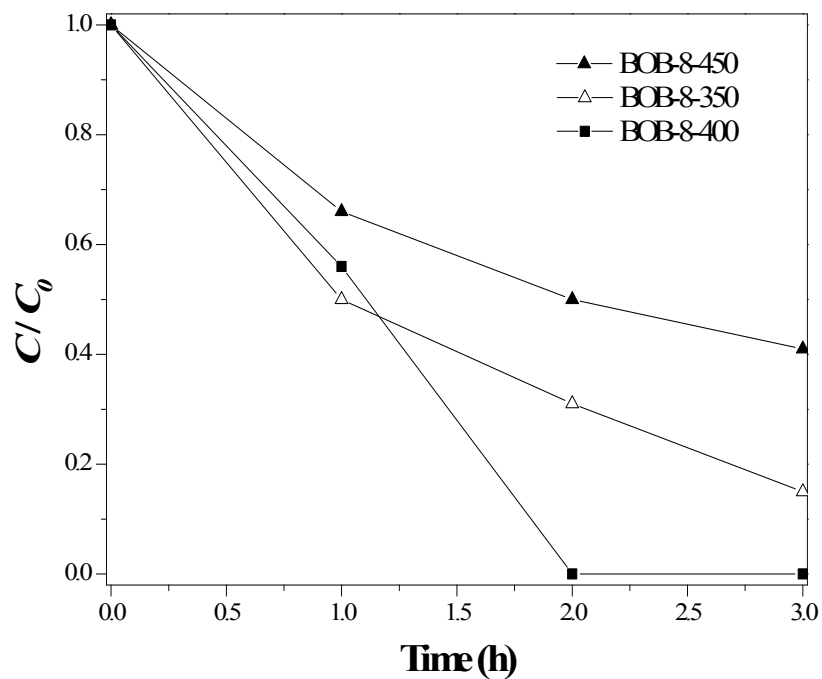




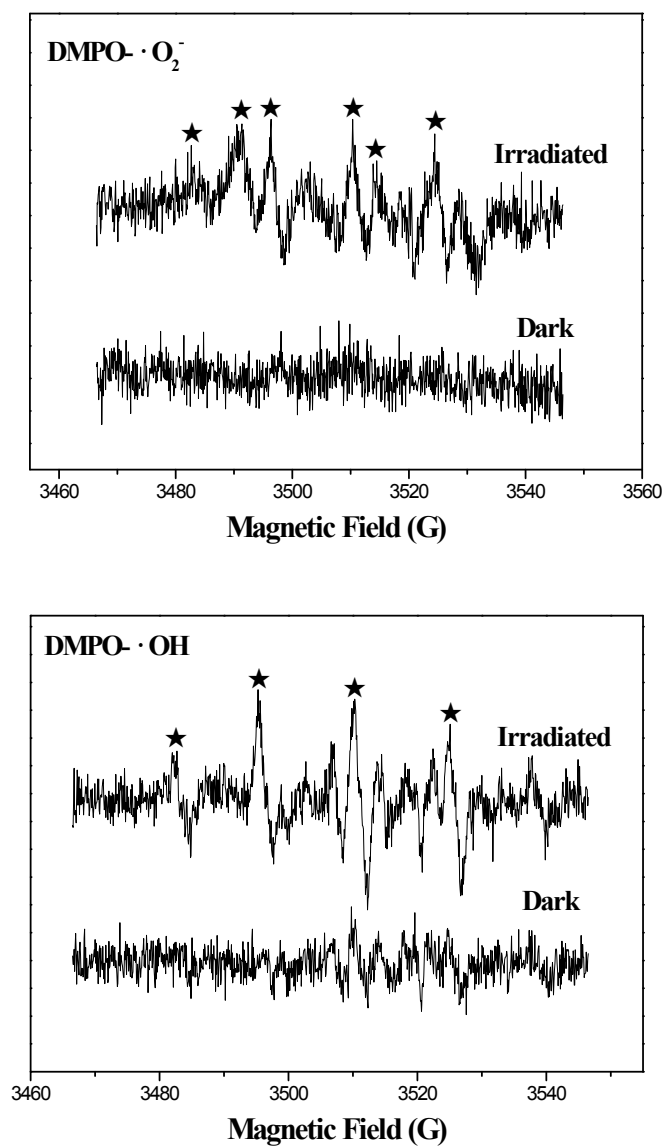
**Fig. S16** Adsorption property of different dyes on BOB-8-400 film in rotating disk reactor. The inserted images presented the color of different dyes after reaching adsorption equilibrium. Adsorption conditions: four glass sheets (each size =  $2.5 \times 2.2$  cm) coated with catalysts on the disk, 55 mL 13 mg/L aqueous dye solution, reaction temperature = 30 °C, rotating speed = 90 rpm.



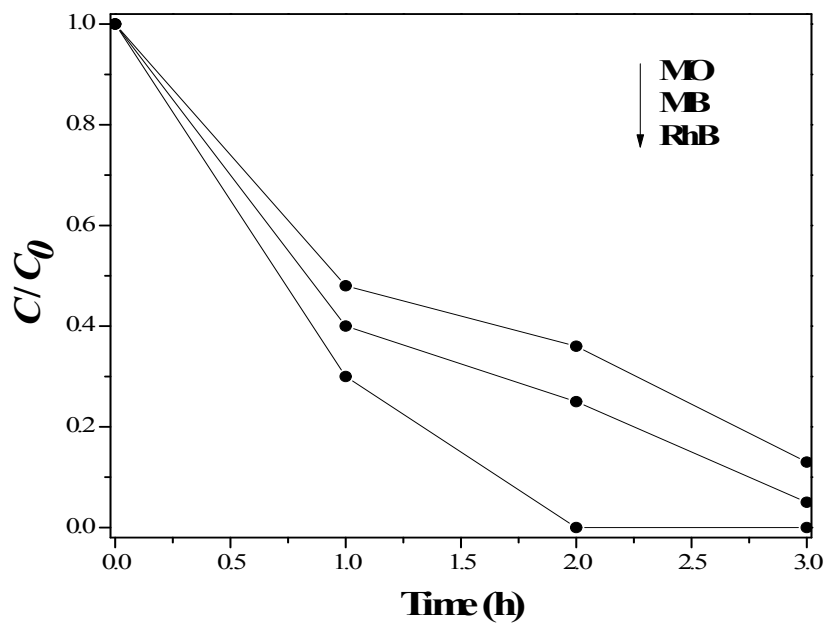
**Fig. S17** Photocatalytic degradation of RhB on different BiOBr films. Reaction conditions: four glass plates (each size =  $2.5 \times 2.2$  cm) coated with catalysts localized on the disk, 55 mL 10 mg/L RhB aqueous solution, reaction temperature = 30 °C, one 300 W Xe lamp (light intensity =  $600 \text{ mW/cm}^2$ ,  $\lambda > 420 \text{ nm}$ ), rotating speed = 90 rpm.



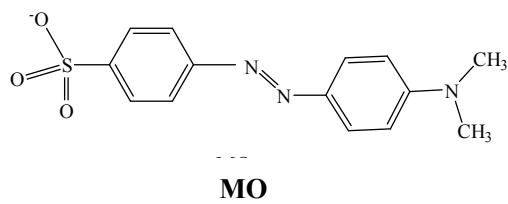
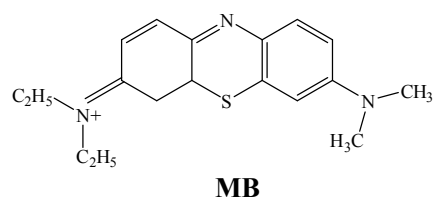
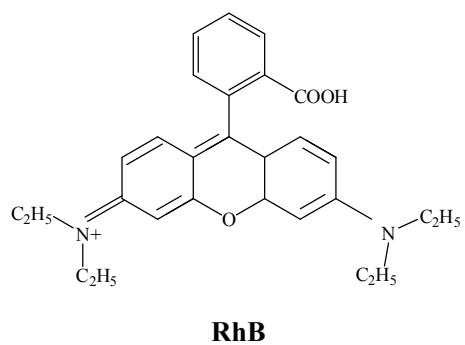
**Fig. S18** Photocatalytic degradation of RhB on different BiOBr films. Reaction conditions: four glass plates (each size =  $2.5 \times 2.2$  cm) coated with catalysts localized on the disk, 55 mL 10 mg/L RhB aqueous solution, reaction temperature = 30 °C, one 300 W Xe lamp (light intensity = 600 mW/cm<sup>2</sup>,  $\lambda > 420$  nm), rotating speed = 90 rpm.



**Fig. S19** ESR spectra of DMPO- $\cdot$ O<sub>2</sub><sup>-</sup> (top) and DMPO- $\cdot$ OH (bottom) adducts on BOB-8-400 catalyst without RhB under visible light irradiation ( $\lambda > 420$  nm) and in dark, respectively.



**Fig. S20** Photodegradation of different dyes on BOB-8-400 film. Reaction conditions: four glass plates (each size = 2.5 × 2.2 cm) coated with catalysts localized on the disk, 55 mL 13 mg/L aqueous dye solution, reaction temperature = 30 °C, reaction time = 1 h, one 300 W Xe lamp (light intensity = 600 mW/cm<sup>2</sup>), rotating speed = 90 rpm.



**Scheme S1** Molecular structure of different organic dye compounds.