

Fig. S1 FT-IR spectra of $\text{BiOCl}_{0.5}\text{I}_{0.5}$, BiOCl and BiOI

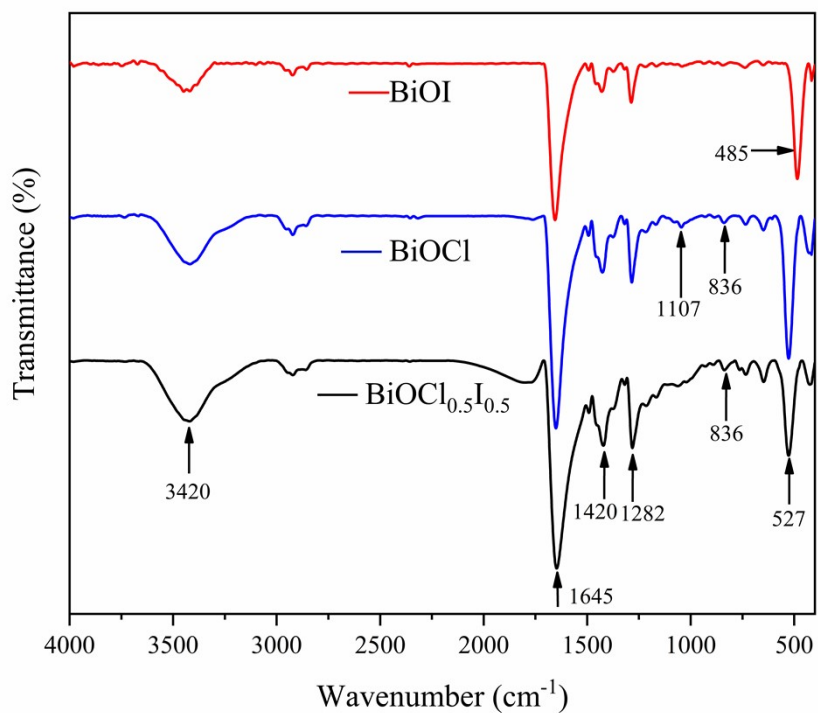


Fig. S2 PL spectra of $\text{BiOCl}_{0.5}\text{I}_{0.5}$, BiOCl and BiOI

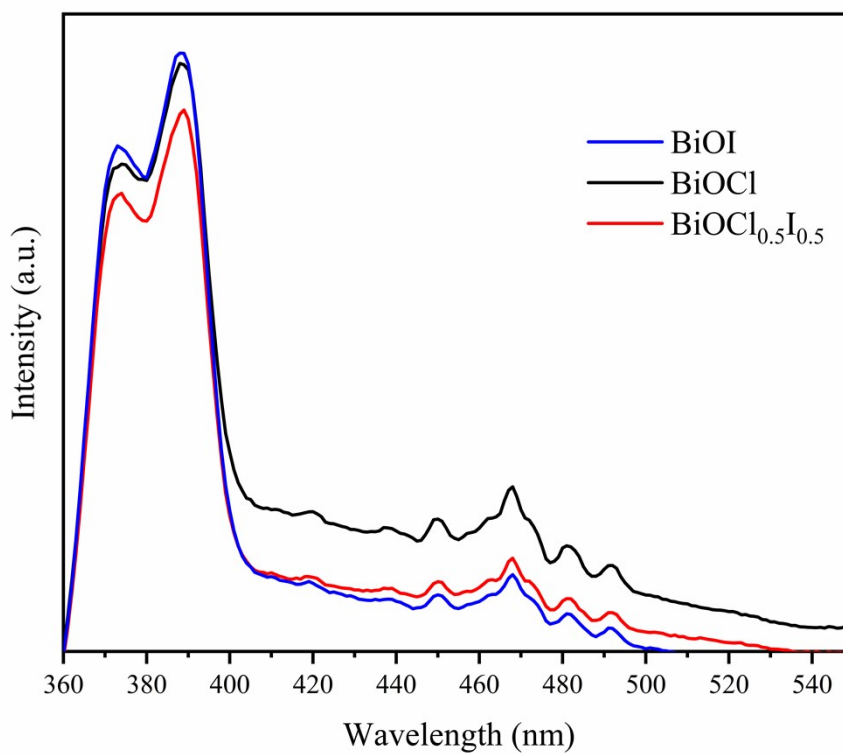


Fig. S3 Variation of reaction rate constant k under different reaction systems

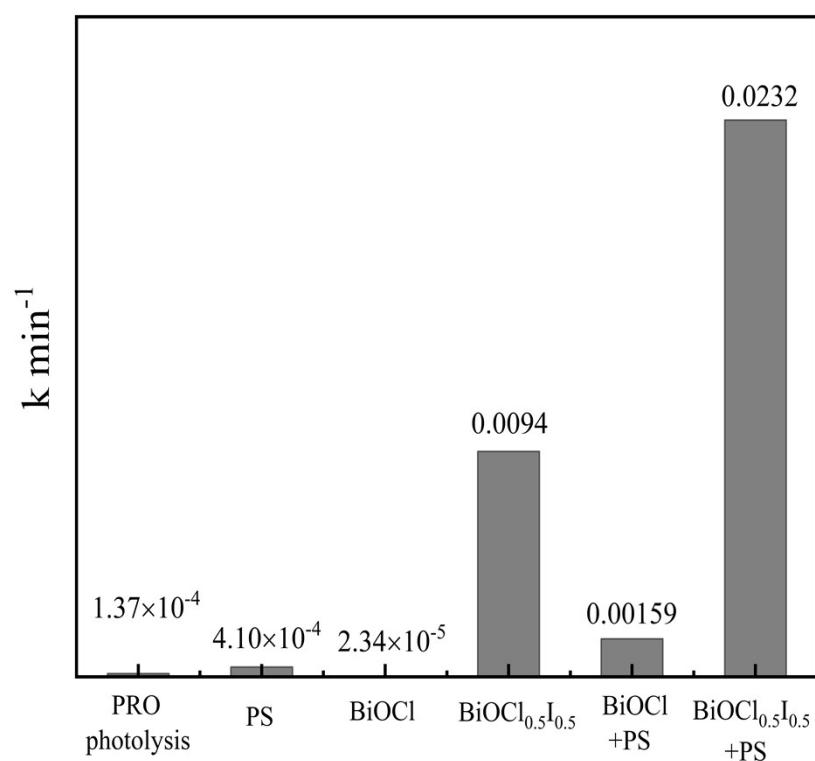


Fig. S4 PRO degradation kinetics on BiOCl, BiOCl_{0.9}I_{0.1}, BiOCl_{0.7}I_{0.3}, BiOCl_{0.5}I_{0.5}, BiOCl_{0.3}I_{0.7}, BiOCl_{0.1}I_{0.9} and BiOI [PS = 0.4 mM, catalysts = 0.01 g, PRO = 10 mg/L]

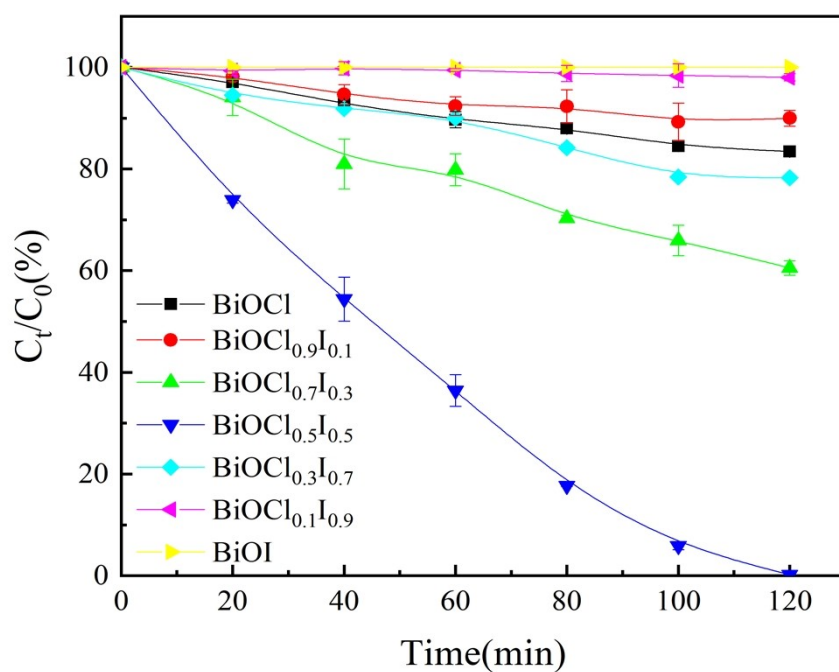


Fig. S5 Variation of reaction rate constant k under different pH conditions

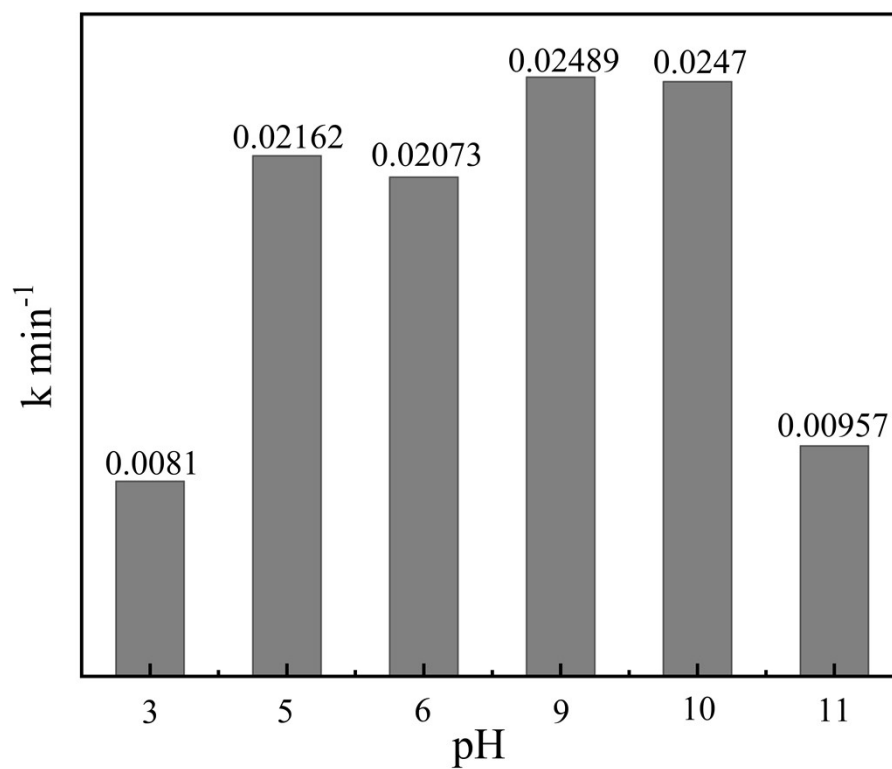


Fig. S6 pH of the solution after the photodegradation

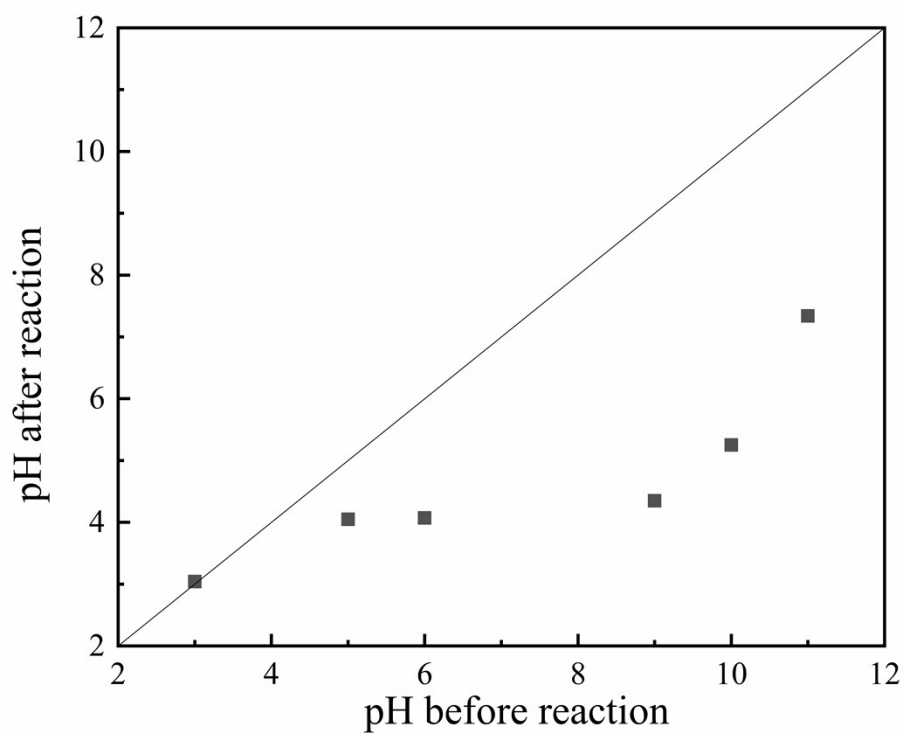


Fig. S7 Effect of initial PRO concentration on PRO degradation [PS = 0.4 mM,

BiOCl_{0.5}I_{0.5} = 0.01 g, PRO = 10 mg/L]

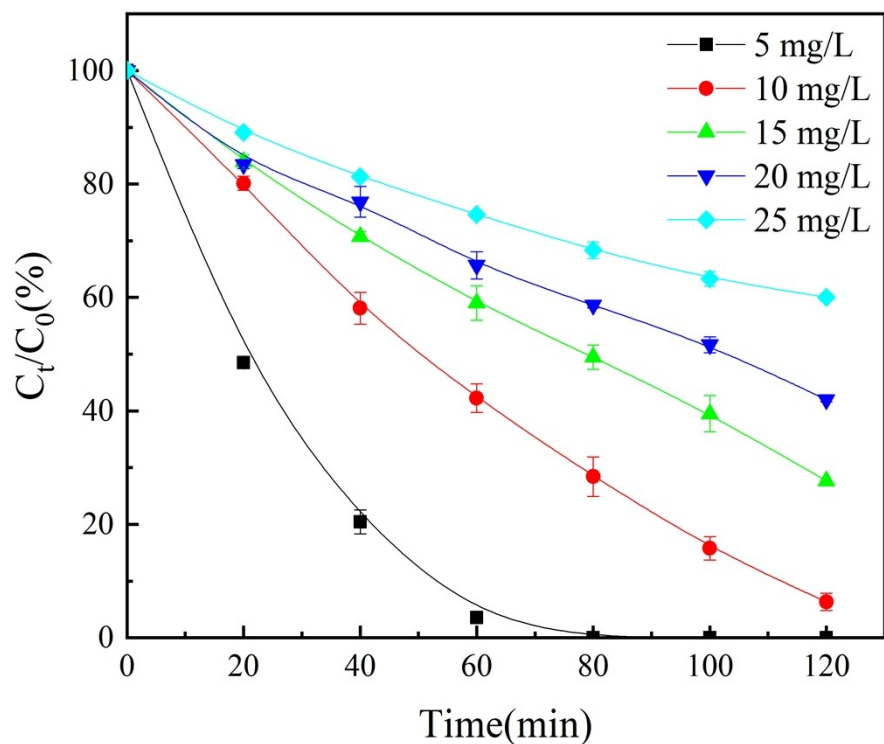


Fig. S8 Variation of reaction rate constant k under different HA concentrations

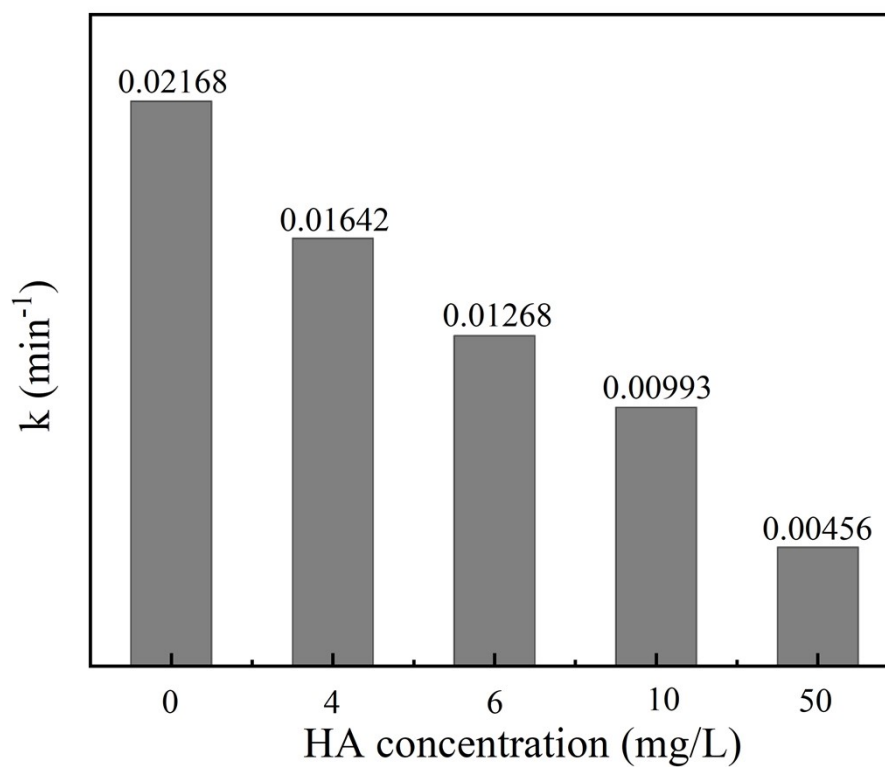


Fig. S9 (a) Cycling experiments of the $\text{BiOCl}_{0.5}\text{I}_{0.5}/\text{PS}$ system [PS = 0.4 mM, $\text{BiOCl}_{0.5}\text{I}_{0.5}$ = 0.01 g, PRO = 10 mg/L] (b) XRD patterns of the fresh and reuse $\text{BiOCl}_{0.5}\text{I}_{0.5}$

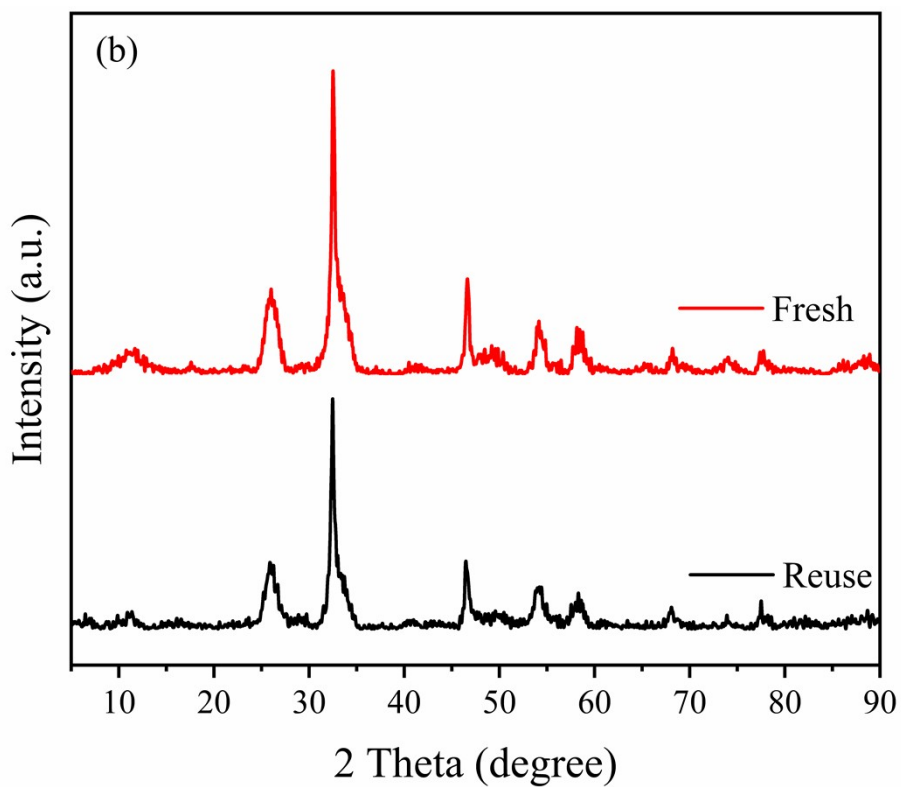
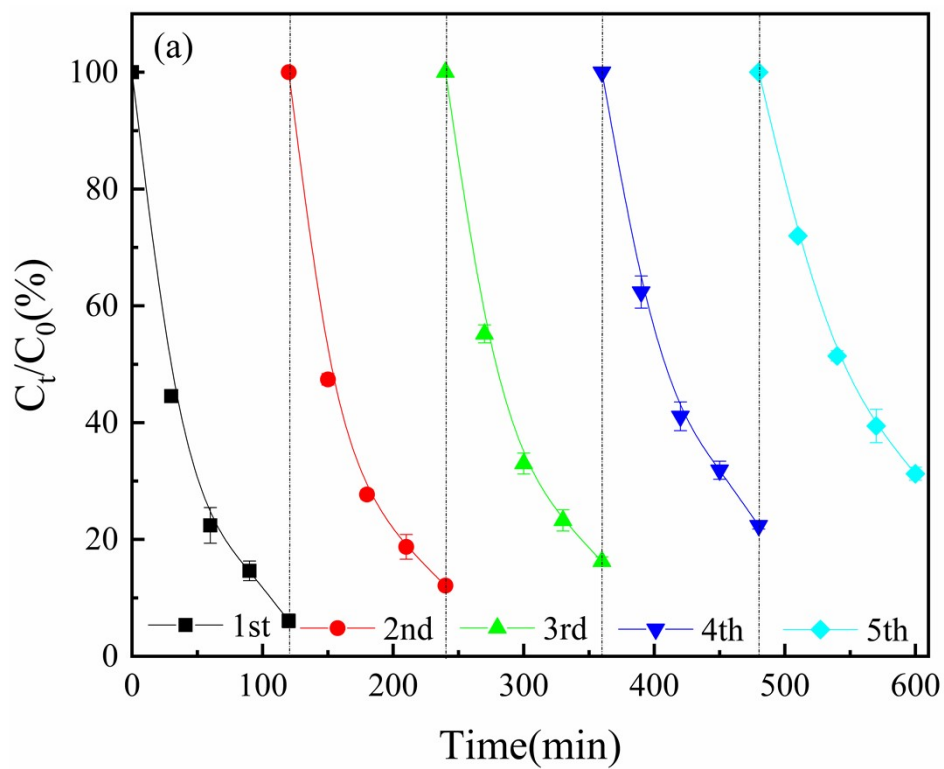


Fig. S10 EPR spectrum results under different conditions

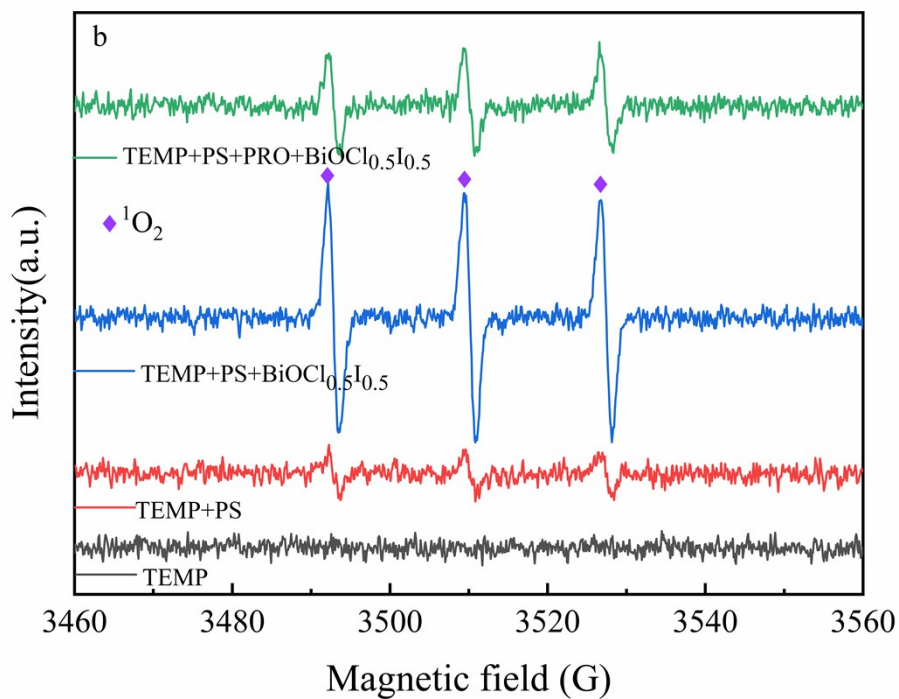
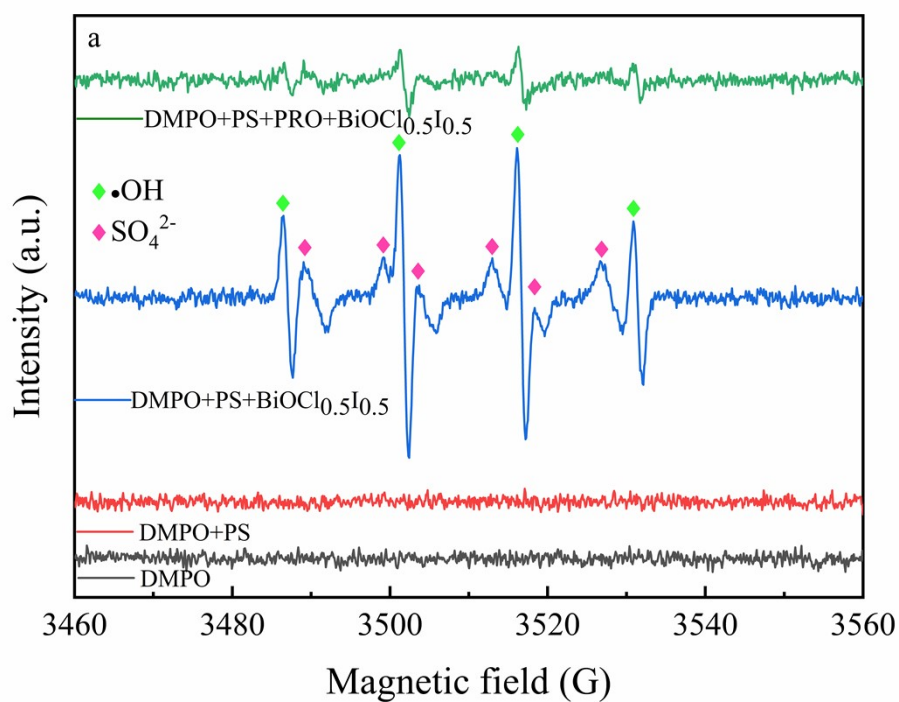


Fig. S11 VB-XPS of $\text{BiOCl}_{0.5}\text{I}_{0.5}$

