

Supplementary information

Phase transformation and heterojunction construction of bismuth oxyiodides by grinding-assistant calcination in the presence of thiourea and its photoactivity

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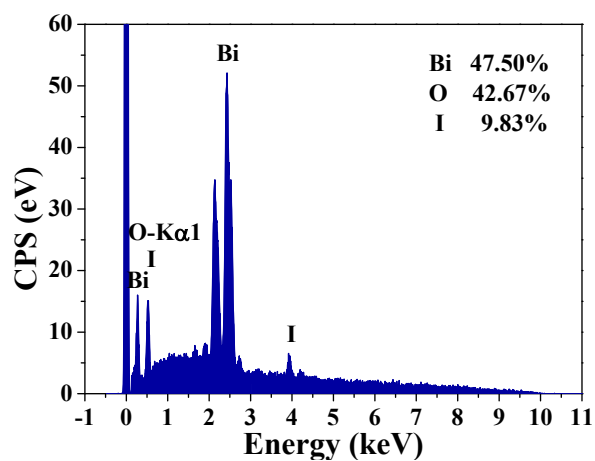


Fig. S1 EDS spectrum of BOI-TU-400°C-h.

Table S1 Comparison of lifetime components (τ_i), contribution of each component (A_i) and average lifetime (τ_A) between BOI-TU-400°C-h and BOI-400°C-h.

Sample	τ_1 (ns)	τ_2 (ns)	A_1 (%)	A_2 (%)	τ_A (ns)
BOI-TU-400°C-h	1.70	22.4	23.6	22.4	0.799
BOI-400°C-h	1.94	21.1	17.5	13.1	0.520

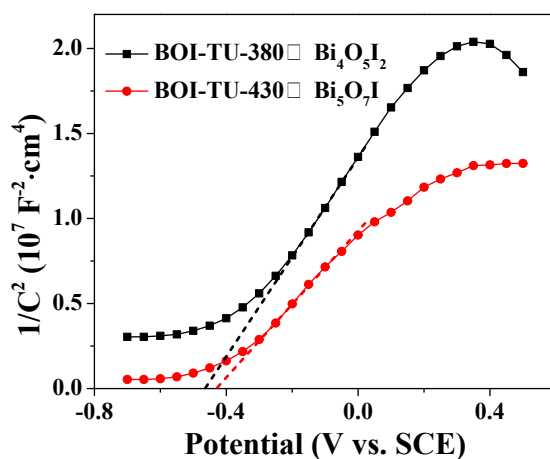


Fig. S2 Mott-Schottky curves of (a) BOI-TU-380°C and (b) BOI-TU-430°C.

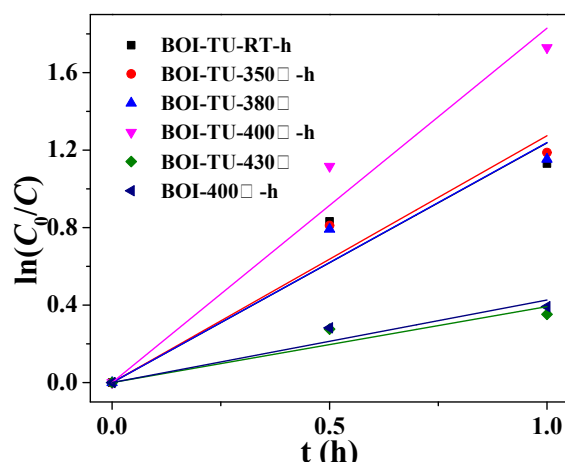


Fig. S3 Pseudo-first-order kinetics degradation plots for tetracycline.

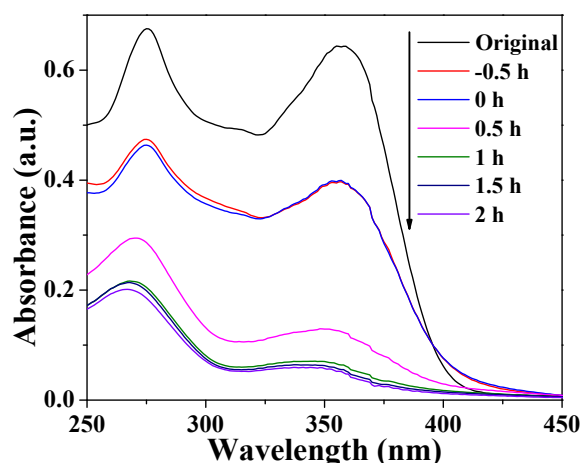


Fig. S4 Time-resolved UV-vis absorption spectral changes of tetracycline.

The contrastive samples were prepared by hydrolysis-assistant annealing route as following. 13 mmol of TU was dissolved in 20 mL deionized water. Then 1 mmol of $\text{Bi}(\text{NO}_3)_3 \cdot 5\text{H}_2\text{O}$ was completely dissolved in the above solution to form a wine-red transparent solution. KI solution (0.5 mmol of KI added in 5 mL deionized water) was then added in the above solution dropwise. After stirring for 12 hours, the orange deposit was collected by washing with deionized water and ethanol for three times, and then dried under ambient condition. Then the samples was heated to 400 °C at a heating rate of 1 °C/min and annealed for 4 h in a muffle furnace.

The light yellow product was washed with deionized water and ethanol, and dried under ambient conditions. Various products were prepared by changing calcination temperature, denoted as BOI-TU-T-hyd. The sample $\text{Bi}_4\text{O}_5\text{I}_2/\text{BiOI}$

obtained without calcining was denoted as BOI-TU-RT-hyd. The photocatalytic performance of these contrastive samples is shown in Fig. S5. The photodegradation efficiencies of tetracycline in 1 h is 42%, 28%, 72%, 29% for BOI-TU-RT-hyd, BOI-TU-350°C-hyd, BOI-TU-400°C-hyd, and BOI-TU-450°C-hyd, respectively.

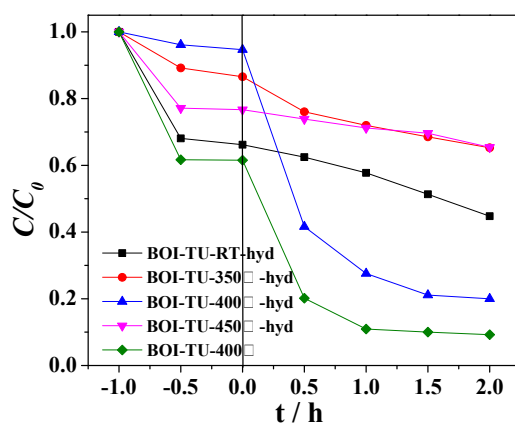


Fig. S5 Photodegradation efficiency of tetracycline on as-prepared catalysts by hydrolysis-assistant annealing route.

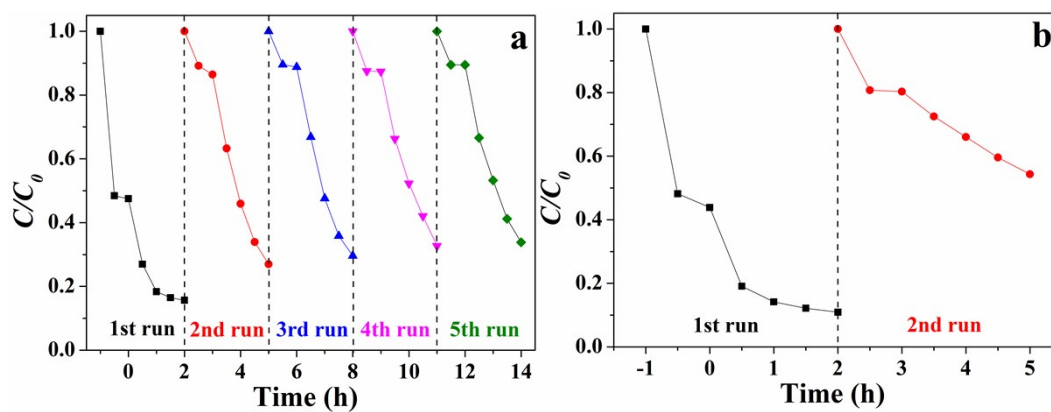


Fig. S6 Recycling tests for the degradation of TC over (a) BOI-TU-400°C-h and (b) BOI-TU-RT-h.

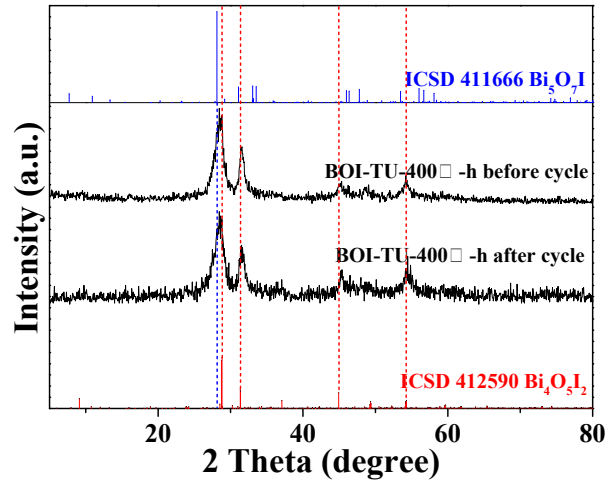


Fig. S7 XRD patterns of the as-prepared BOI-TU-400°C-h before and after 4 cycles.

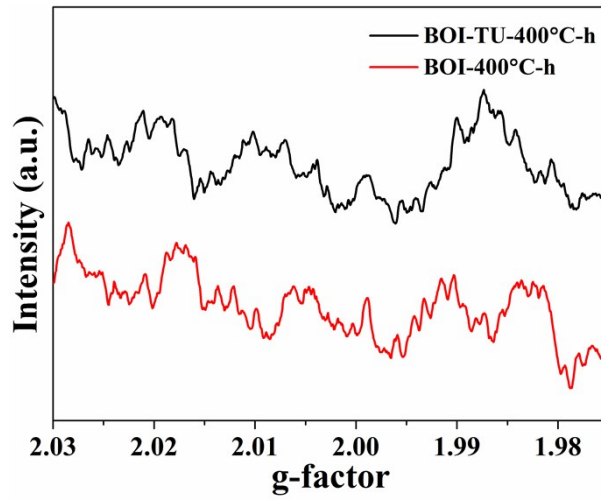


Fig. S8 ESR spectra of BOI-TU-400°C-h and BOI-TU-RT-h.

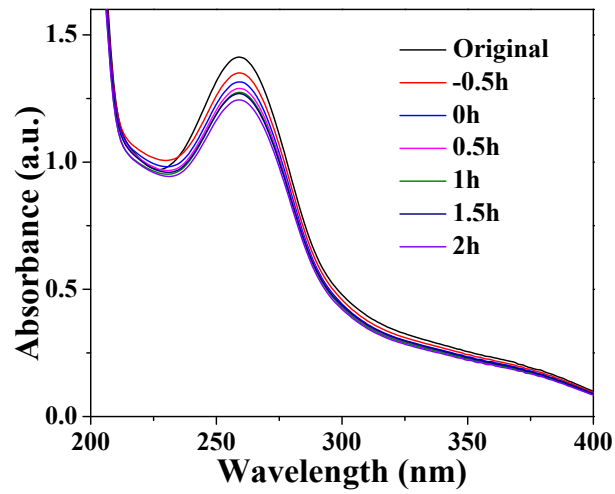


Fig. S9 UV-vis spectra of NBT transformations in BOI-TU-400°C-h photocatalytic system.