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Supporting Information

Enhanced photocatalytic degradation of organic pollutants and hydrogen production by a visible light-responsive Bi₂WO₆/ZnIn₂S₄ heterojunction

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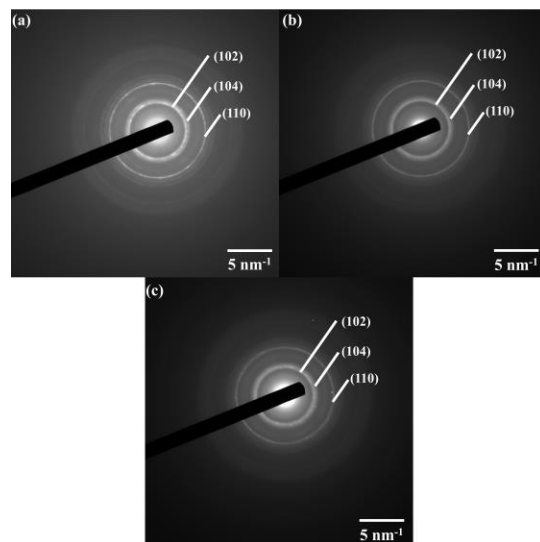


Fig. S1. SAED patterns of the ZnIn_2S_4 samples synthesized using (a) 30, (b) 45 and (c) 60 cycles of microwave irradiation.

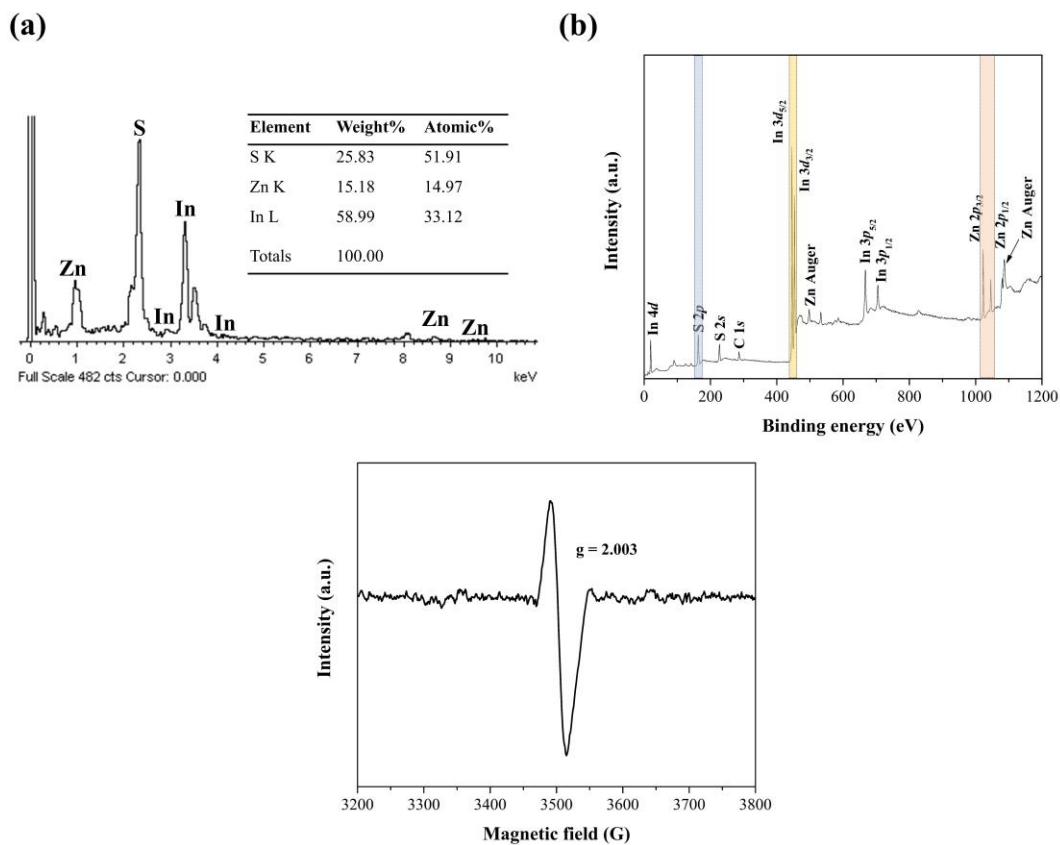


Fig. S2. (a) EDS, (b) survey XPS and (c) EPR spectra of the synthesized ZnIn_2S_4 material.

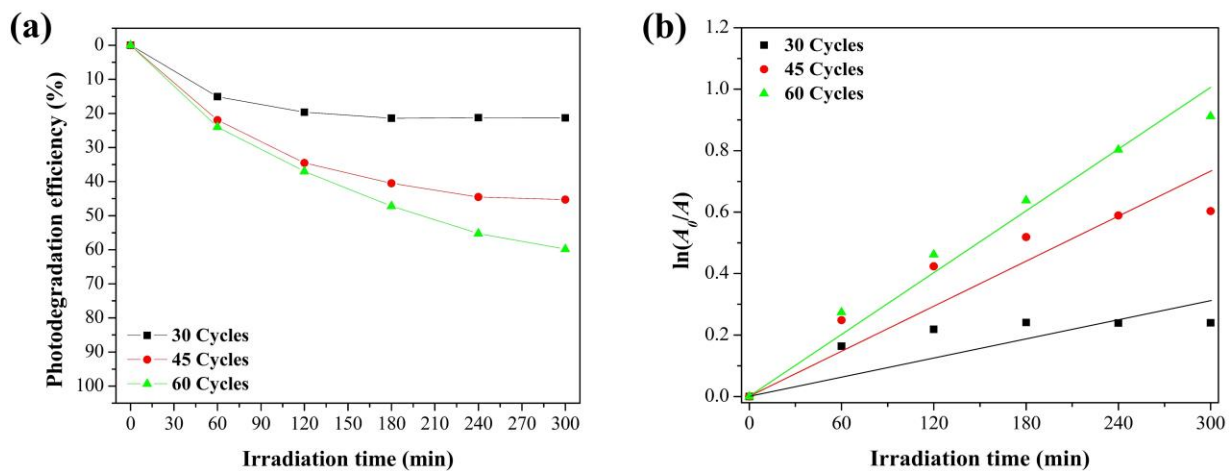


Fig. S3. (a) Photodegradation efficiency of the ZnIn₂S₄ photocatalyst samples towards MB and (b) the corresponding kinetic plots.

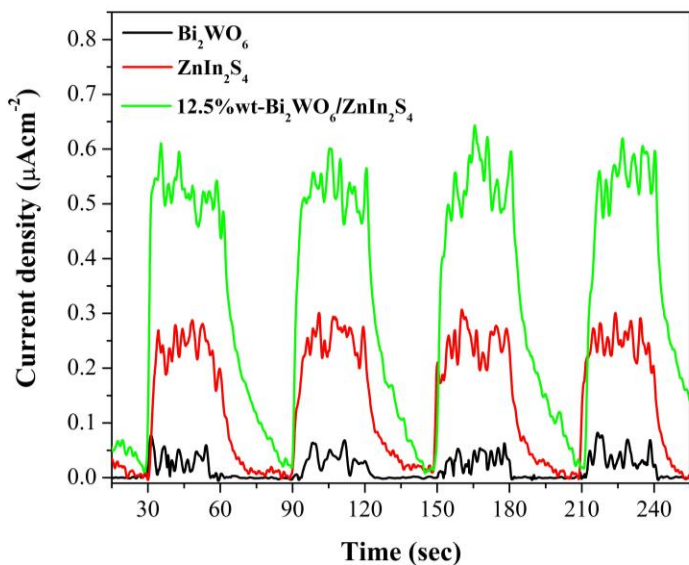


Fig. S4. Transient photocurrent response of Bi₂WO₆, ZnIn₂S₄ and 12.5% wt-Bi₂WO₆/ZnIn₂S₄.

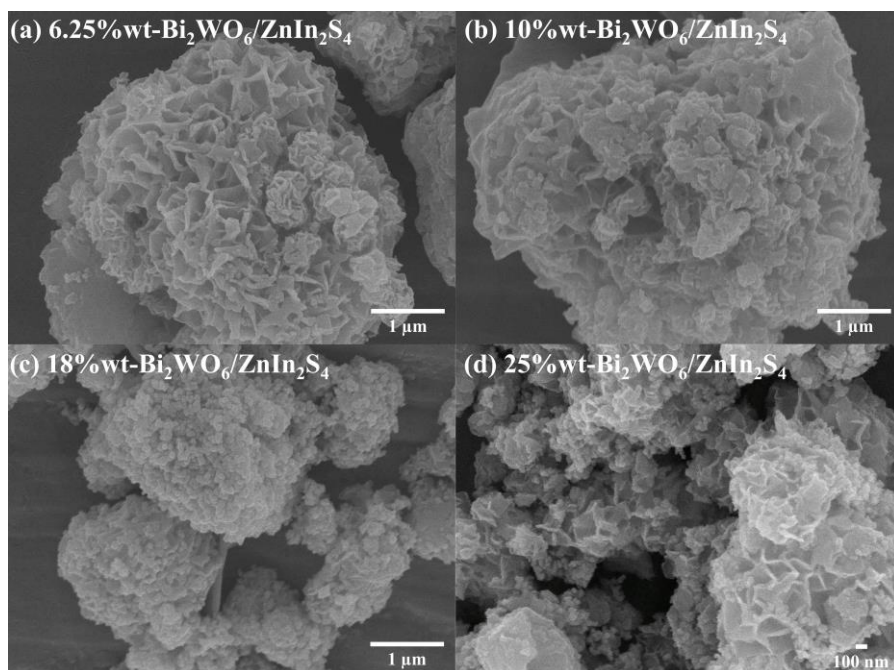


Fig. S5. FESEM images of the $\text{Bi}_2\text{WO}_6/\text{ZnIn}_2\text{S}_4$ nanocomposites with (a) 6.25, (b) 10, (c) 18 and (d) 25 %wt of Bi_2WO_6 , respectively.

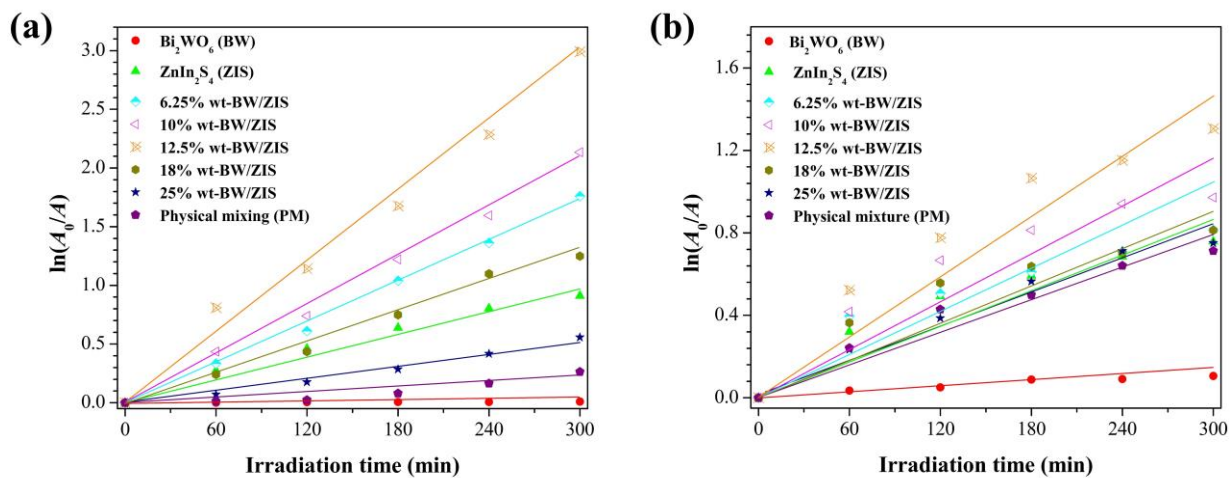


Fig. S6. Kinetic plots of the photocatalytic degradations of (a) MB and (b) SA.

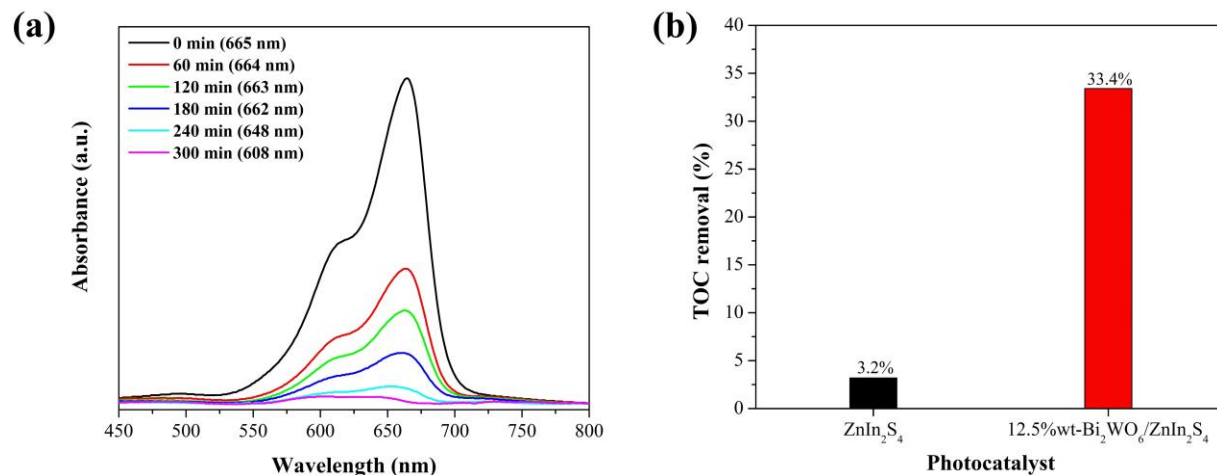


Fig. S7. (a) The changes in the absorption spectra during the photodegradation process of the MB in the presence of the 12.5%wt-Bi₂WO₆/ZnIn₂S₄ photocatalyst and (b) TOC removal of MB over 12.5%wt-Bi₂WO₆/ZnIn₂S₄ and ZnIn₂S₄ under 300 min of visible-light irradiation.

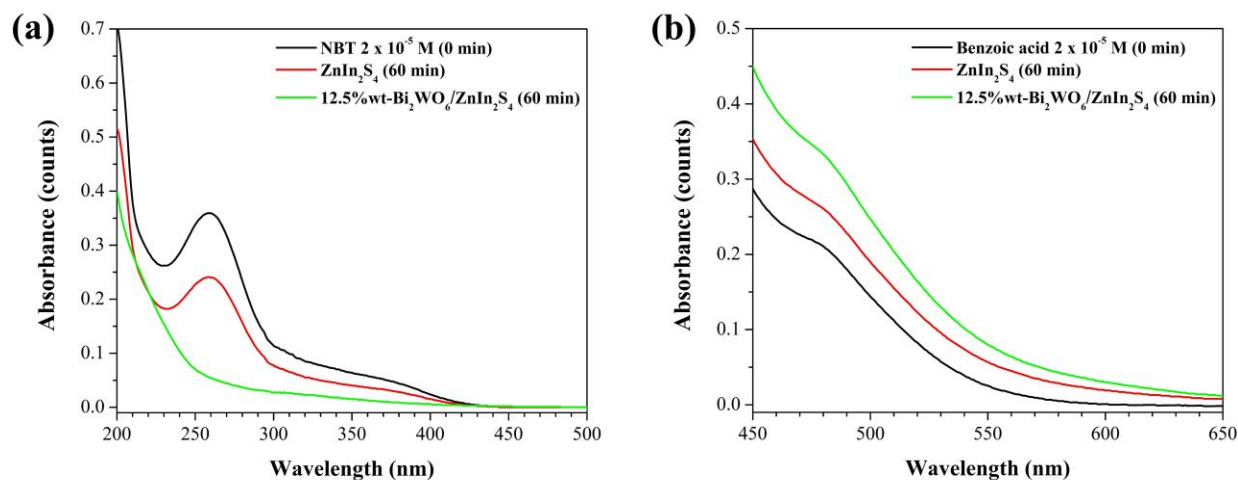


Fig. S8. The detection of O₂^{•-} and •OH radicals using nitrotetrazolium blue (NBT) transformation and benzoic acid hydroxylation methods, respectively. The absorption spectra of (a) nitrotetrazolium blue and (b) Fe(III)-hydroxybenzoic acid complex supernatant solutions.

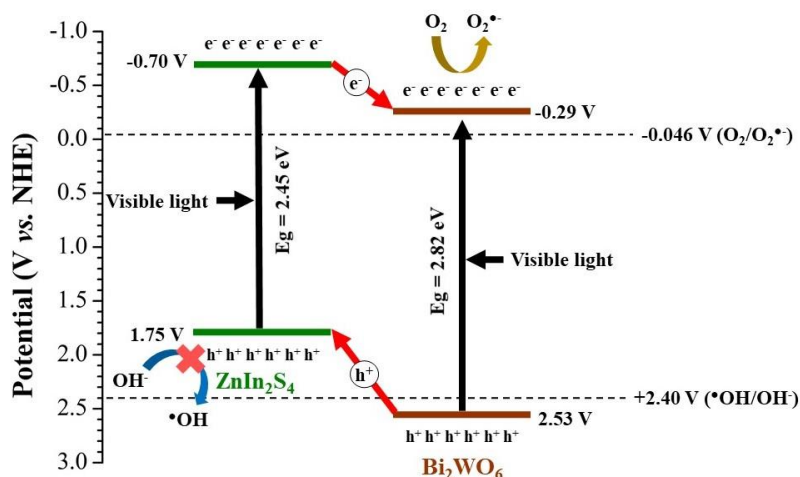


Fig. S9. A conventional charge transfer mechanism of 12.5% wt- $\text{Bi}_2\text{WO}_6/\text{ZnIn}_2\text{S}_4$ heterojunction.

Table S1. Photodegradation efficiency (%DE), calculated initial rate constants (k , min^{-1}) and the corresponding coefficient of determination (R^2) of the photocatalysts toward SA and MB photodegradation.

Photocatalysts	Methylene blue			Salicylic acid		
	%DE	k (min^{-1})	R^2	%DE	k (min^{-1})	R^2
Bi_2WO_6	0.97	0.00003	0.9831	14.0	0.0006	0.9809
ZnIn_2S_4	59.8	0.0033	0.9916	53.2	0.0029	0.9656
6.25% wt- $\text{Bi}_2\text{WO}_6/\text{ZnIn}_2\text{S}_4$	82.8	0.0057	0.9988	55.7	0.0031	0.9592
10% wt- $\text{Bi}_2\text{WO}_6/\text{ZnIn}_2\text{S}_4$	88.2	0.0069	0.9983	62.1	0.0039	0.9599
12.5% wt- $\text{Bi}_2\text{WO}_6/\text{ZnIn}_2\text{S}_4$	95.0	0.0098	0.9966	72.9	0.0050	0.9707
18% wt- $\text{Bi}_2\text{WO}_6/\text{ZnIn}_2\text{S}_4$	71.3	0.0042	0.9964	55.6	0.0031	0.9562
25% wt- $\text{Bi}_2\text{WO}_6/\text{ZnIn}_2\text{S}_4$	42.7	0.0017	0.9927	52.8	0.0028	0.9875
Physical mixture (PM)	23.1	0.0007	0.9970	51.0	0.0026	0.9812