

Supplementary data

Fabrication of novel few-layer WS₂/Bi₂MoO₆ plate-on-plate heterojunction structure with enhanced visible-light photocatalytic activity

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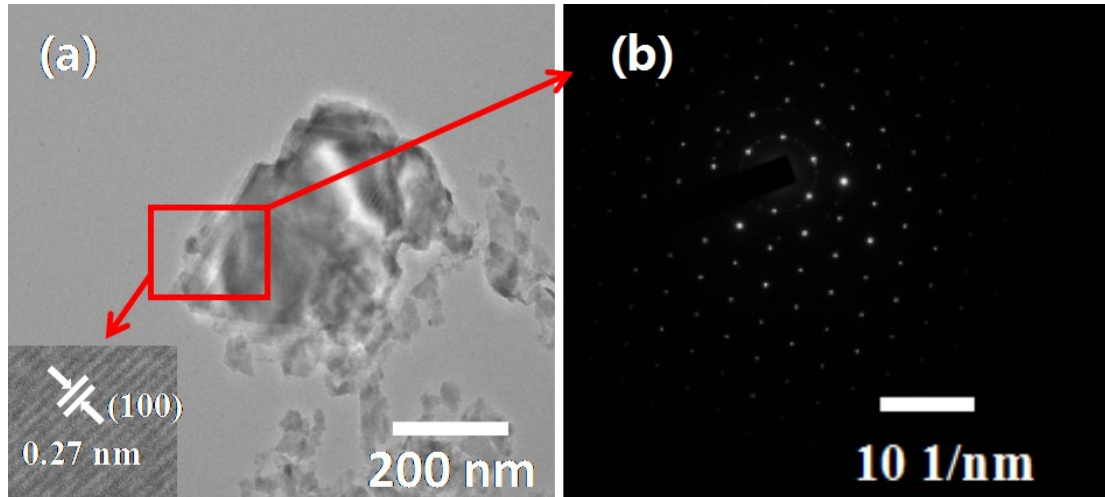


Fig. S1 (a) TEM and (b) the selected area electron diffraction (SAED) pattern of a few layers of WS₂ nanosheets. Inset: HRTEM image of a few layers of WS₂ nanosheets.

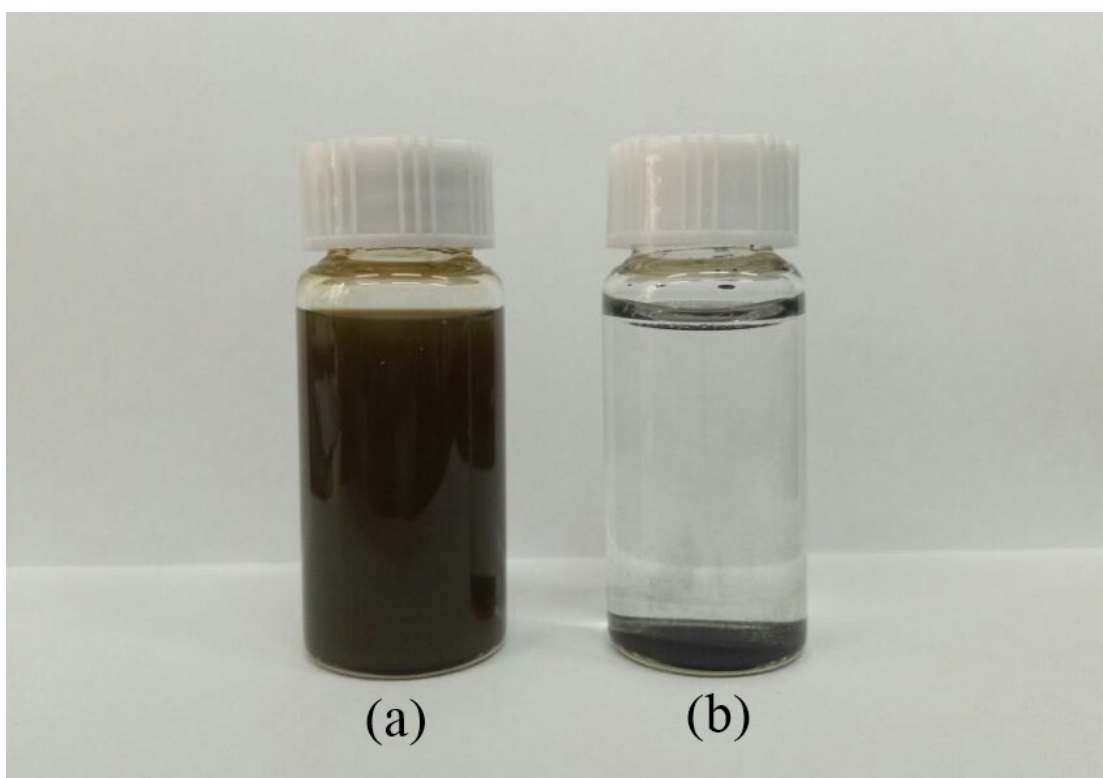


Fig. S2 The photographs of a few layers of WS₂ nanosheets (a) and bulk WS₂ (b) in the ethanol/water mixtures with ethanol volume fractions of 35% after being stored for 20 days.

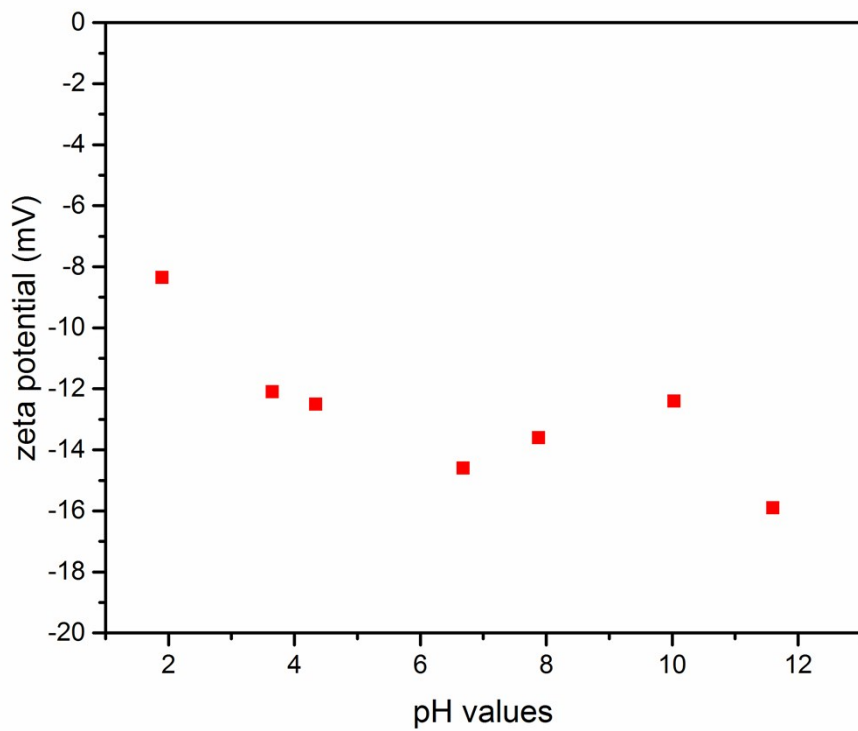


Fig. S3 zeta potential of a few layers of WS₂ nanosheets measured in ethanol solution with adjusted pH range.

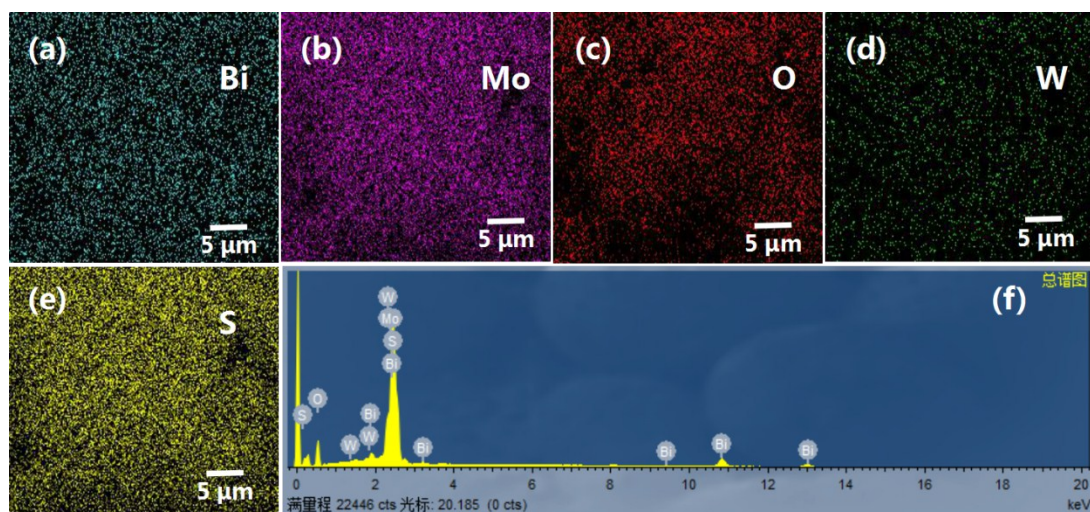


Fig. S4 Energy dispersive X-ray spectroscopy (EDS) distribution maps of sample: (a-e) EDS elemental mapping and (f) EDS spectrum of the hierarchical $\text{WS}_2/\text{Bi}_2\text{MoO}_6$ composite (5 wt% of WS_2).

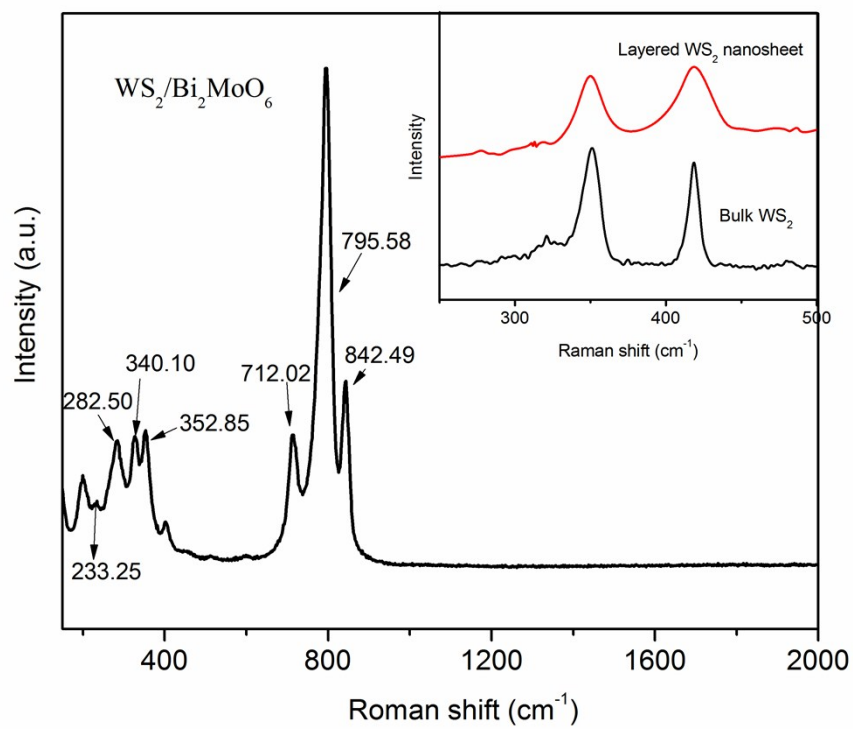


Fig. S5 Raman spectrum of the hierarchical $\text{WS}_2/\text{Bi}_2\text{MoO}_6$ composite (5 wt% of WS_2).
Inset: Raman spectra of the a few layers of WS_2 nanosheets and bulk WS_2 .

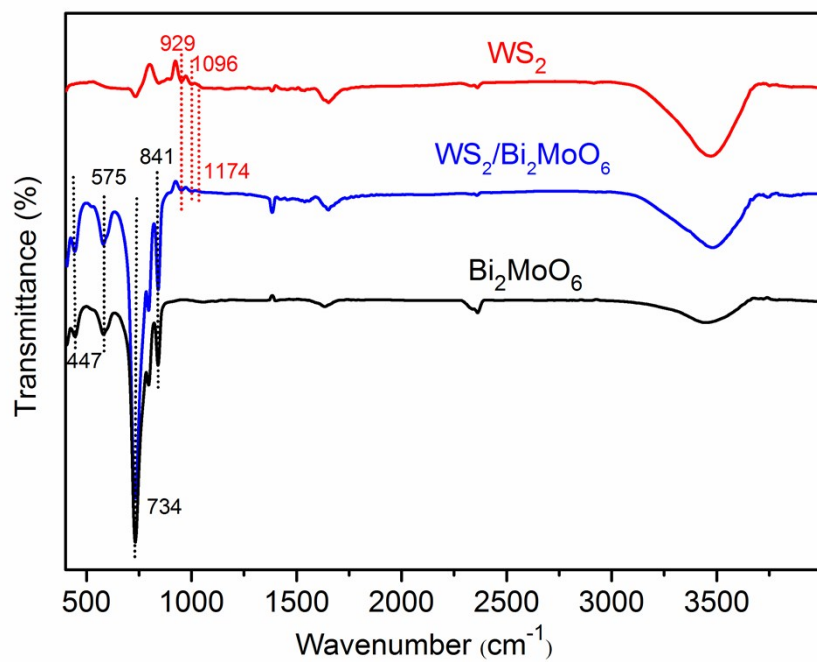


Fig. S6 FT-IR spectra of the pure Bi_2MoO_6 , WS_2 and the hierarchical $\text{WS}_2/\text{Bi}_2\text{MoO}_6$ composite (5 wt% of WS_2).

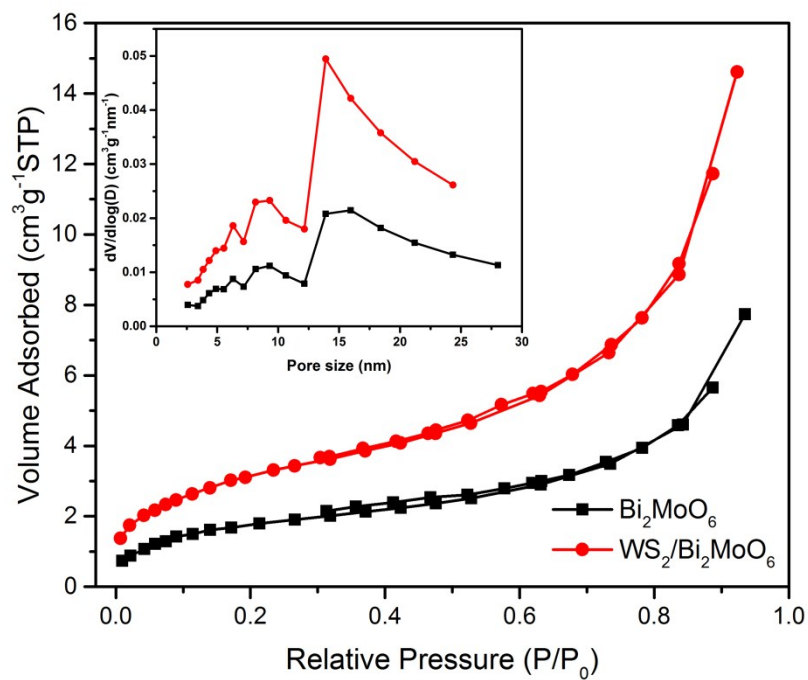


Fig. S7 N_2 adsorption-desorption isotherms of Bi_2MoO_6 and the hierarchical $\text{WS}_2/\text{Bi}_2\text{MoO}_6$ composite (5 wt% of WS_2); the inset is the corresponding pore size distributions.

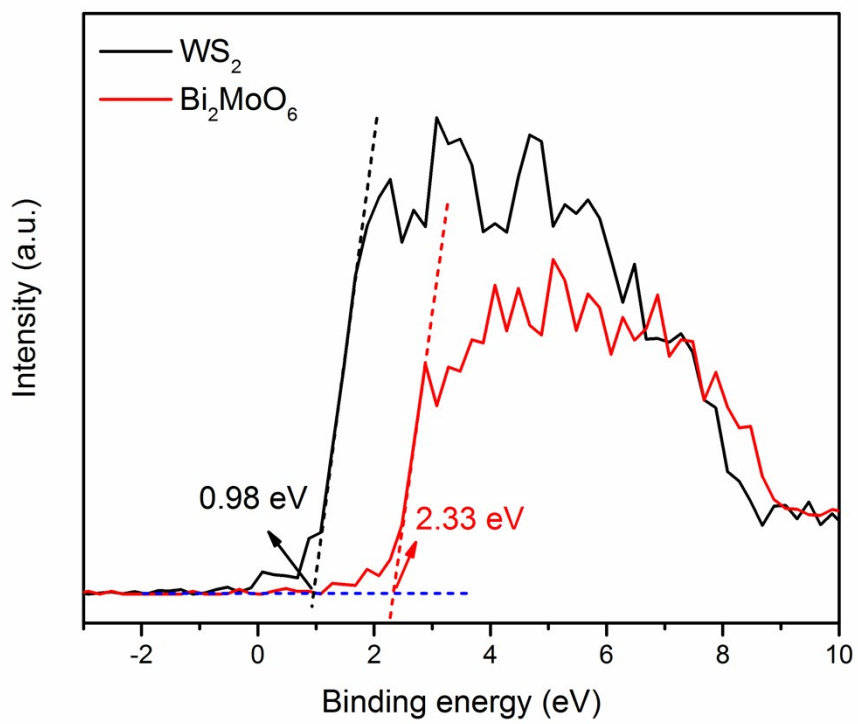


Fig. S8 XPS valence band (VB) spectra of WS₂ and Bi₂MoO₆.



Fig. S9 The SEM micrograph of the hierarchical $\text{WS}_2/\text{Bi}_2\text{MoO}_6$ composite (5 wt% of WS_2) after the recycle experiments.

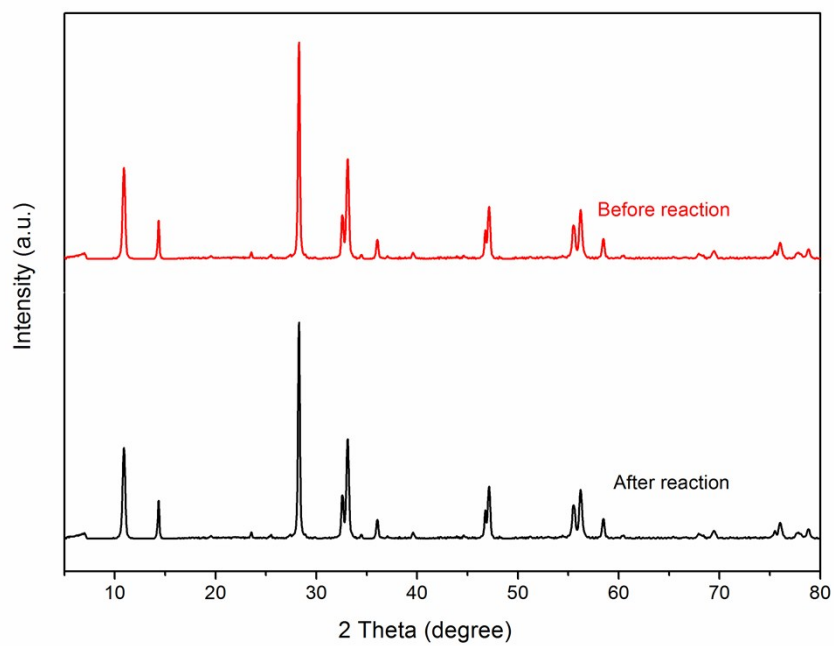


Fig. S10 The XRD patterns of the hierarchical $\text{WS}_2/\text{Bi}_2\text{MoO}_6$ composite (5 wt% of WS_2) before and after photocatalytic reaction.

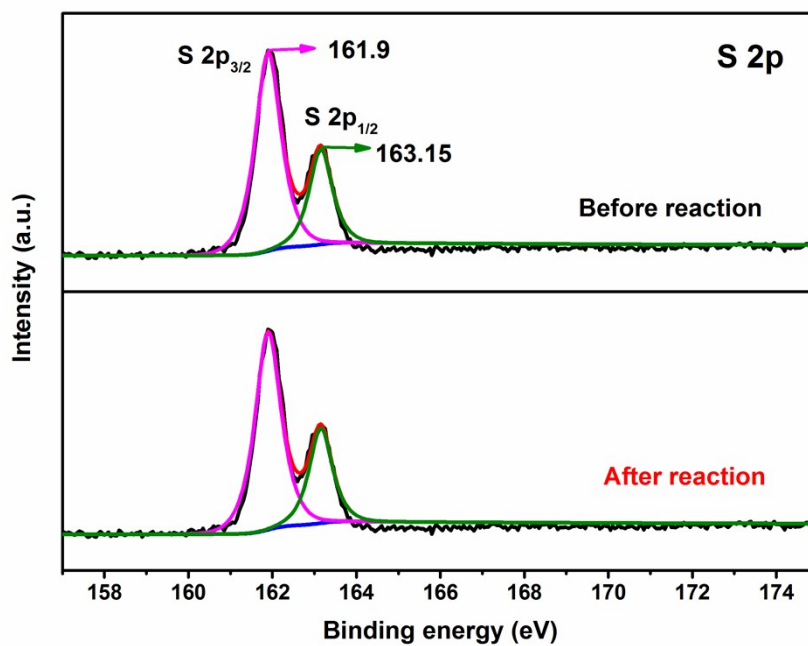


Fig. S11 The high-resolution XPS spectra of S 2p for the hierarchical WS₂/Bi₂MoO₆ composite (5 wt% of WS₂) before and after photocatalytic reaction.

Table S1 The first-order rate constants for RhB degradation with as-synthesized samples under visible light irradiation.

Photocatalysts	Rate constant (min ⁻¹)	Correlation coefficient
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	¹⁾	(R ²)
Blank	0.0005	0.9202
WS ₂	0.0036	0.9939
Bi ₂ MoO ₆	0.0081	0.9994
1 wt% WS ₂ /Bi ₂ MoO ₆	0.0103	0.9978
3 wt% WS ₂ /Bi ₂ MoO ₆	0.0157	0.9845
5 wt% WS ₂ /Bi ₂ MoO ₆	0.0367	0.9745
7 wt% WS ₂ /Bi ₂ MoO ₆	0.0087	0.9975
Physical mixture of Bi ₂ MoO ₆ and WS ₂	0.0098	0.9991