

Electronic Supplementary Information

Coupling with a narrow-band-gap semiconductor for enhancement of visible-light photocatalytic activity: preparation of $\text{Bi}_2\text{O}_x\text{S}_{3-x}$ / Nb_6O_{17} and application for degradation of methyl orange

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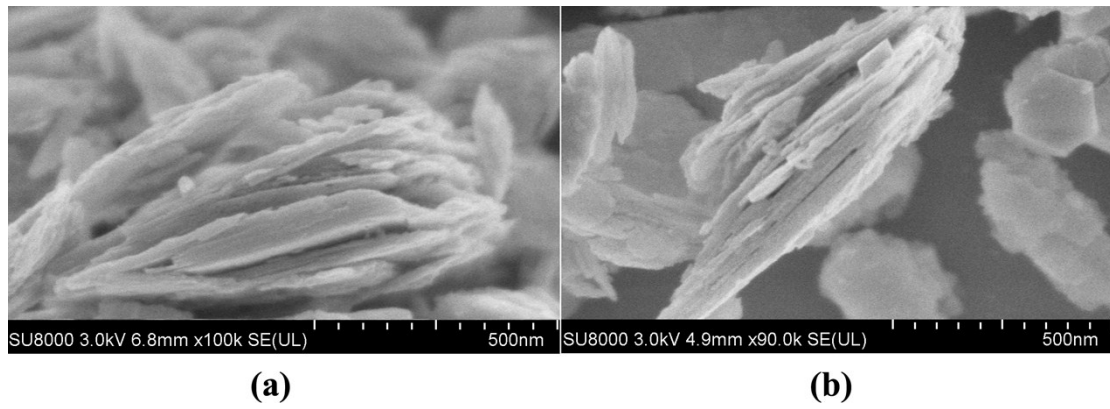


Fig. S1 The SEM images of Bi/Nb-0.1g, which reveals $\text{Bi}_2\text{O}_x\text{S}_{3-x}$ nanosheets are stacked with Nb_6O_{17} nanosheets in the composite to form a 2D sheets complex.

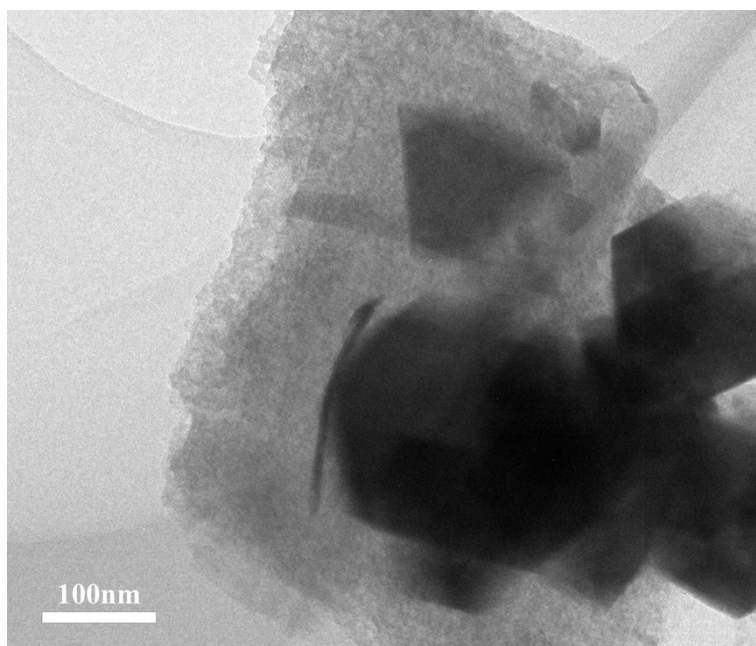


Fig. S2 TEM image of the Bi/Nb-0.1g.

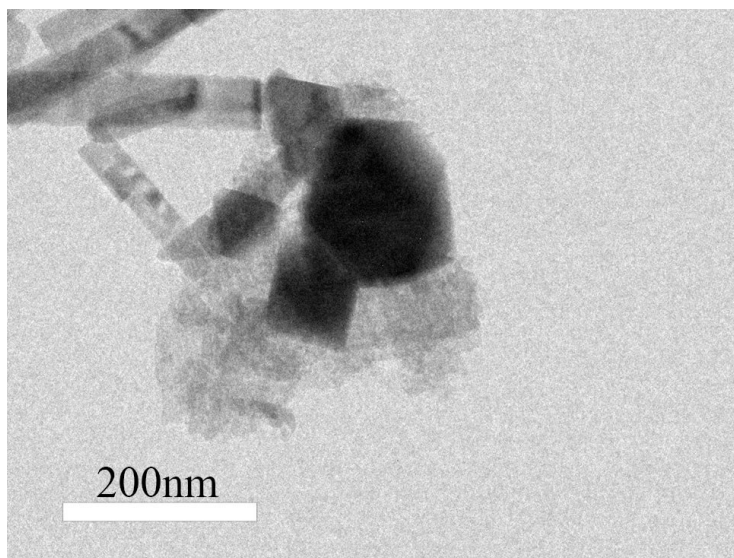


Fig. S3 TEM image of the Bi/Nb-0.3g. Some nanorods of Bi_2S_3 can be detected.

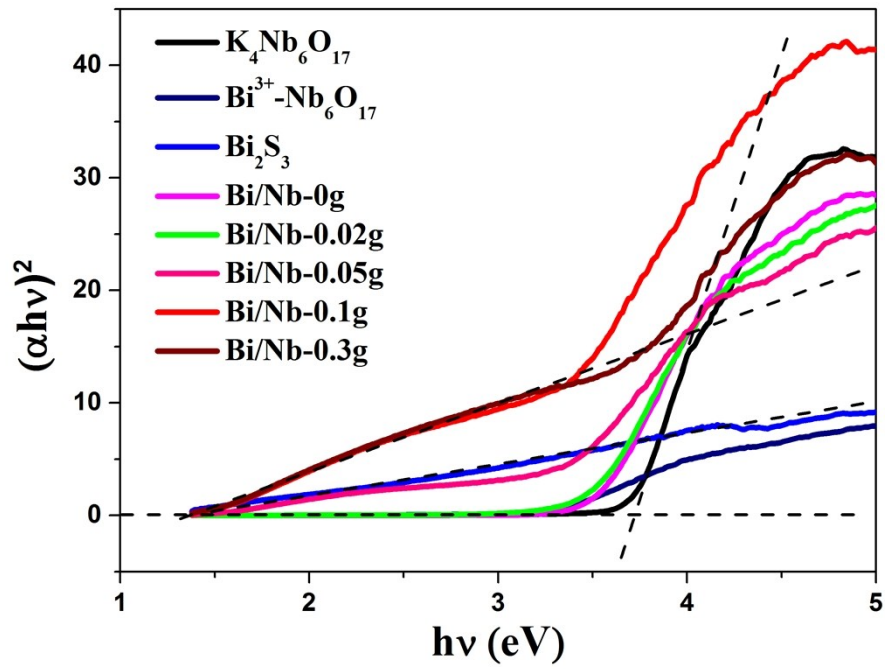


Fig. S4 The relationship between $(\alpha h\nu)^2$ and photon energy ($h\nu$) for pure Bi_2S_3 , $\text{K}_4\text{Nb}_6\text{O}_{17}$ and Bi/Nb composites.

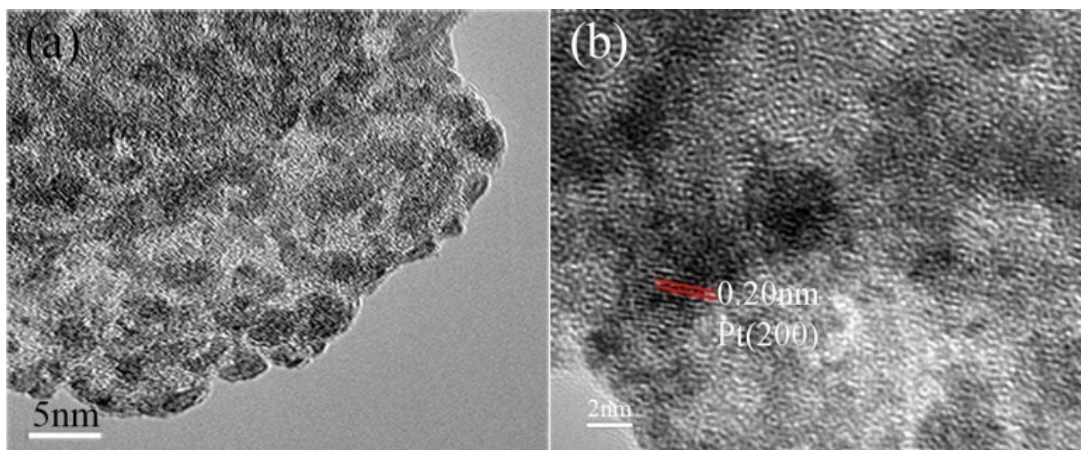


Fig. S5 (a)TEM and (b)HRTEM images of Pt nanoparticles loaded on Bi/Nb-0.1g after visible light irradiation.

H_2PtCl_6 used as electrons trapping agent can further illustrate the transmission path of photoexcited electron. A certain amount of Bi/Nb-0.1g composite was added to 20mL 3% H_2PtCl_6 solution, then photo irradiated with visible light ($\lambda > 400 \text{ nm}$). As shown in Fig. S5a, after photoirradiation, the Pt nanoparticles were deposited on the Nb_6O_{17} sheets. HRTEM show the clear lattice diffraction fringes with the lattice plane distances 0.20 nm can be assigned to Pt 211 lattice plane (Fig. S5b).

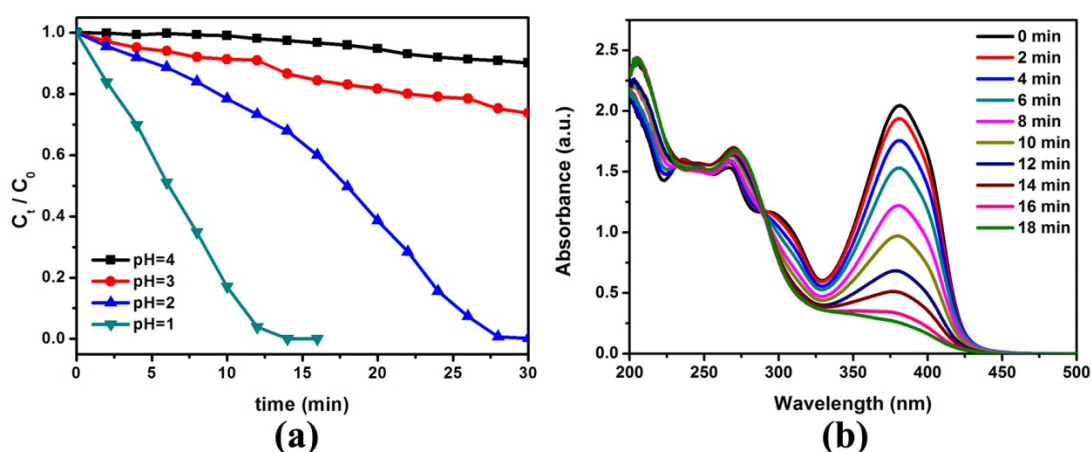


Fig. S6 (a) The influence of pH values on the photocatalytic performance of Bi/Nb-0.1g; (b) UV-Vis spectral changes during the photodegradation of tetracyclines using

Bi/Nb-0.1g as catalyst under visible light irradiation. 20 mg photocatalyst and 20 mL tetracyclines solution (40 ppm) was used in photocatalysis under visible light irradiation.