

Electronic Supplementary Information

***In situ* self-exsolved ultrasmall Fe₂P quantum dots from attapulgite nanofibers as a superior cocatalyst for solar hydrogen evolution**

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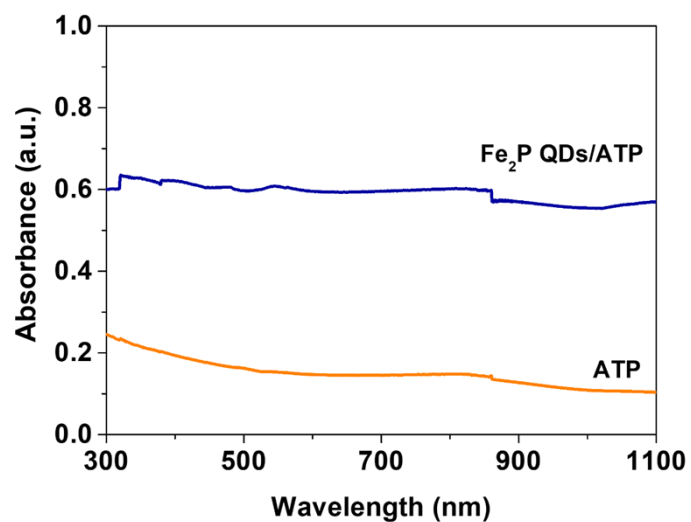


Fig. S1 UV-vis diffuse reflectance spectra of ATP and Fe₂P QDs/ATP.

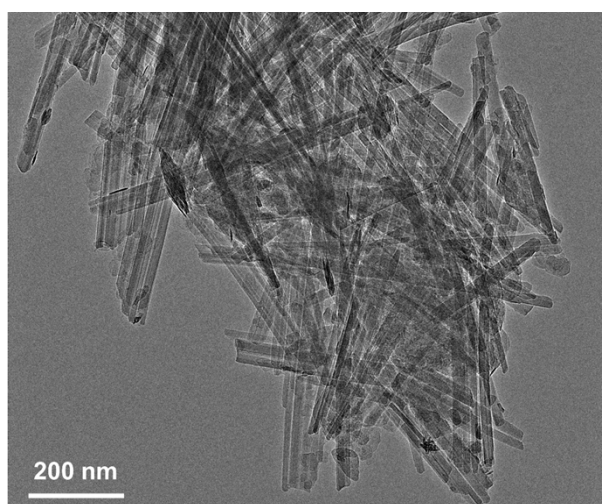


Fig. S2 TEM image of the purified ATP.

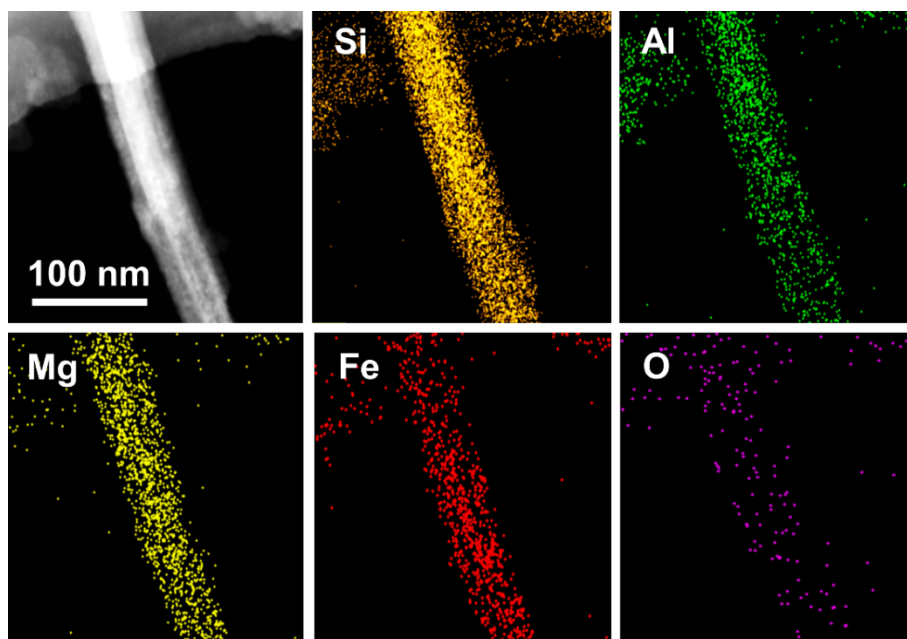


Fig. S3 EDS elemental mapping images of purified ATP.

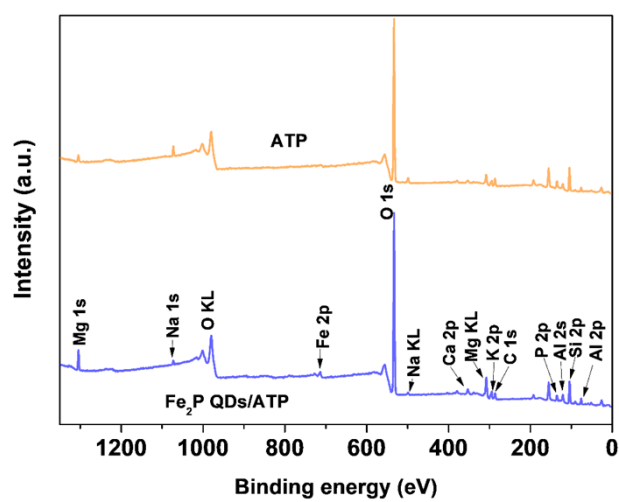


Fig. S4 XPS survey spectra of ATP and Fe₂P QDs/ATP.

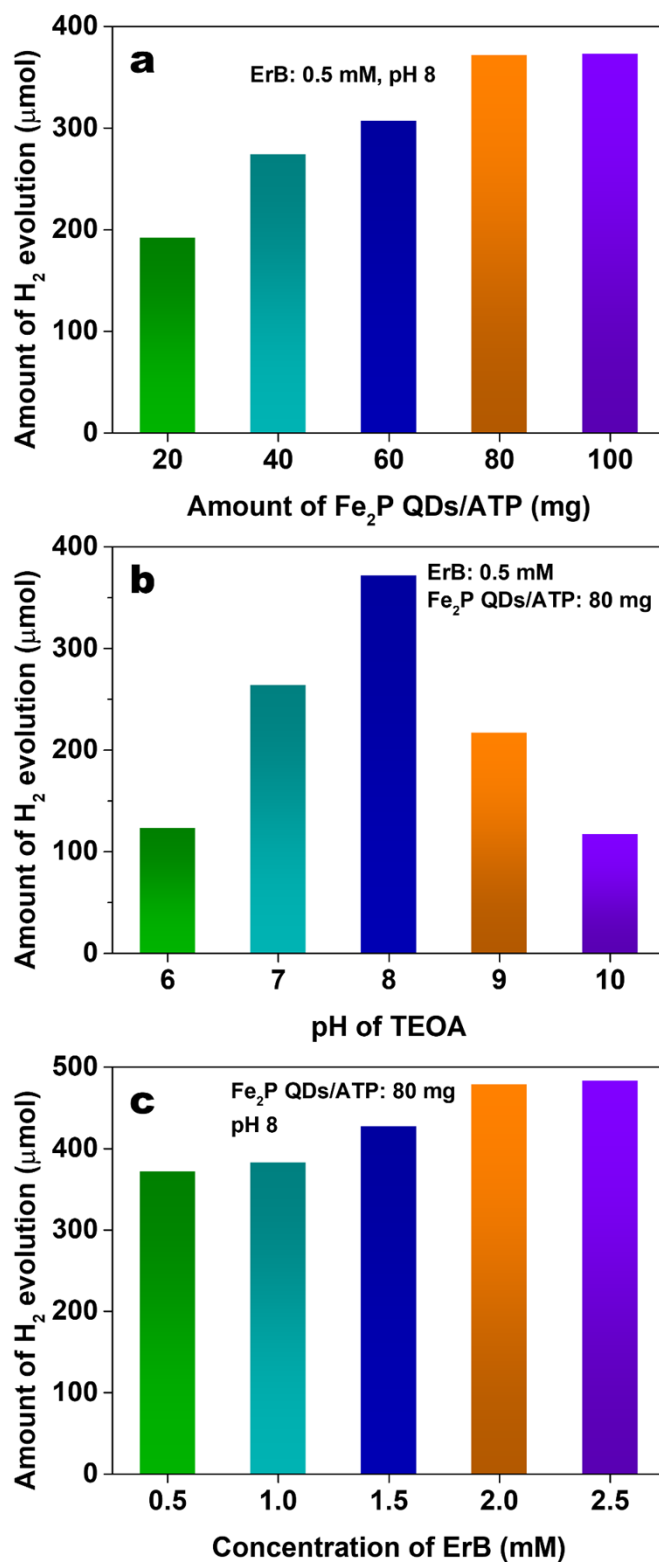


Fig. S5 Photocatalytic H₂ evolution catalyzed by Fe₂P QDs/ATP from ErB-TEOA system as a function of (a) Fe₂P QDs/ATP concentration, (b) pH value of TEOA solution, and (c) ErB concentration. Reaction conditions: light source, white LED lamp, 380 nm $\leq \lambda \leq$ 780 nm; TEOA solution, 25 mL, 10 vol%; reaction time, 5 h.

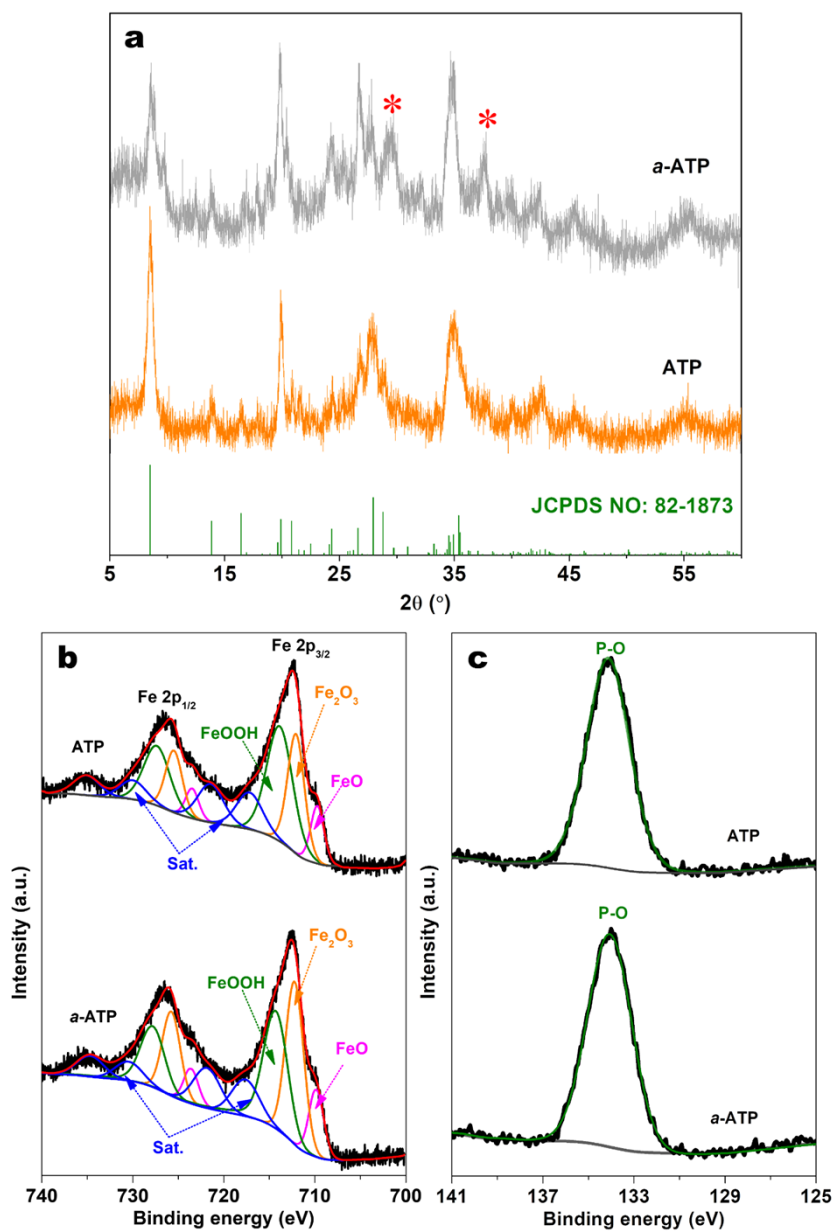


Fig. S6 (a) XRD patterns, (b) Fe 2p, and (c) P 2p XPS spectra of ATP and *a*-ATP.

The symbol “*” represents the XRD peaks from Fe-containing Si, Al, and Mg oxides.

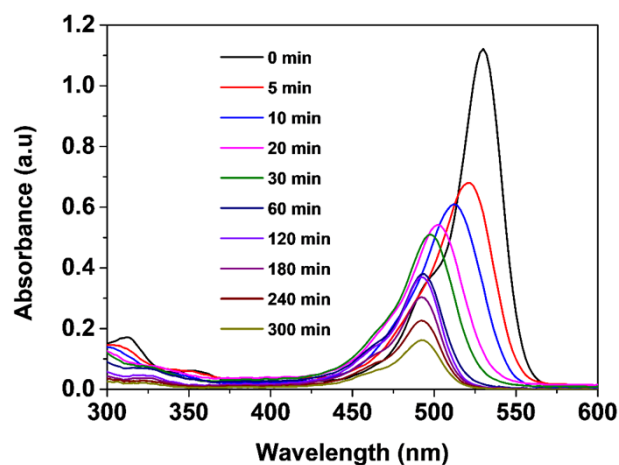


Fig. S7 Time-depedent UV-vis absorption spectra of the system containing ErB (2.0 mM) and Fe₂P QDs/ATP (80 mg) in a TEOA solution upon irradiation. The Fe₂P QDs/ATP particles were removed by centrifugation prior to measurement and the solution was diluted by 10 times. Reaction conditions: Light source: white LED lamp, $380 \text{ nm} \leq \lambda \leq 780 \text{ nm}$; TEOA solution: 25 mL, 10 vol%, pH 8.

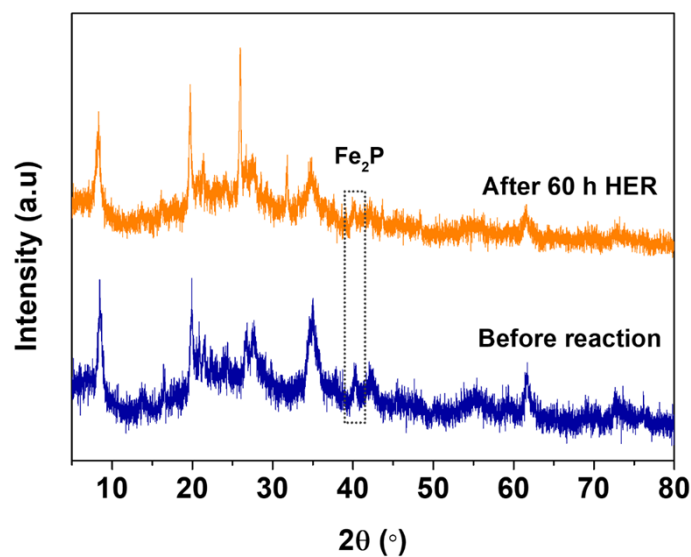


Fig. S8 XRD patterns of Fe₂P QDs/ATP before and after a 60-h HER stability test.

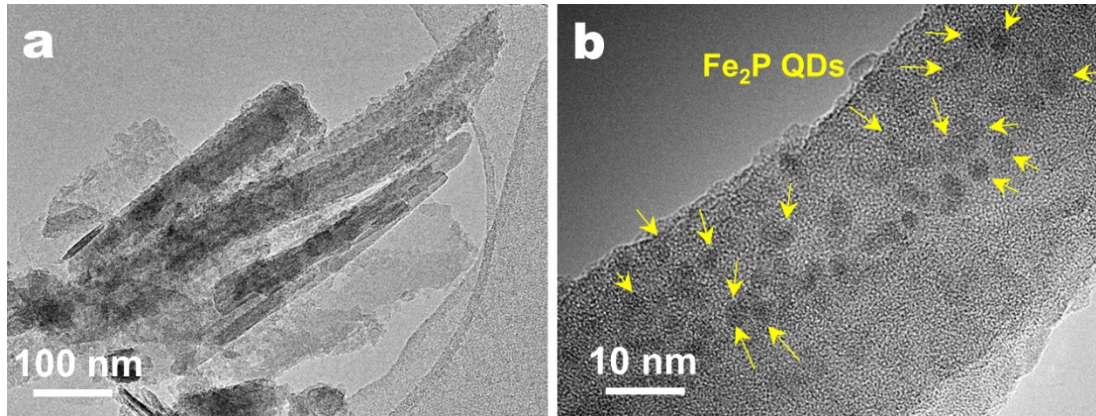


Fig. S9 TEM and HRTEM images of Fe₂P QDs/ATP after a 60-h HER stability test.

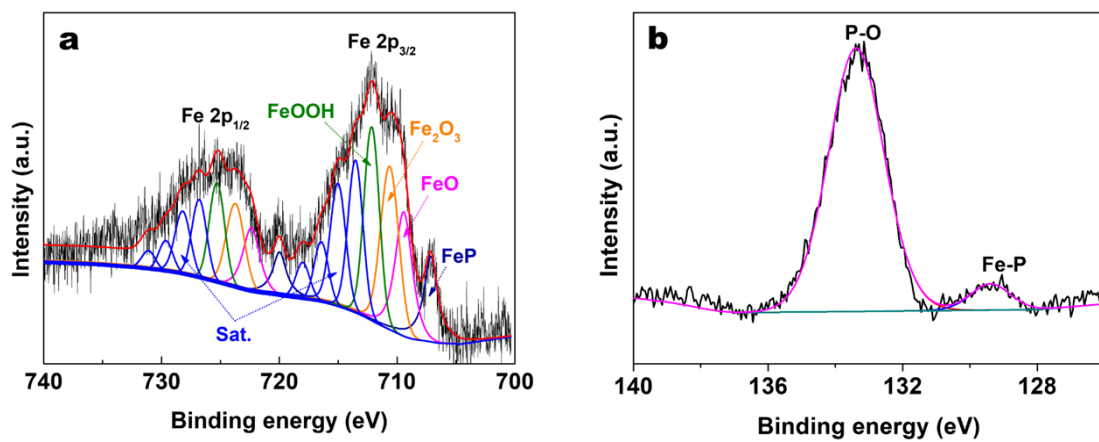


Fig. S10 (a) Fe 2p and (b) P 2p XPS spectra of Fe₂P QDs/ATP after a 60-h HER stability test.

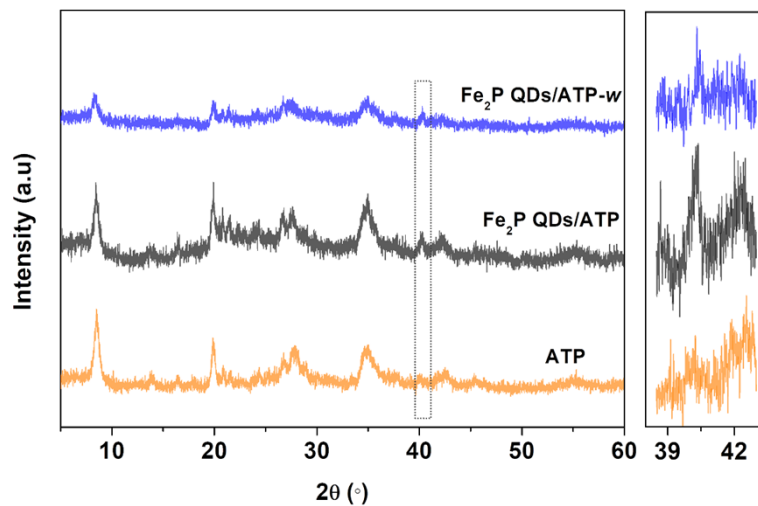


Fig. S11 Comparison of XRD patterns of ATP, Fe₂P QDs/ATP, and Fe₂P QDs/ATP-

w.

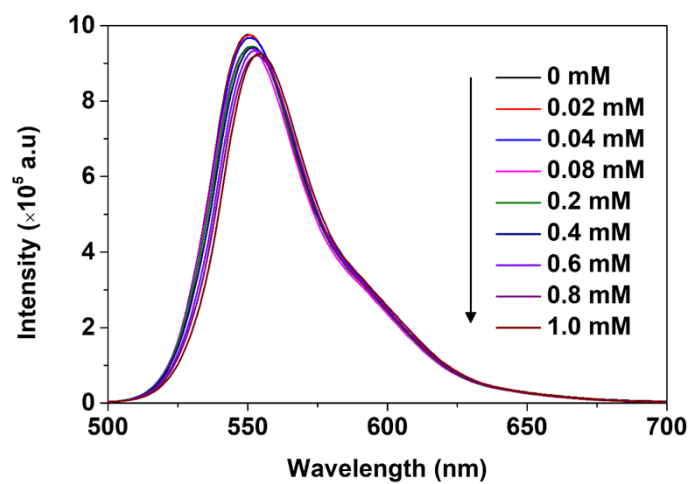


Fig. S12 PL emission quenching of ErB aqueous solutions (10 μM , pH 8.0) by TEOA.

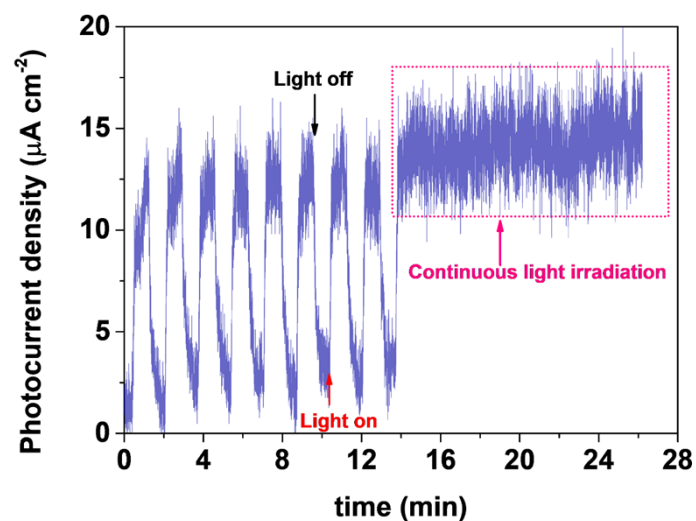


Fig. S13 Photocurrent responses of ErB-sensitized Fe_2P QDs/ATP photocatalytic suspension system under visible light irradiation.

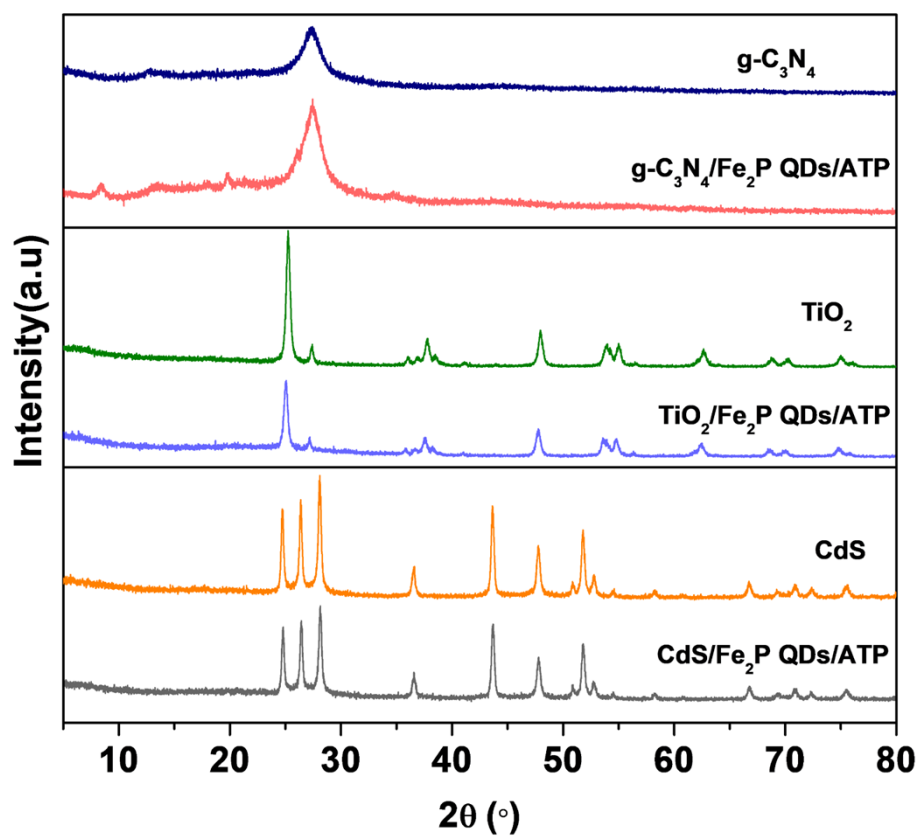


Fig. S14 XRD patterns of g-C₃N₄, TiO₂, and CdS and their composites with 10 wt% Fe₂P QDs/ATP.

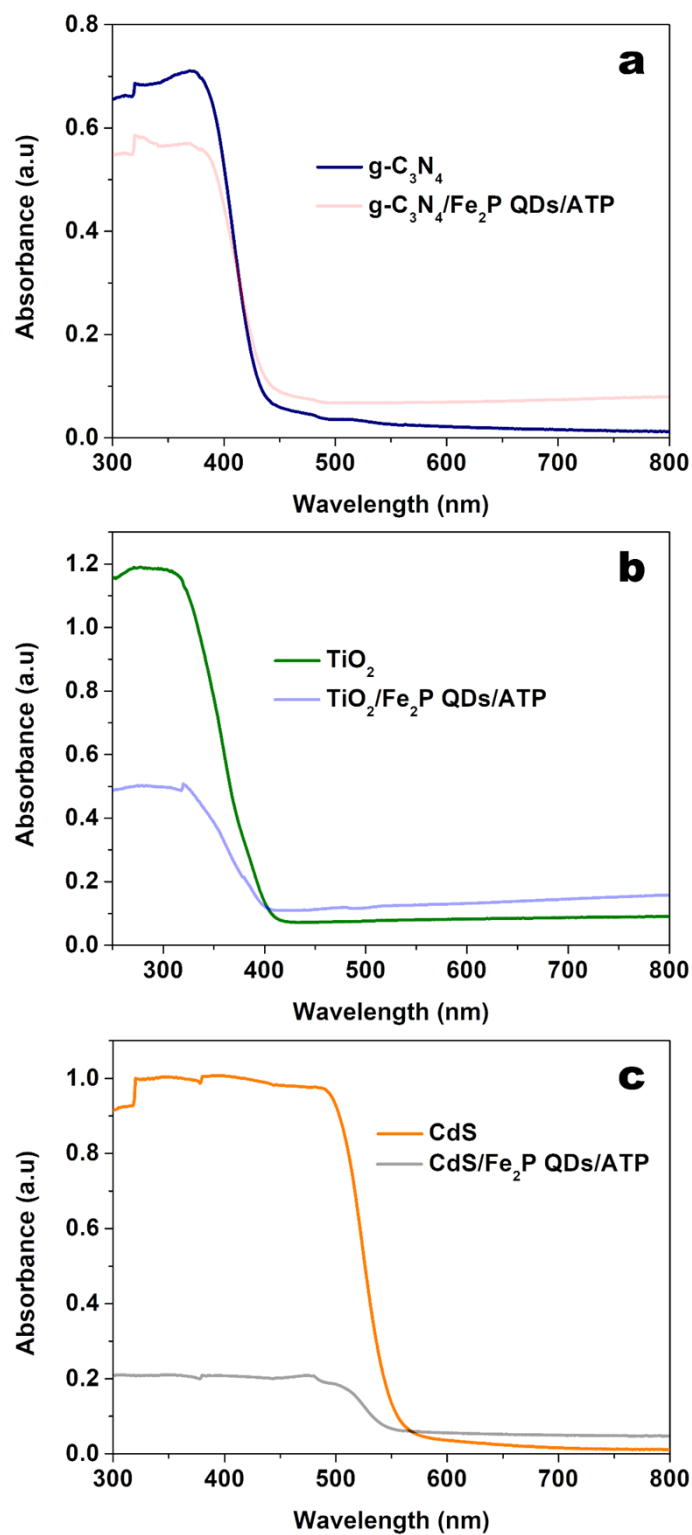


Fig. S15 UV-vis diffuse reflectance spectra of (a) g-C₃N₄, (b) TiO₂, and (d) CdS and their composites with 10 wt% Fe₂P QDs/ATP.