Electronic Supplementary Material (ESI) for Catalysis Science & Technology

Electronic Supplementary Information

Design of Visible-Light Photocatalysts by Coupling of Narrow Bandgap Semiconductors and TiO_2: Effect of Their Relative Energy Band Positions in Photocatalytic Efficiency

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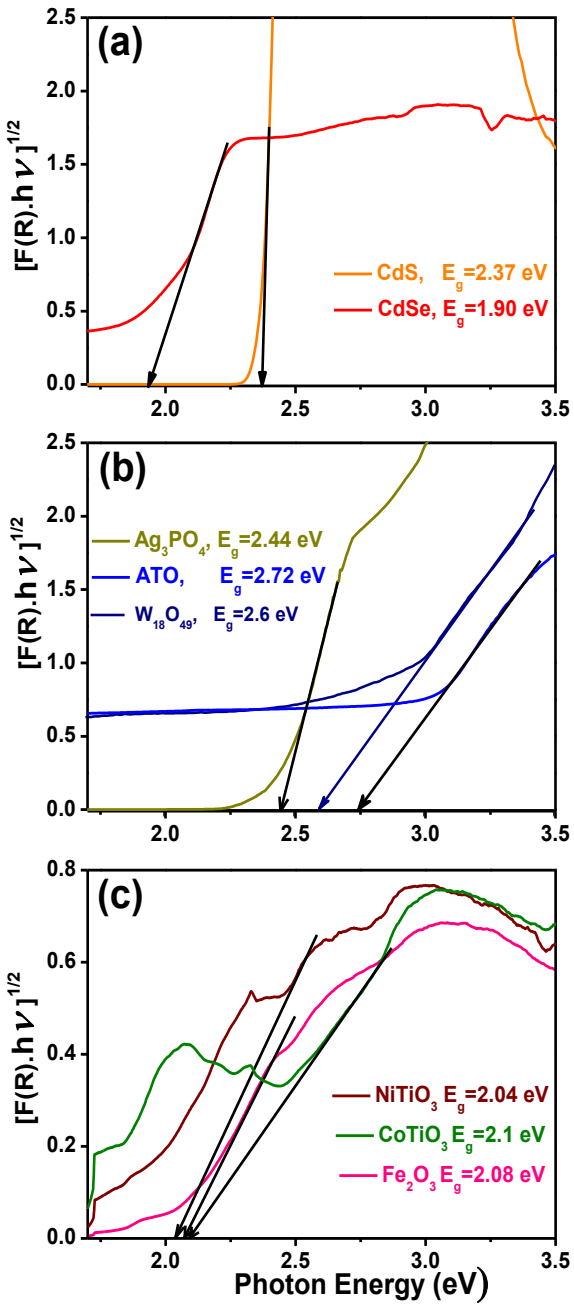

Fig. S1. Diffuse reflectance spectra of sensitizers belonging to Sen-A (a), Sen-B (b), and Sen-C (c), and determination of their bandgaps by plotting Kubelka-Munk function $[F(R).h\nu]^{1/2}$ versus photon energy (eV).

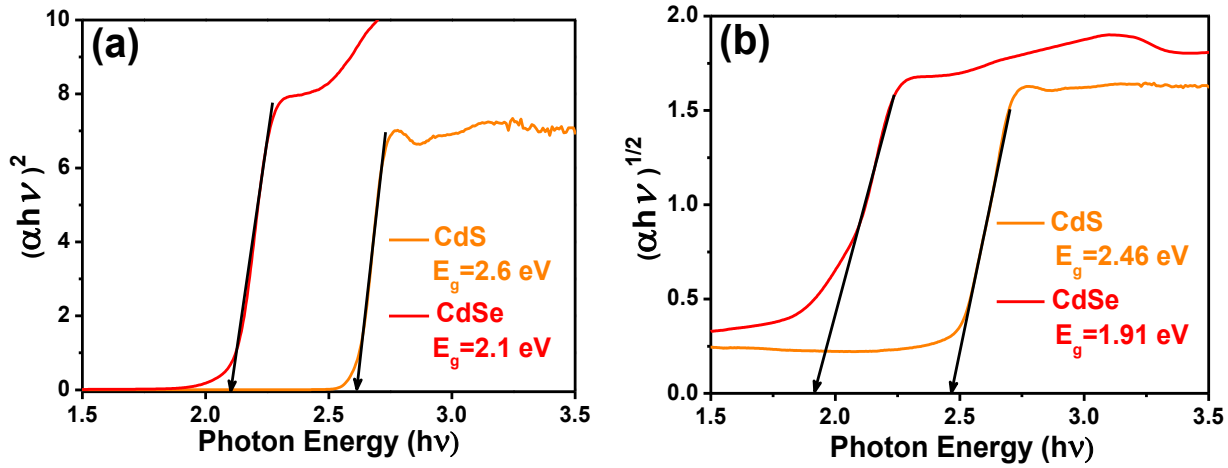

Fig. S2. Estimated band gaps of CdS and CdSe QDs belonging to Sen-A by Tauc plot, exhibiting direct band gaps (a) and indirect band gaps (b).

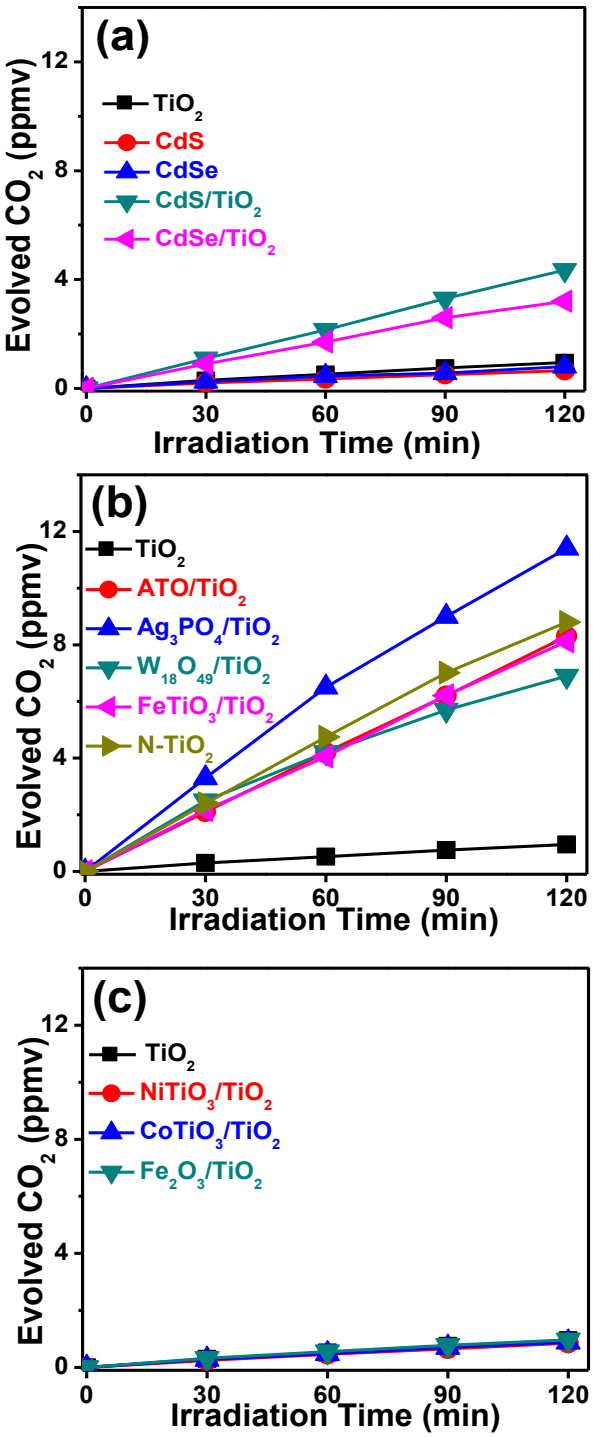

Fig. S3. Visible-light photocatalytic activities of several Type-A (a), Type-B (b), and Type-C (c) heterojunction structures. Gaseous 2-propanol was used as a model compound, and the amounts of CO_2 evolved were monitored as function of irradiation time.

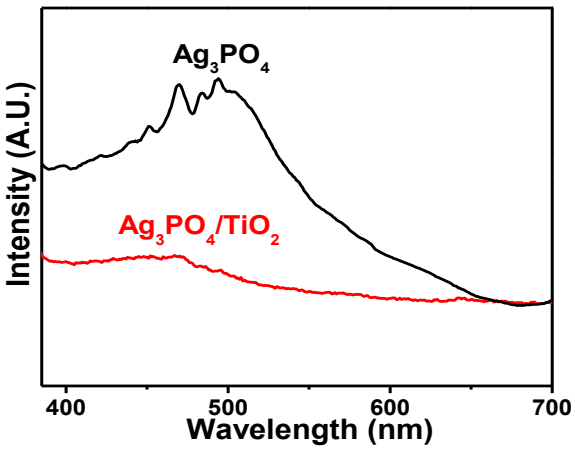

Fig. S4. PL spectra of bare Ag_3PO_4 and Ag_3PO_4/TiO_2 heterocomposite.

It was found that Ag_3PO_4/TiO_2 showed much smaller PL intensity than Ag_3PO_4, as shown in the Fig. S4. The obtained result clearly indicates that the charge recombination in the Ag_3PO_4 was reduced by coupling with TiO_2, thus supporting the hole transfer from Ag_3PO_4 VB to TiO_2.