

Electronic supplementary information (ESI)

Photoinduced ultrafast charge separation in colloidal 2-dimensional CdSe/CdS-Au hybrid nanoplatelets and corresponding application in photocatalysis

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The photocatalytic degradation efficiency or percentage dye degradation (%) is calculated as

$$\text{percentage dye degradation (\%)} = \frac{A_o - A_t}{A_o} * 100 \quad (1)$$

where A_o is the initial absorbance at adsorption-desorption equilibrium before the addition of the catalyst and A_t is the absorbance of remnant dye at definite intervals of time ' t ' after the addition of the catalyst.

The apparent reaction rate constant (k_{app}) for degradation is calculated as:

$$\ln \frac{A_o}{A_t} = k_{app} t \quad (2)$$

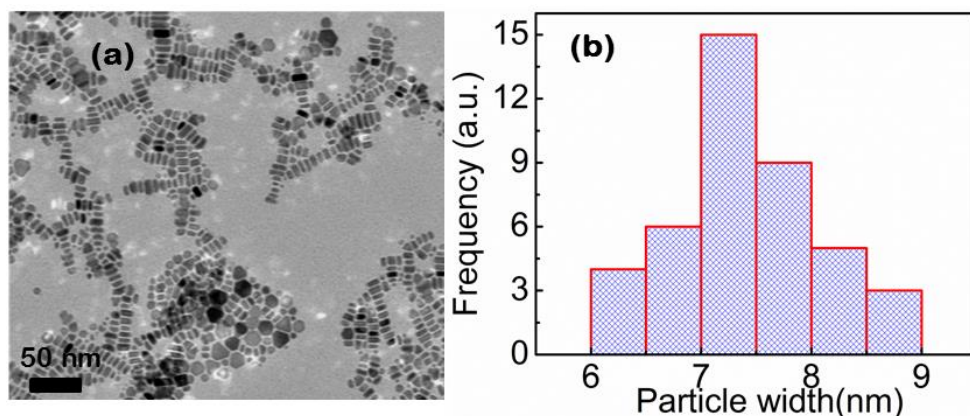


Fig. S1 (a) Self-assembled starting seed particles lying on the edges of the sides showing the thickness, (b) particle width/thickness distribution (histogram) graph.

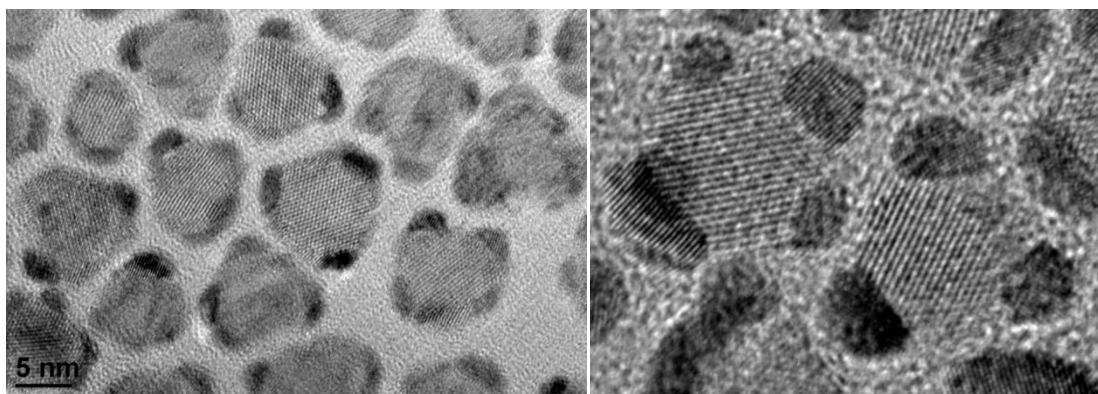


Fig. S2 HRTEM image of few HNCs.

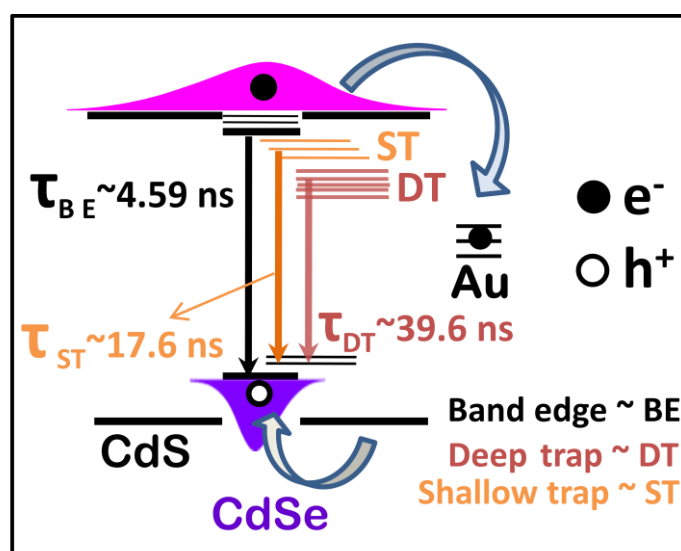


Fig. S3 Schematic diagram of CdSe/CdS-Au heterostructure showing electron transfer to Au NPs and electron-hole recombination which are in the conduction band and the valence band respectively with different trap depth.

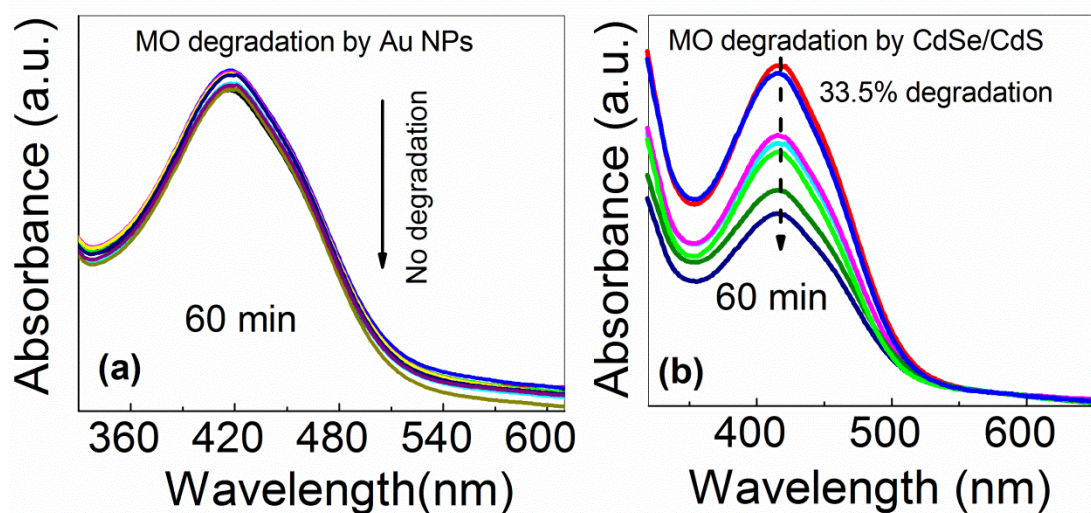


Fig. S4 Optical absorption spectra of 10 mL 0.01 methyl orange in the presence of 7 mg of (a) Au nanoparticles and (b) 2D CdSe/CdS platelets showing the control dye degradation reactions (under sun light).

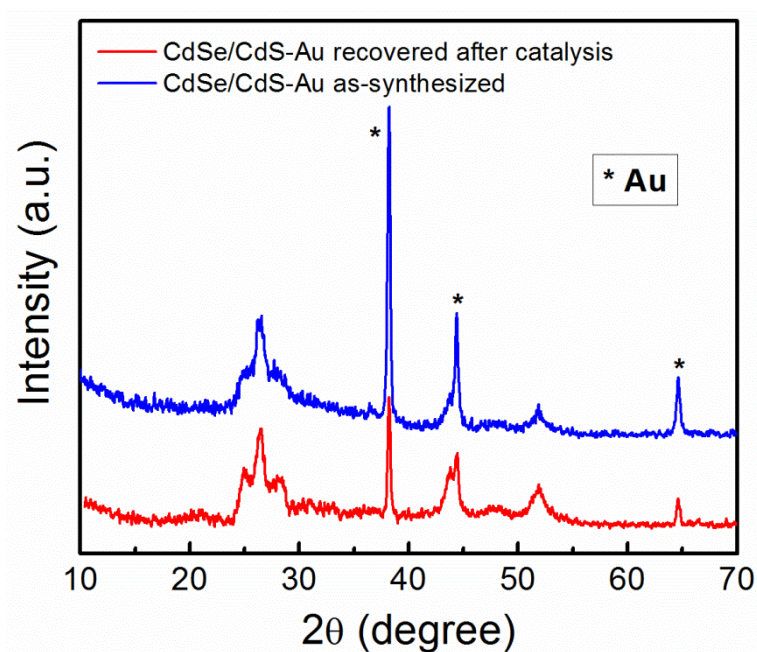


Fig. S5 Comparison of powder XRD patterns of 2D-CdSe/CdS-Au HNCs before and after photocatalytic reactions (6 cycles).

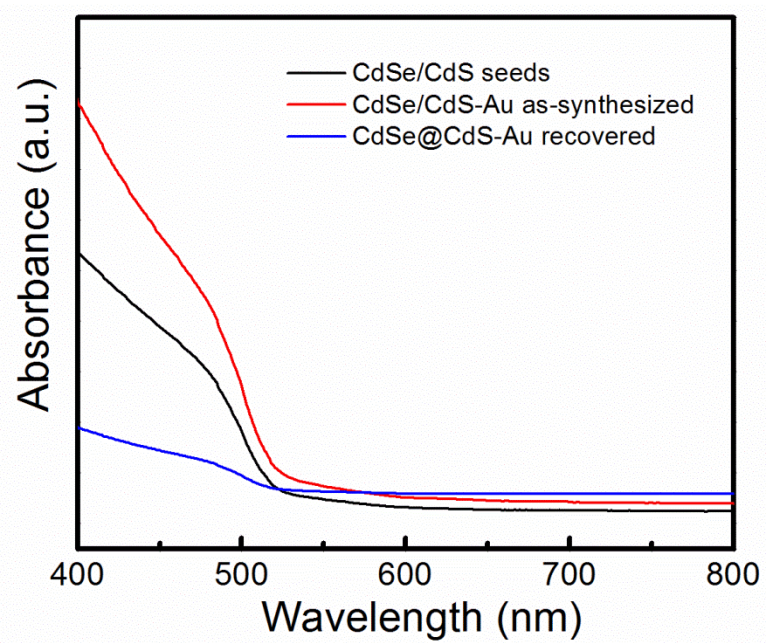


Fig. S6 Comparison of optical absorption spectra of 2D-CdSe/CdS-Au HNCs before and after photocatalytic reactions (6 cycles) along with the optical absorption spectrum of 2D-CdSe/CdS seeds.
