Supporting information

Largely Enhanced Photocatalytic Activity of Au/XS_2/Au (X = Re, Mo) Antenna-Reactor Hybrids: Charge and Energy Transfer

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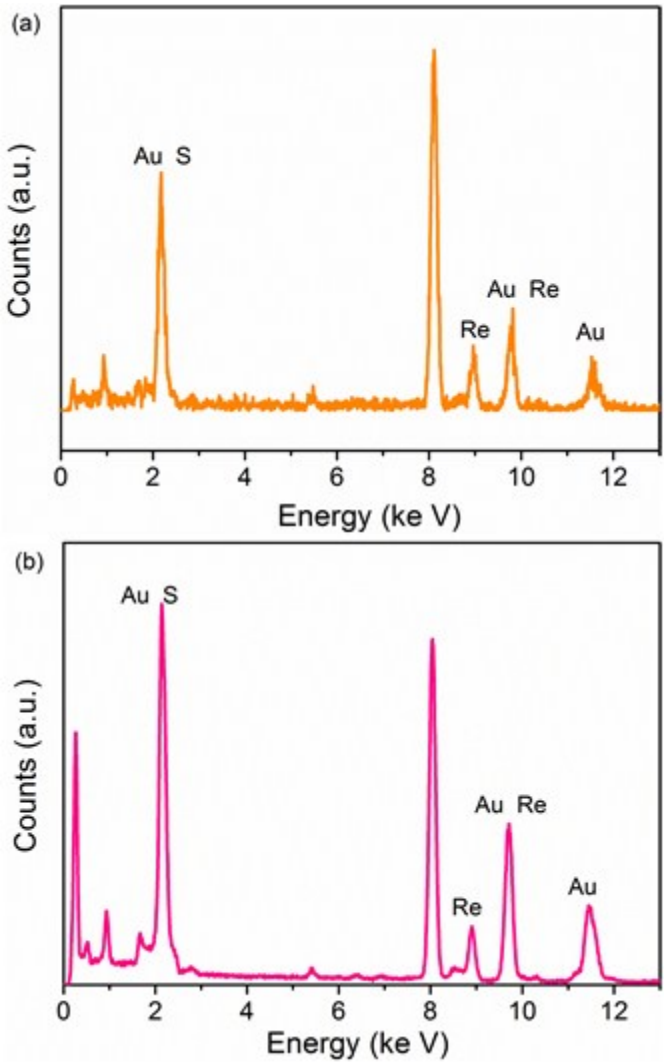

Figure S1. EDS spectra of Au/ReS_2 (a) and $Au/ReS_2/Au$ (b) hybrids.

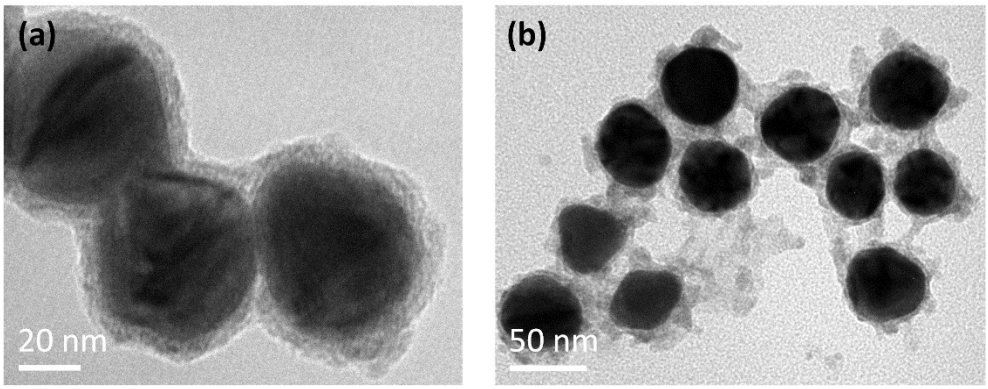

Figure S2. TEM of Au/ReS_2 (a) and Au/MoS_2 (b) hybrids.

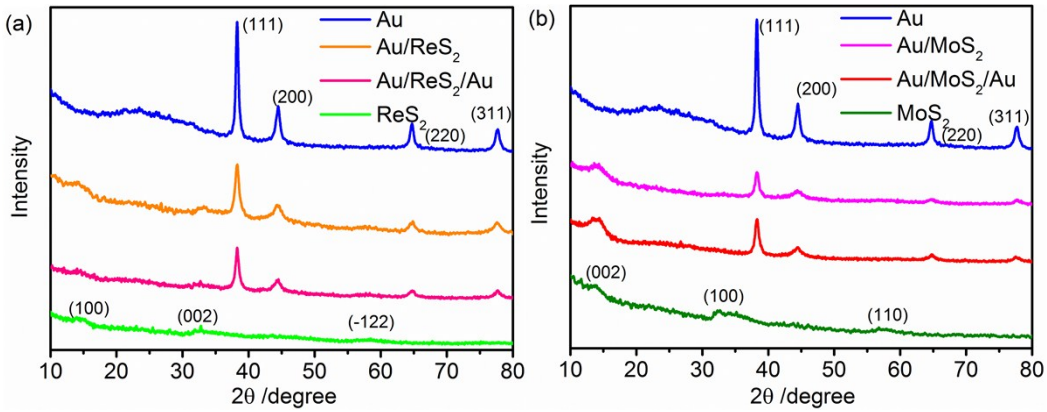

Figure S3. XRD spectra of all as-prepared samples.

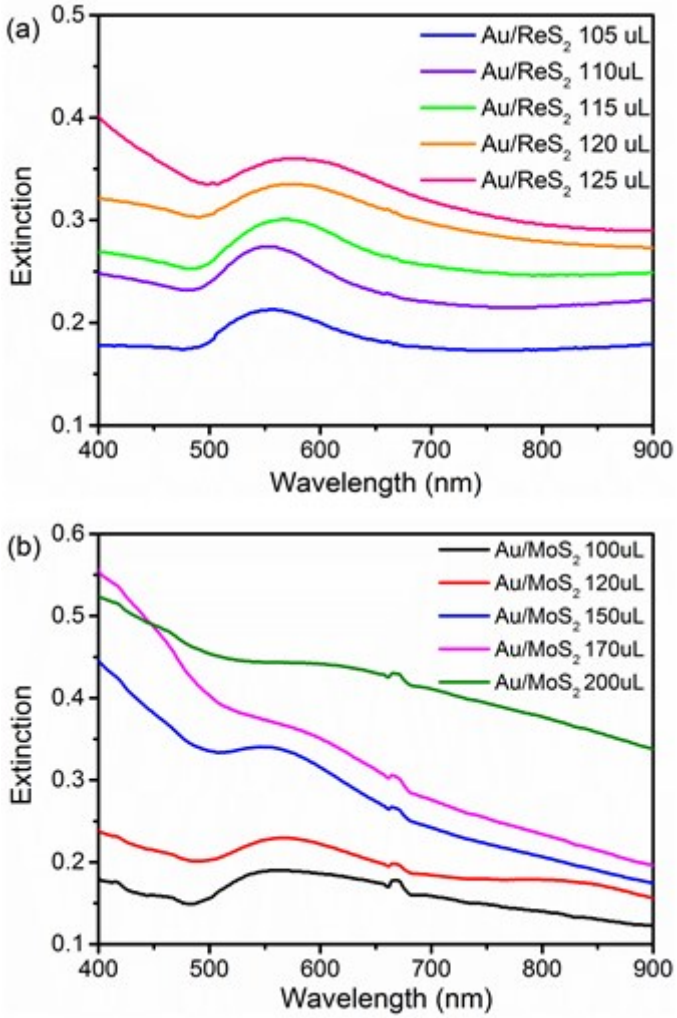

Figure S4. Extinction spectra of Au/ReS_2 (a) and Au/MoS_2 (b) hybrids with the increase of Re and Mo sources, respectively.

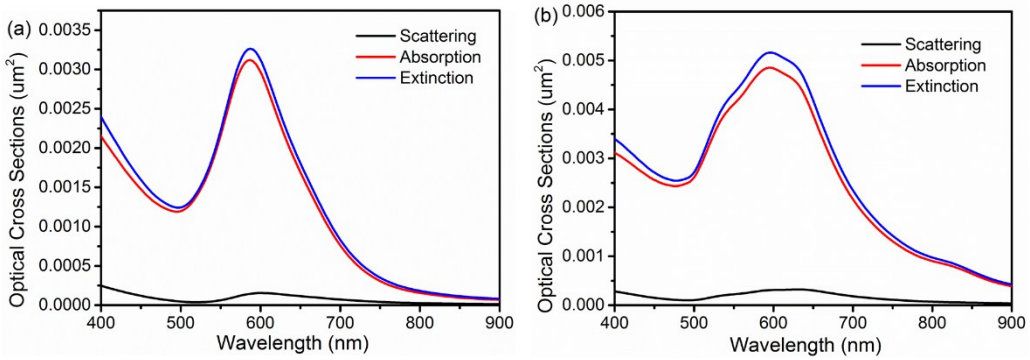

Figure S5. (a) The simulated scattering, absorption and extinction spectra of Au/MoS_2 hybrid; (b) The simulated scattering, absorption and extinction spectra of Au/MoS_2/Au hybrid.

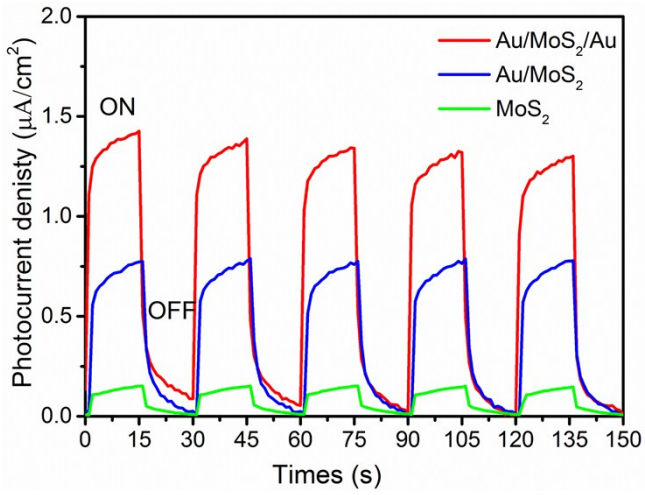

Figure S6. Photocurrent response of MoS_2, Au/MoS_2 and Au/MoS_2/Au under illumination of light with wavelength longer than 420 nm with 15s light on/off cycles.

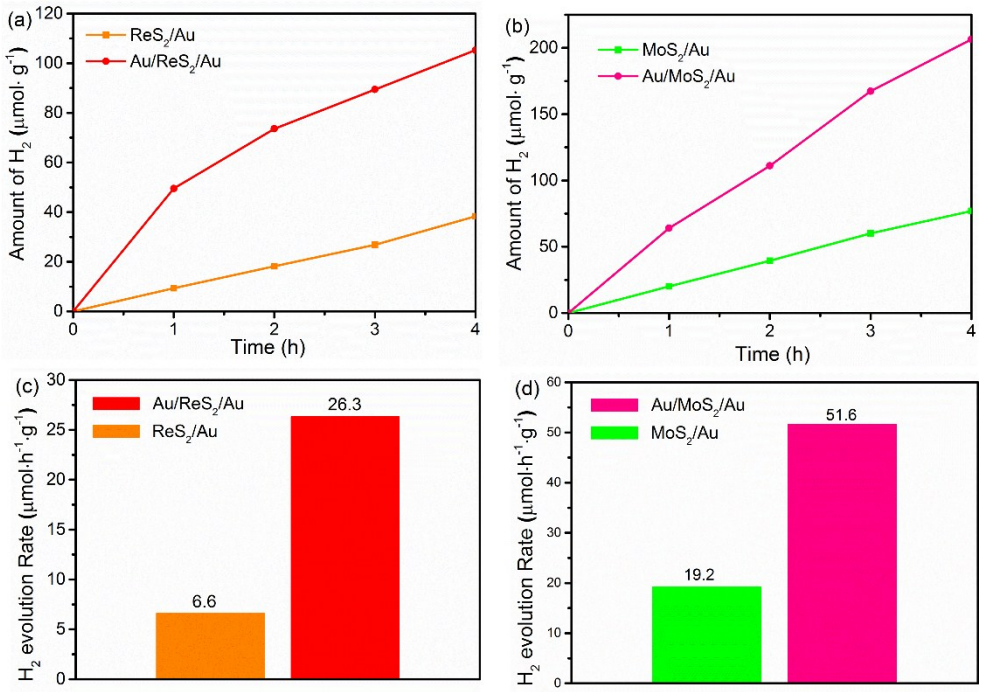

Figure S7. Photocatalytic activity of the as-synthesized samples for H_2 evolution reaction in four hours under visible light irradiation. (a) Time-dependent photocatalytic H_2 evolution for ReS_2/Au and Au/ReS_2/Au hybrids; (b) Time-dependent photocatalytic H_2 evolution for MoS_2/Au and Au/MoS_2/Au hybrids; (c) Comparison of the H_2 generation rates for ReS_2/Au and Au/ReS_2/Au hybrids; (d) Comparison of the H_2 generation rates for MoS_2/Au and Au/MoS_2/Au hybrids.

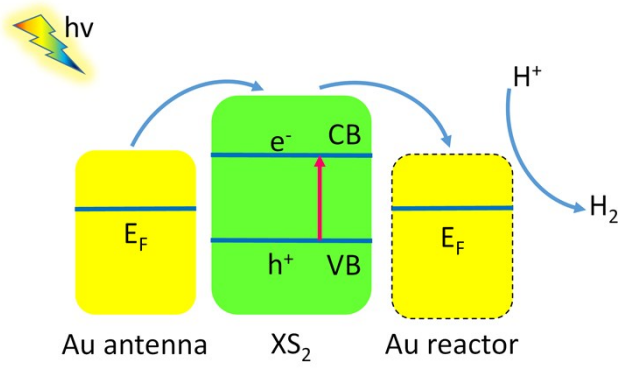

Figure S8. Schematic illustration of the charge transfer mechanism in Au/XS_2/Au during photocatalytic activity.

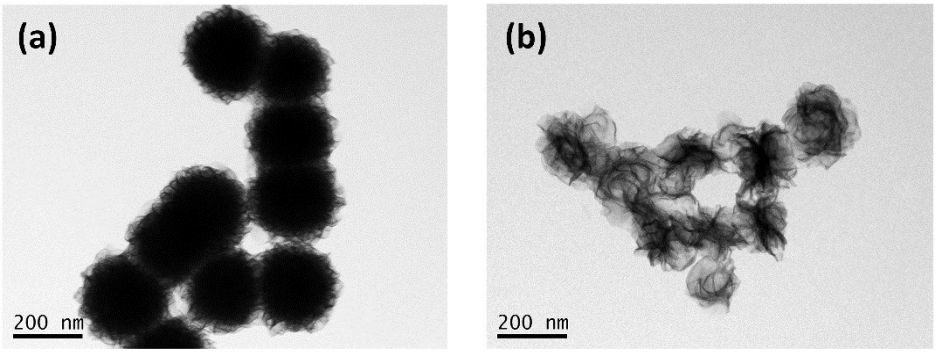

Figure S9. TEM of ReS_2 (a) and MoS_2 (b) hybrids.