Supplementary Information

Promoting photocatalytic hydrogen production by core-shell CdS@MoO_x photocatalyst connected by S-Mo "bridge"

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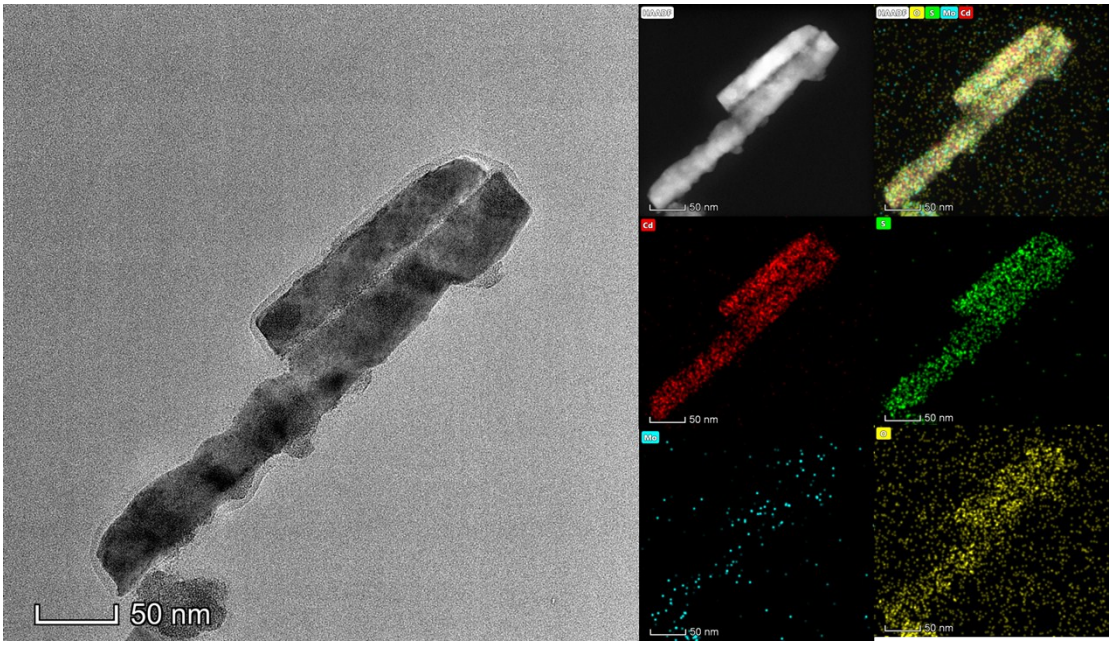

Fig.S1. TEM-EDX image of CdS@MoO_x-0.9 composite and the corresponding element mapping for Cd, S, Mo, O.

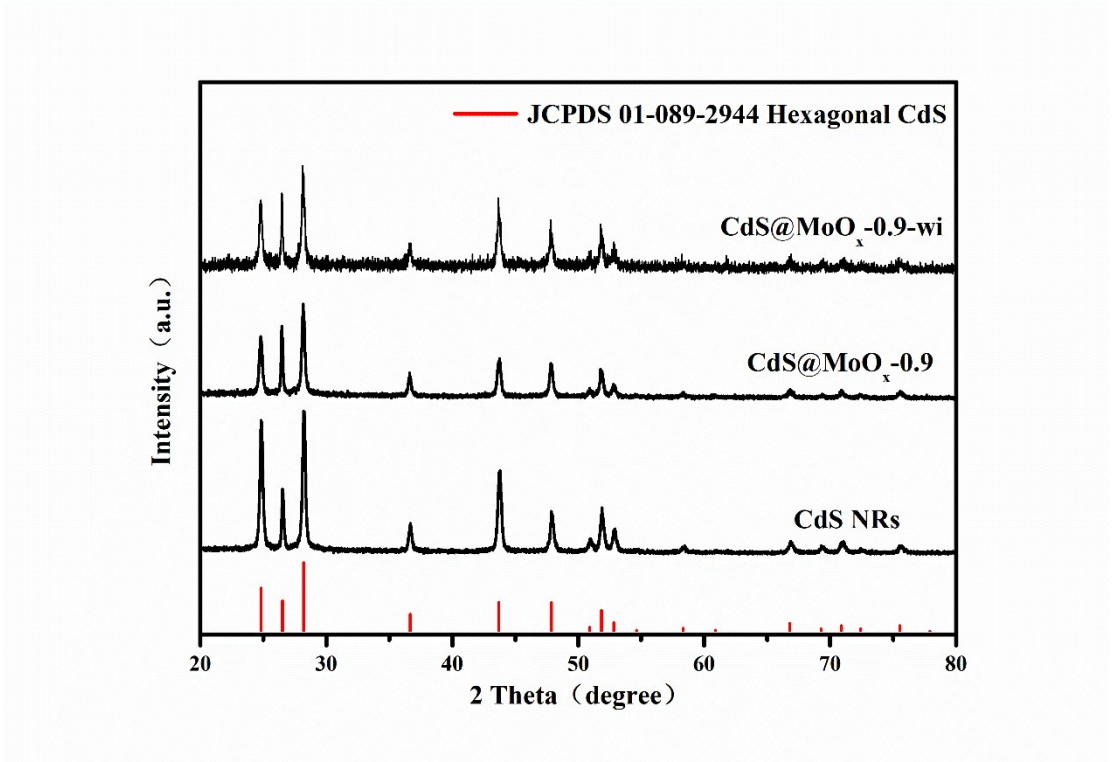

Fig.S2. Typical XRD patterns of CdS@MoO_x-0.9-wi.

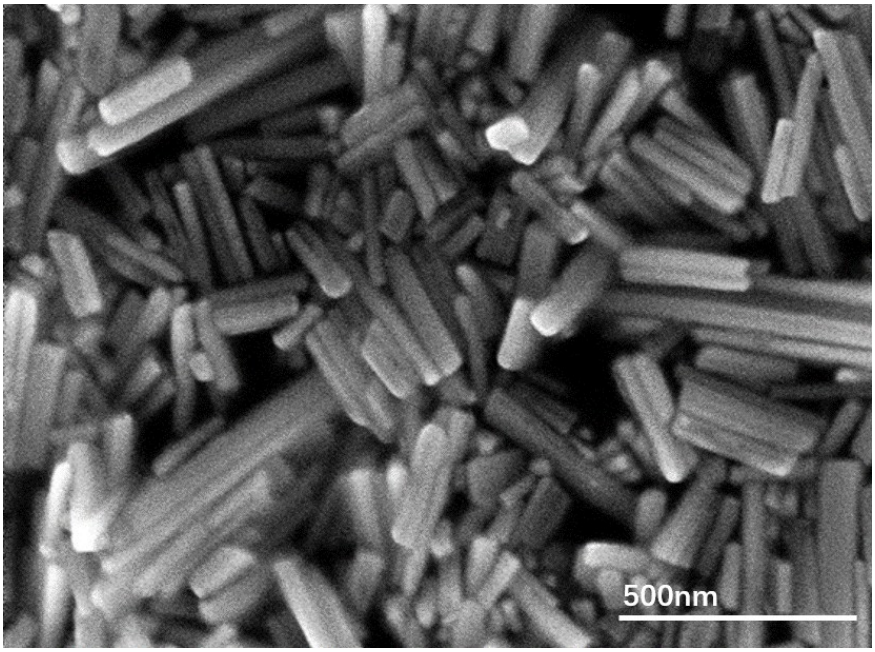

Fig.S3. FESEM image of CdS@MoO_x-0.9-wi.

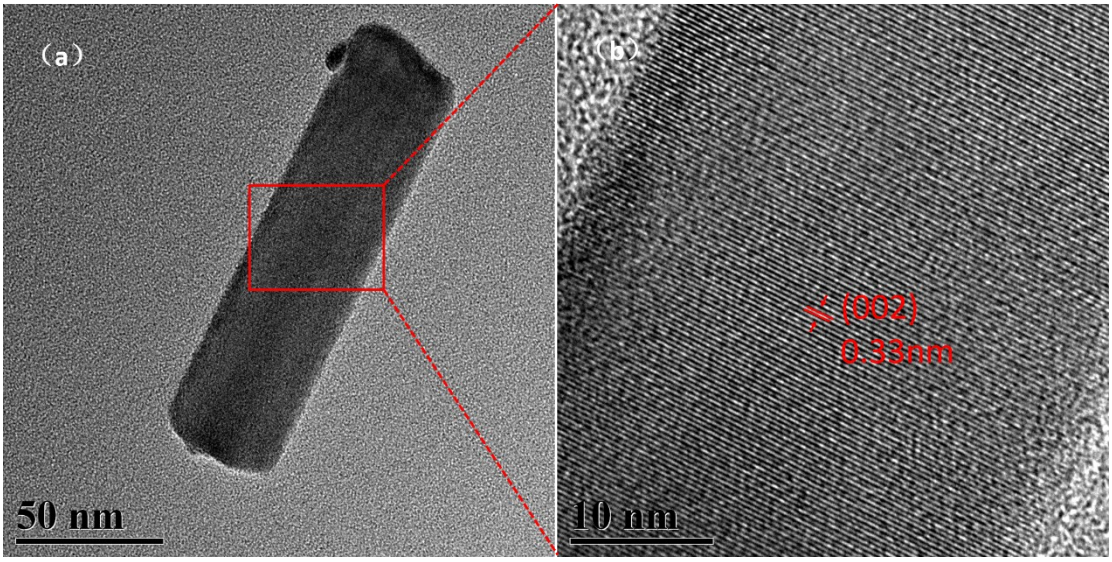

Fig.S4. (a) TEM and (b) HRTEM images of CdS@MoO_x-0.9-wi.

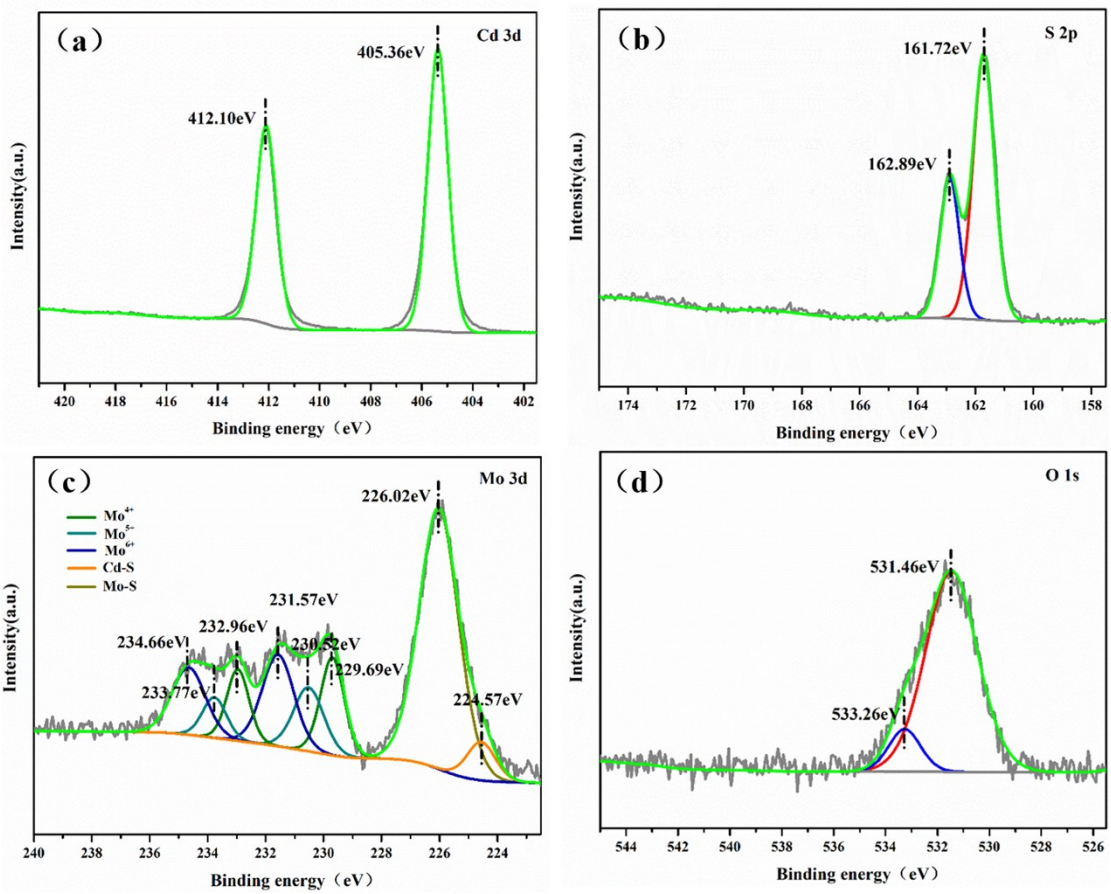

Fig.S5. The high-resolution XPS spectra of (a) Cd 3d, (b) S 2p, (c) Mo 3d and (d) O 1s of CdS@MoO_x-0.9-wi sample.

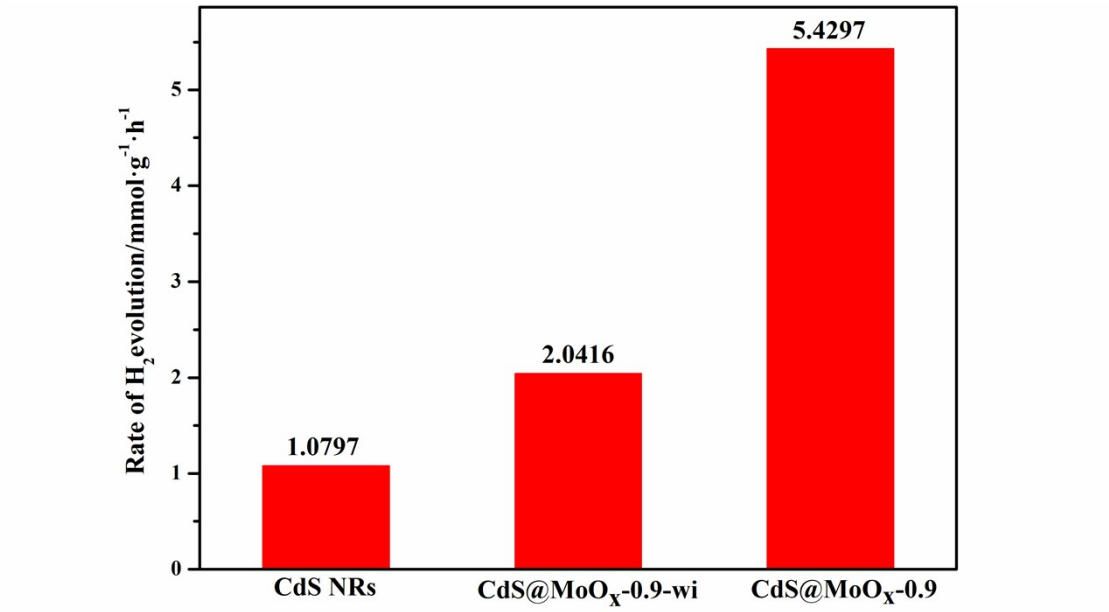

Fig.S6. Comparison of H_2 evolution rates of CdS NRs, CdS@MoO_x-0.9-wi and CdS@MoO_x-0.9.

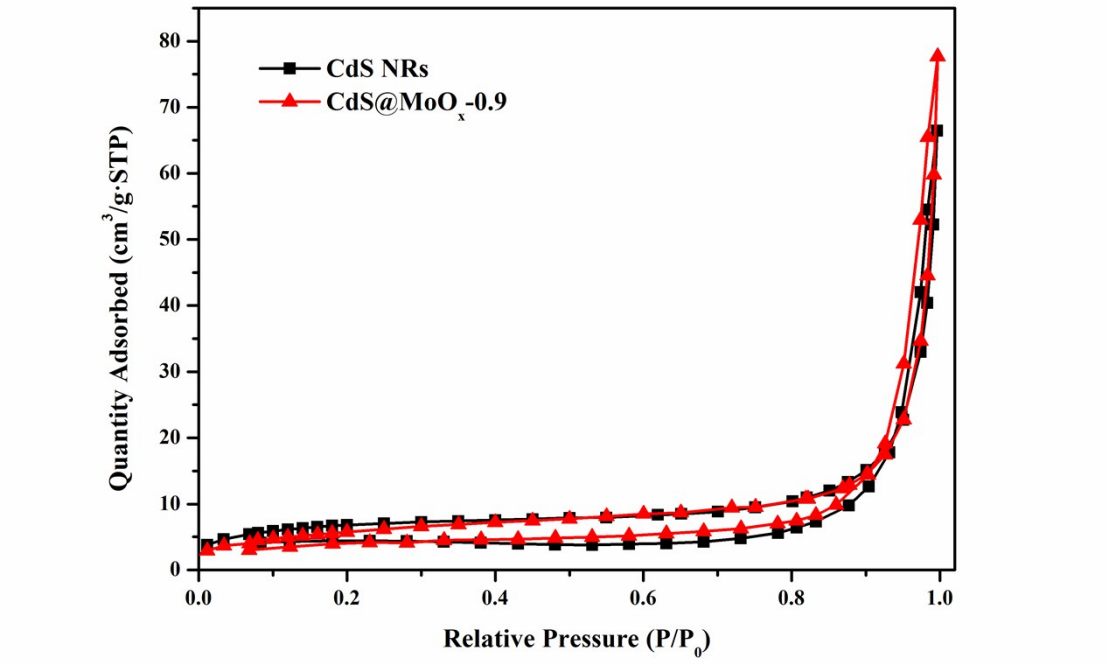

Fig.S7. Nitrogen adsorption desorption isotherms of CdS NRs and CdS@MoO_x-0.9.

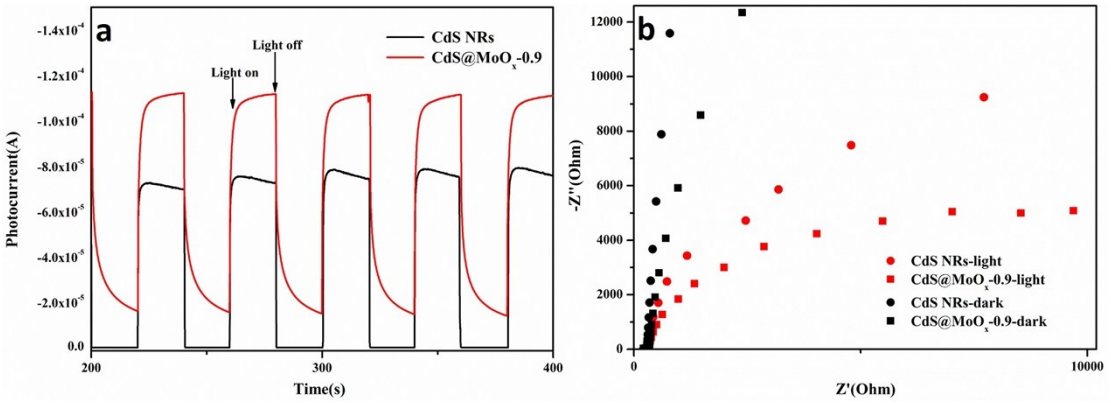

Fig.S8. (a) transient photocurrent and (b) Nyquist plots at an overpotential of 5 mV under the simulated visible-light (or dark) of CdS-NRs and CdS@MoO_x-0.9.

Photocatalyst	Sacrificial reagent	Light source	H_2 production rate ($mmol \cdot h^{-1} \cdot g^{-1}$)	Ref.
CdS@MoO_x	10 vol.% Lactic acid	300 W Xe lamp ($\lambda > 400$ nm)	5.4297	This work
CdS/MoO_x-clusters	20 vol.% Lactic acid	300 W Xe lamp (UV-cut filter)	2.868	[1]
MoO_2-C/CdS	10 vol.% Lactic acid	300 W Xe lamp ($\lambda > 420$ nm)	16.08	[2]
MoO_3@CdS	1.5mol·$L^{-1}$$Na_2SO_3$ 0.2 mol·$L^{-1}$$Na_2S$	300 W Xe lamp ($\lambda > 400$ nm)	5.25	[3]
MoO_2/CdS	10 vol.% Lactic acid	300 W Xe lamp ($\lambda > 400$ nm)	15.11	[4]
CdS/Graphene	10 vol.% Lactic acid	350W Xe lamp ($\lambda > 400$ nm)	1.89	[5]

Table S1. Comparison of photocatalytic H_2 production performance with other CdS-based molybdenum oxide or electron transport media composite photocatalysts

References

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