Electronic Supplementary Material (ESI) for Nanoscale.

Homoepitaxial growth on semiconductor nanocrystals for efficient and stable visible-light photocatalytic hydrogen evolution

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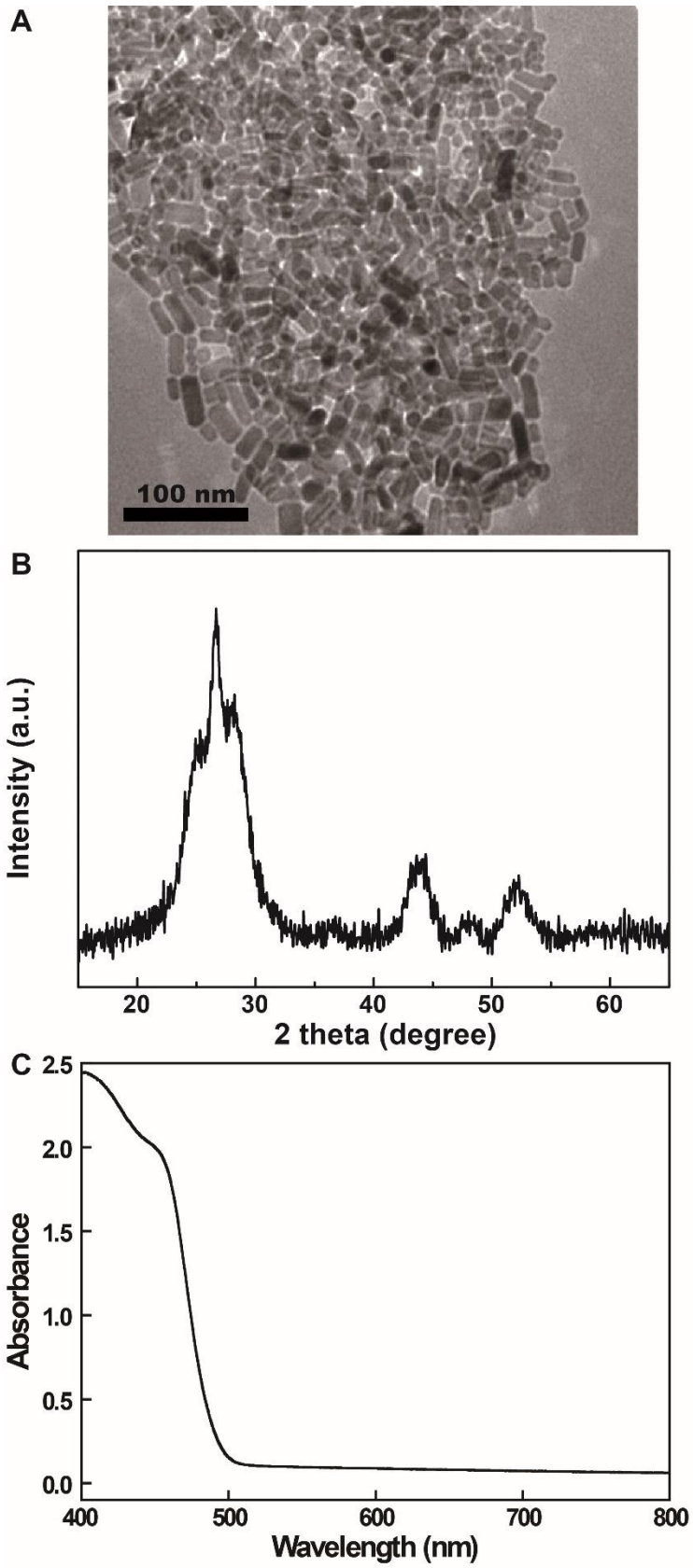

Figure S1. TEM (A)，XRD pattern (B) and UV-vis spectra (C) of CdS NCs by decomposition of $Cd(DDTC)_2$ at 140 ^oC for 30 minutes in the presence of OAm and

ODE.

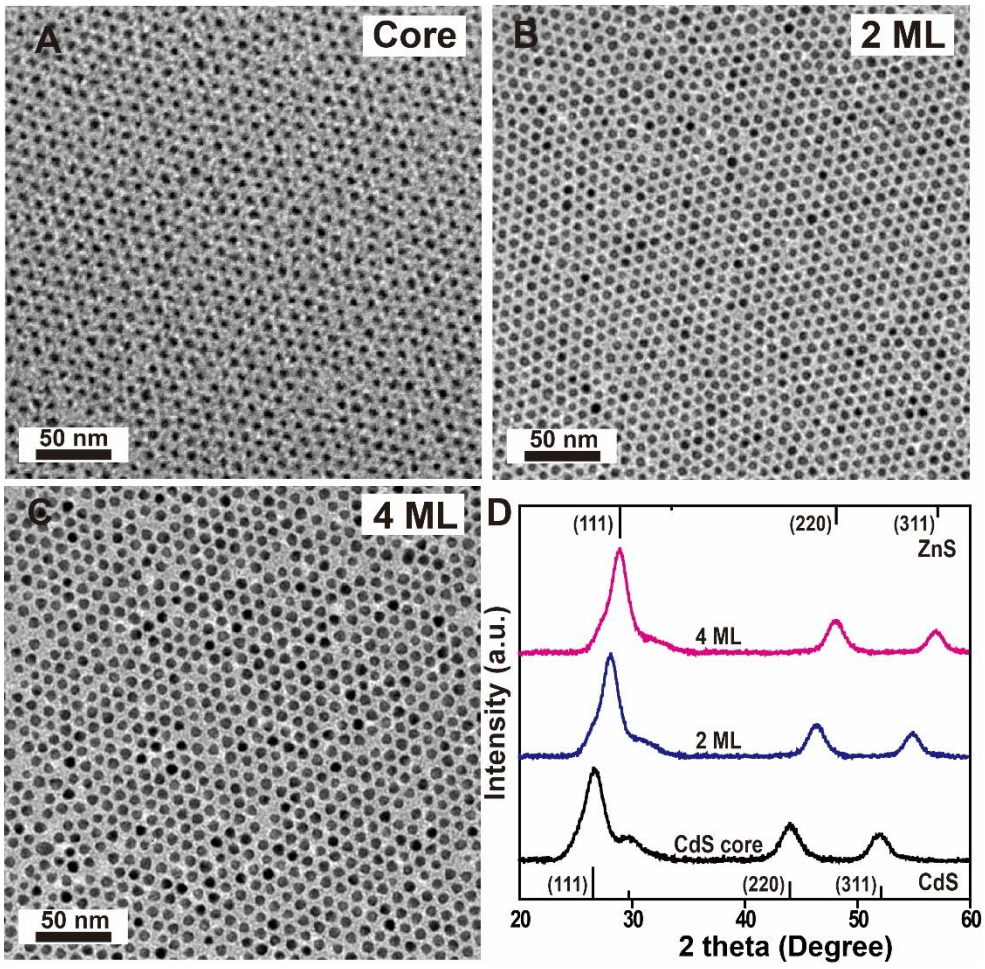

Fig. S2. TEM images of $CdS_{3.6\ nm}$ core (A) and CdS/ZnS_{2ML}(B), CdS/ZnS_{4ML}(C), and XRD pattern for CdS/ZnS core/shell NCs by varing the shell thickness from 2 ML to 4 ML (D).

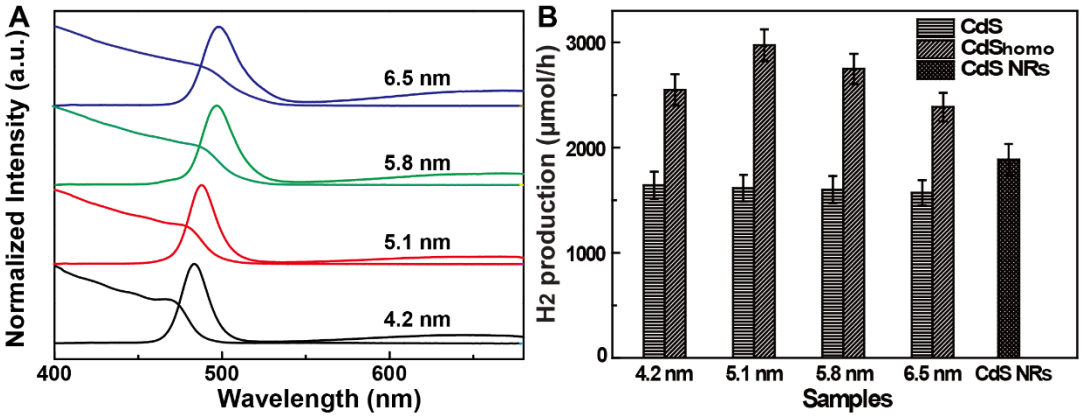

Fig. S3. (A) The UV-vis and fluorescence spectra of CdS nanocrystals with different particle size. (B) The H_2 production rate of same size CdS, CdS_{homo} NCs and CdS NRs directly decomposed from $Cd(DDTC)_2$.

Table S1 Visible-Light-Driven CdS based photocatalysts for hydrogen evolution

photocatalyst	mass (g)	light source	incident light	aqueous reaction solution	activity ($\mu mol \cdot h^{-1} \cdot g^{-1}$)	QE (%, 420 nm)	Ref.
Pt/CdS	0.3	300 W Xe lamp	> 420 nm	0.5 M Na_2S + 0.5 M Na_2SO_3	16	**51**	**1**
Pd/CdS					12.73	**40**	
Pt–Pd/CdS					16.5	**53**	
PdS/CdS					19.96	**64**	
Pt–PdS/CdS					29.23	**93**	
Pt/CdS	0.15	300 W Xe lamp	⩾420 nm	0.35 M Na_2SO_3+ 0.25 M Na_2S	27.33	**60.34**	**2**
NiS/CdS	0.3	300 W Xe lamp	⩾420 nm	0.25 M Na_2S+0.35 M Na_2SO_3	7.26	**51.3**	**3**
Pt-CdS	0.1	300 W Xe lamp	⩾420 nm	20 vol% of L-(+)-lactic acid	29.63	**70.0**	**our work**

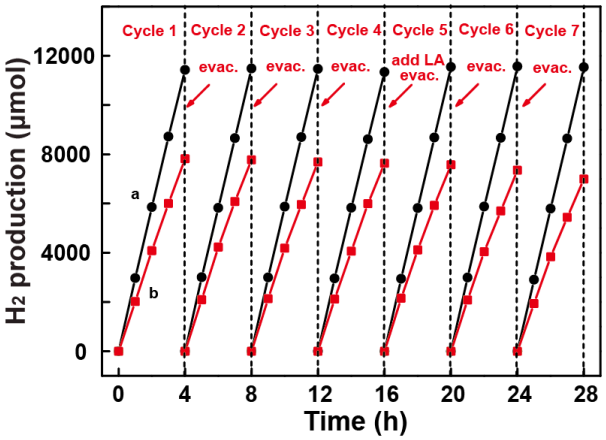

Fig. S4. The stability of H_2 evolution under 7 cycles of irradiation, the system was evacuated after each cycle of irradiation, and L-(+)-lactic acid was supplemented after 4 cycles of irradiation.

References

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