Electronic Supplementary Material (ESI) for New Journal of Chemistry.

A Photo-responsive Electrocatalyst: CdSe Quantum Dots Sensitized WS_2 Nanosheets for Hydrogen Evolution in Neutral Solution

Yueyao Zhong, Bin Chang, Yongliang Shao, Yongzhong Wu*, Xiaopeng Hao*

State Key Lab. of Crystal Materials, Shandong University, Jinan, 250100, China
Email: xphao@sdu.edu.cn, wuyz@sdu.edu.cn

A table of contents

1. Morphology characterizations of WS_2 NSs

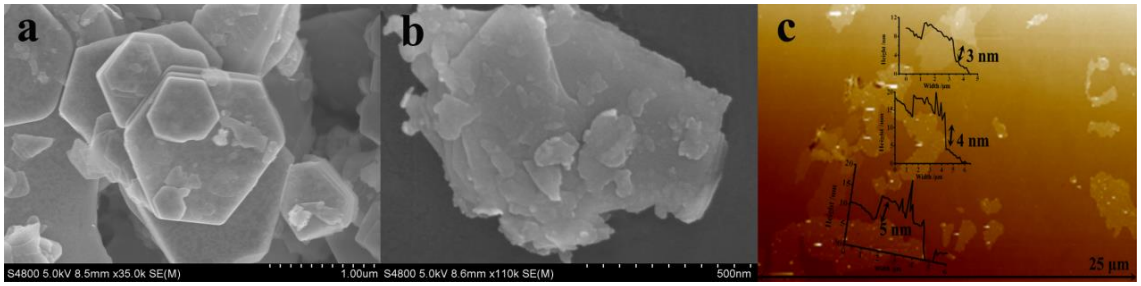

Figure S1. Morphology of WS_2. (a) SEM image of Raw WS_2; (b) SEM image of WS_2 NSs; (c) AFM image of WS_2 NSs.

2. XRD patterns of raw WS_2, WS_2 NSs and CdSe QDs.

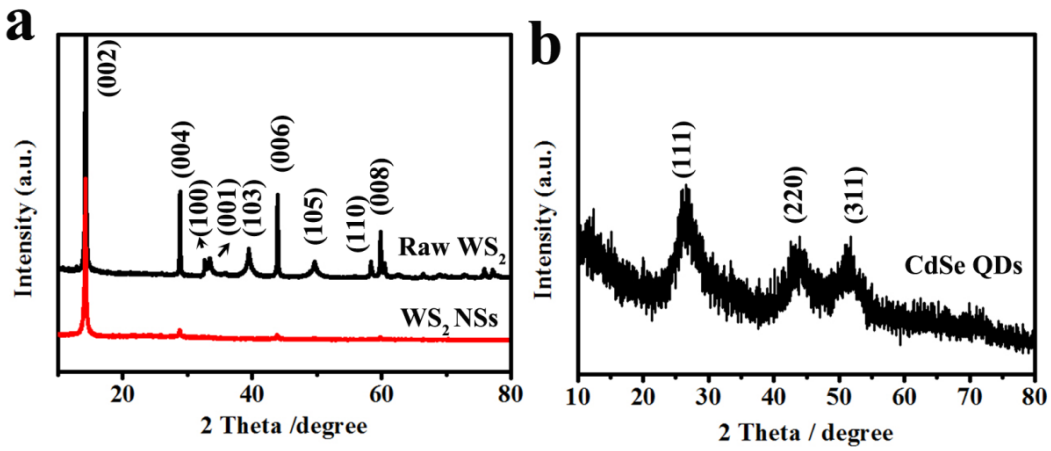

Figure S2. (a) XRD patterns of raw WS_2 and WS_2 NSs; (b) XRD pattern of CdSe QDs.

3. Survey XPS spectra of CdSe QDs, WS_2 NSs and CWS.

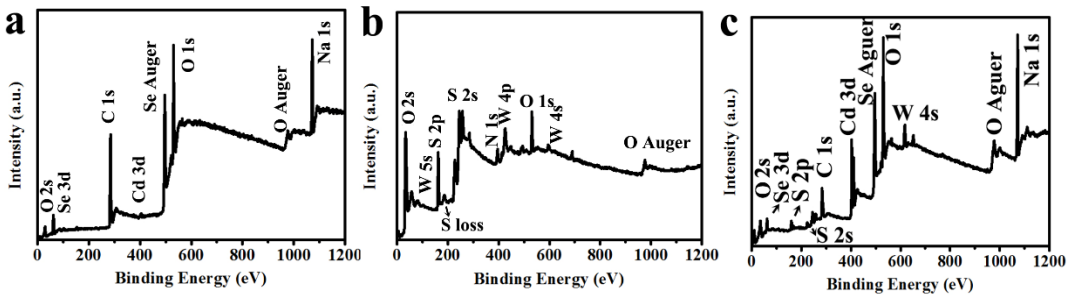

Figure S3. The survey XPS spectra of (a) CdSe QDs; (b) WS_2 NSs; (c) CWS.

4. XPS spectra of WS_2 NSs.

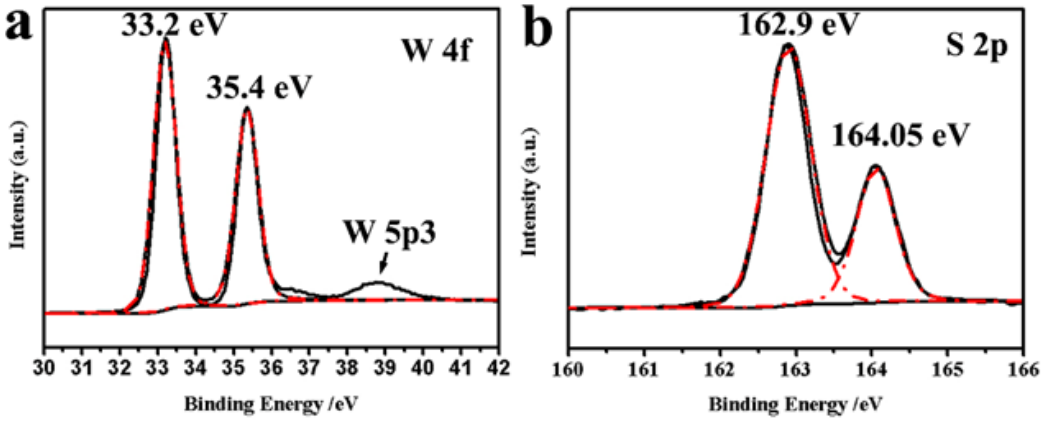

Figure S4. (a) W 4f and (b) S 2p XPS spectra of the WS_2 NSs.

5. XPS spectra of CdSe QDs.

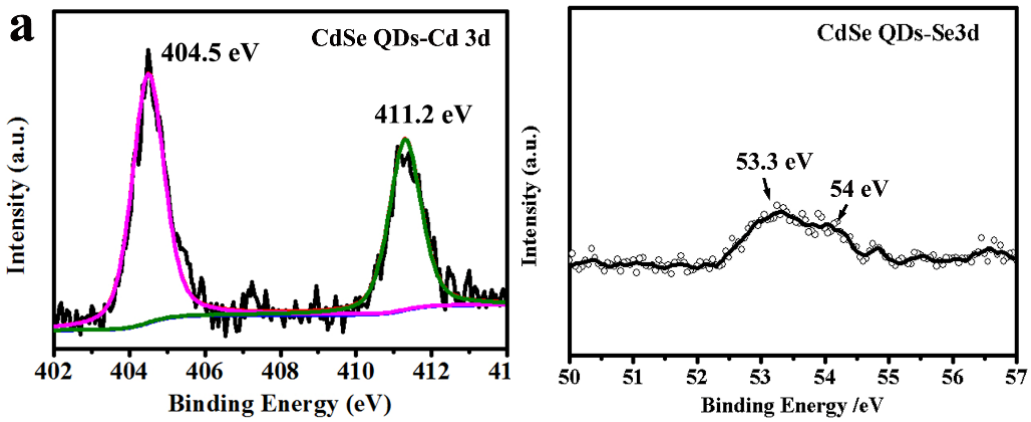

Figure S5. (a) Cd 3d and (b) Se 3d XPS spectra of the CdSe QDs.

6. UV-vis absorption spectra and conresponding band-gaps of CdSe QDs with different reflux reaction time.

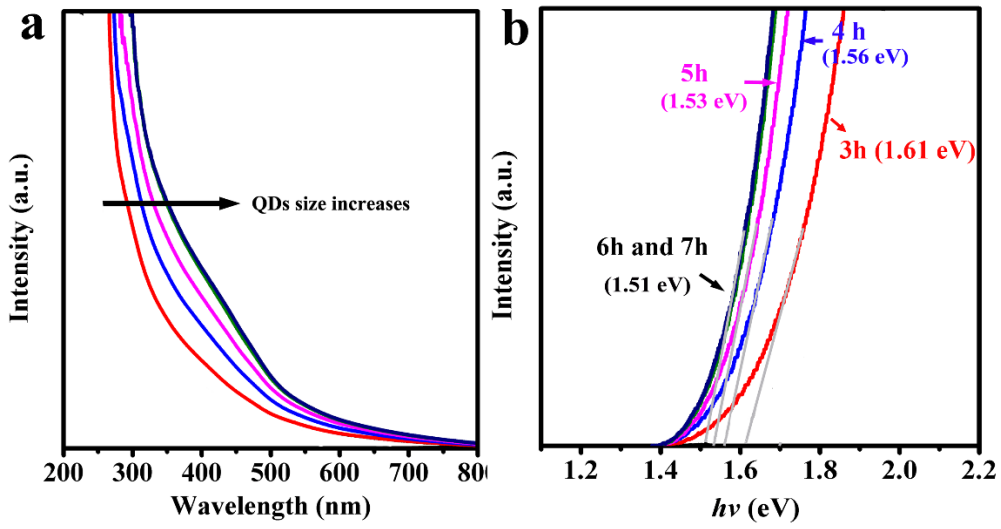

Figure S6. (a) UV-vis absorption spectra and (b) $[F(R)h\nu]^2$ plots versus $h\nu$ of CdSe QDs with different reflux reaction time.

7. UV-vis absorption spectrum and band-gap structure characterizations of WS_2 NSs.

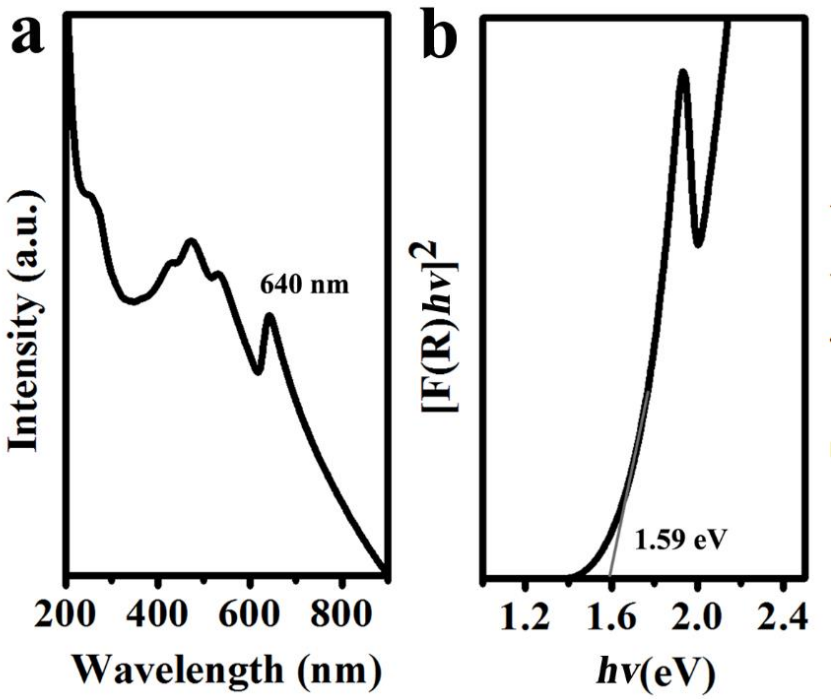

Figure S7. (a) UV-vis absorption spectrum of WS_2 NSs; (b) $[F(R)h\nu]^2$ plots versus $h\nu$ of WS_2 NSs.

8. LSV cureves for CWS with different reflux time before and under visible light irradiation.

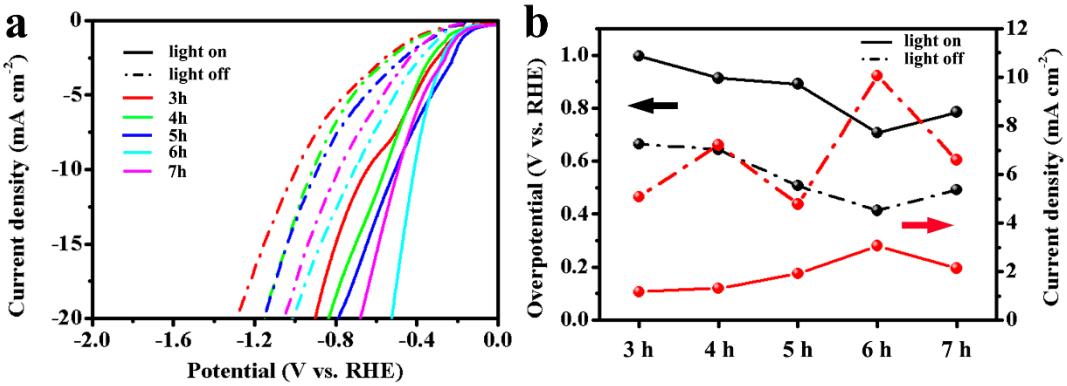

Figure S8. (a) LSV curves for CWS with different reflux time before and under visible light irradiation. (b) The overpotential for driving a current density of 10 mA cm^{-2} and the current density at – 0.4 V vs. RHE of the catalysts.