Supporting information

![Fig. S1](image1) The band gap of the CdS@MoS\(_2\) nanorod prepared with different hydrothermal time. (a) 2h, (b) 3h, (c) 4h and (d) 5h.

![Fig. S2](image2) The band gap of the CdS@MoS\(_2\) nanorod prepared with different deposition time of MoS\(_2\). (a) 0 min, (b) 5 min, (c) 10 min, (d) 15 min and (e) 20 min.

**Fig. S1** The band gap of the CdS@MoS\(_2\) nanorod prepared with different hydrothermal time. (a) 2h, (b) 3h, (c) 4h and (d) 5h.

**Fig. S2** The band gap of the CdS@MoS\(_2\) nanorod prepared with different deposition time of MoS\(_2\). (a) 0 min, (b) 5 min, (c) 10 min, (d) 15 min and (e) 20 min.
Fig. S3: TEM images of CdS@MoS2 nanorod prepared with different hydrothermal time: (a) 2h, (b) 3h, (c) 4h, and (d) 5h. (The CdS nanorods were prepared by hydrothermal method with 7 mmol of Cd(NO₃)₂•4H₂O, and the electrodeposition time of MoS₂ was 15 min.)

Fig. S4: On-off J-t curves of CdS@MoS2 nanorod array prepared with different precursor concentrations under bias of (a) -0.1 V vs. SCE, (b) -1.4 V vs. SCE in 0.50 M Na₂S/Na₂SO₃ solution. The hydrothermal time is 2h, and the electrodeposition time is 15 minutes.