

Supplementary Information

p-type Cu₂O as an effective interlayer between CdS photocatalyst and NiO_x cocatalyst to promote photocatalytic hydrogen production

Xue Qiao^a, Chengsi Pan^a, Yuming Dong^{a,*}, Guangli Wang^a, Huizhen Zhang^a, Yan

Leng^a, Pingbo Zhang^a, Pingping Jiang^a and Yongfa Zhu^{b, a}

^a International Joint Research Center for Photoresponsive Molecules and Materials, School of Chemical and Material Engineering, Jiangnan University, Wuxi 214122, P.R.China

^b Department of Chemistry, Tsinghua University, Beijing, 100084, P.R.China

*Corresponding author: Email addresses: dongym@jiangnan.edu.cn

Table S1 Different amount of load on CdS for first step comparison

	Cu(CH ₃ COO) ₂	TEOA (98%)	PEG400	Light	Illumination time	H ₂ (mmol g ⁻¹ h ⁻¹)
CdS	50 μL	10 ml	1 g	√	1 h	67.02
CdS	100 μl	10 ml	1 g	√	1 h	99.94
CdS	150 μL	10 ml	1 g	√	1 h	85.34
CdS	200 μl	10 ml	1 g	√	1 h	65.51

Table S2 Hydrogen production contrast with or without sacrificial agent.

	Cu (CH ₃ COO) ₂	Ni (CH ₃ COO) ₂	TEOA (98%)	PEG400	Light	Illumination time	HER (mmol g ⁻¹ h ⁻¹)
1	√	√		√	√	1h	46.07
2	√	√	√		√	1h	154.27



Fig.S1 Outdoor equipment of sunlight-driven water splitting by $\text{NiO}_x/\text{Cu}_2\text{O}/\text{CdS}$ composite.

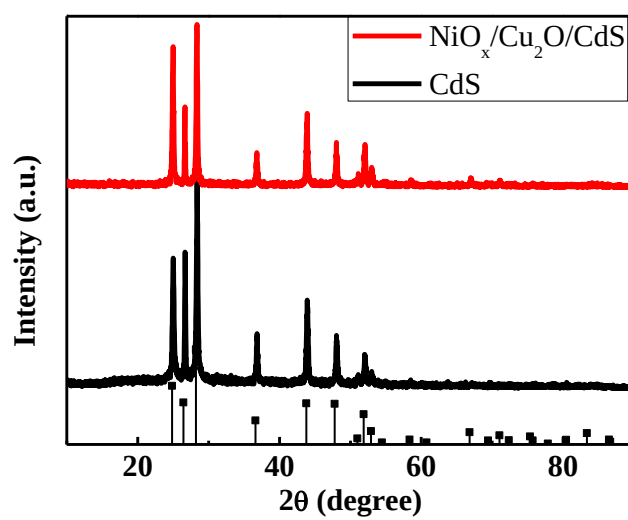


Fig.S2 XRD patterns of $\text{NiO}_x/\text{Cu}_2\text{O}/\text{CdS}$ and CdS .

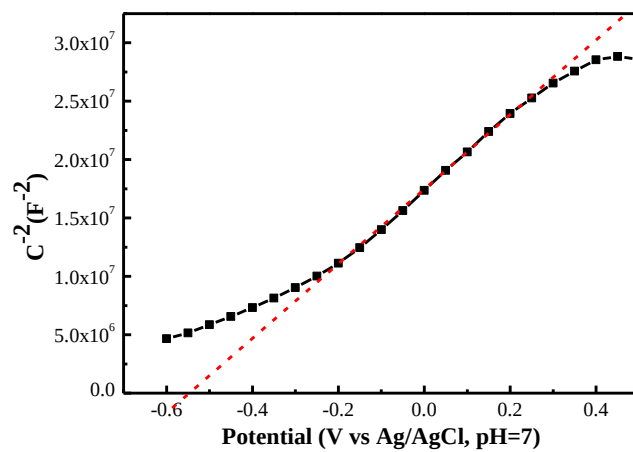


Fig.S3 Mott-Schottky plots of CdS.

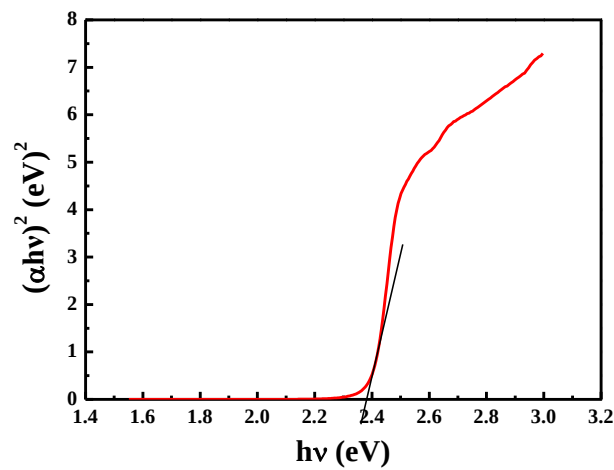


Fig.S4 plots of $(\alpha h\nu)^2$ vs $h\nu$ of CdS.

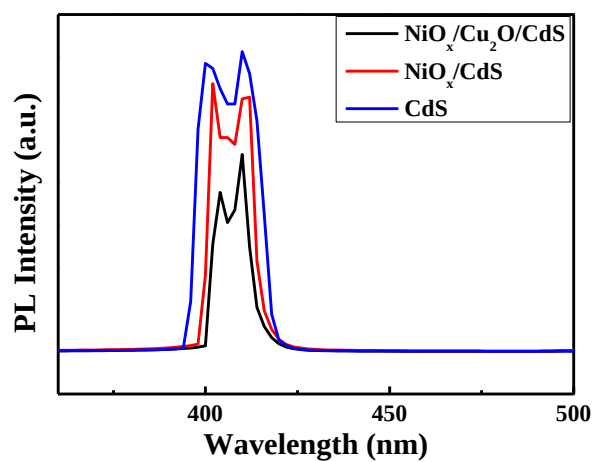


Fig.S5 Photoluminescence spectra of CdS, NiO_x/CdS and $NiO_x/Cu_2O/CdS$.

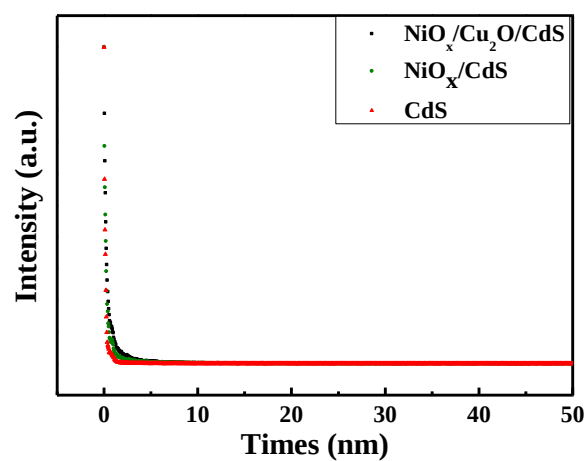


Fig.S6 Transient luminescence spectrum of CdS, NiO_x/CdS and $\text{NiO}_x/\text{Cu}_2\text{O}/\text{CdS}$.

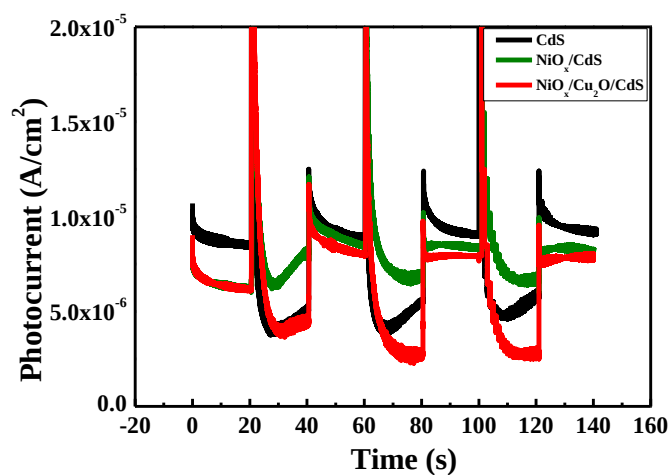


Fig.S7 Photocurrent of CdS, NiO_x/CdS and $\text{NiO}_x/\text{Cu}_2\text{O}/\text{CdS}$.

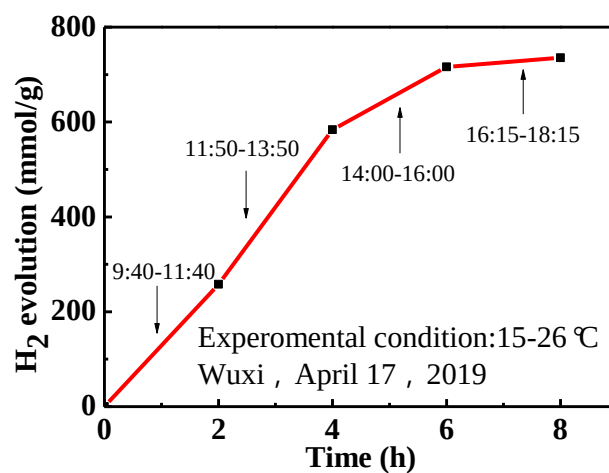


Fig.S8 Amount of hydrogen of $\text{NiO}_x/\text{Cu}_2\text{O}/\text{CdS}$ by sunlight-driven.