

Quantum-dot Sensitized hierarchical NiO p-n heterojunction for effective photocatalytic performance

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Keywords: Hierarchical NiO, CdS QDs, p-n Heterojunction; Dye-degradation

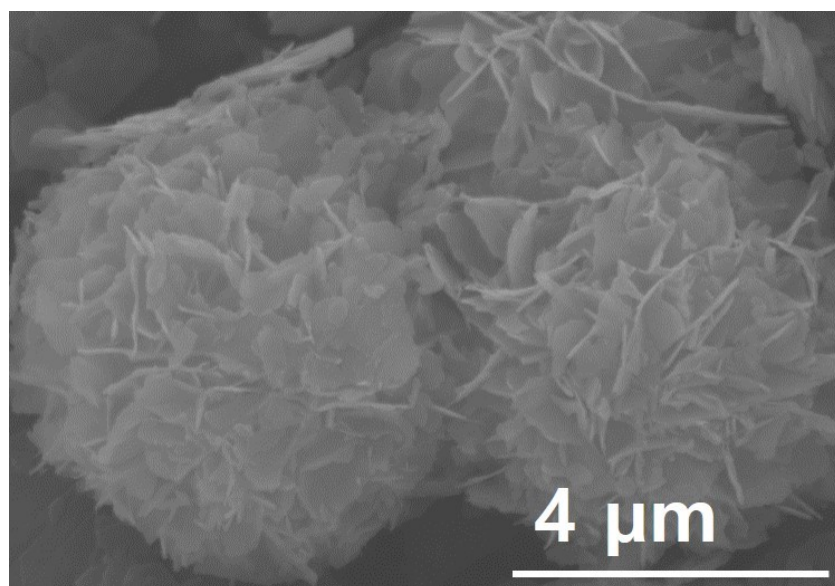


Fig. S1: (a) Scanning electron microscopic image of pristine hierarchical NiO.

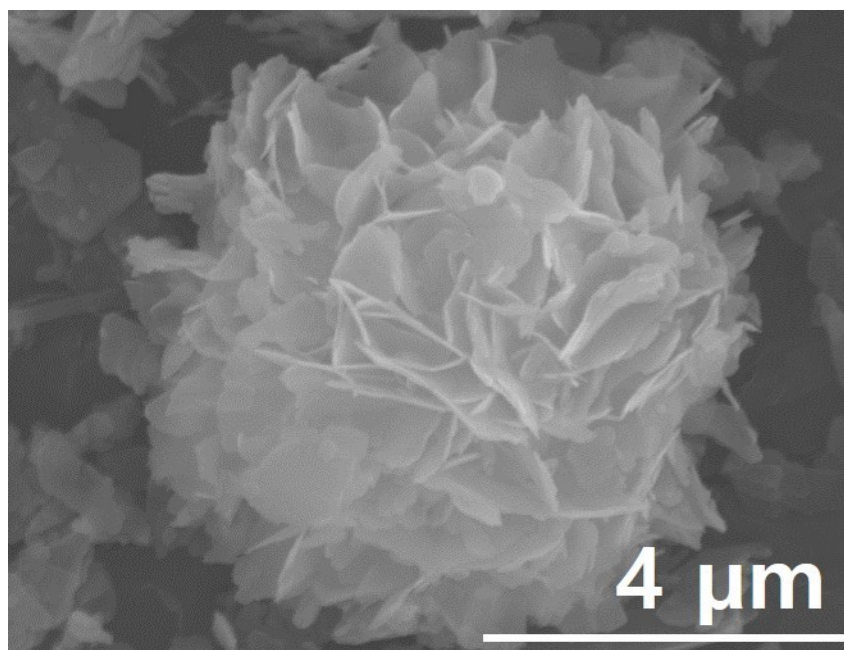


Fig. S2: (a) Scanning electron microscopic image of hierarchical NiO/CdS heterojunction.

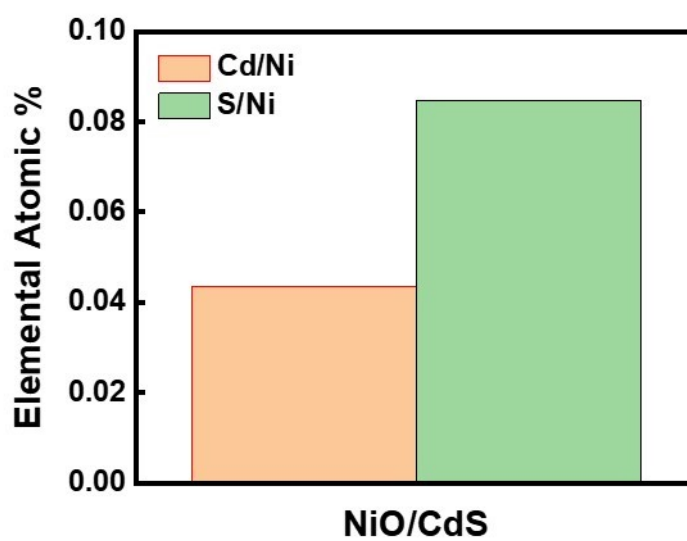
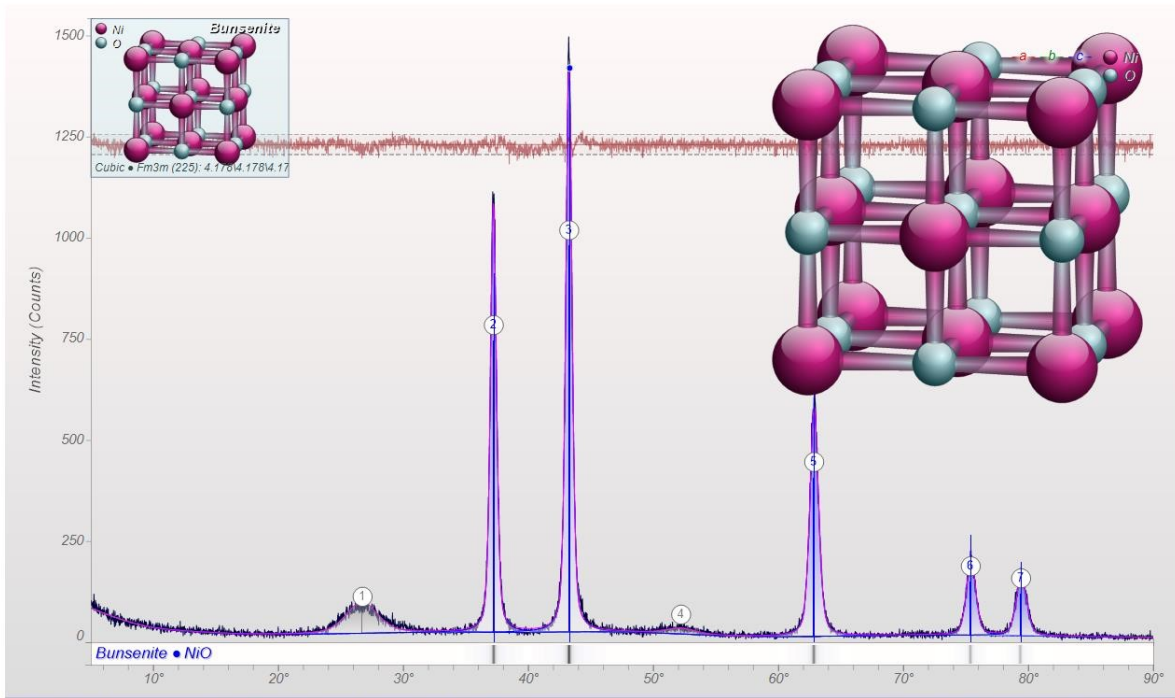


Fig. S3 : EDS-based quantitative comparison for Cd/Ni and S/Ni for CdS/NiO by atomic percent.

NiO_CdS

#	Phase ID	Chemical Formula	PDF-#	RIR	FOM (n)	Scale(I)	Shift(x)	Space Group	a (Å)	b (Å)	c (Å)
1	Bunsenite	NiO	98-000-0133	5.19	0.9 (05)	0.940	0.020°	cFm3m (225)	4.1780	4.1780	4.1780



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NiO_CdS

#	Angle(°)	d(Å)	Centroid	Centroid	BG	Height	H/σ	Area(α1)	Area(α1)%	A/σ	S/L(1.0)	Shape*	FWHM(°)	XS(Å)	(h k l)	Pha
1	26.687 (0.018)	3.3376 (0.0045)	26.687°	3.3376Å	23.0	52.0 (0.6)	84.9	194.7 (2.9)	28.1 (0.4)%	66.4	0.0283	0.488v	3.000 (0.022)	27		
2	37.186 (0.002)	2.4159 (0.0002)	37.186°	2.4159Å	25.5	721.2 (4.0)	179.9	514.9 (3.7)	74.3 (0.5)%	139.0	0.0283	0.488v	0.559 (0.002)	158	(1 1 1)	Buns
3	43.217 (0.001)	2.0917 (0.0001)	43.217°	2.0917Å	26.4	954.7 (4.5)	210.3	692.9 (4.3)	100.0 (0.6)%	159.3	0.0283	0.488v	0.570 (0.002)	158	(2 0 0)	Buns
4	52.168 (0.067)	1.7519 (0.0042)	52.168°	1.7519Å	21.3	9.6 (0.4)	21.3	33.1 (2.0)	4.8 (0.3)%	16.3	0.0283	0.488v	2.794 (0.083)	32		
5	62.810 (0.003)	1.4783 (0.0001)	62.810°	1.4783Å	15.5	392.6 (2.5)	156.1	389.0 (3.2)	56.1 (0.5)%	120.8	0.0283	0.488v	0.784 (0.003)	123	(2 2 0)	Buns
6	75.340 (0.005)	1.2605 (0.0002)	75.340°	1.2605Å	18.3	132.1 (1.6)	84.6	137.5 (2.1)	19.8 (0.3)%	64.5	0.0283	0.488v	0.827 (0.006)	125	(3 1 1)	Buns
7	79.364 (0.007)	1.2064 (0.0002)	79.364°	1.2064Å	16.8	103.7 (1.3)	78.3	121.5 (2.0)	17.5 (0.3)%	60.0	0.0283	0.488v	0.934 (0.008)	113	(2 2 2)	Buns

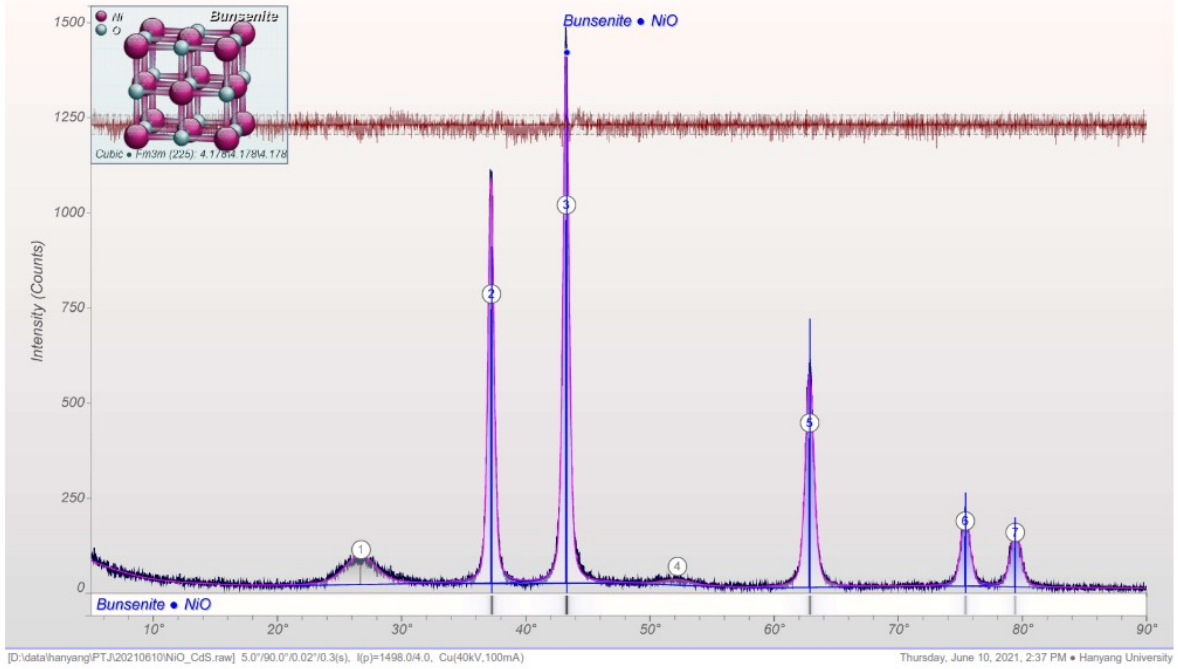
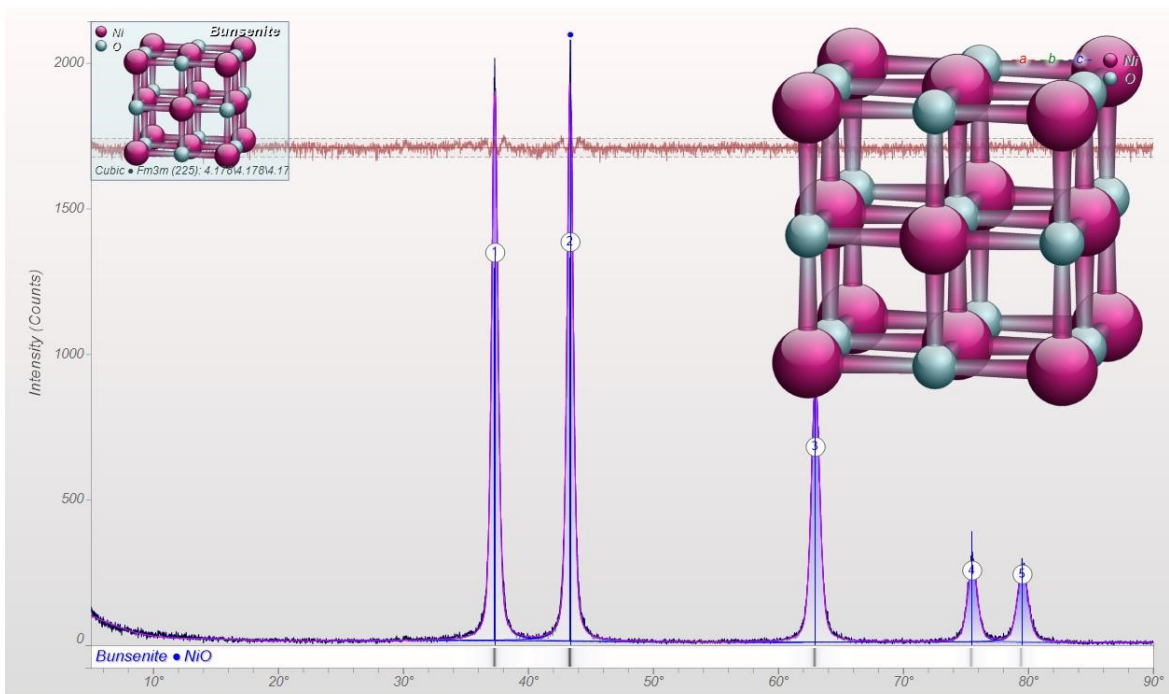


Fig. S4: XRD pattern NiO-CdS

NiO

#	Phase ID	Chemical Formula	PDF-#	RIR	FOM (n)	Scale(I)	Shift(x)	Space Group	a (Å)	b (Å)	c (Å)
1	Bunsenite	NiO	98-000-0133	5.19	1.0 (05)	1.000	0.080°	cFm3m (225)	4.1780	4.1780	4.1780



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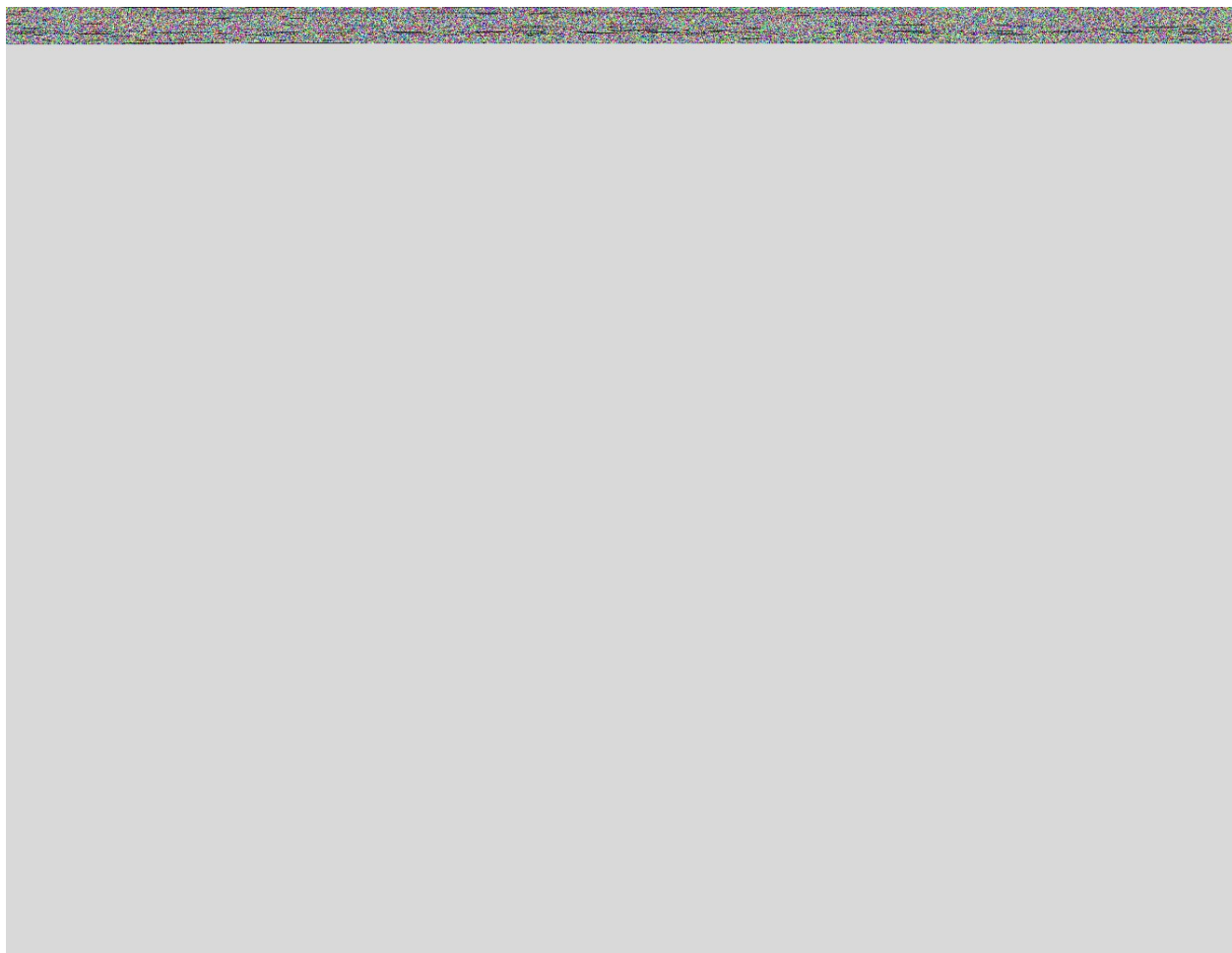


Fig. S5: XRD pattern NiO-CdS.

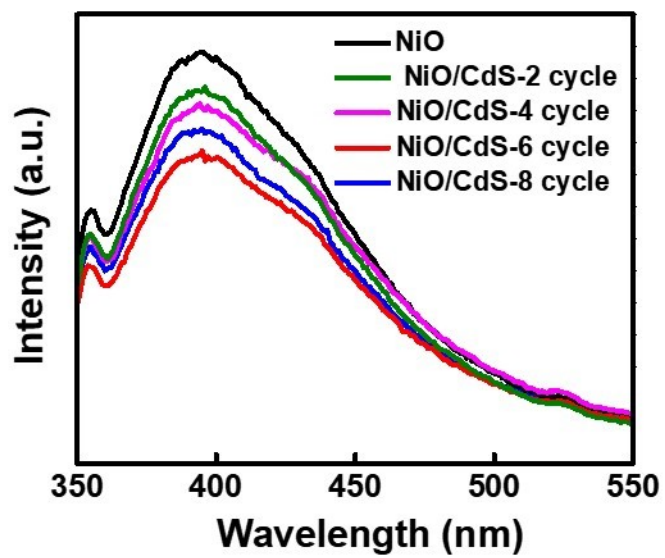


Fig. S6: Photoluminescence spectra of pristine NiO as well as different NiO/CdS p-n heterojunctions.

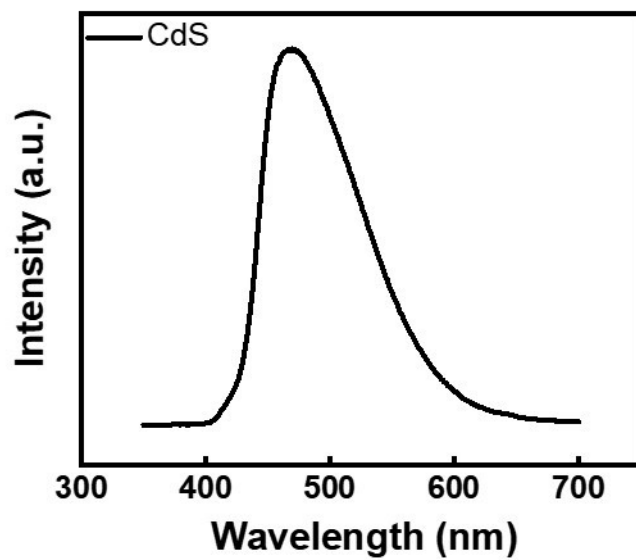


Fig. S7: Photoluminescence spectra of pristine CdS QDs.

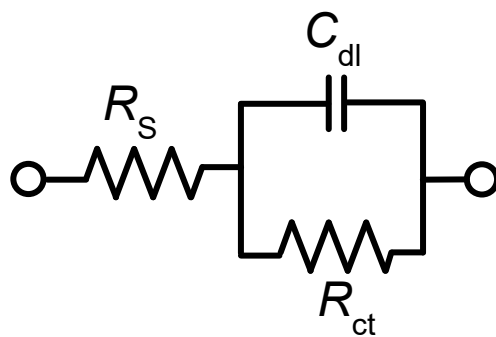


Fig. S8: Equivalent circuit of EIS data.

Table S1: Various electrochemical parameters derived from the EIS study.

Photocatalysts	R_s (Ω)	R_{ct} (Ω)	C_{dl} (μF)
NiO	6.22	9989	0.733
NiO/CdS	4.33	7149	0.551