Supplementary Information

Efficient CdTe Nanocrystal/TiO₂ Hetero-Junction Solar Cells with Open Circuit Voltage Breaking 0.8 V by Incorporating A Thin Layer of CdS Nanocrystal



Figure S1 TEM images of as prepared (a) CdS and (b) CdTe nanocrystal.



Figure S2 Transmission spectrum of FTO/TiO₂/CdS with different thickness of CdS NC film.



Figure S3 EDS obtained on the cross-section of CdTe NC solar cells with configuration of FTO/TiO₂/CdS/CdTe/Au.



Figure S4 J-V characteristic of NC solar cells with different

annealing temperatures (all devices with 3.74 nm CdS interlayer).



Figure S5 XRD pattern of FTO/TiO2 and FTO/TiO2/CdS.



Figure S6 *J-V* characteristic of NC solar cells with different thicknesses of CdS NC film (all devices annealing at 400°C).



Figure S7 (a) *J*-*V* curves for NC solar cells with/without MoO_x buffer layer (b) *J*-*V* curves for NCs solar cells with different ozone etching times.

Device Architecture	Etching Time (s)	Voc (V)	J _{sc} (mA/cm²)	FF (%)	PCE (%)	$R_s(\Omega \cdot \mathrm{cm}^2)$	$R_{sh}(\Omega \cdot \mathrm{cm}^2)$
FTO/TiO2/CdS/CdTe/Au	0	0.73	17.37	40.69	5.16	51.9	268.3
FTO/TiO2/CdS/CdTe/MoO3/A u	0	0.66	15.41	33.92	3.45	42.9	407.5
FTO/TiO2/CdS/CdTe/Au	5	0.67	15.79	42.91	4.54	32.3	203.3
FTO/TiO2/CdS/CdTe/Au	10	0.67	16.55	35.89	3.98	51.4	96.6
FTO/TiO2/CdS/CdTe/Au	15	0.69	16.36	32.69	3.69	96.0	157.8

Table S1 Summarized photovoltaic parameters from Figure S4.