

Supporting Information

CdSe-Sensitized Mesoscopic TiO₂ Solar Cells Exhibiting > 5% Efficiency: Redundancy of CdS Buffer Layer

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Table S1. *j*-*V* characteristics of cascaded CdS/CdSe-sensitized 5 μm thick TiO₂ (without scattering layers) solar cells made with platinized FTO cathode under simulated AM1.5 100 mW cm⁻² illumination.

Sensitizer	<i>V</i> _{oc} (V)	<i>j</i> _{sc} (mA.cm ⁻²)	<i>ff</i> (%)	<i>η</i> (%)
4CdS/5CdSe	0.560	12.14	42.95	2.92
4CdS/6CdSe	0.556	11.59	46.01	2.96
5CdS/5CdSe	0.563	12.70	41.76	3.00
5CdS/6CdSe	0.548	12.82	41.90	2.94
5CdS/7CdSe	0.545	12.92	40.53	2.85

Table S2. Characteristics of 7CdSe and 5CdS/5CdSe-sensitized TiO₂ solar cells (TiO₂ electrodes were 5 and 10.3 μm thick without scattering layers) made with Pt cathode under simulated AM1.5 100 mW cm⁻² illumination.

Thickness of TiO ₂ (μm)	Sensitizer	V _{oc} (V)	j _{sc} (mA.cm ⁻²)	ff (%)	η (%)
5	7CdSe	0.568	12.80	45.71	3.32
5	5CdS/5CdSe	0.563	12.70	41.76	3.00
10.3	7CdSe	0.521	13.70	44.60	3.18
10.3	5CdS/5CdSe	0.496	12.94	45.90	2.95

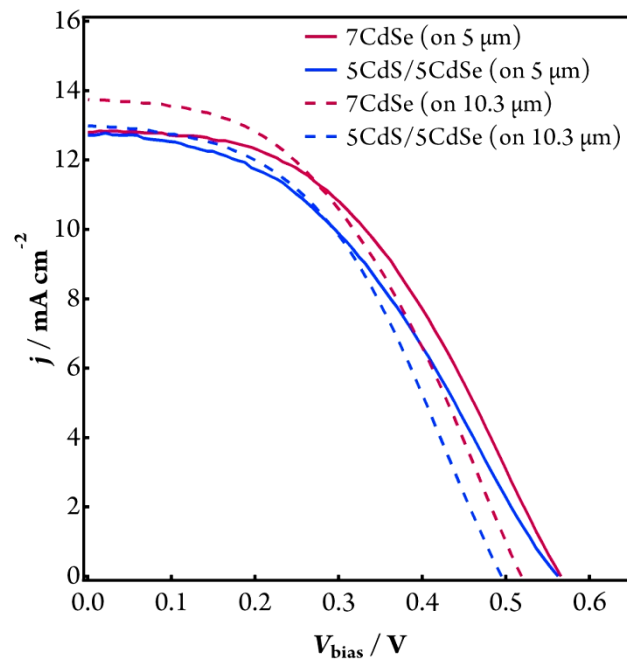


Figure S1. *j*-*V* characteristics of solar cells used for impedance measurement. The cells were made with 7CdSe and 5CdS/5CdSe-sensitized TiO₂ photoanodes (5 and 10.3 μm thick TiO₂ electrodes without scattering layers) and Pt counter electrodes.

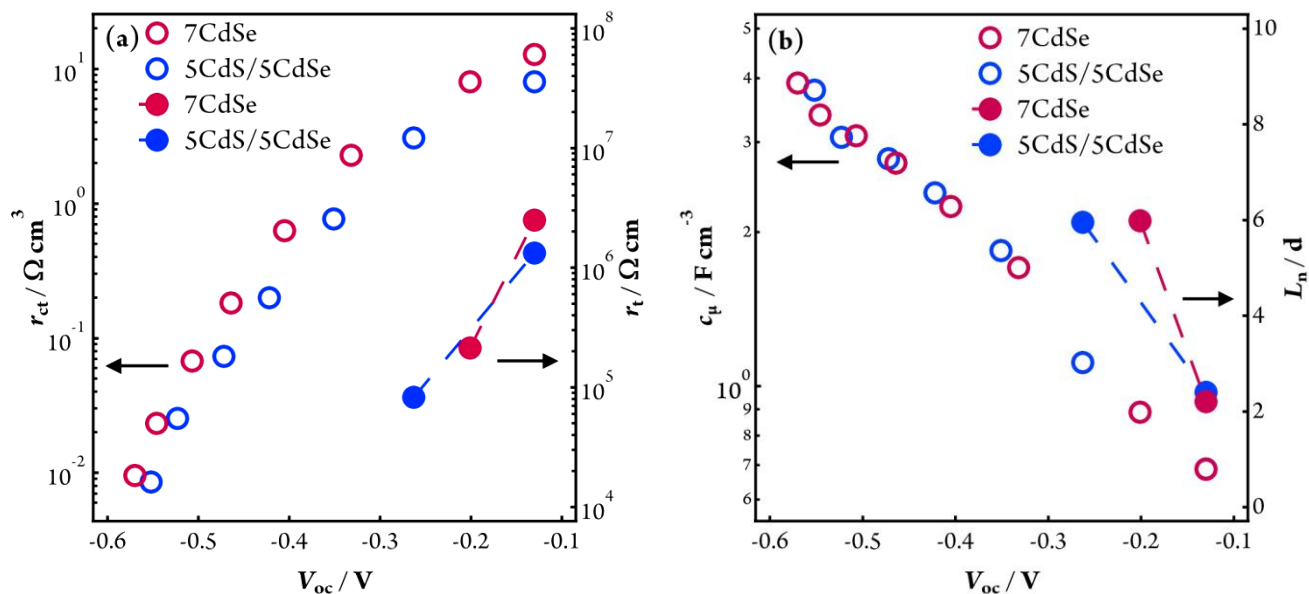


Figure S2. Dependence of distributed charge transfer resistance (r_{ct}), electron transport resistance (r_t) (a) and chemical capacitance (c_{μ}) and electron diffusion length divided by film thickness (L_n/d) (b) versus open circuit photovoltage for SSCs utilizing 7CdSe and 5CdS/5CdSe sensitized 10.3 μm TiO_2 electrodes (without scattering layers) and platinumized FTO cathodes.

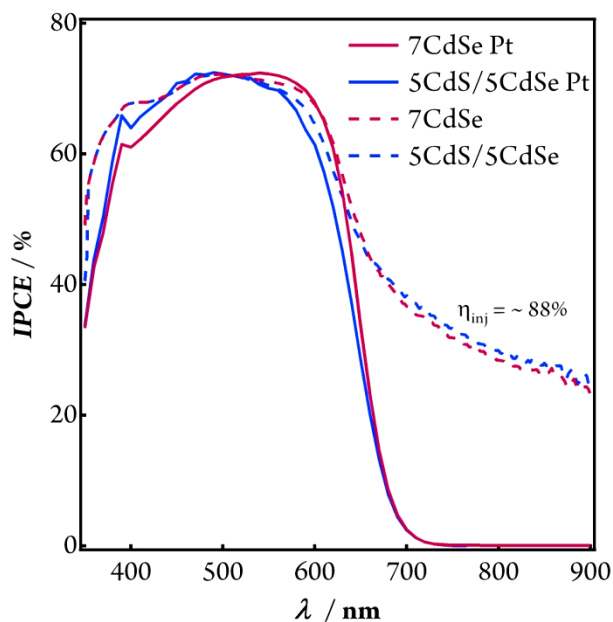


Figure S3. IPCE spectra of 7CdSe and 5CdS/5CdSe cells made with platinumized cathode (solid lines) and the simulated IPCE spectra based on the light absorption of 7CdSe and 5CdS/5CdSe-sensitized thin (2.4 μm) TiO_2 electrodes (dashed lines).