Carrier Generation and Collection in CdS/CdSe Sensitized SnO_2 Solar Cells Exhibiting Unprecedented Photocurrent Densities: Supporting Information

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Optical characteristics of CdS/CdSe sensitized TiO_2 layers. Figure S1 shows the optical density spectrum of a 5.4 μm thick TiO_2 layer sensitized with CdS and CdSe, each deposited by 5 successive cycles of SILAR.

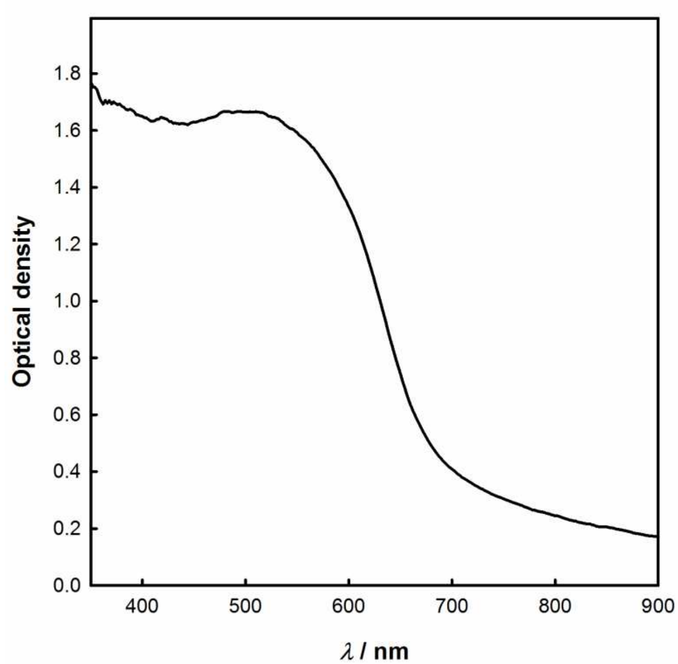

Figure S1. Optical density spectrum for a 5.4 μm thick CdS/CdSe sensitized TiO_2 electrode.

Based upon these data, the light harvesting efficiency of the electrode is predicted to be greater than 99% between 400 and 600 nm for the optimized 9 μm thick TiO_2 layers used to fabricate SSCs.

Equivalent circuit used for analysis of impedance spectra. Figure S2 shows the equivalent circuit used for analysis of impedance spectra. Here R_s is the series resistance, C_{sub} is the substrate capacitance, r_t is the distributed transport resistance, c_μ is the distributed capacitance of the oxide layer, r_{ct} is the distributed charge transfer resistance, Z_d is a Warburg impedance, R_{Pt} is the resistance of the Pt-coated cathode and C_{Pt} is the capacitance of the cathode. The lower case resistances and capacitances are related to the total resistances and capacitance of the oxide layer (of unit area) by $R_t = r_t d$, $C_\mu = c_\mu d$ and $R_{ct} = r_{ct}/\mathrm{d}$.

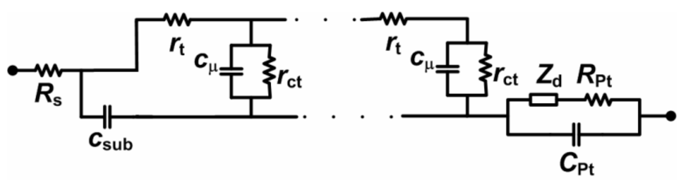

Figure S2. Equivalent circuit used for fitting impedance spectra.