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Electronic Supplementary Information

Toward highly efficient CdS/CdSe quantum dots-sensitized solar cells incorporating with ordered photoanodes on transparent conductive substrates

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Experimental section

Characterization

The UV-vis transmittance spectra were obtained on Shimadzu UV-2550.

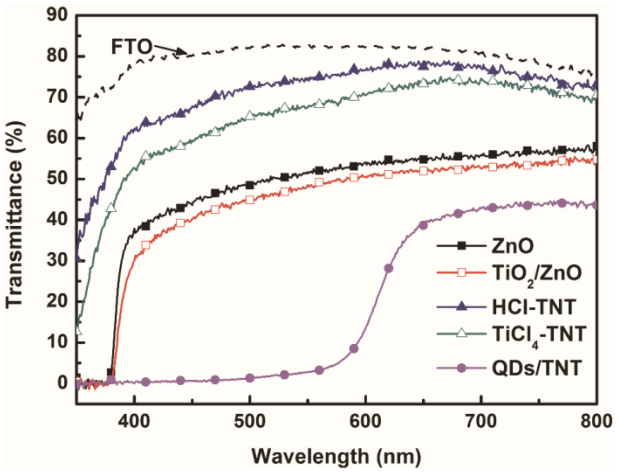

Figure S1. UV-vis transmittance spectra of ZnO nanorod arrays, ZnO/TiO_2 core/shell nanostructure, HCl-TNTs, and $TiCl_4$-TNTs before and after QDs deposition, in comparison with the transmittance spectrum of bare FTO.

Different aligned nanostructures, including ZnO nanorods, ZnO/TiO_2 core/shell nanostructure, HCl-TNT and $TiCl_4$-TNT arrays are further investigated by transmittance spectra. As shown in Figure S1, for the ZnO nanorods, its transmittance is about 50% between 350 nm and 800 nm due to its light-scattering effect, whereas a sharp decrease at 400 nm is due to its intrinsic absorption. After being coated by TiO_2 shell, the film is white and its transmittance slightly reduces since larger diameters of TiO_2 coated nanorods will lead to stronger light-scattering effect. Further etching off the ZnO template affords TNT arrays, the film becomes semi-transparent and its transmittance significantly enhances to about 70% in the range of visible light. After $TiCl_4$ treatment, the transmittance of TNTs slightly decreases because thicker wall of TNT arrays. When CdS/CdSe QDs are successively deposited on $TiCl_4$-TNT arrays, strong absorption in the visible light range will bring about very low transmittance of the film (nearly zero) below 600 nm.