

Supplementary Information

Article: 3-D TiO₂ Nanoparticle/ ITO Nanowire Nanocomposite Antenna for Efficient Charge Collection in Solid State Dye-sensitized Solar Cells

By

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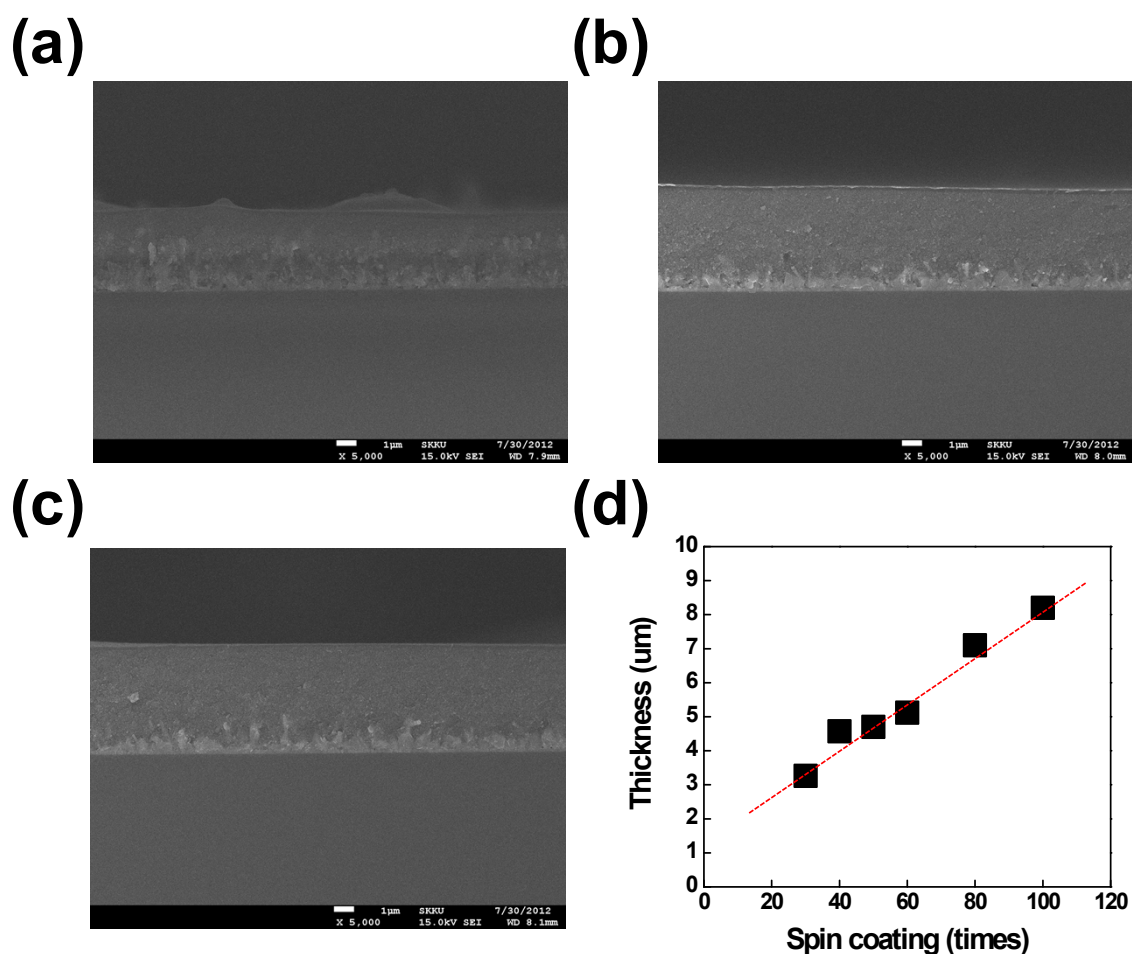


Figure S1. SEM images of 3-D TiO₂ Nanoparticle/ ITO Nanowire nanocomposite photoelectrode thickness was changing number of spin coating; (a) 30 times, (b) 50 times, (c) 80 times, (d) plot of the photoelectrode thickness change according to spin coating times.

Photoelectrode thickness [μm]	J_{sc} [mA cm^{-2}]	V_{oc} [mV]	ff [%]	η [%]
NPs/FTO(0.7 μm)	1.18 $\pm$ 0.14	729 $\pm$ 12.0	68.3 $\pm$ 1.04	0.59 $\pm$ 0.09
NPs/FTO(2.1 μm)	3.63 $\pm$ 0.34	798 $\pm$ 49.0	68.1 $\pm$ 4.41	1.96 $\pm$ 0.14
NPs/FTO(3.47 μm)	2.87 $\pm$ 0.43	719 $\pm$ 39.5	64.3 $\pm$ 9.48	1.31 $\pm$ 0.19
NPs/FTO(4.50 μm) [†]	1.93 $\pm$ 0.33	694 $\pm$ 30.0	57.7 $\pm$ 4.02	0.77 $\pm$ 0.10
NPs/FTO(5.22 μm)	1.52 $\pm$ 0.21	709 $\pm$ 31.1	57.4 $\pm$ 1.49	0.63 $\pm$ 0.07
NPs/FTO(6.52 μm)	0.79 $\pm$ 0.07	531 $\pm$ 10.1	35.3 $\pm$ 1.66	0.15 $\pm$ 0.05
NPs/ITO NWs (3.2 μm)	4.57 $\pm$ 0.67	526 $\pm$ 20.5	33.4 $\pm$ 7.37	0.80 $\pm$ 0.37
NPs/ITO NWs (4.1 μm)	5.91 $\pm$ 0.70	671 $\pm$ 38.2	44.2 $\pm$ 4.94	1.74 $\pm$ 0.18
NPs/ITO NWs (4.8 μm) ^{††}	7.21 $\pm$ 0.16	753 $\pm$ 28.1	53.3 $\pm$ 9.31	2.80 $\pm$ 0.15
NPs/ITO NWs (7.1 μm)	3.21 $\pm$ 0.74	657 $\pm$ 38.1	47.8 $\pm$ 7.79	0.99 $\pm$ 0.01
NPs/ITO NWs (8.2 μm)	1.91 $\pm$ 0.53	606 $\pm$ 38.5	35.1 $\pm$ 5.62	0.39 $\pm$ 0.03

Figure S2. Photovoltaic (PV) properties of TiO_2 NP/ITO NW nanocomposite ss-DSSCs compared with TiO_2 NP based ss-DSSCs according to photoelectrode thickness

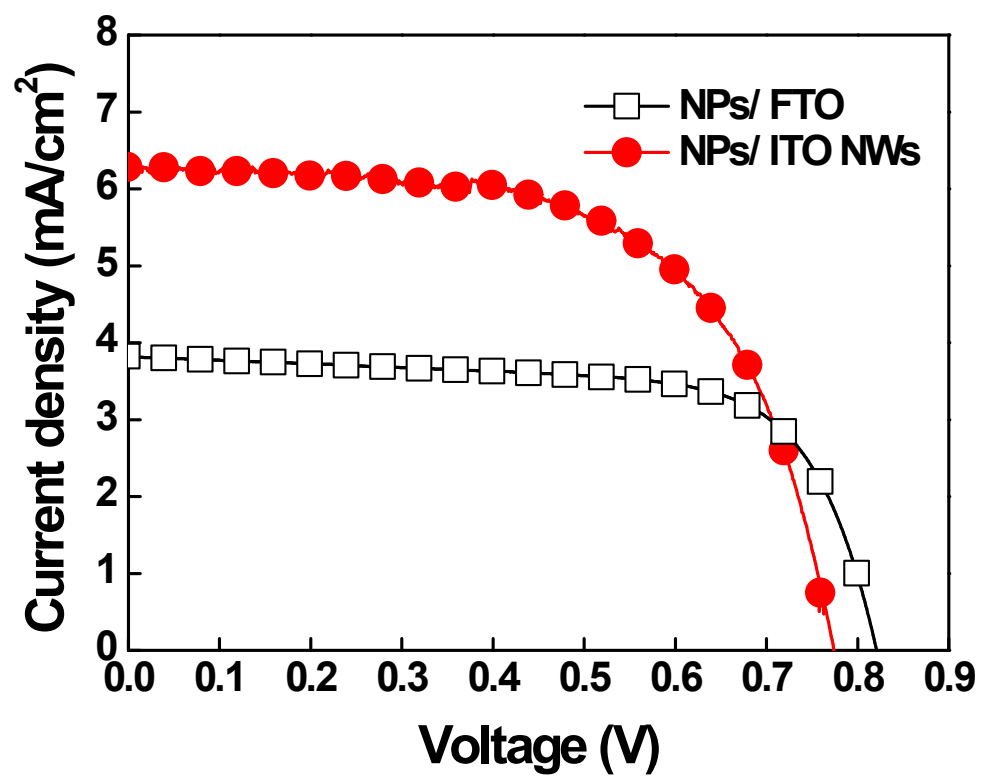


Figure S3. *J-V* curves for best performing cells; TiO₂/ITO NW nanocomposite ss-DSSCs and TiO₂ NP based ss-DSSCs.

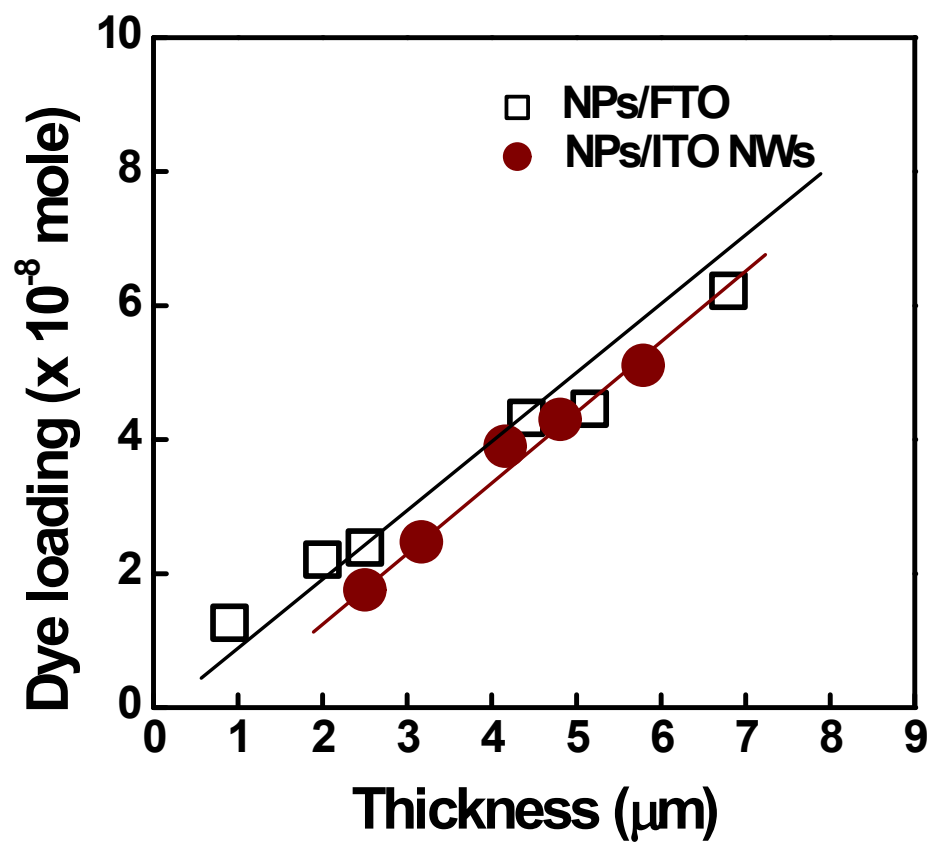


Figure S4. Absorption spectra of desorbed dye solution from each thickness of photoelectrodes (black line, TiO₂ NP based photoelectrode; brown line, TiO₂/ITO NW nanocomposite based photoelectrode)