

Supporting Information:

One-dimensional Hierarchical Titania for Fast Reaction Kinetics of Photoanode Materials of Dye-sensitized Solar Cells

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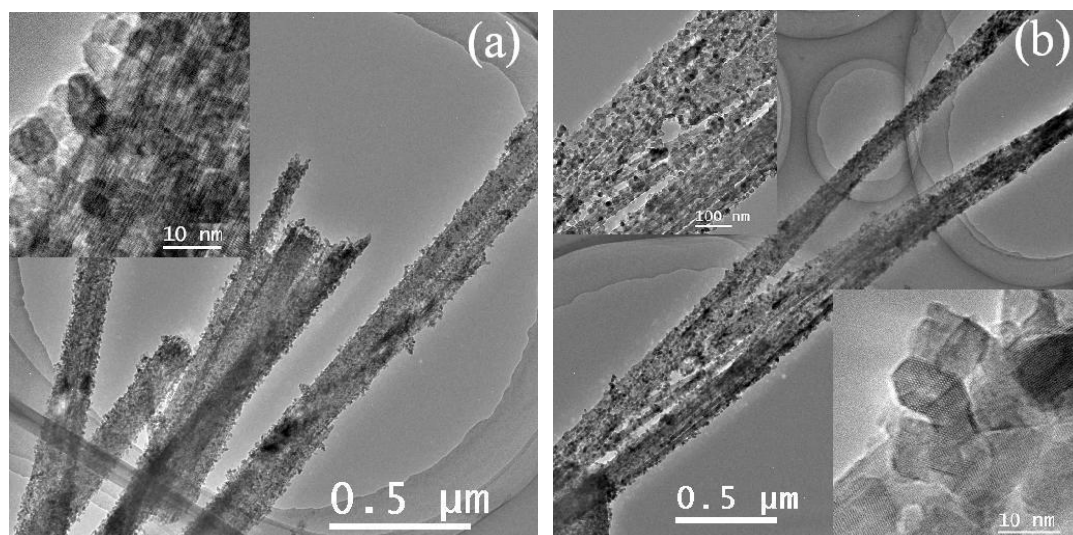


Figure S1. TEM images of one-dimensional titania with hierarchical structures after calcination at 400 °C (a) and 600 °C (b).

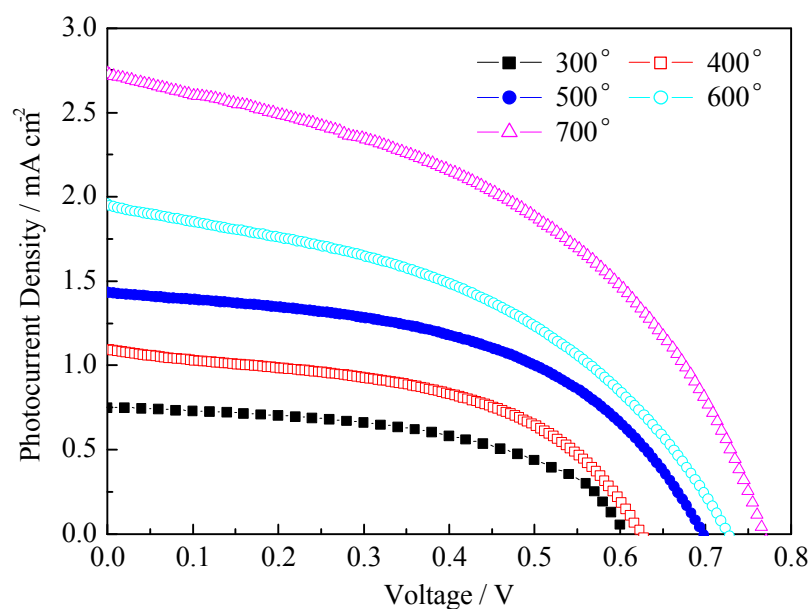


Figure S2. *I*–*V* curves for cells based on titania nanorods calcined at different temperatures. The illumination intensity of 100 mW/cm² with AM 1.5 and active area of 0.25 cm² were applied.

Table S1. Detailed photovoltaic parameters of titania nanorods with different temperature based on N-719 dye.

Nanorods	J_{sc} (mA/cm ²)	V_{oc} (V)	FF (%)	η (%)
300 °C	0.75	0.600	53	0.24
400 °C	1.10	0.625	50	0.34
500 °C	1.43	0.695	51	0.50
600 °C	1.96	0.725	44	0.62
700 °C	2.73	0.770	45	0.94

J_{sc} : short circuit current; V_{oc} : open circuit voltage; FF : fill factor; η : photovoltaic conversion efficiency.

Table S2. Detailed photovoltaic parameters of titania nanoparticles with different temperature based on N-719 dye.

Nanoparticles	J_{sc} (mA/cm ²)	V_{oc} (V)	FF (%)	η (%)
300 °C	2.42	0.588	53	0.75
400 °C	11.63	0.710	56	4.62
500 °C	13.57	0.760	62	6.39
600 °C	12.63	0.795	59	5.92
700 °C	5.11	0.805	58	2.39

J_{sc} : short circuit current; V_{oc} : open circuit voltage; FF : fill factor; η : photovoltaic conversion efficiency.

Table S3. Detailed IMPS/IMVS parameters of the DSSCs based on the one-dimensional titania with hierarchical structures.

Nanocomposites	τ_d (ms)	τ_n (ms)	D_n (cm²/s)	L_n (μm)
300°C	2.31	17.70	4.33×10^{-4}	27.68
400°C	1.83	29.33	5.46×10^{-4}	40.03
500°C	1.46	40.00	6.85×10^{-4}	52.34
600°C	1.18	55.10	8.47×10^{-4}	68.33
700°C	0.94	63.67	1.06×10^{-3}	82.30

τ_d : electron transport time; τ_n : electron lifetime; D_n : electron diffusion coefficient; L_n : electron diffusion length.