Supporting Information for

Hydrogenated ZnO Core-Shell Nanocables for Flexible Supercapacitors and Self-Powered Systems

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Assembly of the DSSCs

0.1 g P25 TiO_2 nanoparticles were continuously mixed with 0.3 mL deionized water. The resulting colloidal dispersions were coated onto indium tin oxide (ITO) glass to form TiO_2 film. Dye sensitization was continued by immersing the fabricated TiO_2 photoanodes in 0.5 mM N719 ruthenium dye ethanol solution for 12 hours at room temperature in a sealed beaker, and then the sensitized film was placed in open air to evaporate the alcohol. The DSSC was assembled in a typical sandwich-type cell with a platinum-coated ITO as a counter anode. The electrolyte solution was injected into the assembled DSSC from the edges by capillary forces. The effective area of a single DSSC is 0.25 cm^2.

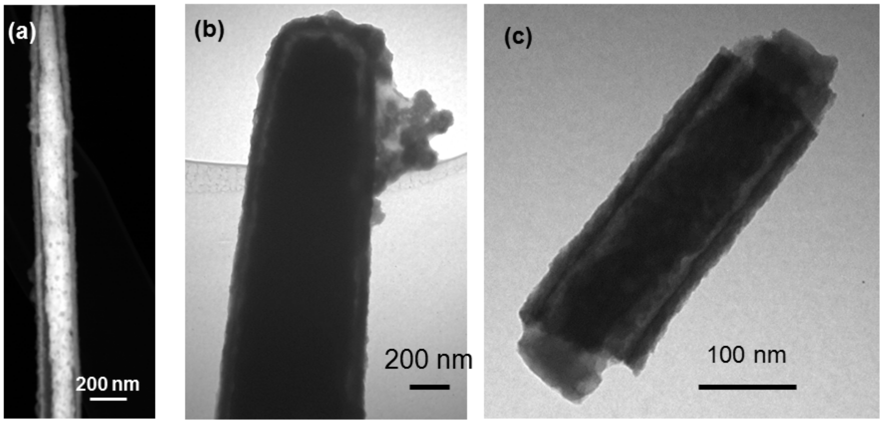

Figure S1. (a) STEM image of HZM core/shell nanostructure. TEM images of the (b) HZC nanocable and (c) HZM nanocable. All suggested core/shell structures.

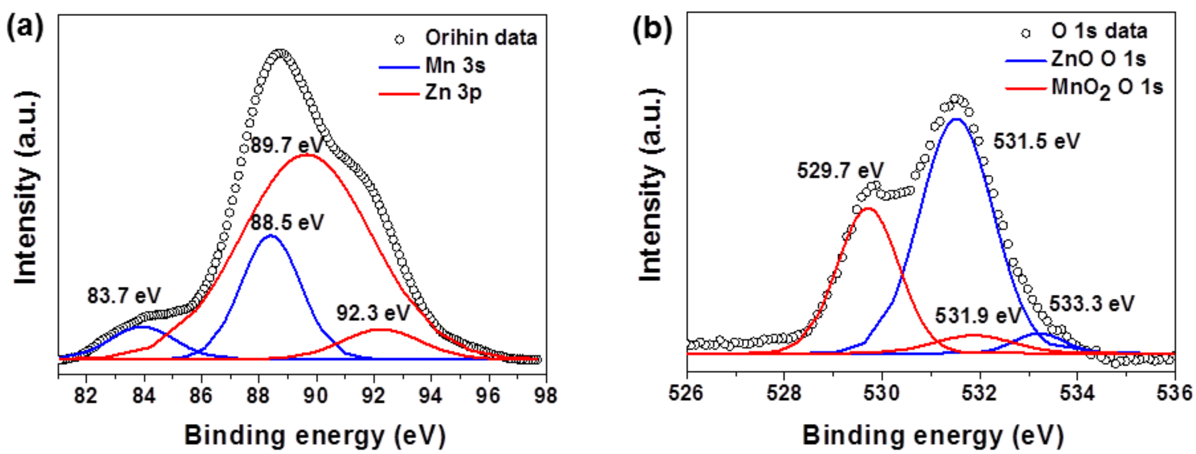

Figure S2. XPS spectra of (a) Mn 3s and Zn 3p and (c) O 1s collected from the HZM core/shell nanocable. ZnO had significant signal interference both in Mn 3s and O 1s, therefore they were not be used to determine valence state of Mn.

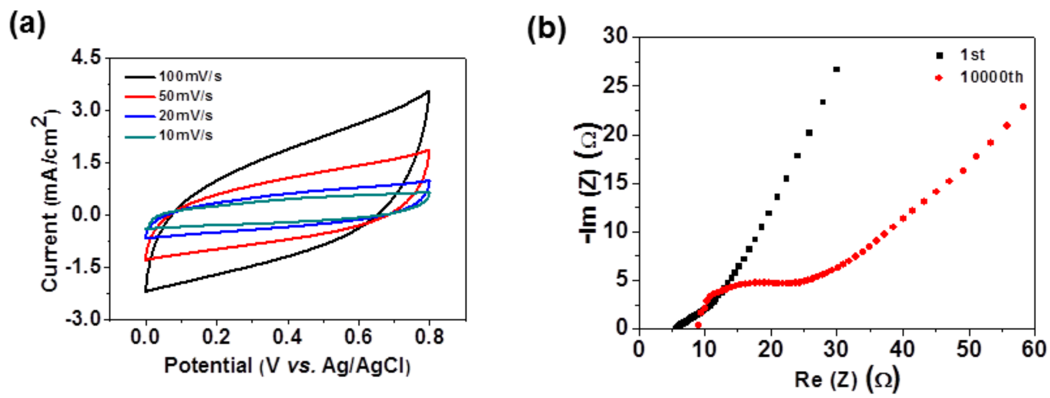

Figure S3. (a) CV curves collected for the HZM SC device at different scan rate. (b) Nyquist plots for the all solid-state HZM SC with an area of 1 cm^2 after 1st and 10000th cycle, respectively.

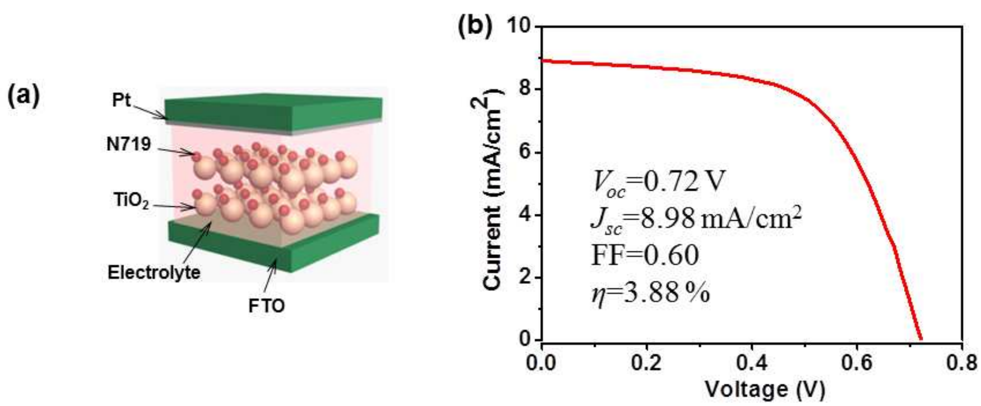

Figure S4. (a) A schematic diagram of a DSSC. **(**b**)** Typical current density/voltage curve of a home-made DSSC under the illumination of AM 1.5. The effective area and maximum power output of a DSSC device was about 0.25 cm^2 and 0.97 mW, respectively.

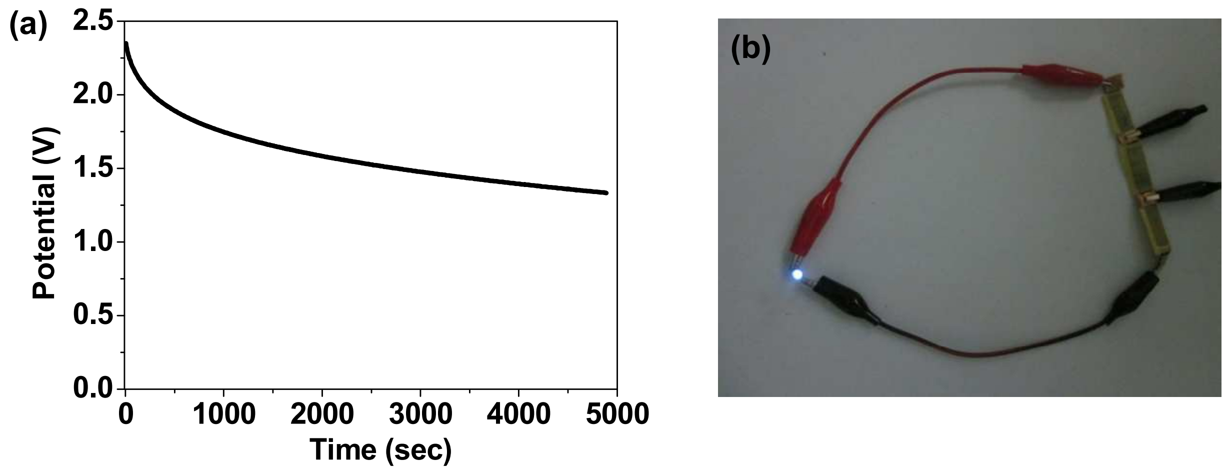

Figure S5. (a)Self-discharge curve of three series-wound SCs. (b) A photo showing an LED powered by three series-wound SCs, which were previously charged by four series-wound DSSCs.

Table S1. Electrical and electrochemical data for ZnO, AZnO, and HZnO electrodes. Carrier concentration was calculated from M-S plots. Areal capacitance was obtained under a discharge current of 0.05 mA/cm^2.

	HZnO	AZnO	ZnO
Carrier concentration (cm^{-3})	2.65×10^{20}	1.86×10^{18}	7.04×10^{17}
Areal capacitance (mF/cm^2)	1.38	0.46	0.27
R_e (Ω)	2.22	3.83	3.77

Table S2. Electrical and electrochemical data for HZM, AZM and ZM electrodes and the HZM-based SC device. Areal capacitance of single electrode was obtained under a discharge current of 1 mA/cm^2, while 0.5 mA/cm^2 for the SC device.

	HZM	AZM	ZM	Device
Areal capacitance (mF/cm^2)	138.7	88.2	49.3	23.47
R_{ct} (Ω)	0.42	0.86	1.2	2.02
R_s (Ω)	2.74	2.94	3.8	5.74

Video S1. A red LED was lighted up by our 3 series-wound SCs, which were previously charged by our DSSCs. This video was speeded up 10 times faster, showing the first 100 seconds of the process.