Electronic Supplementary Information (ESI)

Experimental details

Preparation of coral-like porous SnO_2 hollow architectures

All chemicals were analytical grade and used without further purification as purchased from Shanghai Chemical Reagents Company. In a typical procedure, 10 mmol $SnCl_4 \cdot 5H_2O$ and 20 mmol sucrose were dissolved into a given amount of distilled water to form a homogeneous solution by constant strong stirring. And then, the mixture was transferred into a Teflon-lined stainless steel autoclave with a capacity of 50 mL. The autoclave was sealed and kept in an oven at a constant temperature of 170 °C for 6 h. Subsequently, the autoclave was taken out and allowed to cool to room temperature naturally. The precipitate was collected by centrifugation and washed for several times with ethanol and deionized water alternately, and dried under vacuum. Finally, the as-obtained powders were annealed in a furnace at 500 °C for 1 h in air, and kept for further use.

Fabrication of dye-sensitized solar cell (DSC) and photovoltaic property investigation

The structure of DSC is shown in Fig. S1. DSC is composed of transparent conductive layered glasses, SnO_2 architectures covered with dye molecules, and I^-/I_3^- redox electrolytes in organic solvents. The size of DSC is 5.0 × 5.0 mm^2. Cis- di(thiocyanato)-N,N-bis(2,2'-bipyridyl-4,4'-dicarboxylate) Ru(II) bis-tetrabutylammonium (N719) is served as dye sensitizer. I-V characteristics of the as-fabricated DSC, including open-circuit voltage (V_{oc}), short-circuit photocurrent (J_{sc}), fill factor (FF), and solar energy conversion efficiency (η), are recorded on a Keithley 2400 source meter under a Xenon lamp (1000 W m^{-2}, Changchun Institute of Optics Fine Mechanics and Physics, Chinese Academy of Sciences) which has been calibrated by standard crystalline silicon solar cell.

Figures

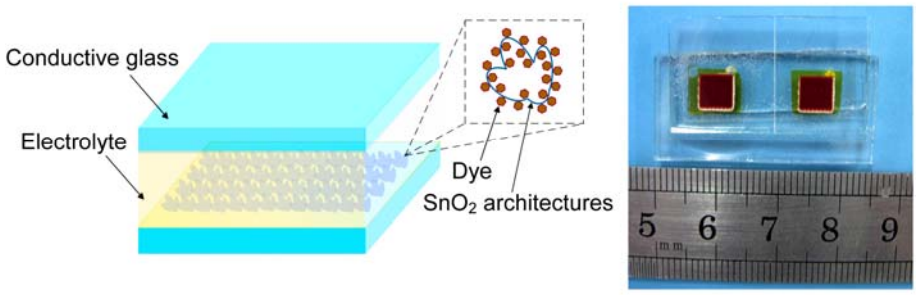

Fig. S1 Structure of the dye-sensitized solar cell based on coral-like porous SnO_2 hollow architectures

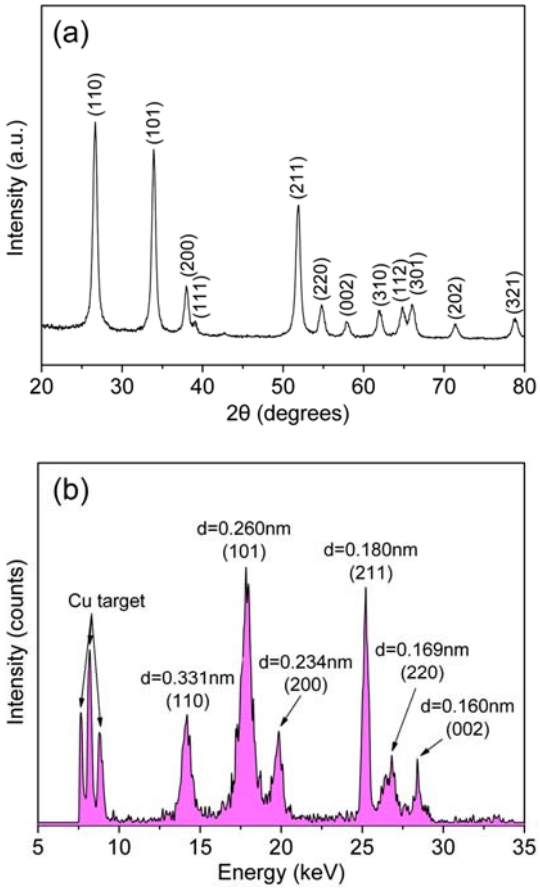

Fig. S2 (a) X-ray diffraction and (b) energy-dispersive X-ray diffraction patterns of the as-prepared products.

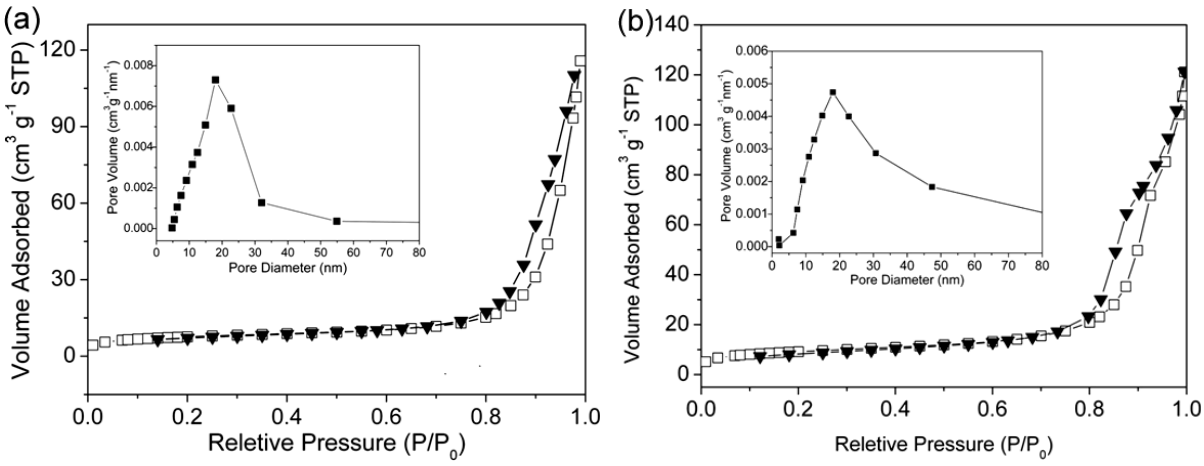

Fig. S3 Typical N_2 gas adsorption and desorption isotherms of (a) coral-like and (b) spherical porous SnO_2 hollow architectures.

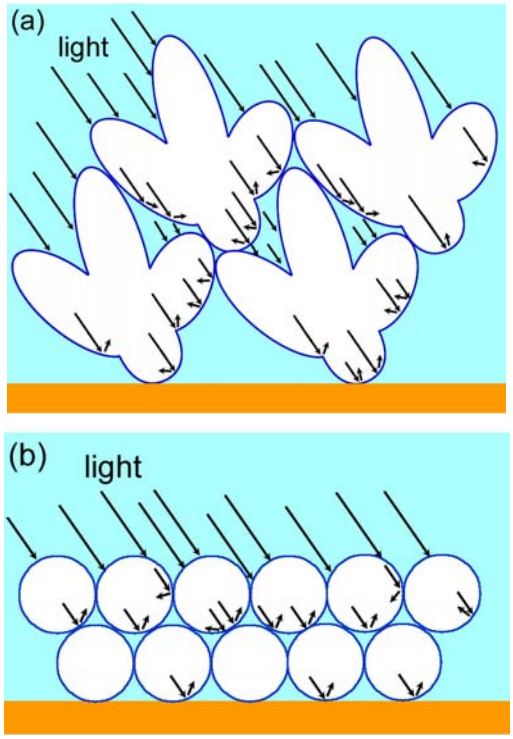

Fig. S4 Schematic illustration of light absorption in dye-sensitized solar cells based on (a) coral-like SnO_2 architectures and (b) spherical SnO_2 materials.