Electronic Supplementary Information

Unique Zn-doped SnO_2 Nano-Echinus with Excellent Transport and Light Harvesting Properties as Photoanode Materials for High Performance Dye-Sensitized Solar Cell†

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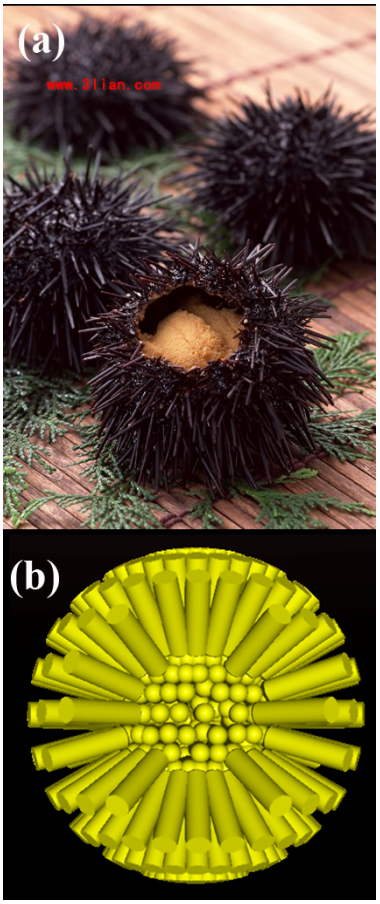

Fig. S1 (a) Photo of the echinus copyright permission from http://www.3lian.com/down/pic/4/410/41188.html. (b) Schematic illustration of the synthesized nano-echinus, showing the nanowire-based shell and interior aggregates of tiny particles.

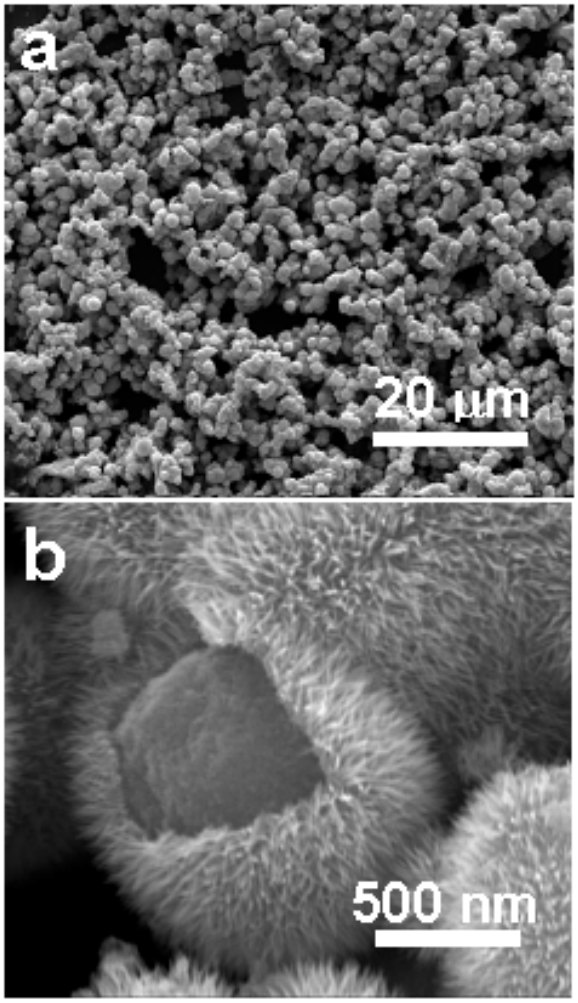

Fig. S2 FE-SEM images of the product after annealing the Zn-doped SnO_2 nano-echinus at 500 °C for 0.5 h.

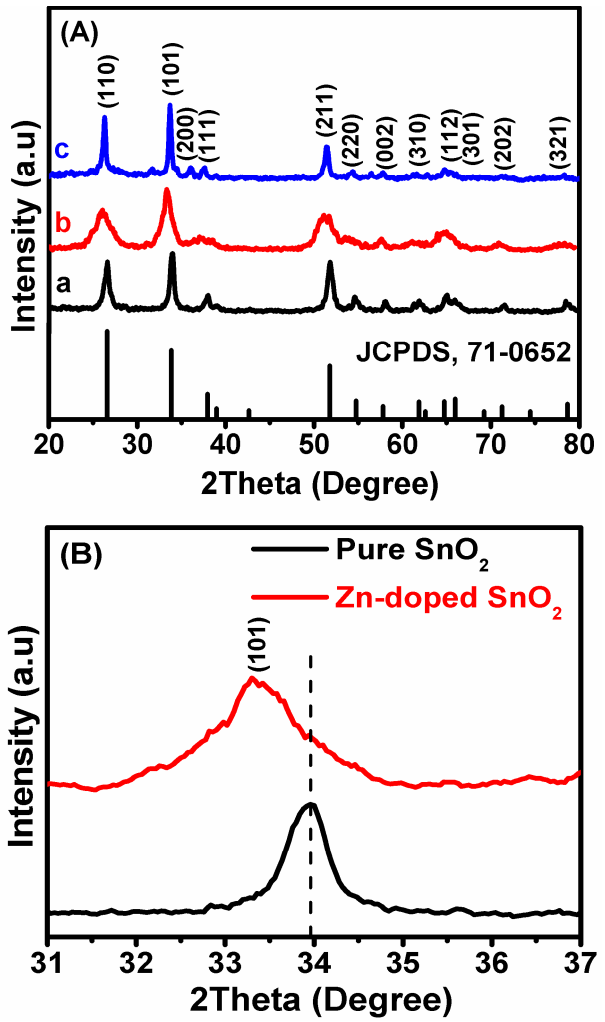

Fig. S3 (A) XRD patterns of (a) the pure SnO_2, and Zn-doped SnO_2 samples (b) before and (c) after annealing irradiation. (B) XRD patterns of the corresponding (101) peak of the pure and Zn-doped SnO_2 samples.

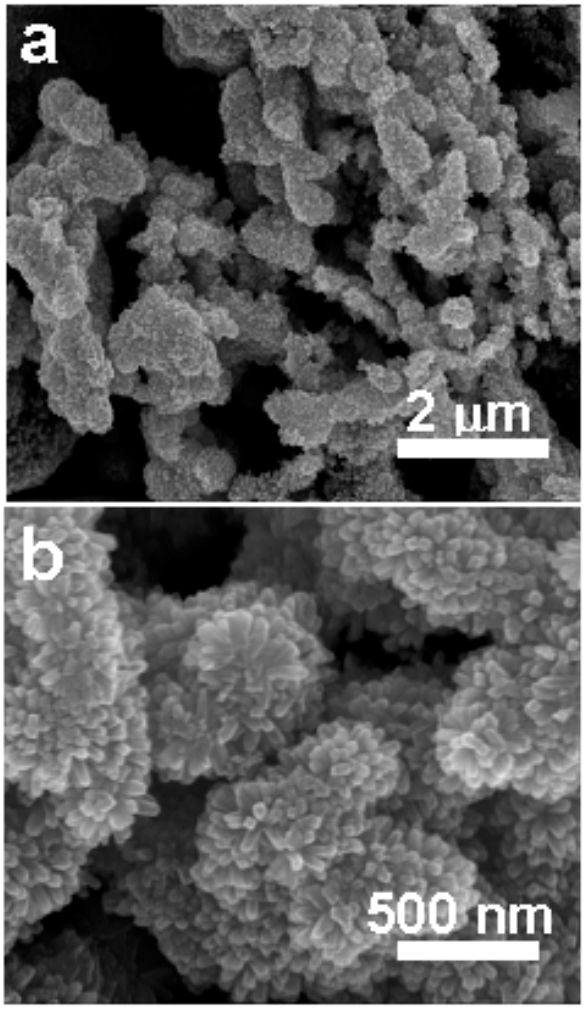

Fig. S4 FE-SEM images of the pure SnO_2 at different magnification.

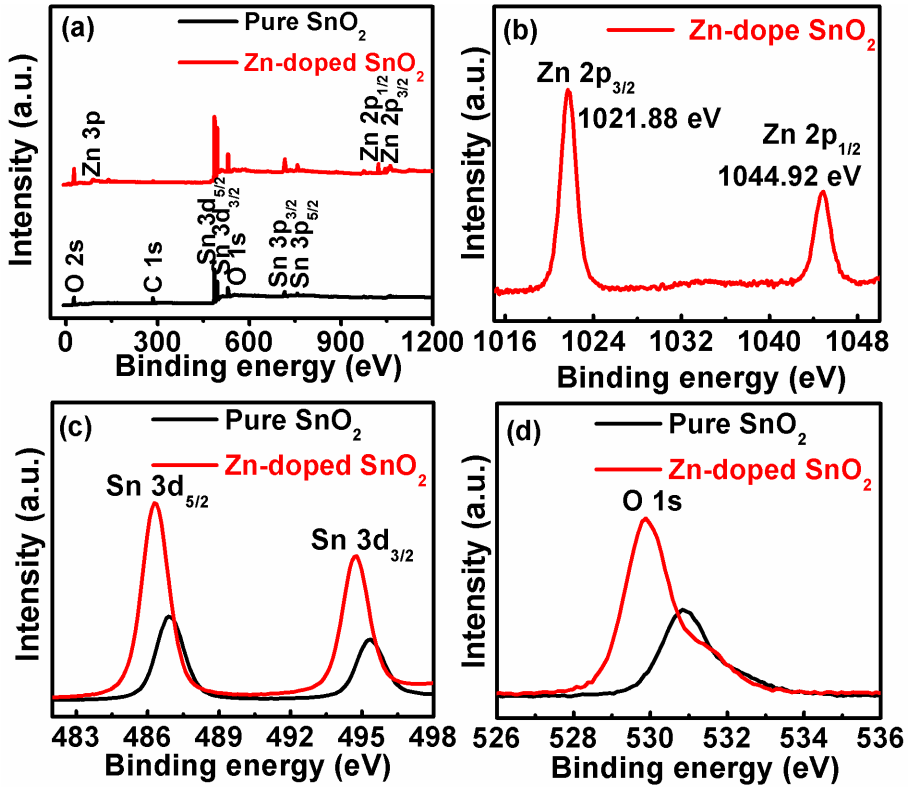

Fig. S5 The typical XPS spectra of the as-prepared pure and Zn-doped SnO_2: (a) the survey spectra, (b) the high-resolution spectra of Zn 2p, (c) the high-resolution spectra of Sn 3d, and (d) the high-resolution spectra of O 1s.

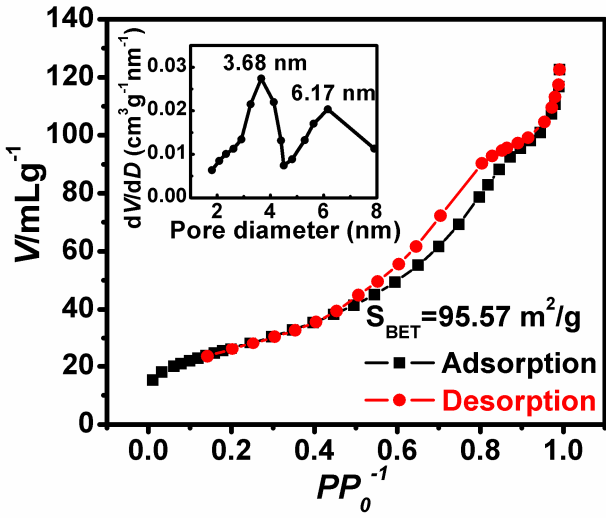

Fig. S6 Nitrogen sorption isotherms of the Zn-doped SnO_2. Inset shows the corresponding pore diameter distribution of sample.

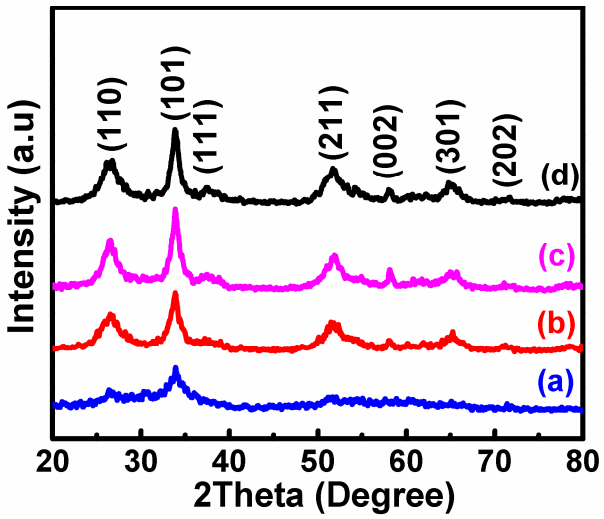

Fig. S7 XRD patterns of as-obtained the Zn-doped SnO_2 at different reaction time of (a) 4h (b)10h (c)16h (d)20h.

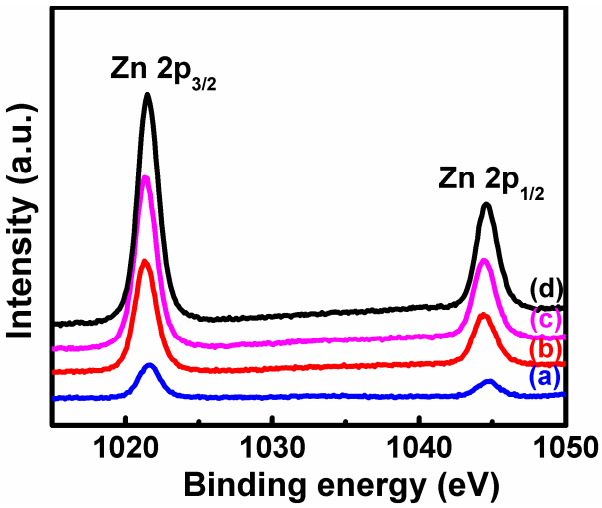

Fig. S8 The high-resolution spectra of Zn 2p of the as-obtained Zn-doped SnO_2 at different reaction time of: (a) 4 h, (b) 10 h, (c)16 h, (d) 20 h.

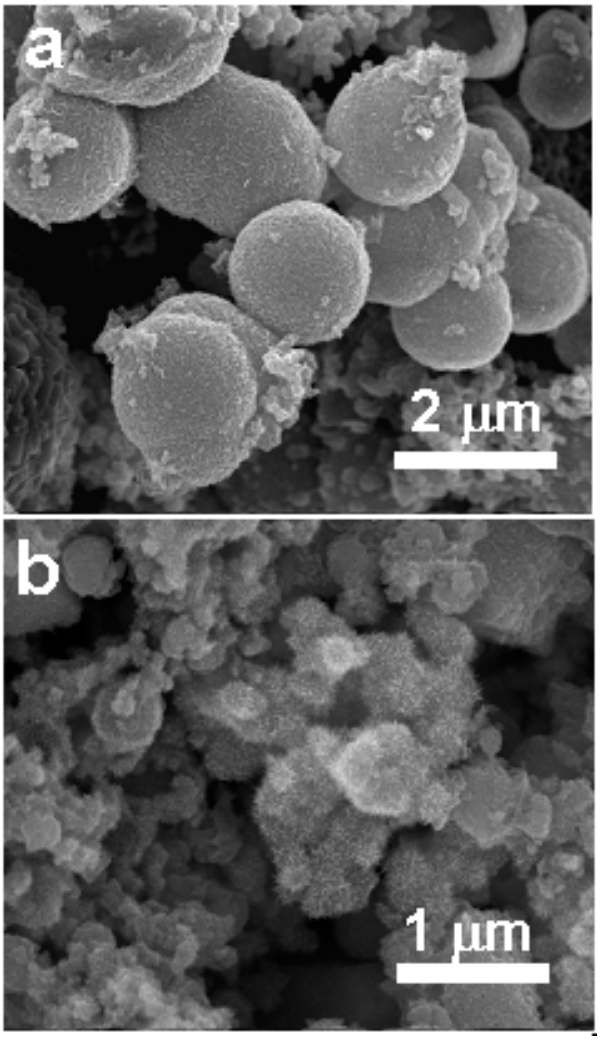

Fig. S9 FE-SEM image of (a) the microscale spheres with rough surface formed with pure H_2O as solvent. (b) the mixture of Zn-doped SnO_2 nanoflowers and particles formed with pure En as solvent.

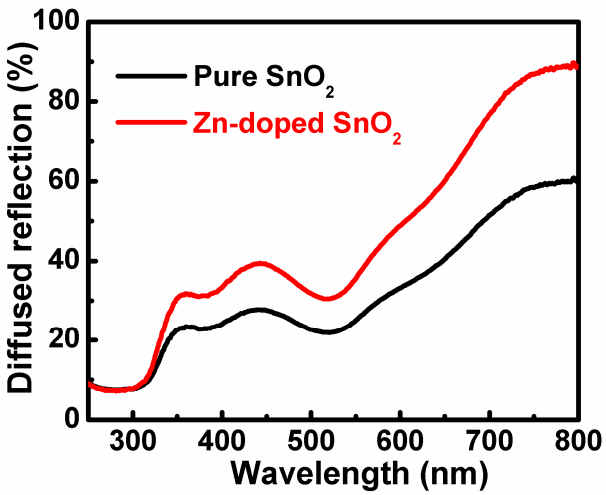

Figure S10. Diffuse-reflectance spectra of the two films after the dye absorption.