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Supporting Information

Hierarchical Growth of SnO_2 Nanostructured Films on FTO Substrates: Structural Defects Induced by Sn(II) Self-doping and Their Effects on Optical and Photoelectrochemical Properties

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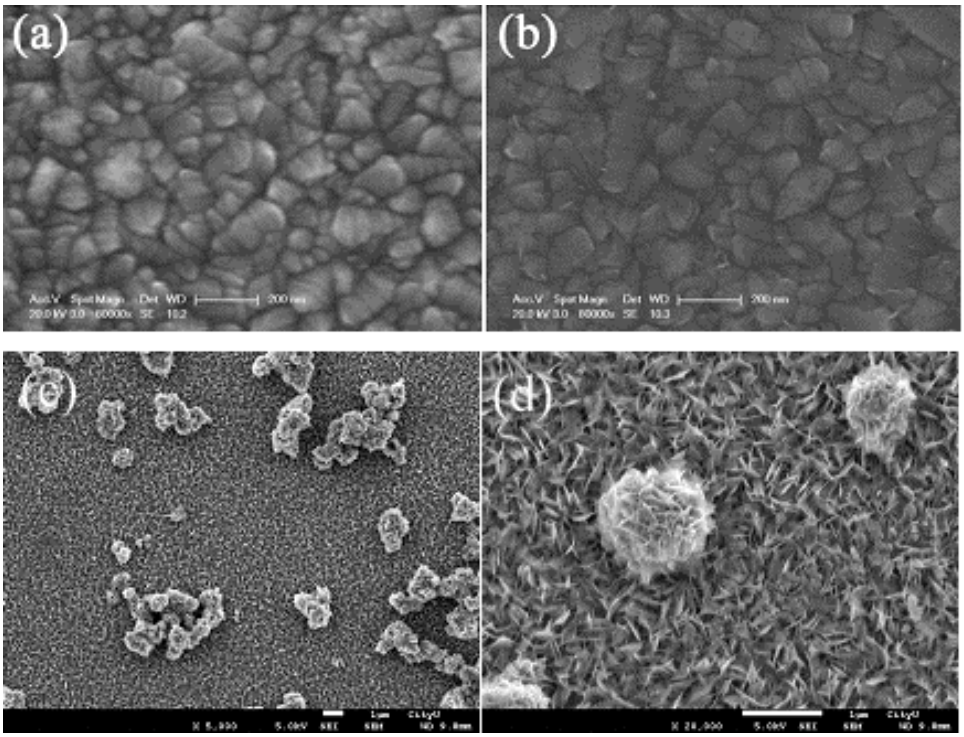

Figure S1. Top view SEM images of (a) bare FTO glass and the SnO_2 films obtained after different hydrothermal reaction time of (b) 2h and (c, d) 3h.

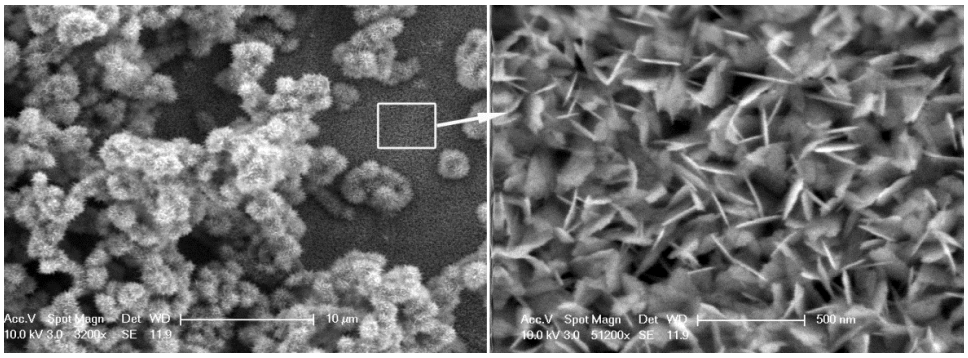

Figure S2. SEM images of SnO_2 nanosheet arrays on steel plate with top covered by hierarchical SnO_2 nanoflowers. The steel was planted with a thin seed layer.

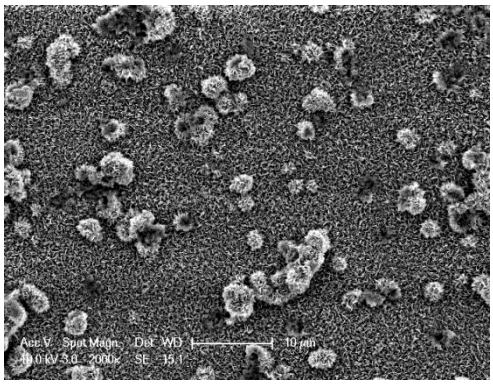

Figure S3. SEM image of SnO_2 bilayer film after ultrasound treatment. The hierarchical SnO_2 nanoflowers are mostly removed, indicating they formed in the precursor solution and were deposited on the top of SnO_2 nanosheet array films by natural precipitation.

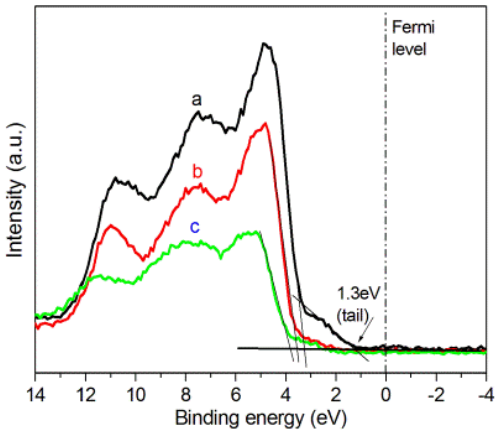

Figure S4. Valence band XPS spectra of the as prepared SnO_2 nanosheet array on FTO substrate (a) and after calcination at 600 ^oC in air for 2h (b). (c) The reference sample prepared by using $SnCl_4$ as tin source instead of $SnCl_2$ with all other parameters constant. The dashed line indicates the Fermi level.