Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting information

Further improvement of battery performance via charge transfer enhanced by solution–based antimony doping into tin dioxide nanofibers

Yong Seok Kim[a], Won Bae Kim[b] and Yong Lak Joo[*a]

[a] *School of Chemical and Biomolecular Engineering, Cornell University, Ithaca, 14853, USA. E-mail: ylj2@cornell.edu*

[b] *School of Materials Science and Engineering, Gwangju Institute of Science and Technology (GIST), Gwangju, 500-712, Republic of Korea.*

Table R1. Summarized atomic percentages of oxygen, tin and antimony for undoped and doped nanofibers.

Element	**Undoping / at.%**	**Nominal 5 at.% doping / at.%**	**Nominal 10 at.% doping / at.%**	**Nominal 15 at.% doping / at.%**
Oxygen	81.20	78.70	78.05	76.71
Tin	18.80	19.87	19.98	20.18
Antimony (doping at.% to tin)	–	1.43 **(6.7 at.%)**	1.97 **(8.9 at.%)**	3.11 **(13.3 at.%)**

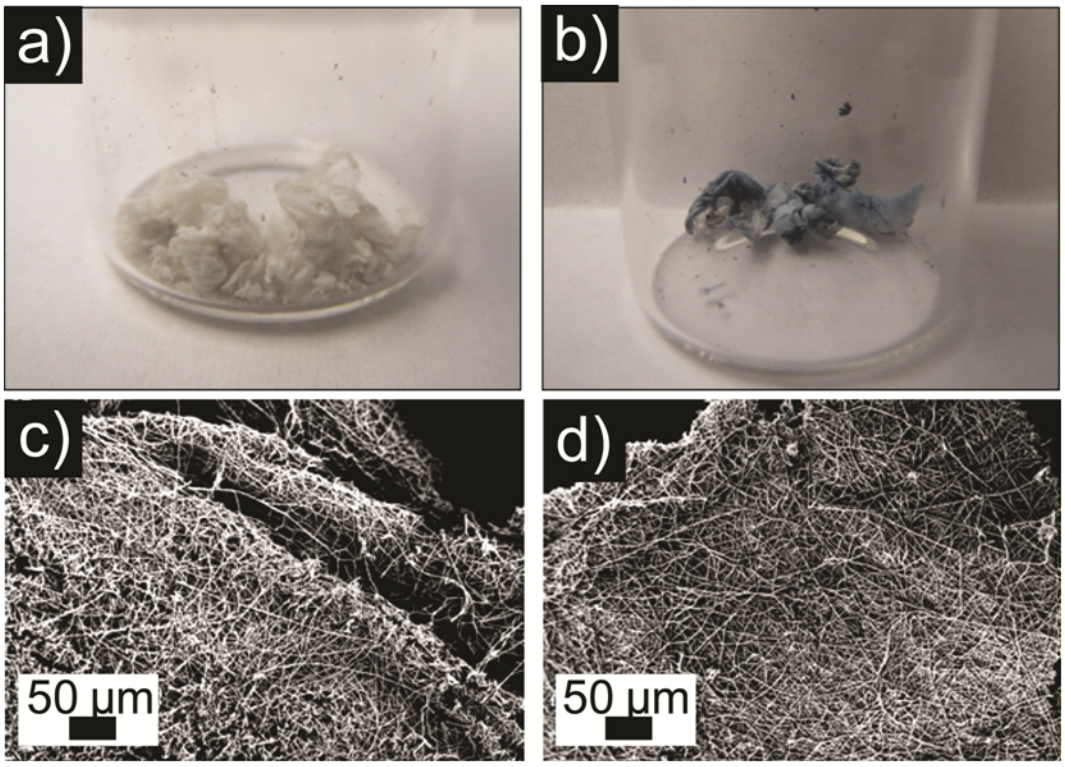

Figure S1. The photographs of (a) pure SnO_2 nanofibers and (b) Sb–doped SnO_2 nanofibers; the SEM images of (c) pure SnO_2 nanofibers and d) Sb–doped SnO_2 nanofibers.

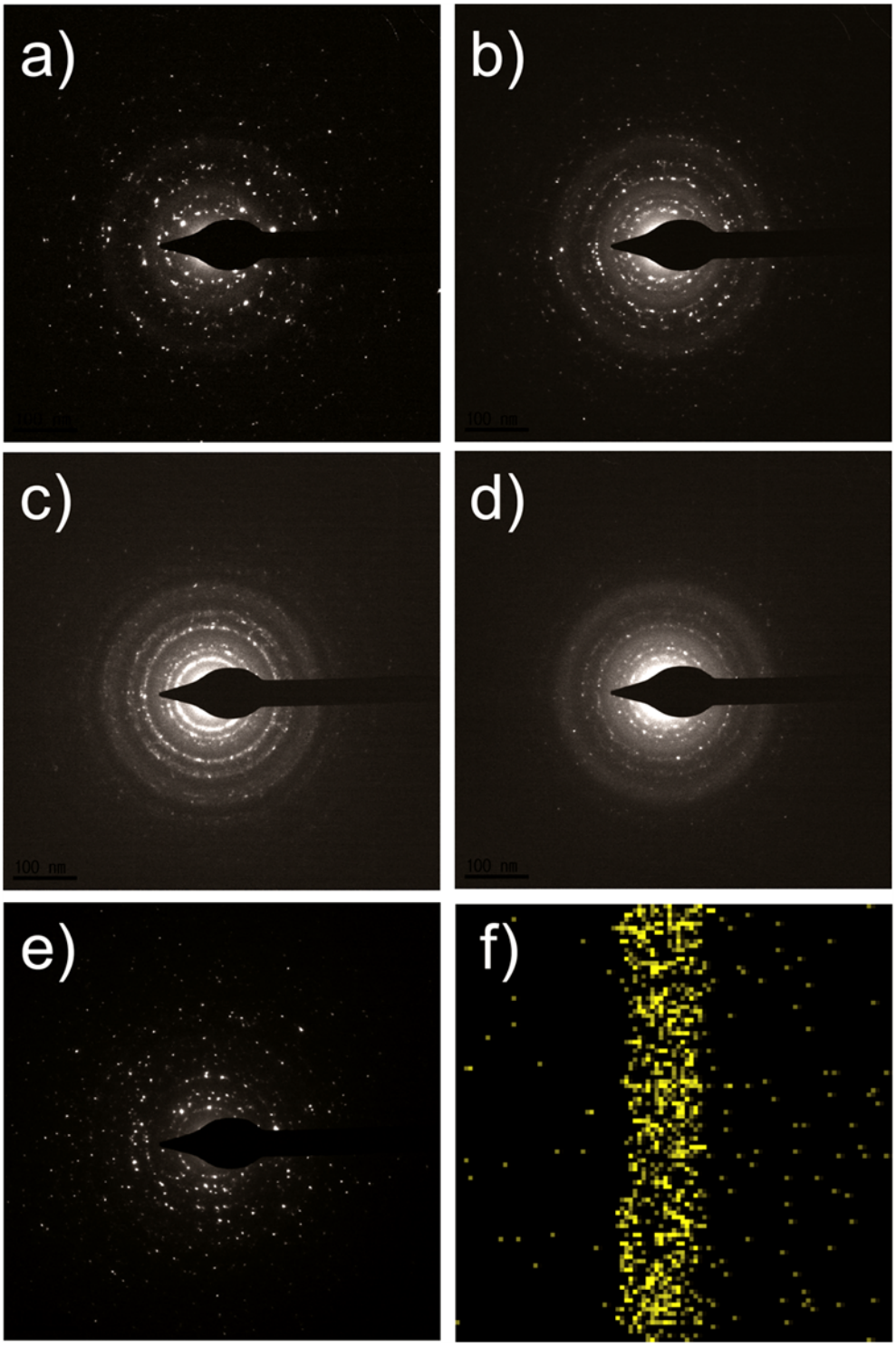

Figure S2. The selected area electron patterns of (a) pure SnO_2 nanofibers and Sb–doped SnO_2 nanofibers with variable doping ratios of (b) 5 mol%, (c) 10 mol%, (d) 15 mol% and (e) 20 mol% ; Antimony element mapping image of Sb–doped (10 mol%) SnO_2 nanofibers by energy dispersive X-ray spectroscopy of TEM.

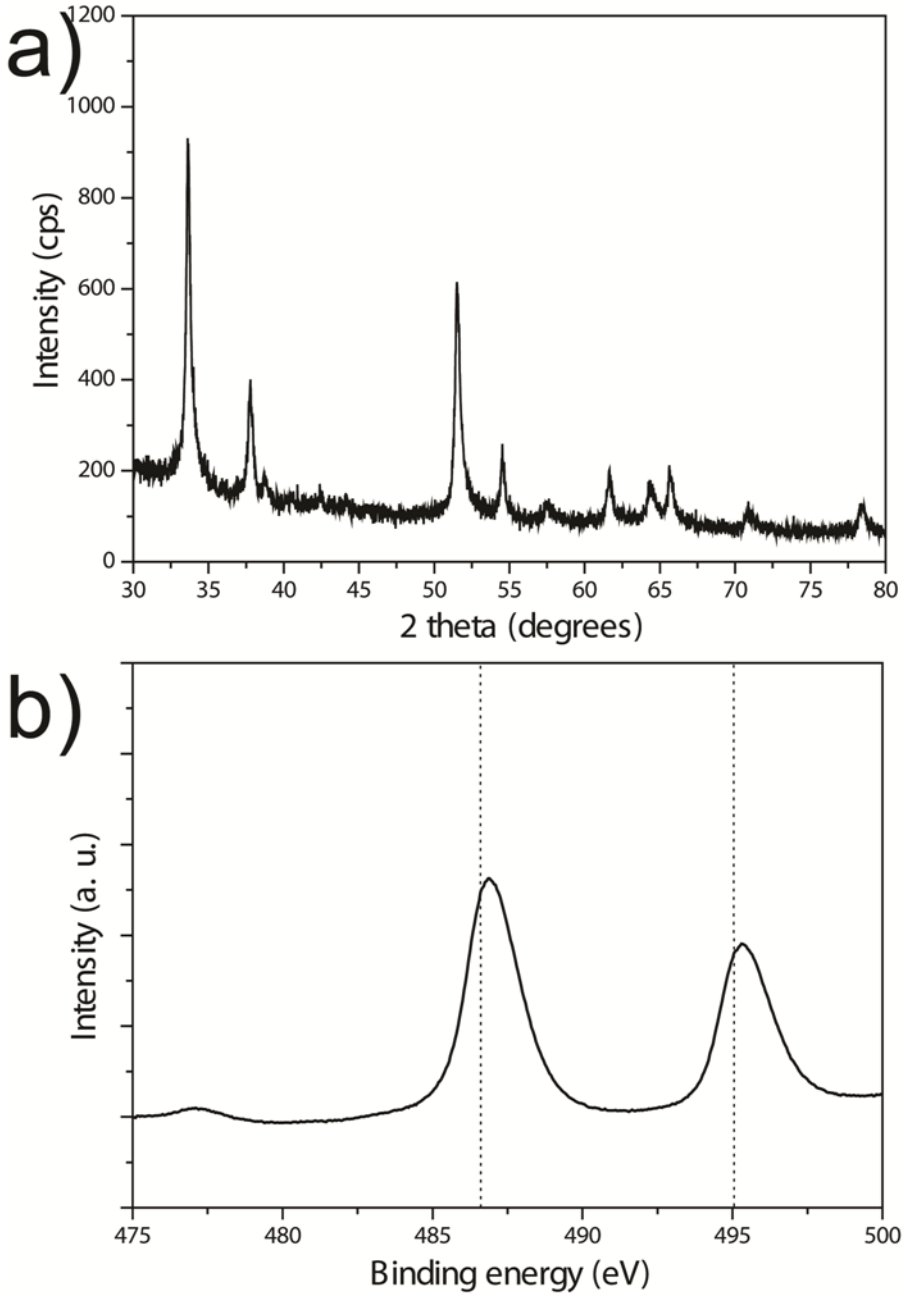

Figure S3. (a) x–ray diffraction and (b) x–ray photoelectron spectrum of Sn3d for Sb–doped (20 mol%) SnO_2 nanofibers.

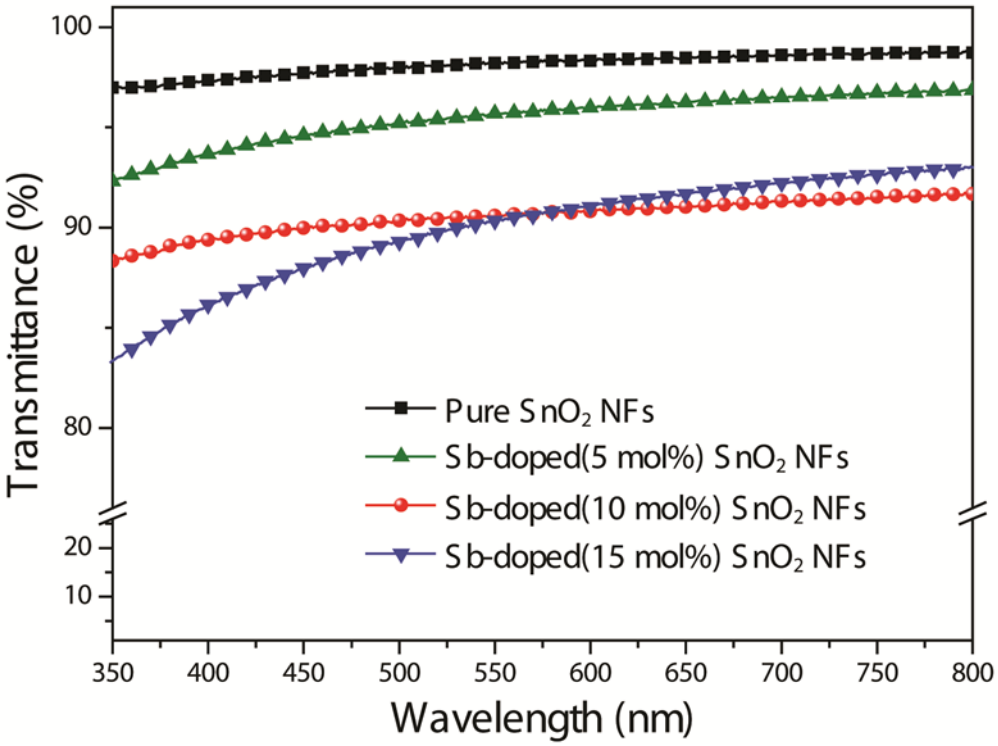

Figure S4. Transmittance spectra of pure SnO_2 nanofibers and Sb–doped SnO_2 nanofibers with variable doping ratios from 5 mol% to 15 mol%.

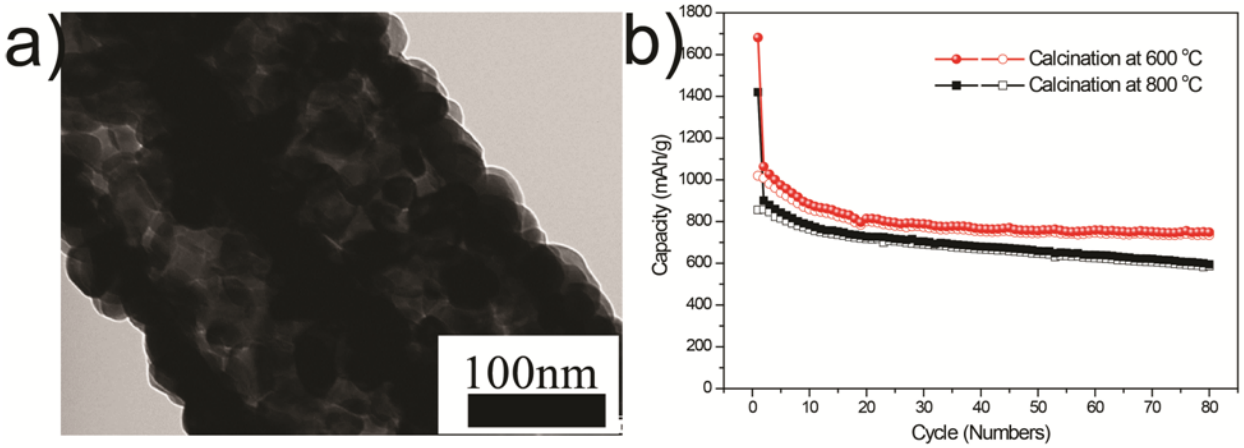

Figure S5. a) TEM image of Sb–doped SnO_2 nanofiber calcined at 800 ^oC and b) cycle life of Sb–doped SnO_2 nanofibers calcined at 800 ^oC and 600 ^oC.