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Support Information

Generation of Highly Ordered Nanoporous Sb-SnO_2 Thin Films with Enhanced Ethanol Sensing Performance at Low Temperature

Shaofeng Shao[a,*], Ralf Koehn[b], HongyanWu[a], TaoWu[a], Wei-Feng Rao [a]

[a]*Department of Materials Physics,CICAEET, Nanjing University of Information Science &Technology, Nanjing, China.*

[b]*Department of Chemistry & Biochemistry, University of Munich, Munich, Germany.*

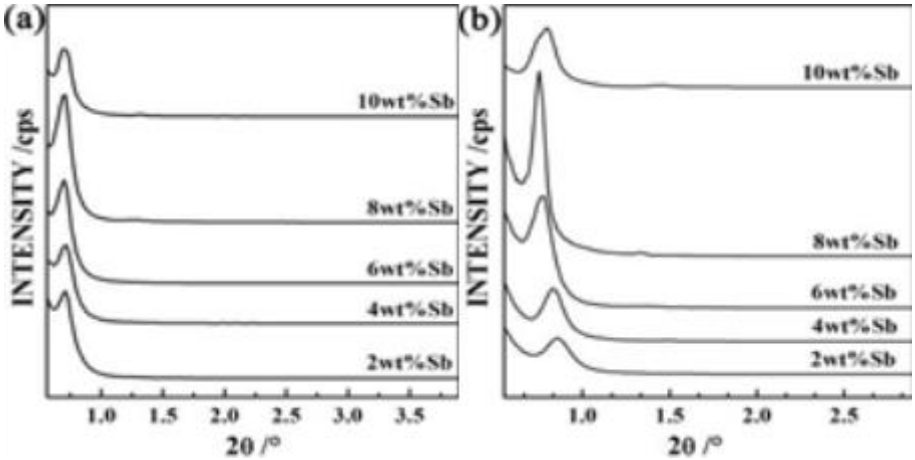

Fig. S1. Small angle XRD patterns of the hydrothermal treated (a) and calcined at 400 ℃ (b) Sb-doped SnO_2 thin films prepared with 2wt%, 4wt%, 6wt%, 8wt% and 10wt% Sb, respectively.

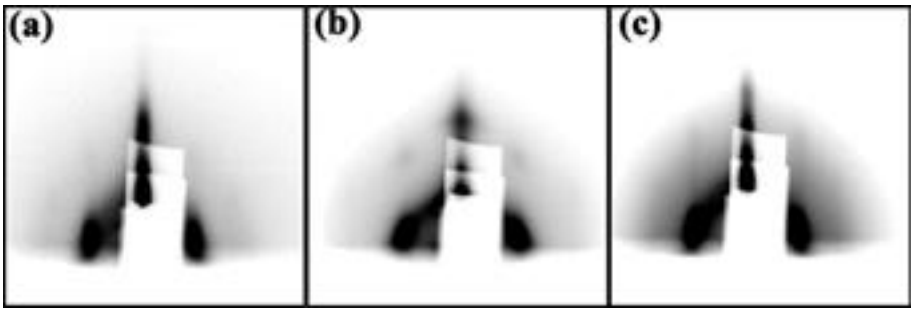

Fig. S2. Grazing-Incidence Small-Angle X-ray Scattering (GISAXS) patterns for 8wt%Sb doped SnO_2(a) 120℃ hydrothermal treatment; annealing at (b) 400℃ and (c) 600℃.

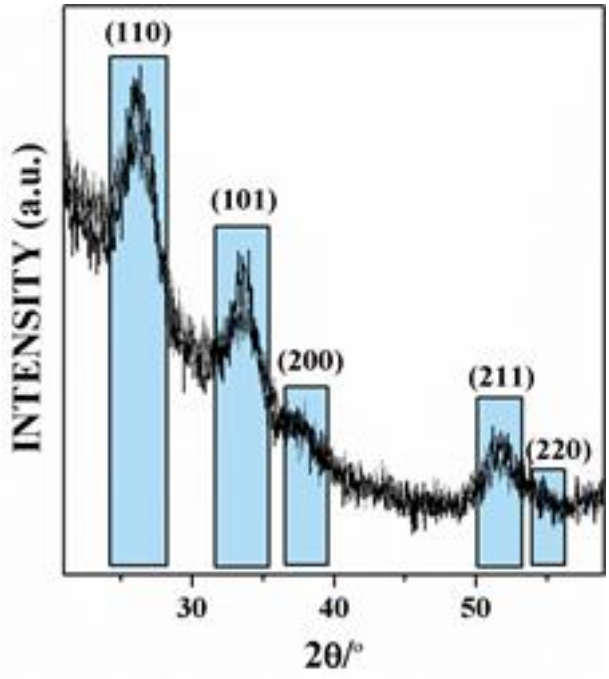

Fig. S3. The XRD pattern of the hydrothermal treated SnO_2 thin film with 8wt% Sb.

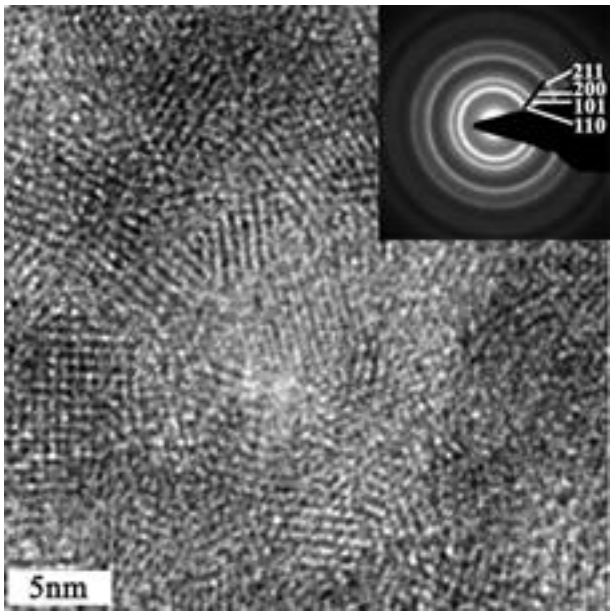

Fig. S4. HRTEM of nanoporous SnO_2 thin films doped with 8wt% antimony calcined at 600℃. The inset picture is the selected-area electron diffraction patterns of the whole area, indicating the formation of randomly oriented SnO_2 nanocrystallites.

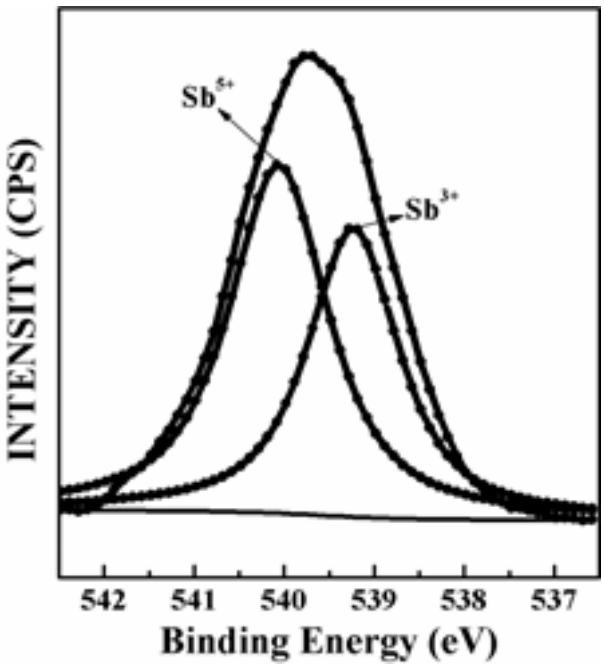

Fig. S5. The high-resolution XPS spectra of the analysis for Sb valency at Sb $3d_{3/2}$ peak.

Sensing materials	Ethanol concentration	Operating temperature	Response value	Response time	Recovery time
This work	50 ppm	100 ℃	30.8	54 sec	58 sec
SnO_2/TiO_2 nanobelt	100 ppm	96 ℃	18.5	500 sec	250 sec
Zn/SnO_2 porous nanospheres	50 ppm	150 ℃	10.5	/	/
0.05%CNT-SnO_2 nanocomposites	100 ppm	150 ℃	6.4	95 sec	360 sec
In-SnO_2 anopowder	100 ppm	150 ℃	5	<1000 sec	<1000 sec
17%SnO_2-In_2O_3 film	100 ppm	100 ℃	1.02	160 sec	260 sec

Table S1. SnO_2-based ethanol gas sensors reported before and in this work.