Electronic Supplementary Information (ESI) for

Polyethylene glyol-directed SnO_2 nanowires for enhanced gas-sensing properties

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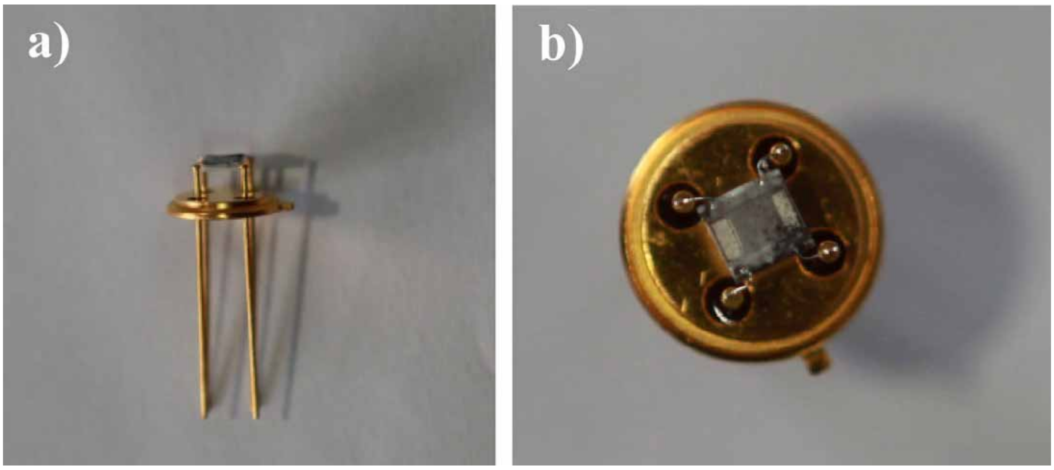

Fig. S1. a) Side-view and b) top-view pictures of the test sensor.

The sensor-testing device is mainly composed of an integrated programmable temperature controlling system, a supplement of standard gas, and signal acquisition. An analog digit converter (ADC) was employed to convert the sensor output voltage to a digital signal for data acquisition. A CRZ platinum thin film resistance thermometer element (CRZ-1632, purchased form HAYASHI DENKO, Japan) and another ADC were employed to measure the temperature of the sensor. A digit analog converter (DAC) was used to control the heating power. Temperature of the sensor was controlled by a computer program. The sensor was placed in a closed chamber with a total inside volume of 1500 mL. For each experiment, the chamber was filled initially with synthetic air. The sensor temperature was modulated by the computer program, and at the same time the temperature and output voltage of the sensor were acquired using the same computer program. A certain amount of gas is introduced into the chamber through a computer controlled opening and closing of mass flow controllers (MFC). The sensor devices were heated by an Agilent E3640A programmable DC power supply, and the resistances of the sensitive layers were acquired by a Keithley 2400 source meter.

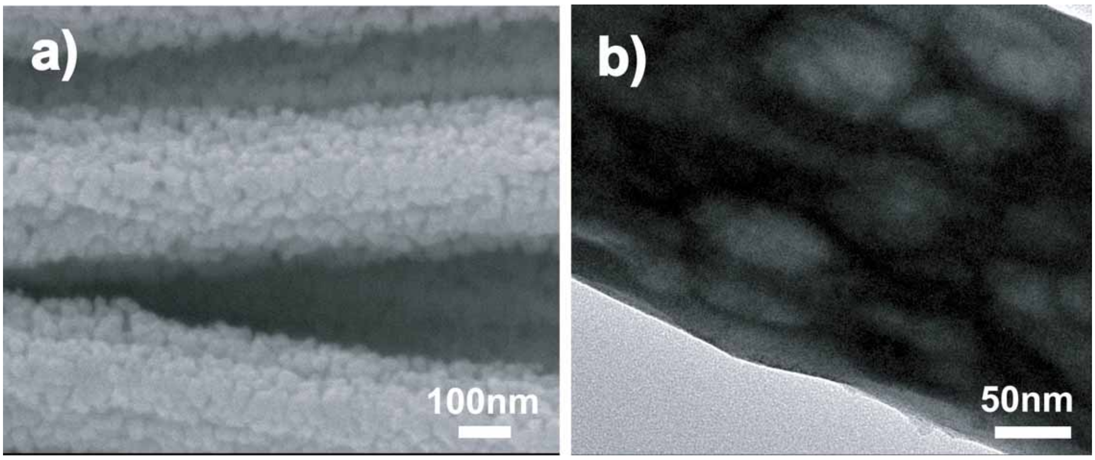

Fig. S2. a) SEM and b) TEM images of the precursor of SnO_2 nanowires.

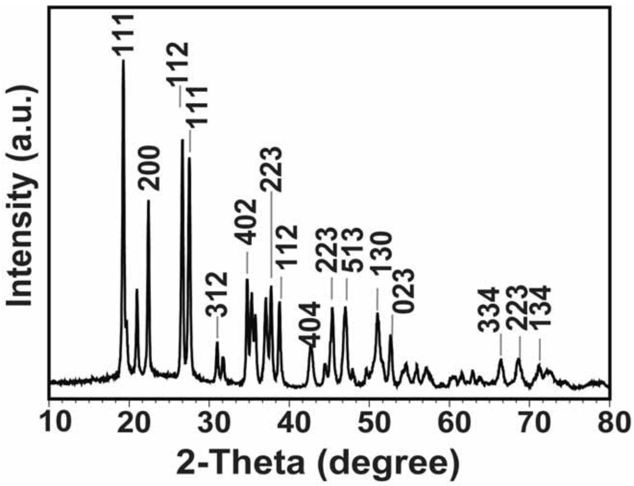

Fig. S3. XRD pattern of the SnC_2O_4 precursor of SnO_2 nanowires.

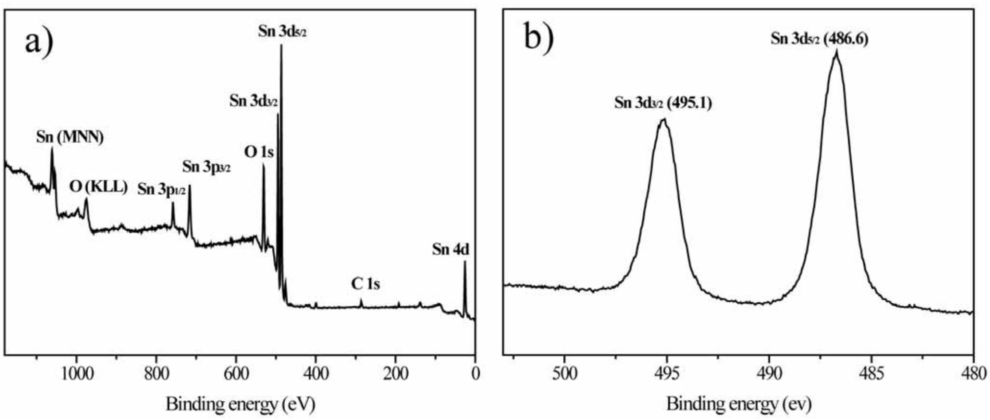

Fig. S4. a) XPS survey spectrum and b) XPS for Sn 3d of SnO_2 nanowires.

XPS is carried out to investigate the surface compositions and chemical state of the as-synthesized SnO_2 nanowires. The results reveal the mainly existing elements of Sn and O and confirm the formation of pure rutile SnO_2, which is in good agreement with the XRD analysis.