

Support Information

Ultrafine Nanoparticles of W-Doped SnO₂ for Durable H₂S Sensor with Fast Response and Recovery

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Materials Characterization

The morphology and EDX-mapping of the product were characterized by the field emission scanning electron microscopy (SEM, FEI Nova Nano 230) and high resolution emission electron microscope (FEI Tecnai G2 F20 S-Twin). The crystal phase of the product was detected by X-ray diffraction (XRD, Cu K α radiation, $\lambda=0.15406$ nm, PANalytical) at 40 KV and 40 mA. The surface information was obtained from X-ray photoelectron spectroscopy (XPS, Thermo Escalab 250Xi). Raman spectrum was obtained from a RENISHAW inVia reflex confocal Raman microscope using a 532-nm laser.

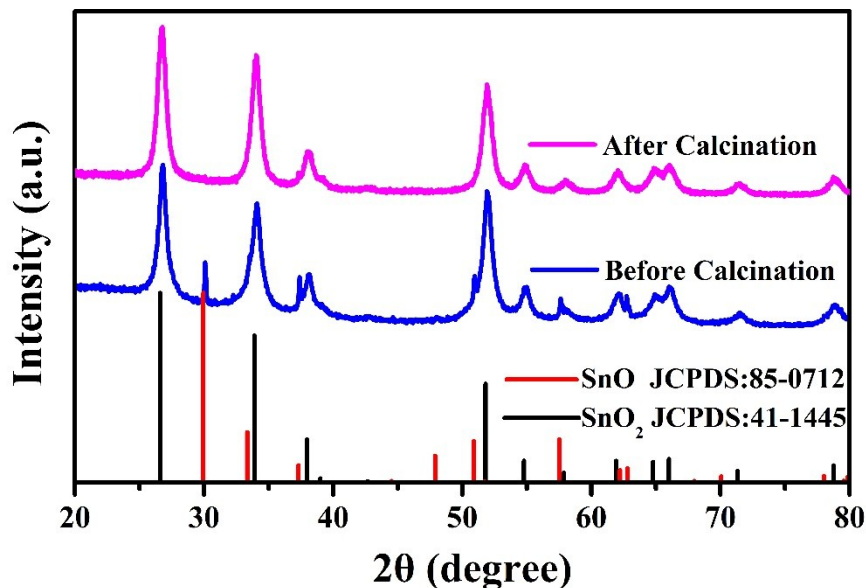


Figure S1 XRD pattern of the prepared SnO₂ before calcination and after calcination

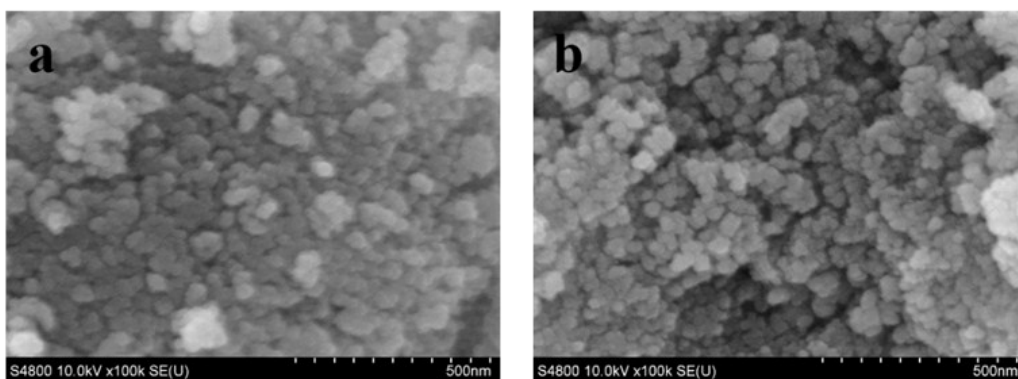


Figure S2 SEM images of (a) pristine SnO₂ and (b) W-doped SnO₂ WS-5

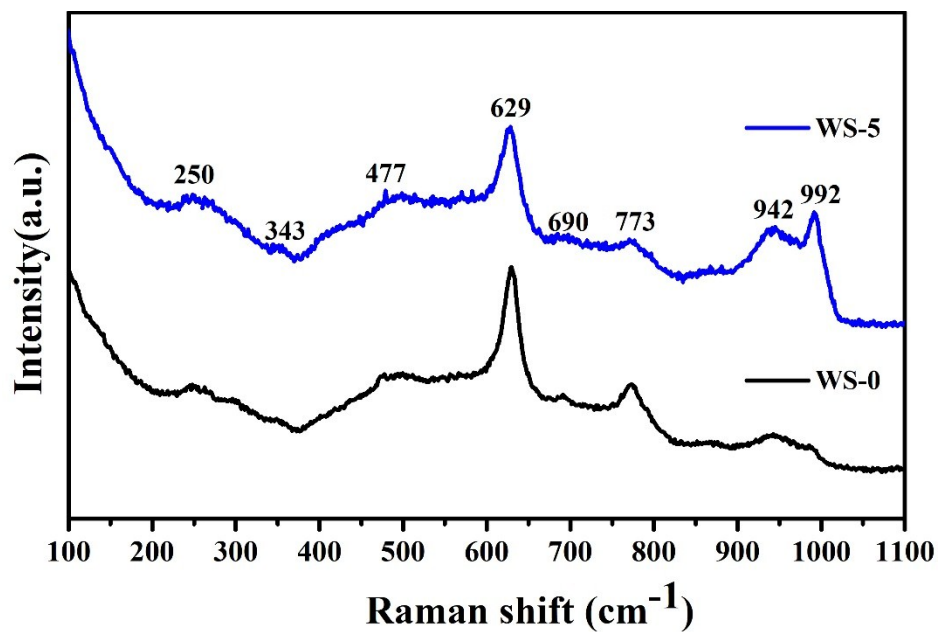


Figure S3 Raman scattering spectra of pristine SnO_2 and W-doped SnO_2 nanoparticles

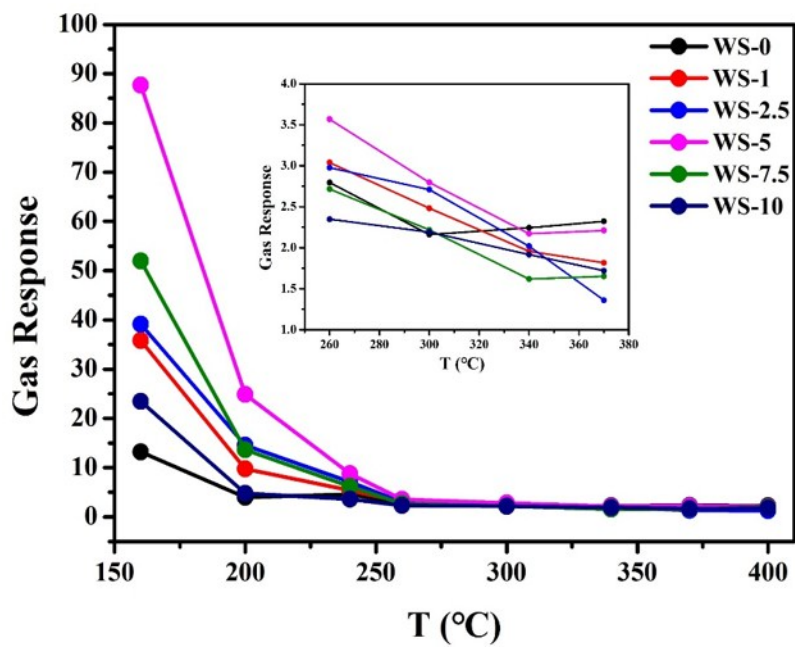


Figure S4 Gas response of SnO_2 and W doped SnO_2 based sensor to various temperature from 160°C to 400°C

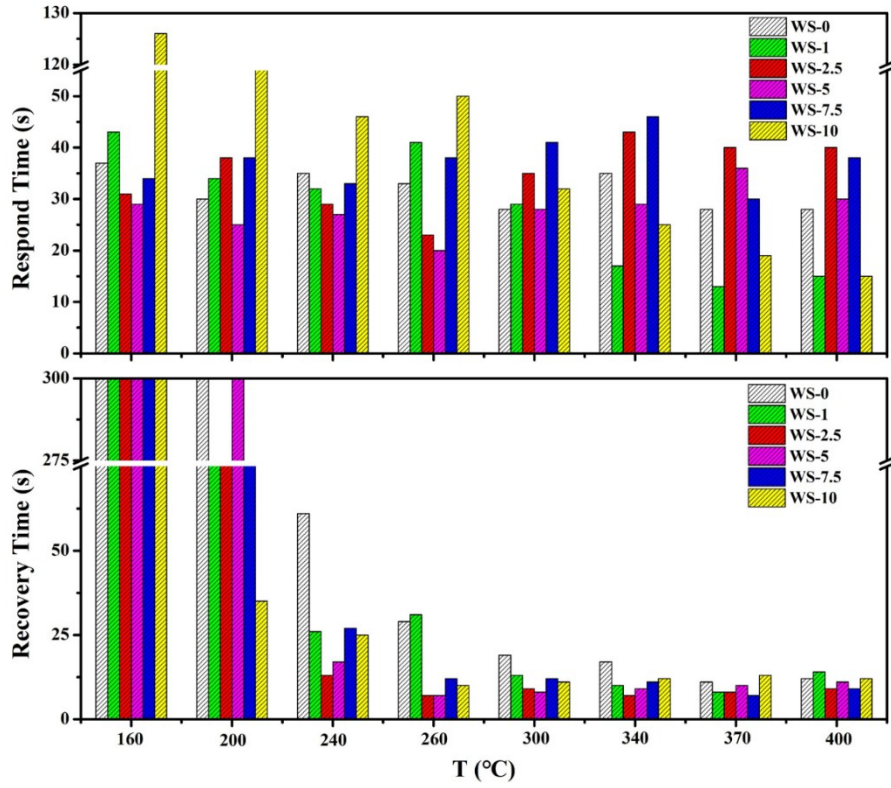


Figure S5 Response time and recovery time of the SnO₂ and W doped SnO₂ based sensors upon exposure to 10 ppm H₂S gas at an operating temperature from 160°C to 400°C.

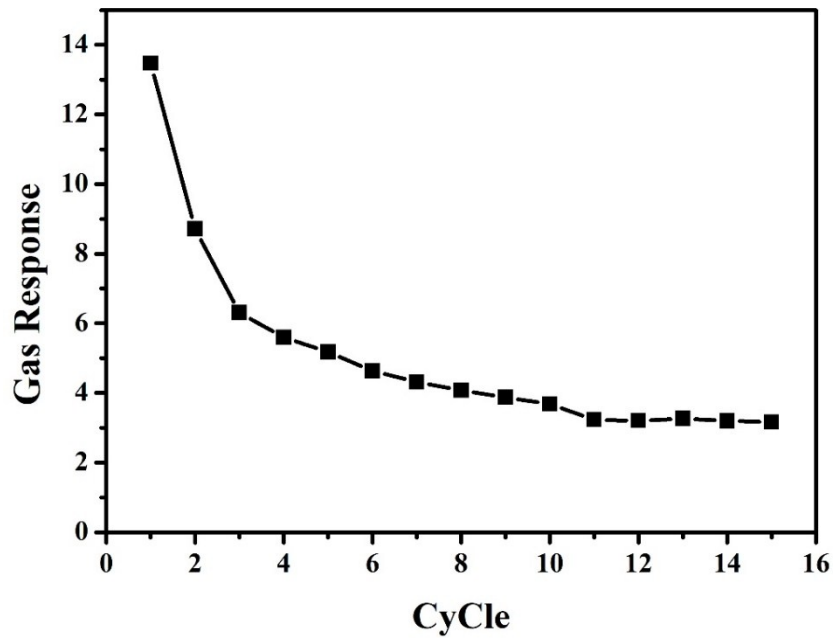


Figure S6 Response of WS-5 sensor passivation under 10ppm H₂S at 260°C.

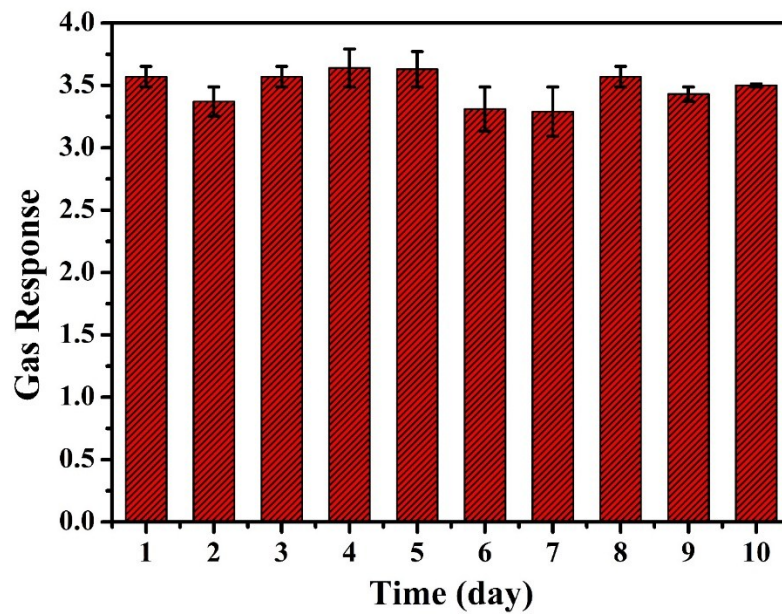


Figure S7 Long-term stability of WS-5 to 100 ppm H₂S at 260 °C.