

### Supporting Information for

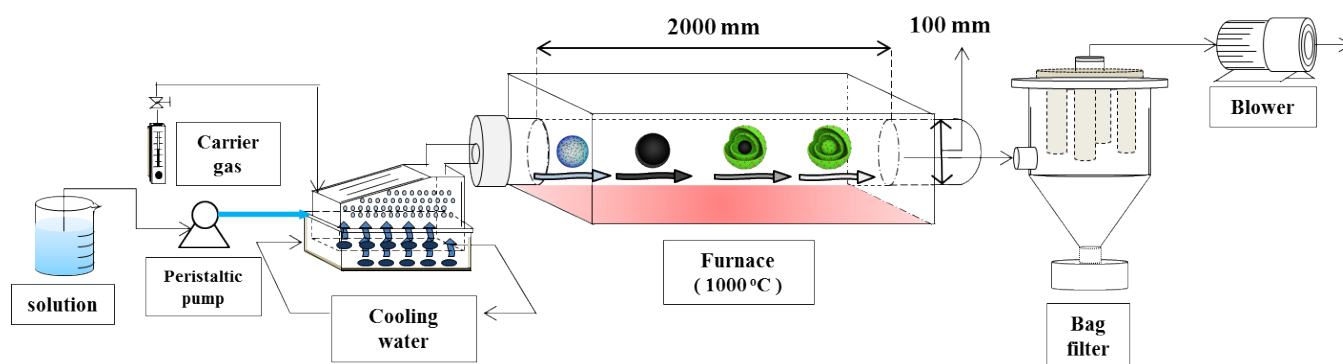
## High performance chemiresistive H<sub>2</sub>S sensors using Ag-loaded SnO<sub>2</sub> yolk-shell nanostructures.

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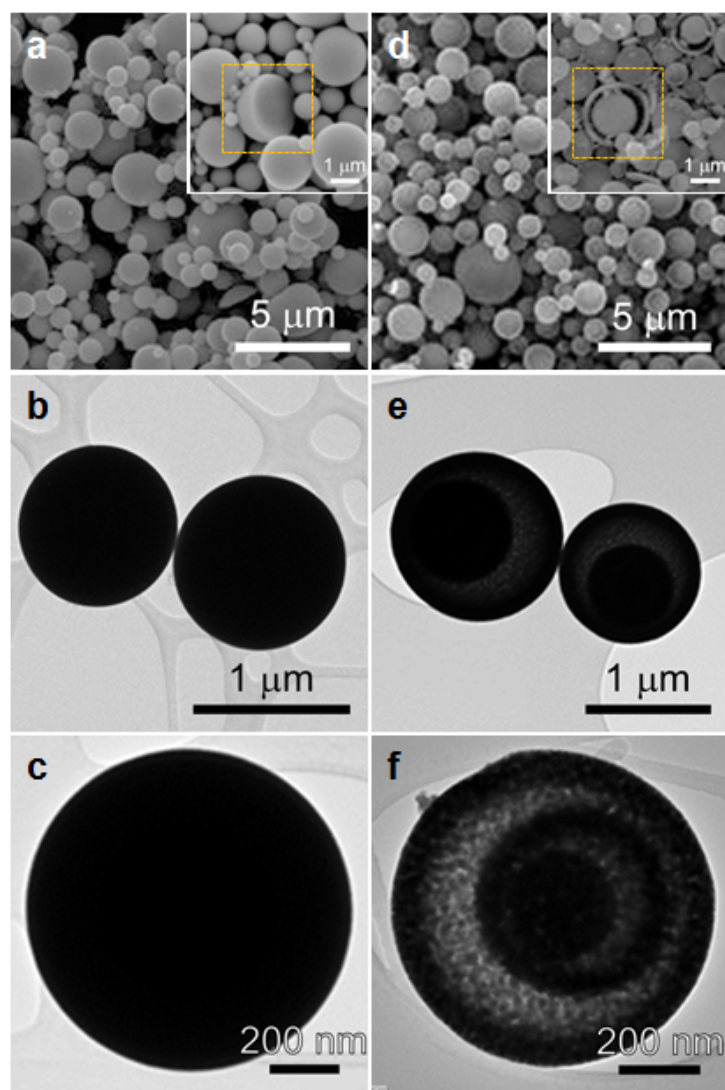
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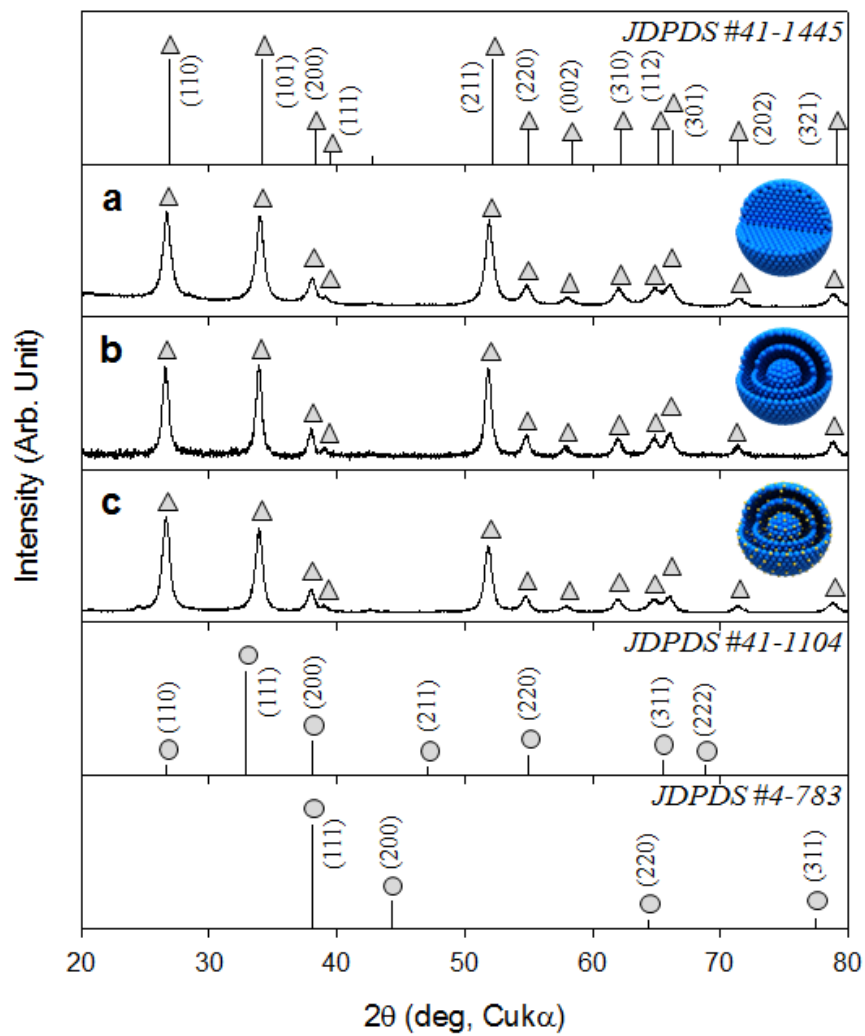
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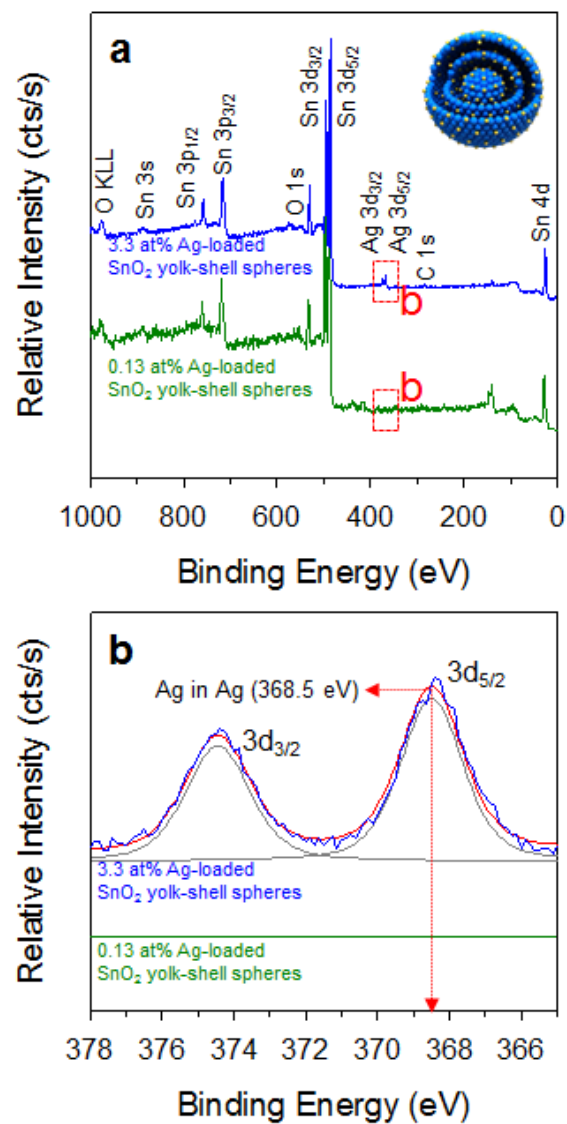
**Fig. S1** Schematic diagram of the large scale ultrasonic spray pyrolysis process.



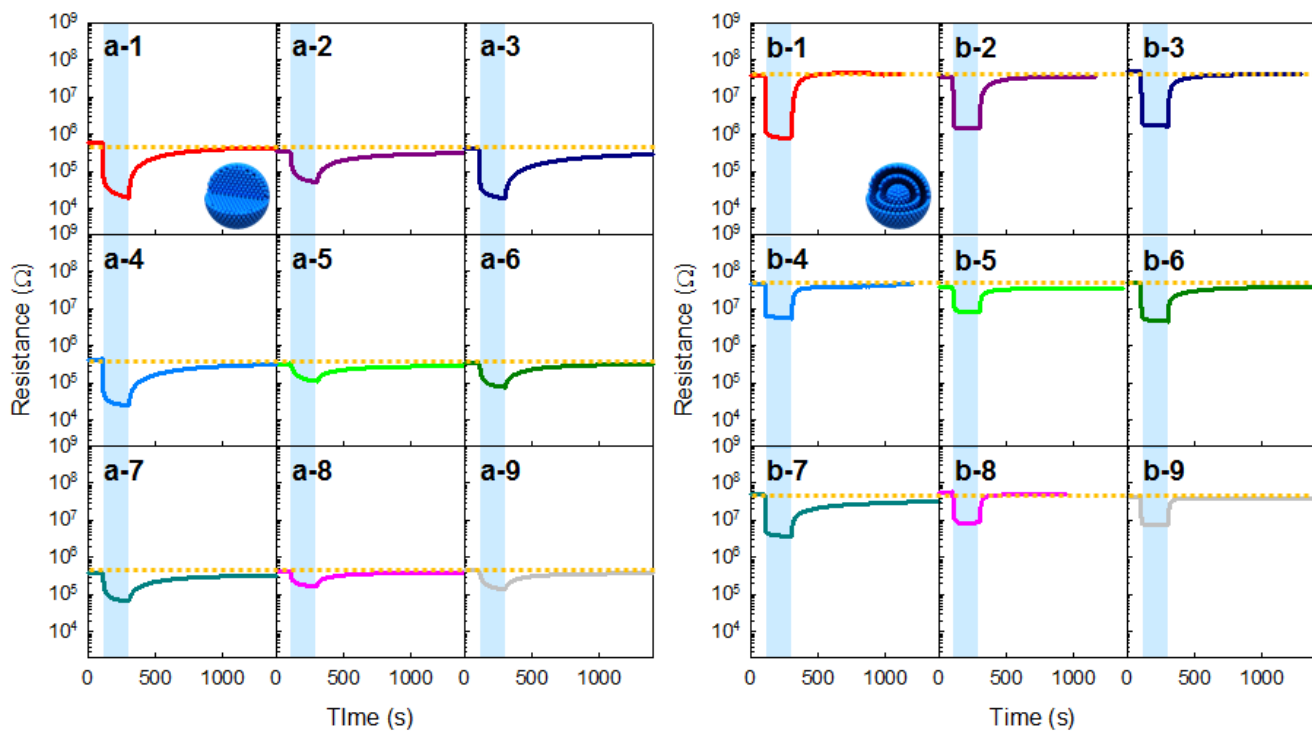
**Fig. S2** SEM and TEM images of (a-c) SnO<sub>2</sub> spheres with dense inner structures (D-SnO<sub>2</sub>) and (d-f) pure SnO<sub>2</sub> yolk-shell spheres (YS-SnO<sub>2</sub>).



**Fig. S3** X-ray diffraction patterns of (a) D-SnO<sub>2</sub>, (b) YS-SnO<sub>2</sub>, and (c) Ag-YS-SnO<sub>2</sub> spheres.



**Fig. S4** X-ray photoelectron spectroscopy results of SnO<sub>2</sub> yolk-shell spheres loaded with 0.13 and 3.3 at% Ag: (a) full range spectra and (b) 3d<sub>3/2</sub> and 3d<sub>5/2</sub> peaks.



**Fig. S5** Dynamic sensing transients to 5 ppm interference gases at 350°C: (a) D-SnO<sub>2</sub> spheres, (b) YS-SnO<sub>2</sub> spheres (a,b-1: C<sub>2</sub>H<sub>5</sub>OH; a,b-2: HCHO; a,b-3: trimethylamine; a,b-4: NH<sub>3</sub>; a,b-5: benzene; a,b-6: toluene; a,b-7: o-xylene; a,b-8: H<sub>2</sub>; a,b-9: CO).