

Supporting Information (SI) for

Facile Approach to Synthesize Au@ZnO Core-Shell Nanoparticles and Their Application for Highly Sensitive and Selective Gas Sensors

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Synthesis of Au NPs:

The Au NPs were synthesized by using a simple solution process reported in our previous paper.¹In brief, HAuCl_4 solution (250mL, 1mM) was heated with a mild stirring until the boiling point (100 °C) was reached. A solution of trisodium citrate (25mL, 34mM) was then added to the solution with rapid stirring. The mixed solution was kept at 97⁰C for 15min with constant stirring. After that, the resulting Au colloid was finally allowed to cool down to room temperature and used further without any centrifugation. The size of the prepared Au NPs are found about 10-15nm.

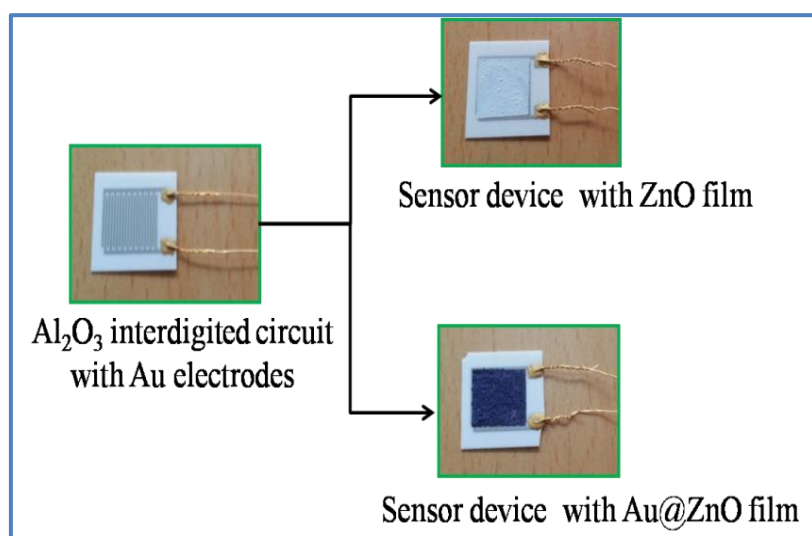


Fig.S1 Photographs of sensor devices made from pure ZnO NPs and Au@ZnO CSNPs.

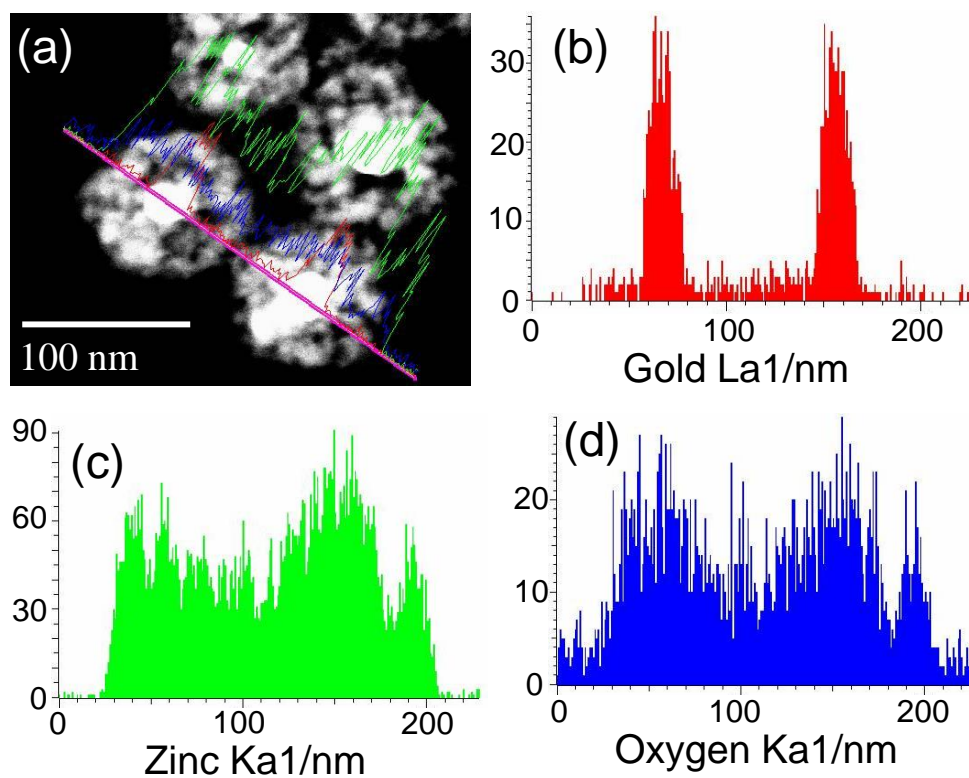


Figure S2. (a) HAADF-STEM line scan images of Au@ZnO CSNPs showing the intensities of (b) Au, (c) Zn and (d) O elements.

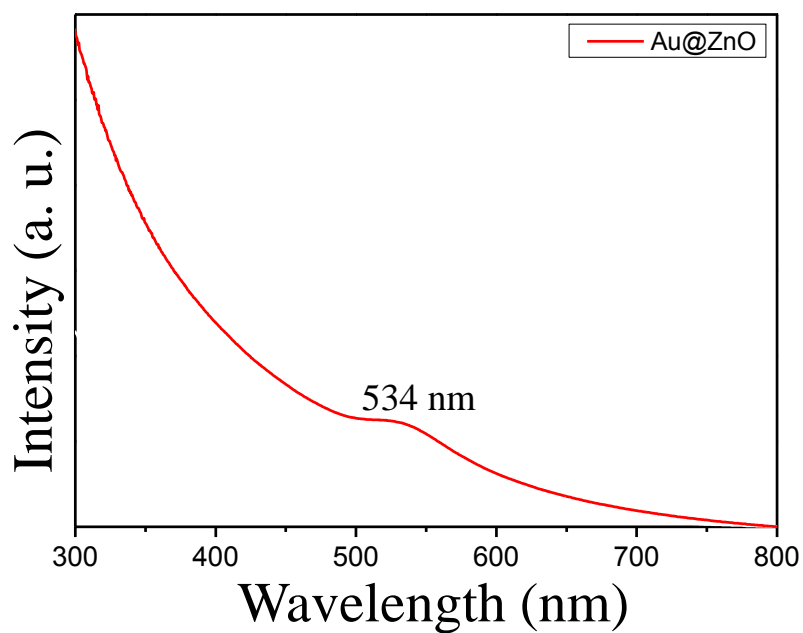


Figure S3. UV-visible spectrum of as synthesized Au@ZnO CSNPs.

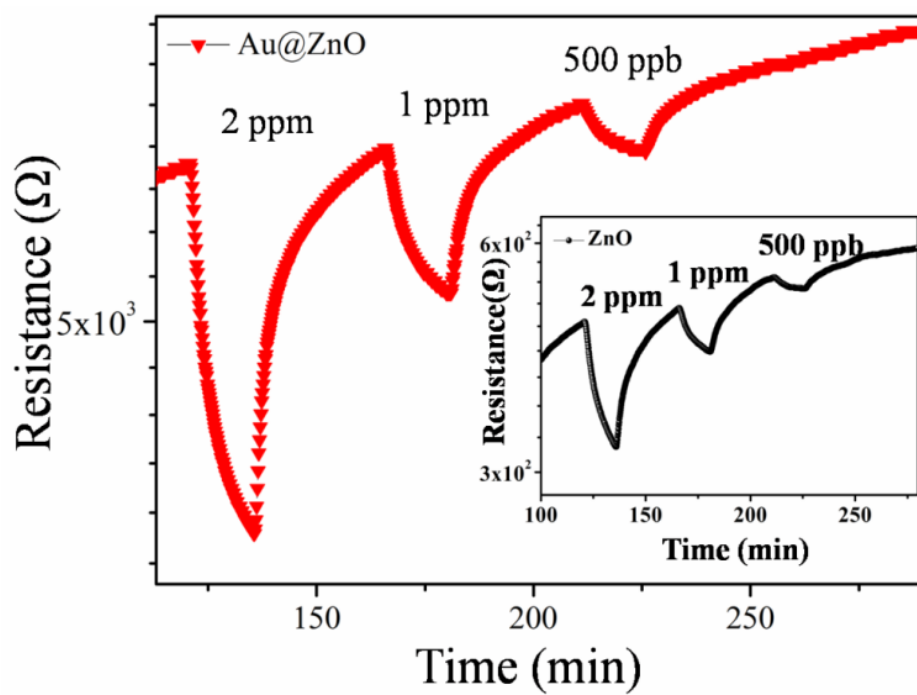


Figure S4. Dynamic H_2 sensing transients of pure ZnO NPs and Au@ZnO CSNPs (500 ppb - 2 ppm) at 300°C .

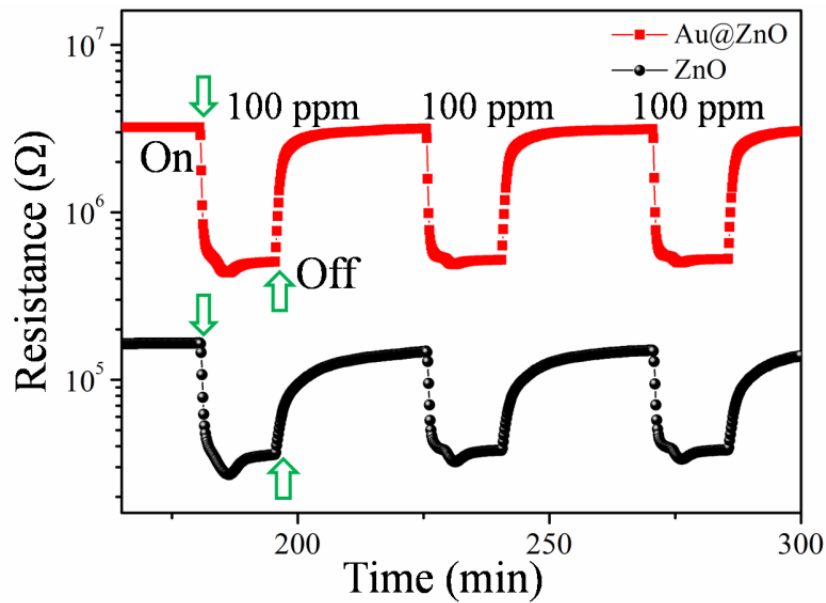


Figure S5. Response reproducibility test of the ZnO NPs and Au@ZnO CSNPs sensors at 400°C.

REFERENCE:

- (1) Yu, Y-T.; Dutta, P. Examination of Au/SnO₂Core-Shell Architecture Nanoparticle for Low Temperature Gas Sensing Applications. *Sens. Actuators, B* **2011**, *157*, 444–449.