

Supporting Information

Nanometer-Thick Films of Aligned ZnO Nanowires Sensitized with Au Nanoparticles for Few-ppb Level Acetylene Detection

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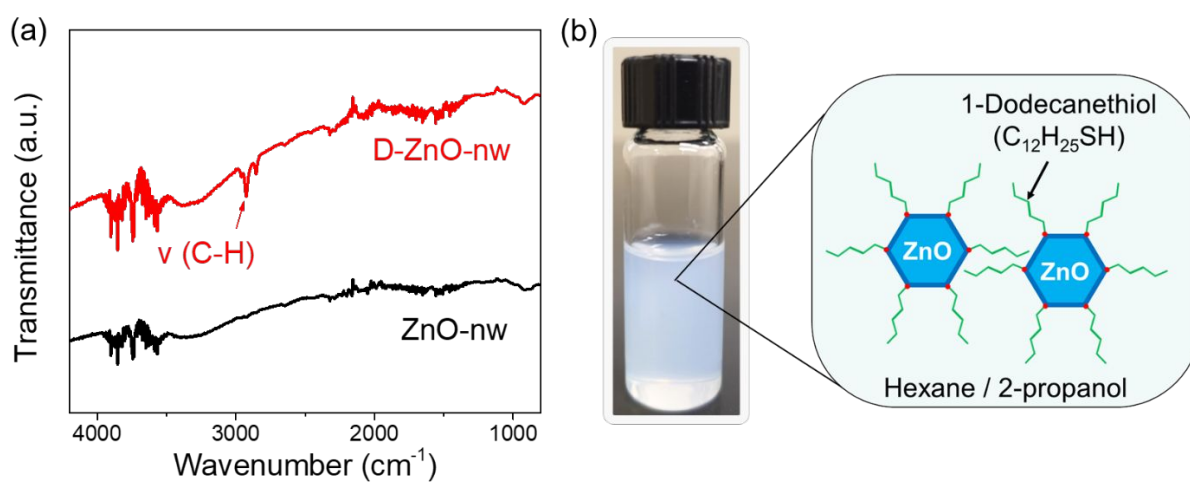


Figure S 1 (a) FTIR spectra of pristine and functionalized ZnO nanowire. (b) Colloidal solution of ZnO nanowire in hexane.

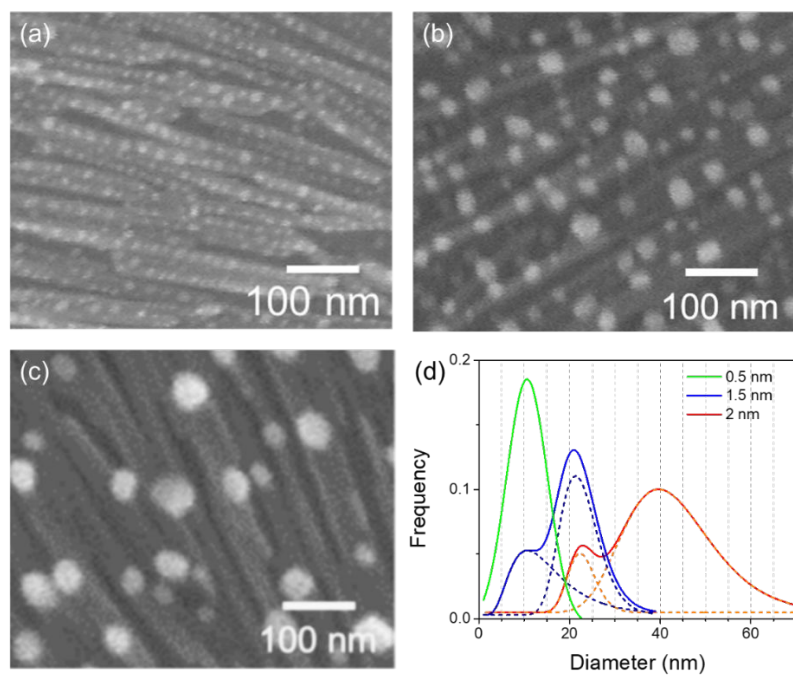


Figure S 2 (a-c) SEM of annealed Au@ZnO-LF samples with initial Au loading of 0.5 nm (13 wt%), 1.5 nm (39 wt%), and 2 nm (52 wt%). Particle size distributions of 0.5nm-2nm Au@ZnO-LF based on SEM images

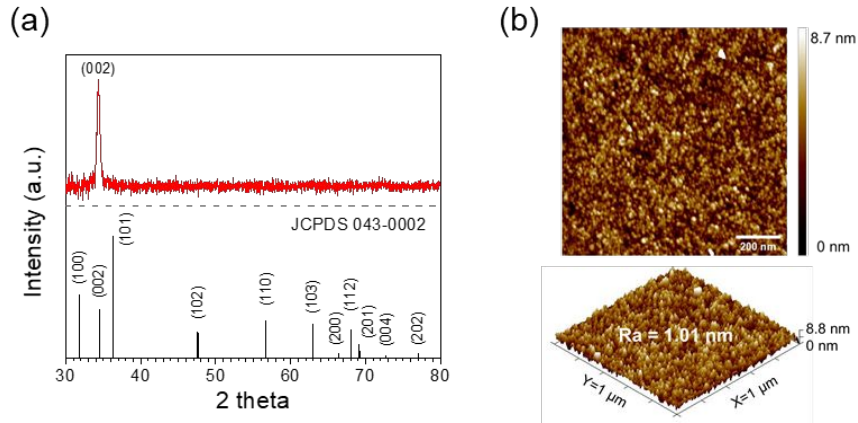


Figure S 3 (a) Texture of ZnO sputtered film revealed by XRD. (b) Surface morphology and roughness of ZnO sputtered film revealed by AFM.

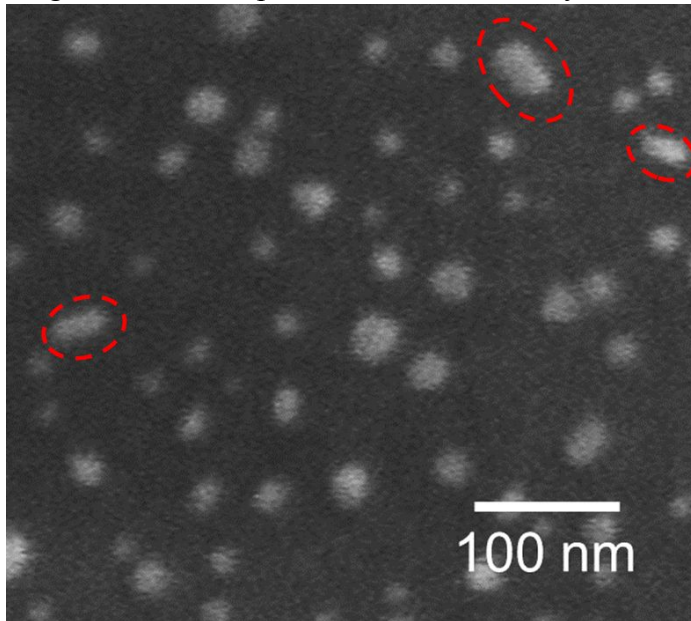


Figure S 4 SEM image of Au@ZnO_SF annealed at 400 °C for 100 h. Binary collisions and fusions of Au NPs as large as 20 nm are marked in red.

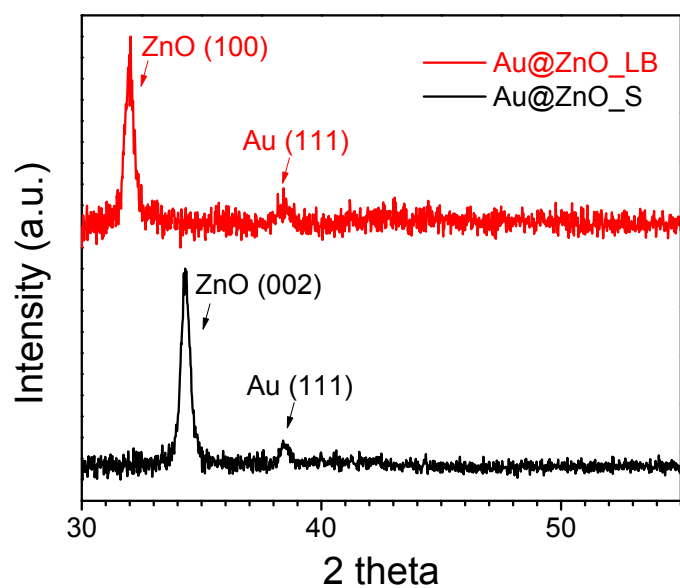


Figure S 5 XRD patterns of Au doped ZnO film after annealing at 400 °C for 24 h.

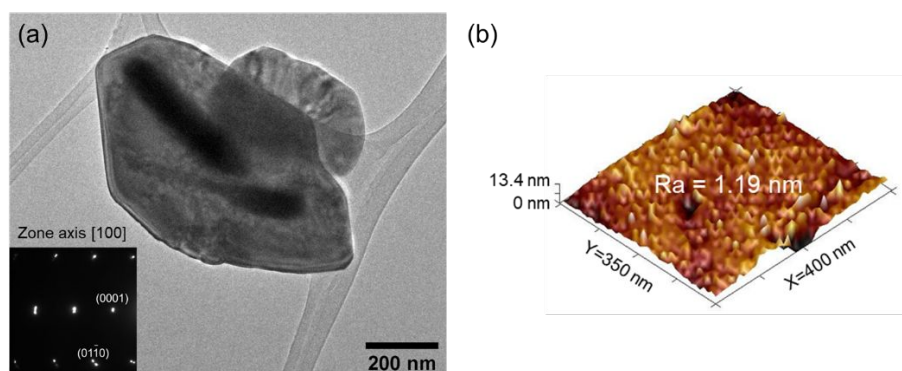


Figure S 6 (a) TEM of ZnO nanoplate with (100) as primary crystal facet. (b) Surface roughness of ZnO nanoplate.

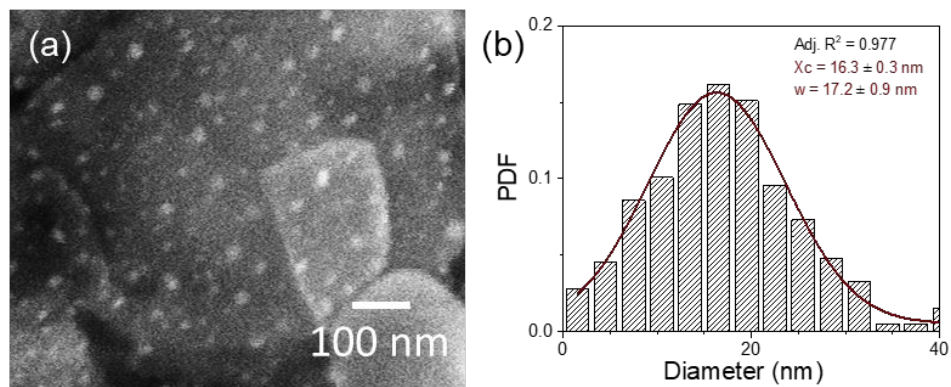


Figure S 7 (a) SEM of Au@ZnO_NP annealed at 400 °C for 24 h. (b) Particle size distribution.

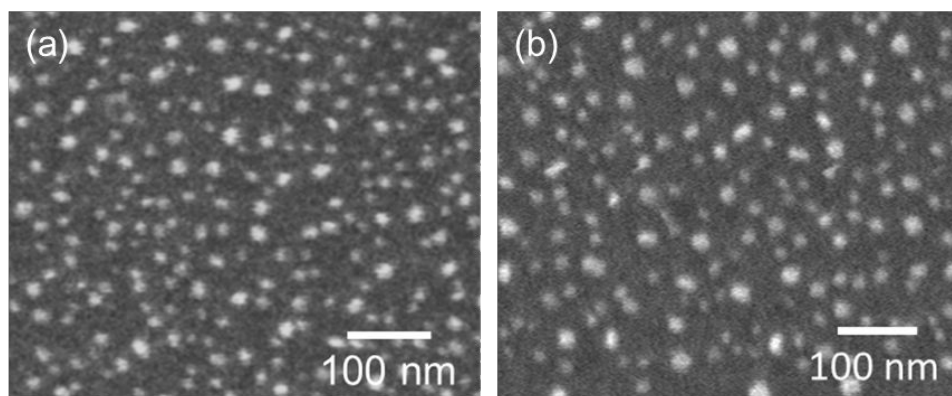


Figure S 8 SEM images of Au@ZnO_SF before (a) and after (b) the stability test.

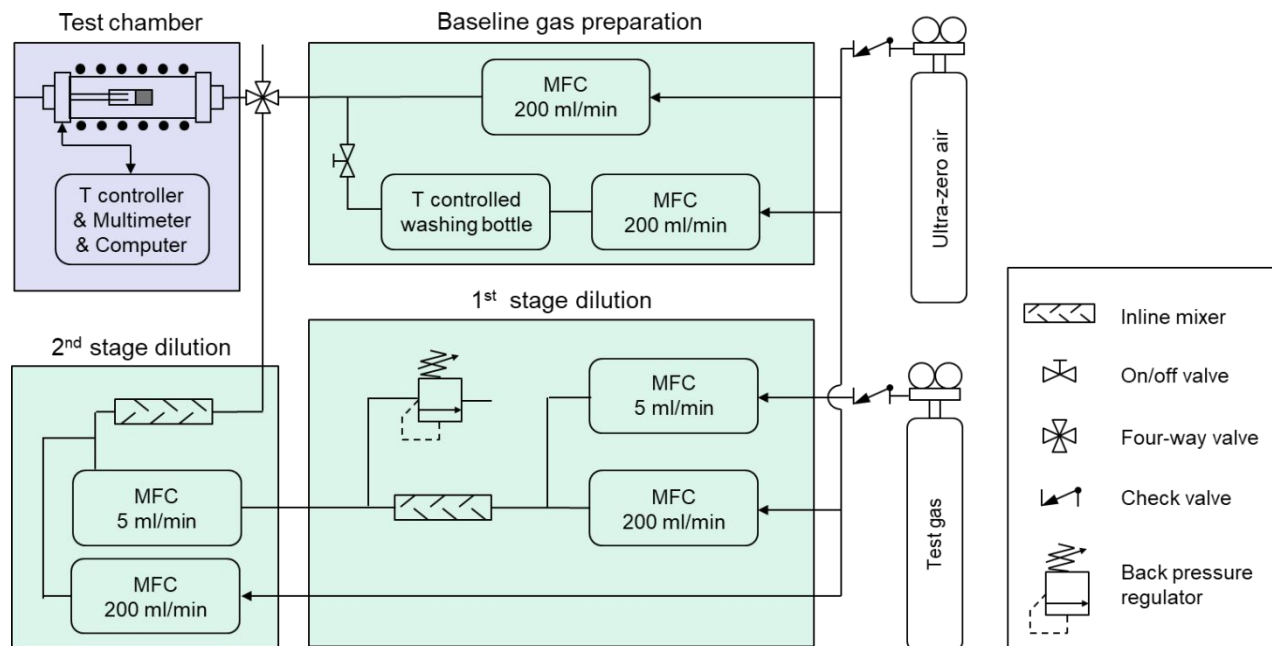


Figure S 9 Schematic of gas sensor testing system used in this work.