Supporting Information

Gas Sensor for Efficient Acetone Detection and Application Based on Au-Modified ZnO Porous Nanofoam

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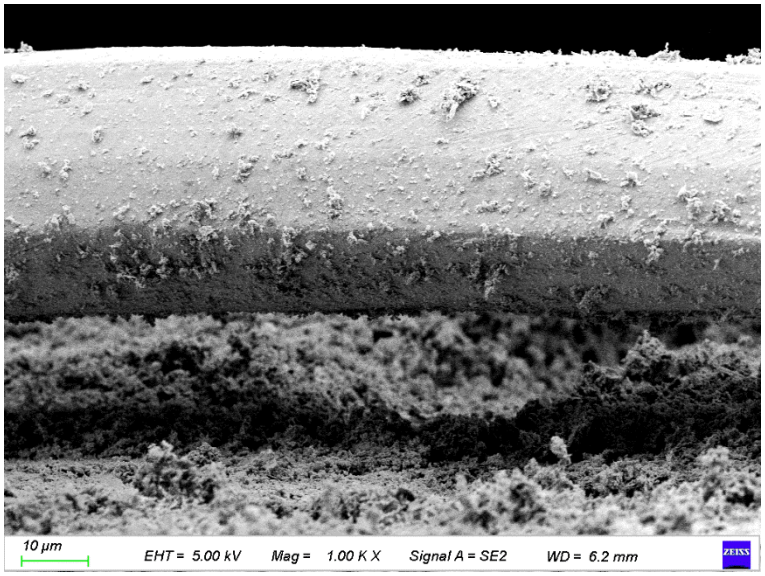


Figure S1. The cross-sectional SEM image of the Au/ZnO-3.0% coated on ceramic tube.

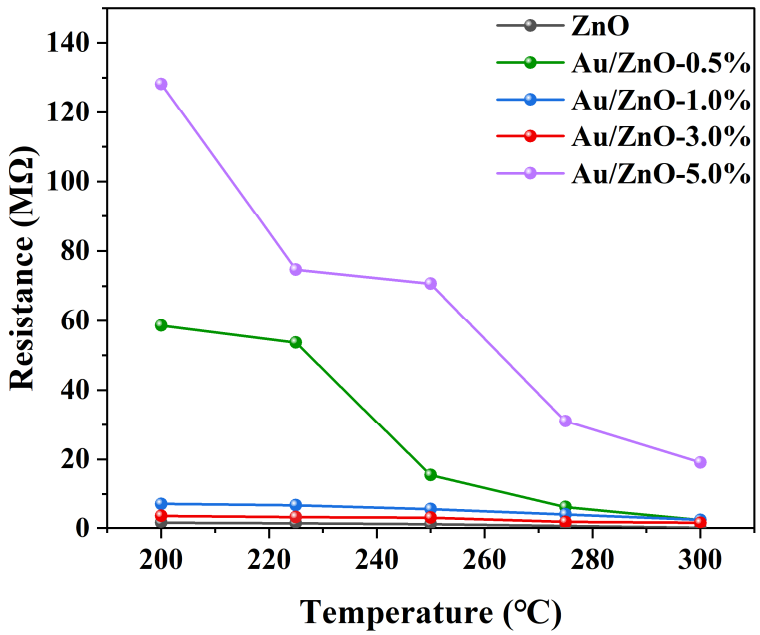


Figure S2. The resistances in air at various working temperatures of the gas sensors.

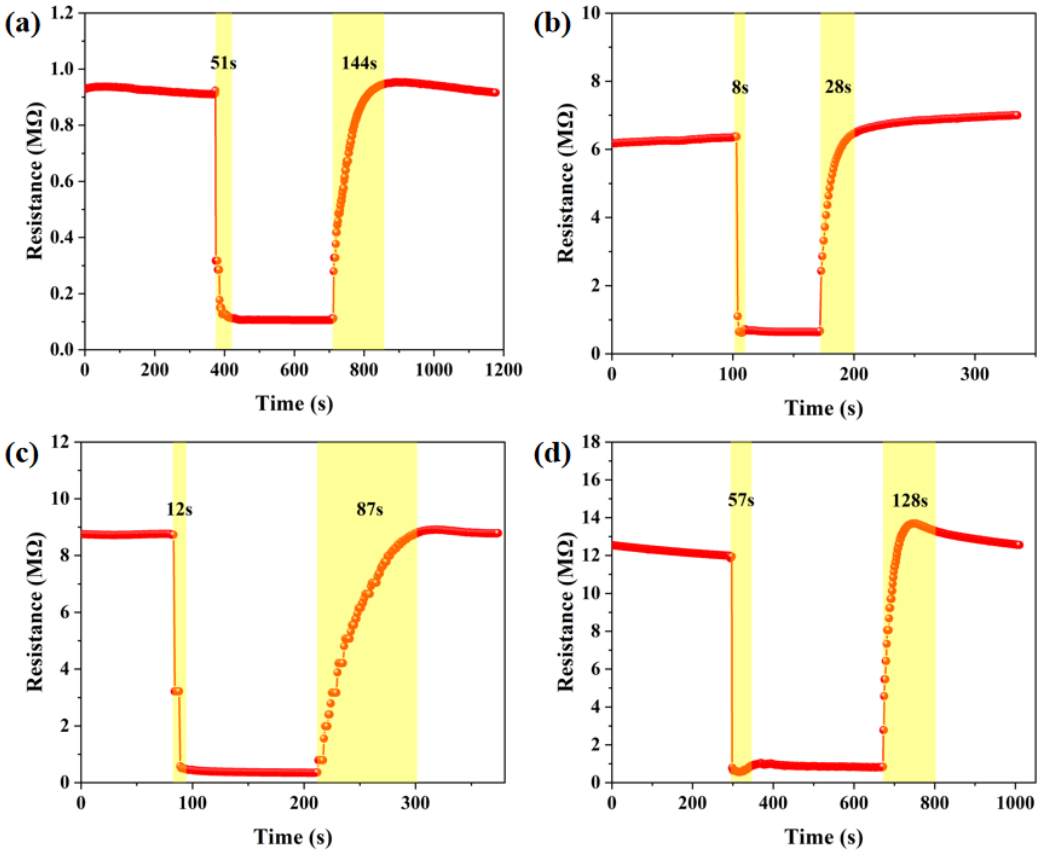


Figure S3. The response/recovery time of sensors to 100 ppm acetone at 275 °C. (a) ZnO, (b) Au/ZnO-0.5%, (c) Au/ZnO-1%, and (d) Au/ZnO-5%.



Figure S4. The image of the fabricated gas sensing device.

Table S1. Comparison of the acetone-sensing performance of the fabricated Au/ZnO porous nanofoam than that of sensors reported in literature.

Sensitive material	Optimum working temperature (°C)	Response value (Acetone concentration)	Reference
Au/ZnO porous nanofoam	275	20.02 (100 ppm)	This work
Flower-Like TiO_2	330	33.72 (250 ppm)	*Nanoscale Research Letters* 17 (2022) 82
SnO_2/Pd-NiO nanowires	450	14.88 (500 ppm)	*RSC advances* 14 (2024) 12438-12448
Au-loaded Co_3O_4	190	14.5 (100 ppm)	*Sensors and Actuators B: Chemical* 344 (2021) 130182
Pt-loaded Co_3O_4/$CoMoO_4$	250	24.12 (20 ppm)	*Physica E: Low-dimensional Systems and Nanostructures* 164 (2024) 116042.
Nb-doped CeO_2 nanofibers	240	23.27 (100 ppm)	*Applied Surface Science* 602 (2022) 154303
Ru/NiO-0.5% flower-like microspheres	200	12.6 (100 ppm)	*Sensors and Actuators B: Chemical* 313 (2020) 127965
Hollow CuO/Cu_2O octahedrons	350	3.52 (50 ppm)	*Sensors and Actuators B: Chemical* 423 (2025) 136783
C-d-mFe_2O_3 NRs	225	5.2 (2.5 ppm)	*Journal of Colloid and Interface Science* 622 (2022) 156-168
ZnO/$ZnFe_2O_4$ microspheres	250	94 (100 ppm)	*ACS Applied Nano Materials* 7 (2024) 16066-16074
Co_3O_4-decorated porous TiO_2 nanofibers	250	71 (100 ppm)	*Journal of Alloys and Compounds* 919 (2022) 165875