## Electronic Supplementary Information

# Insights into the effect of Au particle size on the triethylamine sensing properties based on Au-ZnO nanoflower sensor

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## Experiment Results:

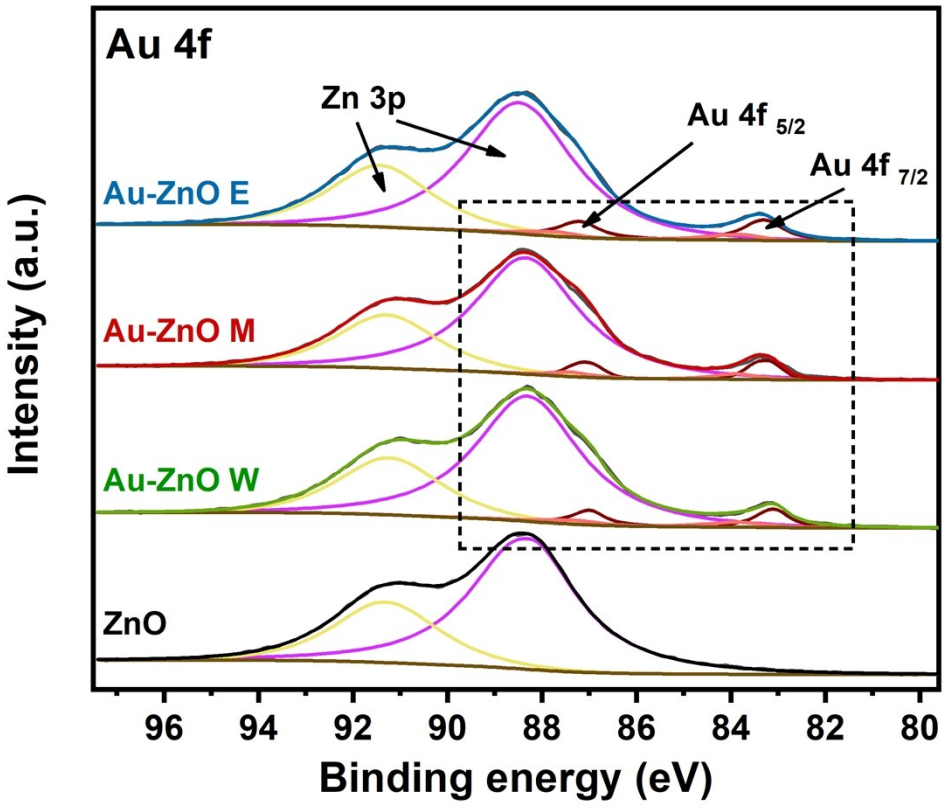


**Fig. S1** XPS spectra Au 4f of ZnO and Au-ZnO samples.

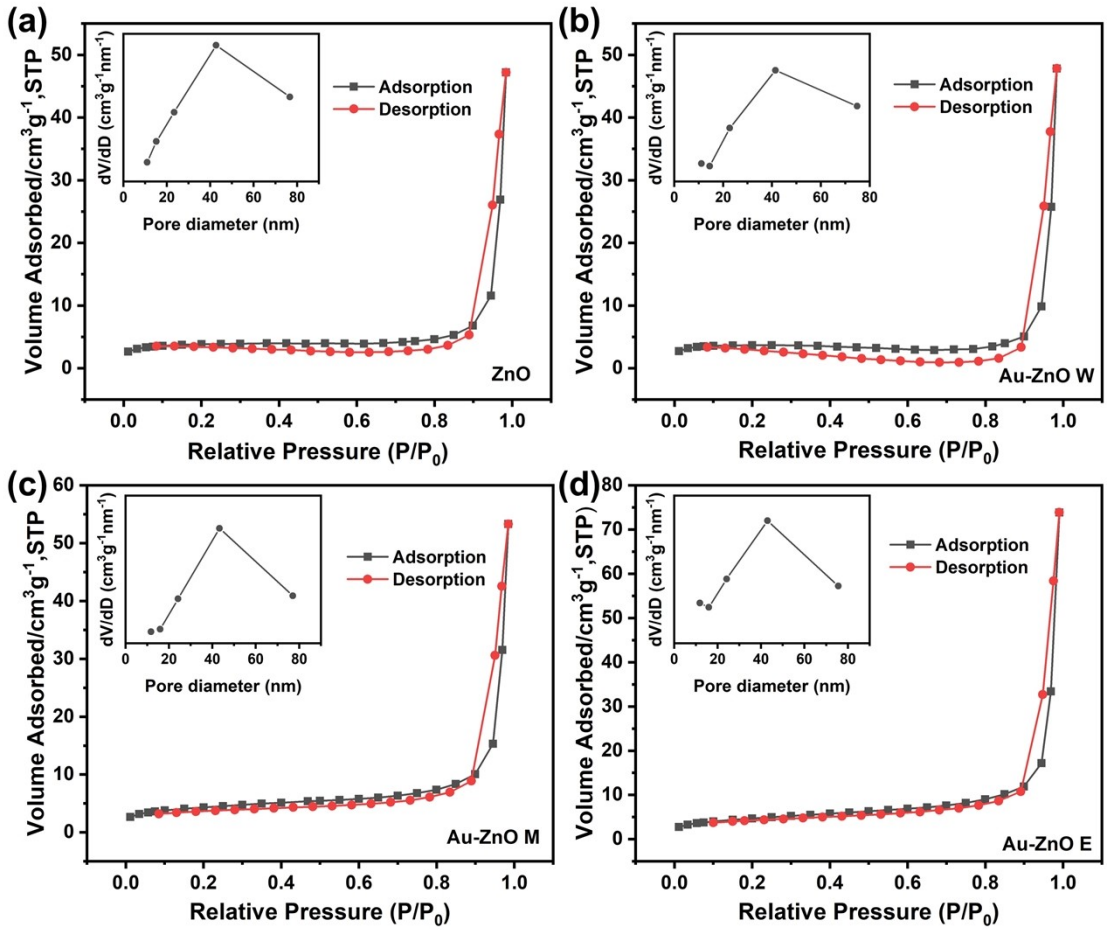


**Fig. S2** Nitrogen adsorption-desorption analyses of (a) ZnO; (b) Au-ZnO W; (c) Au-ZnO M and (d) Au-ZnO E (insets are the pore size distribution curves of the corresponding sample).

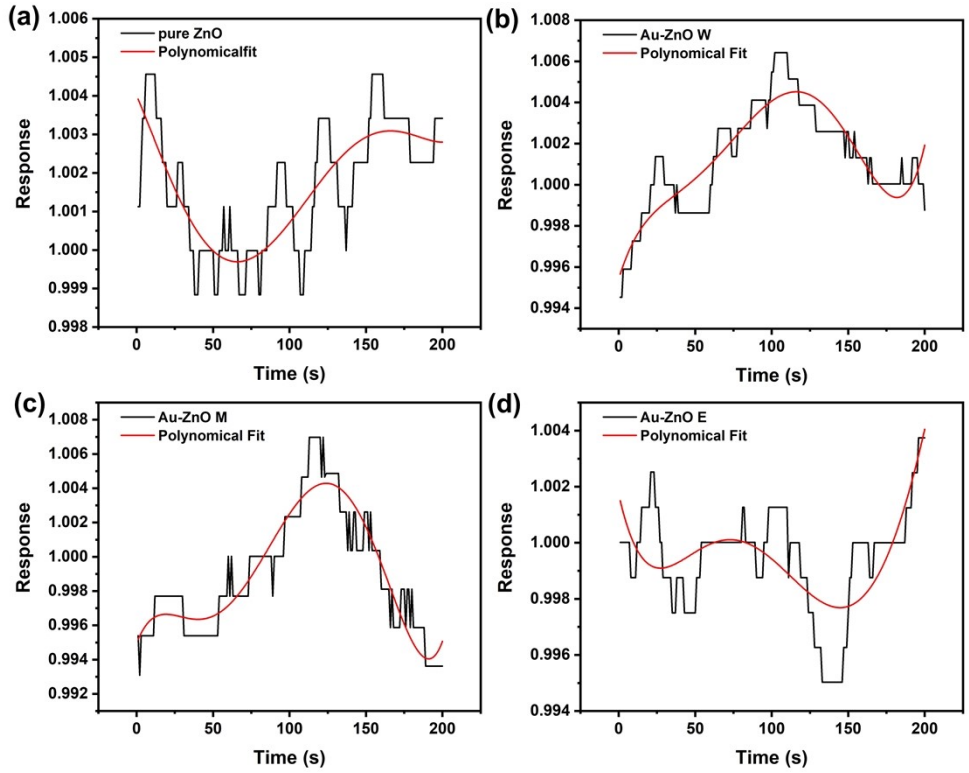


**Fig. S3** Plots of 5th order polynomial fitted normalized resistance of four sensors as a function of time at the baseline before target gas exposure: (a) ZnO; (b) Au-ZnO W; (c) Au-ZnO M and (d) Au-ZnO E.

**Table S1.** 5th order polynomial fitting data for different sensors.

| Time (sec) | ZnO | | Au-ZnO W | |
|---|---|---|---|---|
| | ***Yi-Y*** | ***(Yi-Y)²*** | ***Yi-Y*** | ***(Yi-Y)²*** |
| 1 | -2.79E-03 | 7.78E-06 | -1.13E-03 | 1.29E-06 |
| 20 | -9.20E-04 | 8.48E-07 | 2.39E-04 | 5.73E-08 |
| 40 | -1.62E-03 | 2.64E-06 | -1.06E-03 | 1.12E-06 |
| 60 | 2.50E-04 | 6.26E-08 | -1.01E-03 | 1.02E-06 |
| 80 | -1.06E-03 | 1.12E-06 | 9.79E-05 | 9.59E-09 |
| 100 | 4.17E-04 | 1.74E-07 | 1.41E-03 | 1.99E-06 |
| 120 | 1.65E-03 | 2.73E-06 | -6.30E-04 | 3.98E-07 |
| 140 | -1.52E-03 | 2.32E-06 | -8.10E-04 | 6.64E-07 |
| 160 | 1.49E-03 | 2.22E-06 | 1.84E-04 | 3.39E-08 |
| 180 | -7.30E-04 | 5.26E-07 | 6.34E-04 | 4.01E-07 |
| 200 | 6.18E-04 | 3.82E-07 | -3.17E-03 | 1.00E-05 |
| $V_x^2$ | 2.08E-05 | | 1.70E-05 | |
| *RMS* | 1.44E-03 | | 1.30E-03 | |
| *S* | 1.30 | | 17.0 | |
| *LOD* (ppm) | 3.33E-03 | | 2.29E-04 | |
| *LOD* (ppb) | 3.33 | | 0.230 | |

**Table S1.** 5th order polynomial fitting data for different sensors.

| Time (sec) | Au-ZnO M | | Au-ZnO E | |
|---|---|---|---|---|
| | ***Yi-Y*** | ***(Yi-Y)²*** | ***Yi-Y*** | ***(Yi-Y)²*** |
| 1 | 2.21E-04 | 4.87E-08 | -1.48E-03 | 2.20E-06 |
| 20 | 1.06E-03 | 1.13E-06 | 2.05E-03 | 4.19E-06 |
| 40 | -9.60E-04 | 9.21E-07 | -5.80E-04 | 3.31E-07 |
| 60 | 2.86E-03 | 8.20E-06 | 5.73E-05 | 3.28E-09 |
| 80 | 4.50E-04 | 2.03E-07 | -4.40E-05 | 1.98E-09 |
| 100 | -1.70E-04 | 2.95E-08 | 1.84E-03 | 3.40E-06 |
| 120 | 2.74E-03 | 7.49E-06 | 3.43E-04 | 1.18E-07 |
| 140 | -2.96E-03 | 8.74E-06 | -2.69E-03 | 7.24E-06 |
| 160 | -1.48E-03 | 2.20E-06 | 1.90E-03 | 3.63E-06 |
| 180 | 3.01E-03 | 9.05E-06 | -1.50E-04 | 2.13E-08 |
| 200 | -1.44E-03 | 2.09E-06 | -3.00E-04 | 9.08E-08 |
| $V_x^2$ | 4.01E-05 | | 2.12E-05 | |
| *RMS* | 2.00E-03 | | 1.46E-03 | |
| *S* | 21.0 | | 26.2 | |
| *LOD* (ppm) | 2.86E-04 | | 1.67E-04 | |
| *LOD* (ppb) | 0.286 | | 0.167 | |

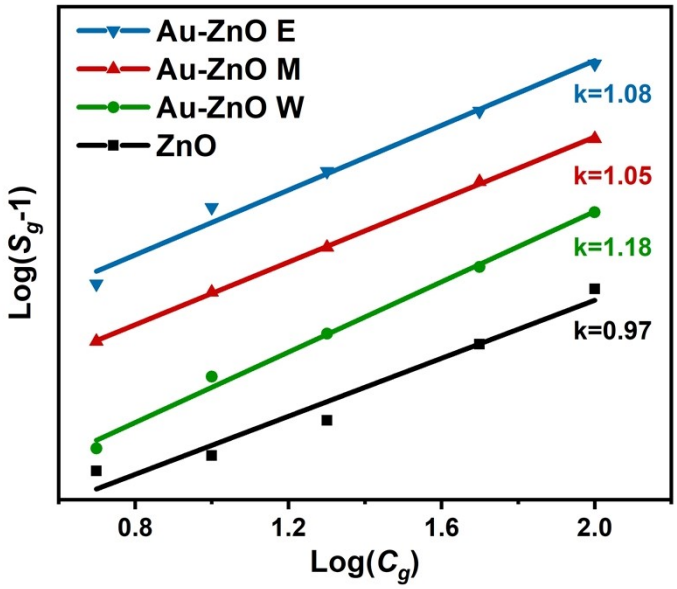


**Fig. S4** Log ($S_g$-1) ~ Log ($C_g$) curves of ZnO and Au-ZnO.