Supporting information

In-situ synthesis of porous array film on filament induced micro-gap electrode pair and their use as resistance-type gas sensor with enhanced performances

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Figure S1. (a) The measuring electric circuit and (b) the three-dimensional diagram of the test circuit for the gas sensor (V_h : heating voltage, V_c : circuit voltage, and R_L : load resistance).

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Figure S2. (a) The photograph of the PS colloidal monolayer template on the glass slide. (b) The typical FESEM image the PS colloidal monolayer template.

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Figure S3. The XRD pattern of ZnO porous array film. The lines correspond to the crystal planes of hexagonal wurtzite ZnO.

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Figure S4. The responses of the micro-gap electrode pair based sensor to 10 ppm ethanol at different operating temperatures.





Figure S5. (a) Front and (b, c) cross-sectional FESEM images of the porous array film fabricated on the silicon substrate.





Figure S6. (a) The XRD pattern and (b) FESEM image of SnO₂ sensing films. (c) The XRD pattern and (d) FESEM image of Fe₂O₃ sensing films.





Figure S7. A continuous gas sensing measurement without recovery to 1-5 ppm ethanol vapor for (a) SnO_2 and (b) Fe_2O_3 based sensors. The black and red curve represent the micro-gap electrode pair based sensor and the normal sensor respectively. The operating temperature of all the sensors is 300 °C.