Electronic Supplementary Information for:

**Au Nanoparticle Decorated Porous SnO$_2$ Hollow Spheres: a New Model for Chemical Sensor**

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**Fig. S1.** Photographs of the alumina tube (a) and the completed gas sensor (b)

**Fig. S2.** Working principle of gas sensing test: (R$_L$) a load resistance connected in series to the sensor, ($V_h$) heating voltage to control the operating temperature, ($V_c$) circuit voltage of 5V and ($V_{out}$) sensor signal voltage collected by a computer.