

# Supporting information

## **Solution-processed Chloroaluminum Phthalocyanine (ClAlPc) Ammonia Gas Sensor with Vertical Organic Porous Diodes**

Govindsamy Madhaiyan<sup>1, \*</sup>, An-Ting Sun<sup>3</sup>, Hsiao-Wen Zan<sup>2</sup>, Hsin-Fei Meng<sup>1</sup>,  
Sheng-Fu Horng<sup>3</sup>, Li-Yin Chen<sup>2, \*</sup>, Hsiao-Wen Hung<sup>4</sup>

<sup>1</sup> Institute of Physics, National Yang Ming Chiao Tung University, Hsinchu, Taiwan.

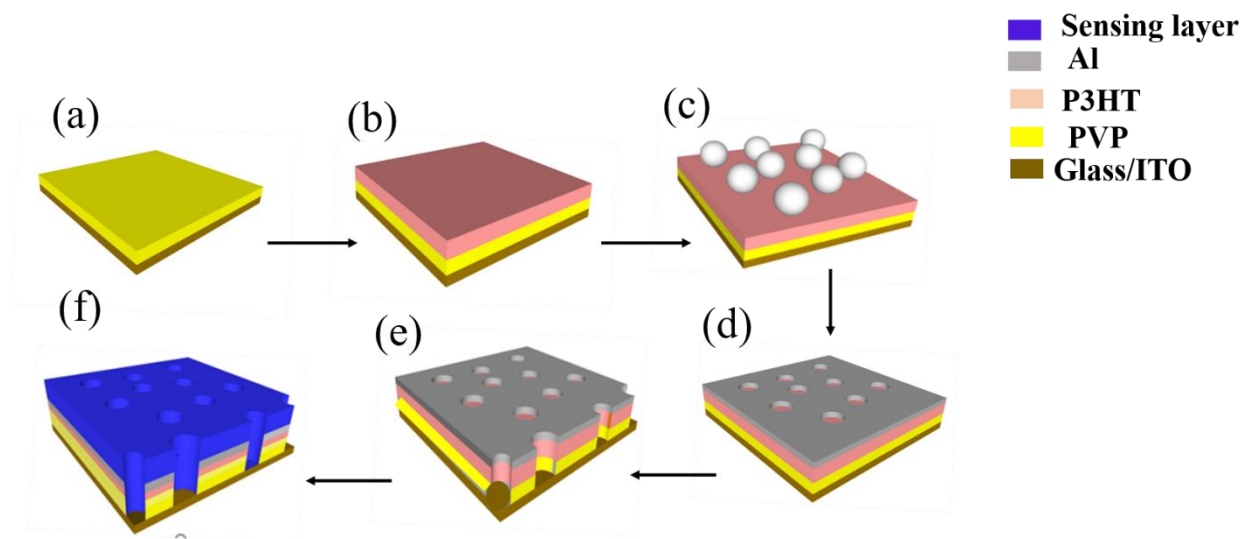
<sup>2</sup> Department of Photonics, Institute of Electro-Optical Engineering, College of Electrical and Computer Engineering, National Yang Ming Chiao Tung University, Hsinchu, Taiwan.

<sup>3</sup> Department of Electrical Engineering, National Tsing Hua University, Taiwan

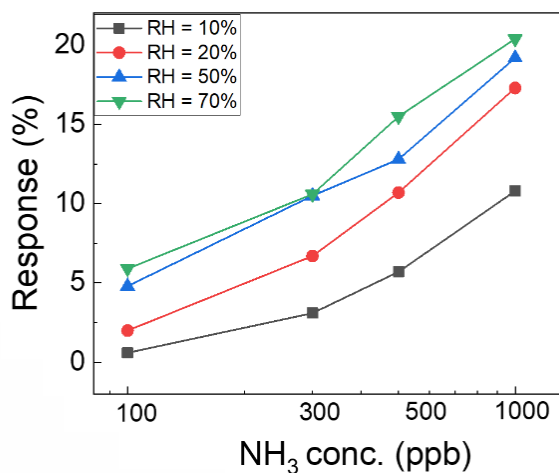
<sup>4</sup> Intelligent Energy-Saving Systems Division, Green Energy and Environment Research Laboratories, Industrial Technology Research Institute, Hsinchu, Taiwan,

Corresponding authors

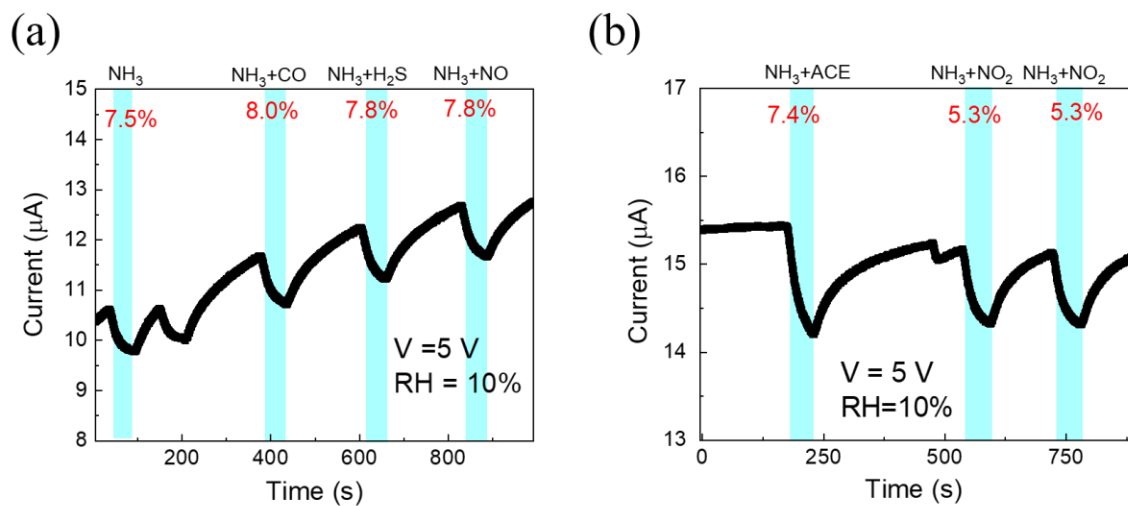
govindaswamy01@gmail.com (G. Madhaiyan), lychen@nycu.edu.tw (L.-Y. Chen)



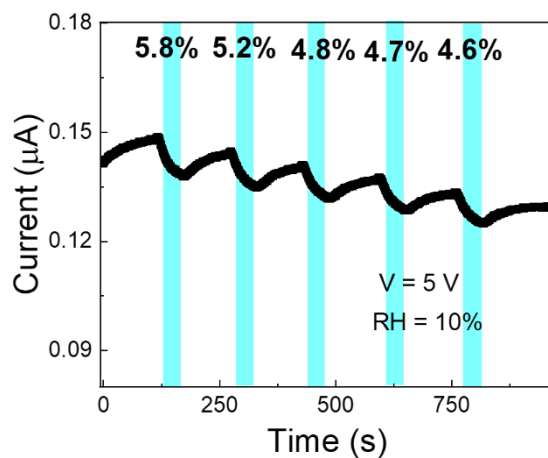
**Figure S1** The fabrication process flow of the proposed VOD sensor. (a) PVP and (b) P3HT surface modification layer was formed on ITO glass substrate by spin coating. (c) PS (Polystyrene) nanosphere formation. (d) Top electrode deposition by thermal evaporation; the PS spheres were removed by scotch tape. (e) O<sub>2</sub> plasma etching. (f) ClAlPc sensing material was spin coated onto the substrate to complete the sensor fabrication.



**Figure S2** Sensing response as a function of NH<sub>3</sub> concentration at different RH level (10% ~ 70%)



**Figure S3** The real-time NH<sub>3</sub> sensing measurement of ClAlPc device with different interfering gases (Interfering gases: NH<sub>3</sub> = 1:1 ppm). (a) pure NH<sub>3</sub>, NH<sub>3</sub>+CO, NH<sub>3</sub>+H<sub>2</sub>S, and NH<sub>3</sub>+NO. (b) NH<sub>3</sub>+ACE, NH<sub>3</sub>+NO<sub>2</sub>, and NH<sub>3</sub>+NO<sub>2</sub>.



**Figure S4** Repeatability of ClAlPc sensor (after one month) for 5 cycles with fixed concentration of 1 ppm NH<sub>3</sub> gas.