Supporting Information

Growth and NO_2 Sensing Properties of Biaxial p-SnO/n-ZnO Heterostructured Nanowires

*Pham Tien Hung,[1,2], Phung Dinh Hoat[2], Vu Xuan Hien[3], Hee-Young Lee[4], Sangwook Lee[1,5], Joon-Hyung Lee[1,5], Jeong-Joo Kim[1,5], Young-Woo Heo[1,5,]**

[1] School of Materials Science and Engineering, Kyungpook National University (KNU), Daegu 41566, Korea
[2] Department of Physics, Le Quy Don Technical University, No. 236 Hoang Quoc Viet street, CauGiay District, Hanoi, Vietnam
[3]School of Engineering Physics, Hanoi University of Science and Technology, No. 01 Dai Co Viet street, Hanoi, Vietnam
[4]School of Materials Science and Engineering, Yeungnam University, Gyeongsan 38541, Korea
[5]KNU Advanced Material Research Institute, Kyungpook National University, Daegu 41566, Republic of Korea

Corresponding Author

*Email: ywheo@knu.ac.kr

Experimental detail

The synthesis of ZnO nanowires

Without catalyzed ZnO nanowires were growth directly on the glass substrate via thermal oxidation process. The glass substrate is 20 cm away from the source which was mixed from active carbon and ZnO powder (both purities are 99.99%) in a 1:1 weight ratio. The source put in an alumina boat and was loaded at the center of a quartz tube. For synthesis of the ZnO nanowires, a conventional thermal chemical vapor deposition (CVD) process with mixed N_2-O_2 gas (N_2: 4 sccm, O_2: 1 sccm) was used. The furnace was heated up to 950°C and the pressure in the processing tube was controlled at 2 x 10^{-2}Torr. After the quartz tube was evacuated to ~ 5 x 10^{-3}Torr, the furnace temperature was increased from room temperature to 950°C. When the temperature increased up to growth temperature (950°C), a mixed N_2-O_2 gas (N_2: 4 sccm, O_2: 1 sccm) was provided as the reaction gas. While introducing the reaction gas, the pressure of the system was maintained at 2 x 10^{-2}Torr and the temperature was kept at 950°C for 1 h. The substrate was placed downstream at the sampling point at a temperature of 450 °C. After the reaction, the furnace was naturally cooled down to room temperature and the ZnO nanowires were collected on the glass substrate.

Figure S1 shown the FE-SEM image and XRD pattern of as-synthesized ZnO nanowire on the glass substrate.

Figure S1. (a) FE-SEM image, (b) XRD pattern of as-synthesized ZnO nanowire on the glass substrate

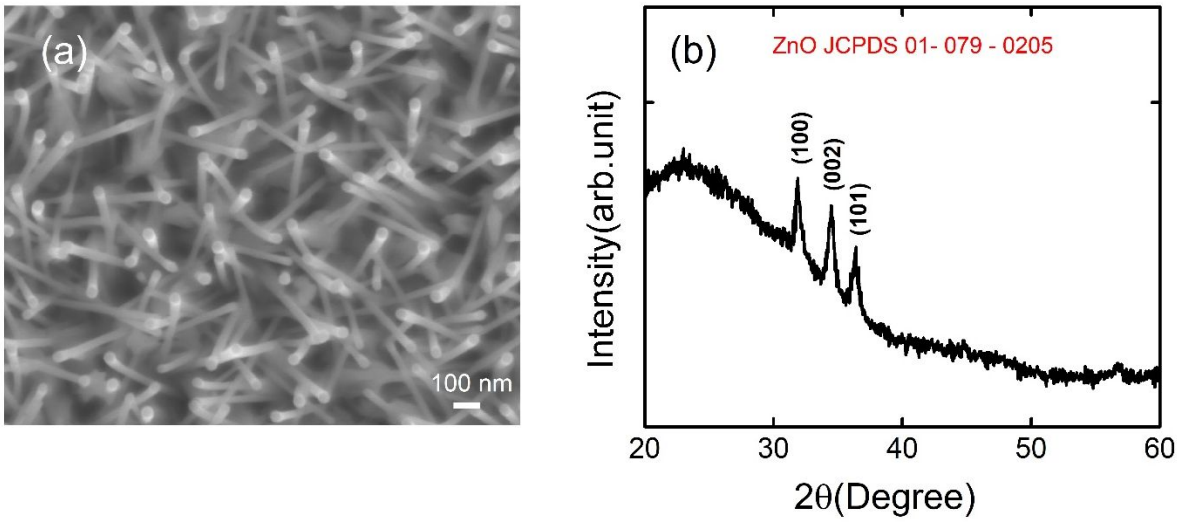

Figure S2. Setup of our dynamic gas testing system