Supplementary Information

The Influence of Carrier Concentration on Piezotronic Effect in ZnO/Au Schottky Junction

Shengnan Lu§,Junjie Qi§, Yousong Gu, Shuo Liu, Qiankun Xu, Zengze Wang, Qijie Liang and Yue Zhang*

§ These authors contributed equally.
*Corresponding author: yuezhang@ustb.edu.cn

a State Key Laboratory for Advanced Metals and Materials, School of Materials Science and Engineering, University of Science and Technology Beijing, Beijing 100083, People’s Republic of China.
b Key Laboratory of New Energy Materials and Technologies, University of Science and Technology Beijing, Beijing 100083, People’s Republic of China.

1. Figures

Figure S1. The optical image of the fabricated device. The solid line is the area of the synthesized ZnO, while the dashed line is the Au electrode area.
Figure S2. Atomic force microscope topography image (left) and contact potential difference (right) of the ZnO nanorods under 0 mW/cm$^2$ (a), 0.1 mW/cm$^2$ (b), 0.4 mW/cm$^2$ (c), 1.2 mW/cm$^2$ (d) UV light illumination.

2. The method that apply strain

The strain was introduced based on the level principle with the help of the equipment that assembled ourselves. Briefly, as shown in Fig. S3, the point O is fixed and cannot move, while the point B is free, where we can precisely control its displacement. And A is where the device located and the loading location. When we move B to B$_1$, the A moves to A$_1$ simultaneously. Since the displacement of B is controllable, the movement of A can be acquire from the equation

$$AA_1 = \frac{OA}{OB}BB_1$$

Furthermore, as the elasticity modulus of glass is bigger than that of ZnO, the movement of A ($AA_1$) is approximately equal to the deformation of ZnO NRs. In
addition, the original length of ZnO NRs can be required from the cross section image in Fig. 1(a). Hence the strain applied on ZnO nanorods is easily introduced by precisely controlling the displacement of B.

Figure S3. The schematic diagram of the strain applied.