

## Supplementary Information

### Temperature sensitive optical properties of exciton and room-temperature visible light emission from disordered Cu<sub>2</sub>O Nanowires

Peng Wang,<sup>a\*</sup> Xinhong Zhao,<sup>b</sup> Hairong Li,<sup>a</sup> Lingshan Li,<sup>c</sup> Jing Li,<sup>d</sup> Guofu Ma,<sup>a</sup> and Jingxian Chang<sup>a</sup>

<sup>a</sup>School of Physical Science and Technology, Lanzhou University, Lanzhou 730000, China

<sup>b</sup>Department of Optical Information Science and Technology, School of Mechanical Engineering, Jiangsu University, Zhenjiang 212013, China

<sup>c</sup>OriginLab (Guangzhou) Ltd., No. 109 Tiyuxi Road, Guangzhou 510620, China

<sup>d</sup>Maternity & Child-care Hospital of Gansu province, Lanzhou, 730050, China

\* Corresponding author. Tel.: +86-931-8911213. Fax: +86-931-8913554  
E-Mail address: [wangpeng@lzu.edu.cn](mailto:wangpeng@lzu.edu.cn)

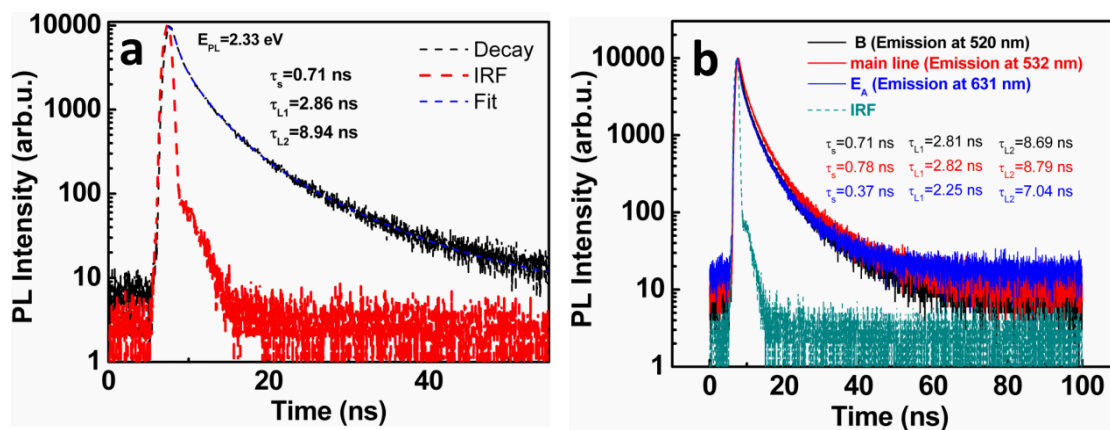


Fig. S1 (a) PL decay of the  $\text{Cu}_2\text{O}$  nanowires (NWs) in semi-log y scale recorded at the emission of 2.33 eV at room temperature. (b) PL decays of  $\text{Cu}_2\text{O}$  NWs with the emission of 2.36, 2.33, and 1.965 eV (i.e., 520, 532, 631 nm) in semi-log y scale at the temperature of 77 K,  $\tau_s$ ,  $\tau_{L1}$ , and  $\tau_{L2}$  characterize the three lifetime components of the  $\text{Cu}_2\text{O}$  NWs.

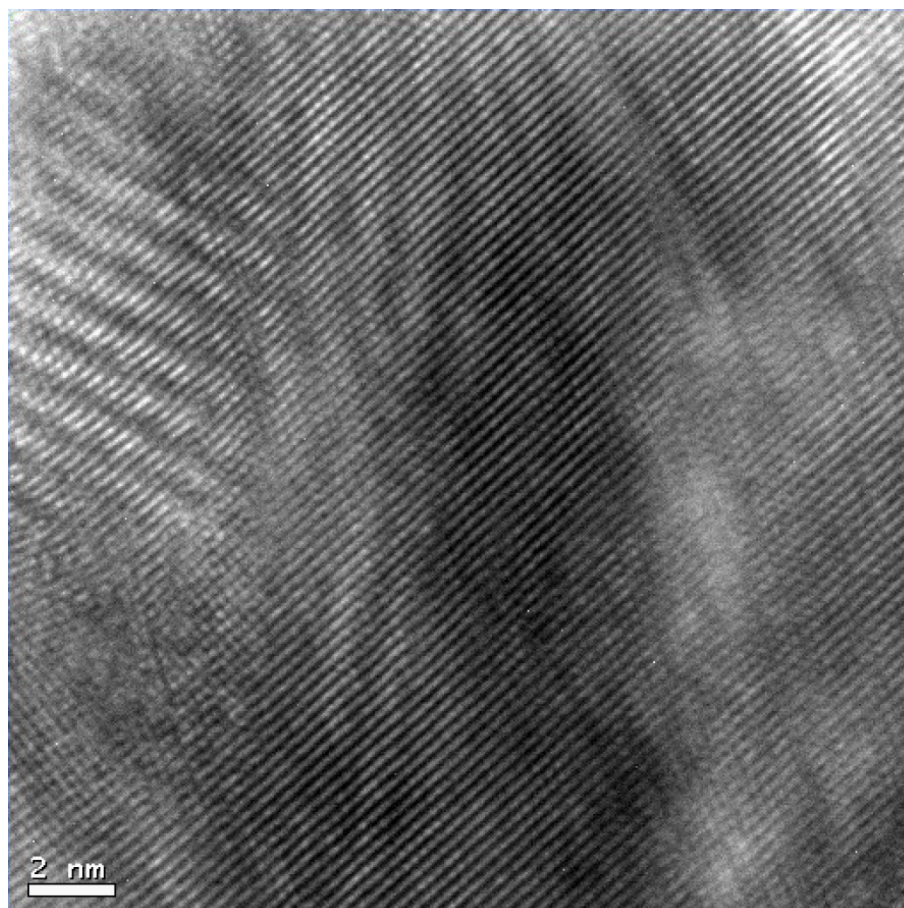


Fig. S2 A high-resolution Transmission electron microscope (HRTEM) image of the same  $\text{Cu}_2\text{O}$  NW.

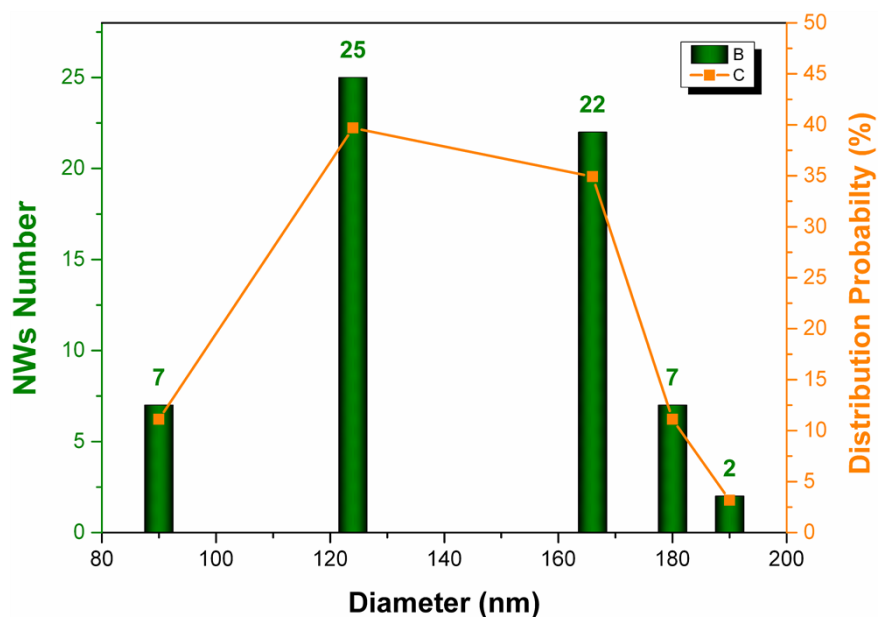


Fig. S3 A diameter distribution diagram of the prepared  $\text{Cu}_2\text{O}$  NWs.