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Control of ZnO nanowire growth and optical properties in a vapor deposition process

Nannan Bi ¹, Lei Zhang ¹, Qiang Zheng ², Fei Zhuge ¹, Jiupeng Li ¹, Xuan P.A. Gao ^{3,*}, Juan Du^{1,*}

¹ CAS Key Laboratory of Magnetic Materials and Devices, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Ningbo 315201, China

² School of Materials and Chemical Engineering, Ningbo University of Technology, Ningbo 315211, China

³ Department of Physics, Case Western Reserve University, Cleveland, Ohio, 44106, USA

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* Corresponding authors. Prof.; Tel.: +86 574 86685150; +1 216 3684031; Fax: +1 216 368 4671.

E-mail address: Dajuan@nimte.ac.cn (Juan Du); xuan.gao@case.edu (Xuan P.A. Gao).

A vapor deposition method was applied to synthesize zinc oxide (ZnO) nanowires and nanorods with diameter from 40 nm to 500 nm, length from 1 μm to 70 μm by adjusting the flow rate of argon, oxygen and the pressure during growth. Results of scanning electron microscopy (SEM) and high resolution transmission electron microscopy (TEM) proved the hexagonal wurtzite structure of the synthesized ZnO nanowires or nanorods, which grow along the $\langle 0001 \rangle$ direction. The results show that the growth conditions strongly impact the morphology, growth rate and optical properties of the ZnO nanostructures. The ZnO nanowires with small

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