

Single crystal ZnO nanorods synthesized by hydro-thermal method on various seed layers

HyeWon Nam, SangHyo Lee, JunSeok Lee, JongHyun Lee, and JinPyo Hong

¹Novel Functional Materials and Device Lab, Hanyang University, Seoul, 133-791, Korea

Structural properties of single crystal ZnO nanorods which were synthesized on the ZnO seed layer formed by an inductively coupled RF sputtering system and atomic layer deposition (ALD) system, respectively by hydro-thermal method with zinc nitrate ($\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$, Aldrich) and hexamethylenetetramine (HMT, Aldrich) in convection oven were investigated. The crystalline of the ZnO nanorods is determined by the crystal structure of the ZnO seed layer. The maximum length of ZnO nanorods were about 2 μm as synthesizing time was extended up to 17 hours. Structural properties of vertically aligned ZnO nanorods were investigated by X-ray diffraction (XRD) and scanning electron microscopy (SEM). Single crystalline formation of ZnO nanorods is observed by transmission electron microscopy (TEM).