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Influence of Hexamethylenetetramine on the Low Temperature Chemical Bath Deposited ZnO Nanorods

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Abstract content
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Nanostructured zinc oxide (ZnO) nanorods were synthesized using an easy, low cost and low temperature chemical bath deposition (CBD) technique on glass substrate. ZnO thin films were prepared using ethanol as a solvent and zinc acetate ($\text{Zn}(\text{CH}_3\text{COO})_2 \cdot 2\text{H}_2\text{O}$) as a solute, and then used as seed layer template for the subsequent growth of ZnO nano-rods. The growth solution consists of zinc nitrate hexahydrate ($\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$) and hexamethylenetetramine (HMT). The influence of different concentrations of hexamethylenetetramine on the structural and morphological properties of ZnO nanorods were investigated using X-ray diffraction (XRD) and scanning electron microscope (FE-SEM), respectively. For additional characterization of the ZnO NRs, surface topography measurements were performed using Atomic Force Microscope (AFM). XRD patterns of the ZnO nanorods grown using CBD at 60deg:C for four hours shows a remarkably strong diffraction peak at the (002) plane indicating that all the ZnO nanorods possessed pure hexagonal wurtzite structures. SEM images revealed the changes in morphology of ZnO nanorods upon addition of different amounts of hexamethylenetetramine.

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