

Abstract Details

Title: Deposition and Characterization of ZnO Thin Film using Sol-Gel Spin Coating Approach

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Abstract: ZnO is the semiconductor material used in many applications under the opto-electrical properties. ZnO is a wide band gap metal oxide semiconductor material which is used in gas sensors, solar cells, light emitting diode and surface acoustic wave devices. This paper reports the sol gel preparation and characterization of ZnO thin film. ZnO thin film was prepared by solgel process using zinc acetate dehydrate as a precursor, ethanol as a solvent and monoethanolamine (MEA) as a stabilizer. The solution was deposited on n-type silicon (111) substrate by spin coating at 3000 rpm. Hydrolysis and condensation process produced a complex solution. After drying at 100°C, samples were annealed at 575°C by post heating. Precise control of concentration of precursor, solvent used, spinning speed of the substrate and heat treatment conditions, are the factors which strongly affect the crystallographic orientation and morphology of the resultant ZnO films. The crystallinity of the film as found from X-ray diffraction (XRD) had different orientations at different temperatures.. Morphology is determined by scanning electron microscopy (SEM) and transparency and optical properties are determined by UV-visible.

Keywords: ZnO, Sol-gel, Spin coating, Anealing.