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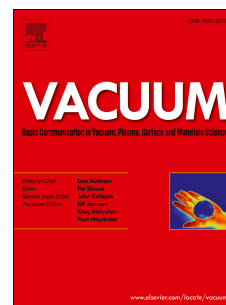
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Fabrication and characterization of CdS doped ZnO Nano Thick Films

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Abstract

In the present work, microstructural and optical properties of Cadmium Sulfide (CdS) doped Zinc Oxide (ZnO) thick film is investigated. Two samples undoped ZnO and 2wt % CdS-doped ZnO thick film have been fabricated on the glass substrate. The fabricated film is characterized by X-Ray Diffraction (XRD) and Atomic Force Microscopy (AFM). X-ray diffraction patterns showed that crystallite size decreasing with CdS doping and it is 45nm and 38nm for ZnO and CdS-doped ZnO thick film. The variation on the surface morphology was observed using AFM measurement. The AFM results indicate that grain size and roughness parameter decreases, but microstrain increases with CdS content. The UV-Vis absorption spectra of the ZnO and ZnO-CdS showed that the optical band-gap decreased from 3.18eV to 2.10eV with 2wt% CdS doping concentration. The present study demonstrates that fabricated films have polycrystalline structures and peaks matching the hexagonal ZnO structure.

Keyword Thick film; ZnO; CdS; XRD; AFM and U-V spectroscopy

1.INTRODUCTION

In recent years nanotechnology has established its applications in various fields of science and technology. Presently, nano materials with size < 100nm are widely studied by various researchers due their unique properties such as physical, chemical and optical, which drastically change due to a large surface to volume ratio, reduced particle size etc. [1-2]. ZnO, a wide band gap intrinsic n-type semiconductor, is one among the most widely studied materials for UV light-emitting diodes, solar cells, field emission displays, gas sensors and lasers [3-4]. There are several methods used to

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