



XRD and SEM Characterization of Chemically Deposited $Pb_xCd_{1-x}S$ Thin Films

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ABSTRACT

$Pb_xCd_{1-x}S$ thin films ($0.0 \leq x \leq 1.0$) have been deposited on glass substrate by Chemical Bath Deposition technique at 75°C temperature. The source material Cadmium Acetate, Lead Acetate and Thiourea were used to prepare thin films. Ammonia was used as complexing agent. For good quality of uniform films the various preparative parameters such as deposition temperature, time and pH of the reaction mixture were optimized. The deposited samples were characterized through structural, surface morphological and compositional studies. The Structural property of film is studied by using x-ray diffraction technique. The X-ray diffraction results show that the films are of $Pb_xCd_{1-x}S$ composite with individual PbS and CdS planes. XRD analysis shows that all thin films are polycrystalline with a hexagonal (CdS), Cubic (CdS) and orthorhombic (PbS) structure. Scanning electron micrograph of different films was also investigated. The crystallite size measured by XRD and FESEM studies was found to be varied with composition 'x'. EDXS shows compositional analysis of prepared films.

Keywords: $Pb_xCd_{1-x}S$ Thin Films, XRD, FESEM, EDXS.
