

DEPOSITION TIME EFFECTS ON THE MICROSTRUCTURE AND PROPERTIES OF CDS THIN FILMS PREPARED BY CHEMICAL BATH DEPOSITION

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Abstract

Cadmium sulfide (CdS) thin films have been developed by chemical bath deposition (CBD) method. The prepared films are reproducible, adherent to the substrate, pinhole free and uniform. Amongst the different process parameters, the deposition time plays a significant role in obtaining device quality of the CdS layer. It has been observed also that precursor compositions have huge impacts on the growth of the layer. The surface microstructure has been studied using field emission-scanning electron microscopy (FE-SEM) and components have been quantified using energy dispersive X-ray spectroscopy (EDX). It is found that the crystallinity of the deposited layer improves by annealing about 250 to 300 °C which is shown by X-ray diffraction (XRD) results. It is also calculated the direct band gap of the CdS film which is very close to the other reported values.

Keywords: Chemical bath deposition; cadmium sulfide; solar energy materials; microstructure; thin films.