37. Nanocrystalline CdS Thin Films Prepared By Chemical Bath Deposition

M. N. Musale, S. K. Devade

ABSTRACT

CdS thin films were prepared using CBD method. Cadmium Sulfide [CdS] thin films have been used for solar cells. CdS films are prepared by chemical bath deposition. The CBD method is based on the controlled precipitation of the materials in such way that the precipitation occurs uniformly in to the substrate. In addition film formation on the substrate takes place when the ionic product exceeds the solubility. For cadmium sulfide CdS thin films were prepare solution bath containing $CdSO_4$, Thiourea (CH_4 N_2S) and Ammonium Hydroxide (NH_4OH). The films of different thicknesses were deposited on the glass substrate. The deposition parameters speed of rotation of substrate, temperature of chemical bath, pH of solution and deposition time were optimized. The CdS thin films were investigated using X-ray diffraction (XRD), Fourier transformation, Infrared spectroscopy (FTIR). This film prepared at 80^c C for 60 minutes had cubic phase with homogeneous and small grains. From the FTIR analysis of the CdS thin films broad absorption band in the range 3000-3600 per cm. and the peak of CN stretching vibration at 1949 per cm were found.

Keywords: Cadmium sulfide thin films, chemical bath deposition, X-ray diffraction (XRD), Fourier Transform Infrared Spectroscopy (FTIR).