

Structural, analysis and optical studies of cadmium sulfide nanostructured

Abstract

Cadmium sulfide (CdS) thin films of nanostructure were prepared and deposited on glass substrates with Cd:S (1.2 to 0.05 mol/L) annealed at 400 °C and different spin coating speed (1000 and 5000 rpm) using sol-gel spin coating technique. Structural, morphological and analytical studies were investigated by x-ray diffraction XRD, scanning electron microscopy (SEM), atomic force microscopy (AFM) and UV-VIS Spectrophotometer. It is found that the average grain size of CdS thin films is 1.35 to 2.66 nm for the thin films prepared at 1000 and 5000 rpm respectively. The band gap was also calculated from the equation relating absorption coefficient to wavelength. The band gap indicates the film is transmitting within the visible range and the band gap changes because of the grain size of the CdS in the films. The effect of grain size on the semiconductor properties is under consideration. And the calculated results by specific models of refractive index are in agreement with experimental and theoretical data. The physical conditions were kept growing and identically.