**ABSTRACT**

CdS thin films with (1 1 1) orientation were prepared by chemical bath deposition technique at 80±5 °C using the reaction between NH4OH, CdCl2 and CS(NH2)2. The influence of annealing temperature varying from 150 °C to 250 °C was studied. X-ray diffraction studies revealed that the films are polycrystalline in nature with cubic structure. Various parameters, such as dislocation density, stress and strain, were also evaluated. SEM analysis indicated uniformly distributed nano-structured spherically shaped grains and net like morphology. Optical transmittance study showed the wide transmittance band and absence of absorption in the entire visible region. I-V characterization of p-Si/n-CdS diode and photoluminescence studies were also carried out for the CdS films.