CHEMICALLY GROWN CdSe:SbTHIN FILM STRUCTURES:GROWTH & CHARACTERIZATION

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A chemical bath deposition process is employed for deposition of the CdSe:Sb thin films with Sb^{3+} concentration from 0.005 mol% to 5 mol%. The deposition parameters were optimized for good quality samples and found to be 60^0C,90 min,72 rpm and 10 respectively. The colour of the samples went on changing from dark orange red to yellowish orange with the increased antimony concentration. The terminal thickness was found to be increased with the Sb^{3+} content from 0 to 0.1-mol% and decreased for further increase in Sb^{3+} concentration up to 5-mol%. The as deposited films were found to be polycrystalline with the hexagonal wurtzite structure. The optical absorption studies give a high coefficient of absorption (= 10^4 cm^{-1}) with an allowed direct type of transitions. The optical energy gap (E_g) decreased, typically form 1.79 eV to 1.61 eV as the Sb^{3+} concentration was increased from 0 to 0.1-mol% and then it increased at higher Sb^{3+}concentration. Electrical conductivity measurements in the temperature range 300K to 550 K revealed two types of conduction mechanisms, namely grain boundary scattering limited and a variable range hopping conduction. The carrier concentration (n), mobility (μ) and intergrain barrier potentials ($\Phi_{B,S}$) were computed.