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$Cd_{1-x}Mn_xS$ nanocrystaline thin film preparation and studies on structural and electrical properties

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$Cd_{1-x}Mn_xS$ thin films with x value ranging between 0 to 0.5 were deposited onto the glass substrates using a chemical deposition process. The composition of the as- grown samples was determined by an EDS technique. The polycrystalline growth resulted over the whole range studied and both CdS and $Cd_{1-x}Mn_xS$ films exhibited hexagonal wurtzite structure with growth orientation along (101) direction. Typically, the lattice parameter 'a' decreased from $4.131A^0$ to $4.110A^0$ for the change of x from 0 to 0.1 and thereafter it returned to its original value. Similar changes in c with x were also observed ($6.710\ A^0$ to $6.688\ A^0$). Average crystallite size increased with increase in x from 0 to 0.1 and then decreased for further increase in x. The electrical conductivity is found to be enhanced with x upto 0.01 and then decreased with further increase in x. The activation energies were calculated in both the conduction regions. The transport characteristics such as thermoelectric power, carrier concentration (n), mobility (μ), and barrier height (Φ_b) were studied as a function of the working temperature and materials composition and attempted to correlate with the observed changes in structural characteristics.

Biography

Jaiprakash S Dargad complited his Ph.D. work from Swami Ramanand Tirth Marathwada University, Nanded, MS, India at the age of 47 years. He is the the Principal of Dayanand Science College, Latur, MS, India, He has published more then 35 research papers in reputed journels.

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