

## **EFFECT OF LI DOPING ON THE STRUCTURAL AND SOME OPTICAL STUDIES OF CdS THIN FILMS FABRICATED BY SOL–GEL TECHNIQUE**

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### **ABSTRACT**

This research deals with the study of the structural and some optical properties of as-deposited CdS and CdS:Li thin films, grown on ultrasonically cleaned glass substrates at 300K by sol-gel spin-coating technique with the spin speed and spin time of 1000 rpm and 10 seconds, annealed to annealing temperatures 623K during 150min in digital furnace. XRD analysis reveals that the films crystallize in polycrystalline hexagonal structure. The average crystallite size of CdS:0, 0.05, 0.1, and 0.15 mol% Li thin films calculated from the most intense peaks are equal to 8.666nm, 9.341nm, 9.933nm, and 11.112nm, respectively. The optical transmittance values of CdS film reaches to 91.8% inter VIS(longer than 500 Å) and NIR regions, then decrease to 89.3% for 0.15 mol% Li, which is important for its applications as window layers in solar cells. The values of optical energy gap of CdS and Li doping by 0.05, 0.1, and 0.15 mol% were equal to 3.08 eV, and 2.97, 2.93, 2.89 eV respectively. Dielectric constant and loss had been investigated in this work.

**KEYWORDS:** CdS: Li Thin Films, Sol-Gel Spin Coating, Structural, Optical Energy Gap