

# Structural and Optical Characterizations of Spin Coated Cobalt-doped Cadmium Oxide Nanostructured Thin Films

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**Abstract:** Cd<sub>1-x</sub>Co<sub>x</sub>O thin films (with molar ratios x=0.0 – 8.0%) were grown onto glass substrates via the sol–gel spin coating technique. XRD results indicate that a CdO single phase with a cubic polycrystalline structure is formed. The crystallinity of CdO thin films is gradually deteriorated with increasing the Co ratio. AFM images of the films confirm the decrease of the grain size of the CdO films with increasing Co content. The direct optical band gap is red shifted from 2.580 eV to 2.378 eV with the increase of Co content. The refractive index, the dispersion parameters, and the optical conductivity of CdO thin films showed an enhancement with increasing cobalt dopant ratio. The correlation between the structural modifications and the resultant optical properties are reported.

**Keywords:** Sol-gel; Cadmium oxide; Thin films; Band gap; Refractive index; Optical conductivity.