

# Structural optical magnetic properties of Co doped -MoO<sub>3</sub>sprayedthin films.

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**Abstract:** this works deals with the synthesis of Cobalt doped MoO<sub>3</sub>thin films which were grown on glass sub-strates by the spray pyrolysis at 460°C. First, X-ray diffraction analysis shows an orthorhombic structure related to -MoO<sub>3</sub>allotropic variety with (020) and (040) preferred orientations. The surface topography performed by atomic force microscopy (AFM) shows that the grain size varies from 150 to 280 nm. Second, optical parameters, such as optical band gap, Urbach energy, refractive index and dielectric constants were studied in terms of Co content. This optical study shows a direct transition of all pre-prepared thin films and normal dispersion of the refractive index showing both Cauchy and Wemple & Di-dominico variations. On the other hand, PL measurements show transition bands mainly in blue and green domains related to band-to-band transitions as well as to oxygen vacancy in all films. Finally, magnetic measurements at room temperature using vibrating sample magnetometer (VSM) technique reveal a ferromagnetic behavior of such doped films.

**Keywords :** MoO<sub>3</sub>, Thin films, optical properties, Magnetic Properties, Spray pyrolysis