

## **Influence of Dopant of Tin (Sn) on the Optoelectronic and Structural Properties of Cadmium Sulfide (CdS) Pellets**

**Authors :** Himanshu Pavagadhi, Maunik Jani, S. M. Vyas, Jaymin Ray, Vimal Patel, Piyush Patel, Jignesh P. Raval

**Abstract :** The preparation of pure and Sn-doped cadmium sulfide (CdS) pellets was carried out using a compression technique with a pelletizer. The energy dispersive X-ray (EDX) analysis is used to confirm the purity and stoichiometric ratio of Cd, S, and Sn in the prepared pellets. The surface morphology of the pellets was examined using a scanning electron microscope. Both XRD and Raman scattering spectrum analysis confirmed the doping effect in the CdS pellets. The X-ray diffraction (XRD) analysis confirmed the hexagonal structure and revealed that the grain size decreases with increasing Sn dopant concentration in the parent CdS pellet. The optical properties of the pellets were evaluated by measuring diffuse reflectance using a UV-vis spectrophotometer. The analysis indicated that as the Sn concentration increases in the parent CdS pellet, the optical band gap decreases. This implies that the optical properties of the CdS material are also affected by the Sn dopant.

**Keywords :** CdS, Sn dopant, UV-Spectrophotometer, XRD

**Conference Title :** ICMMSSE 2025 : International Conference on Metallurgy, Materials Science and Engineering

**Conference Location :** New York, United States

**Conference Dates :** May 24-25, 2025