



Influence of Sulphur doping on Optical and Structural Parameters of Thermally Evaporated Non-crystalline CdS_xSe_{1-x} Thin Films

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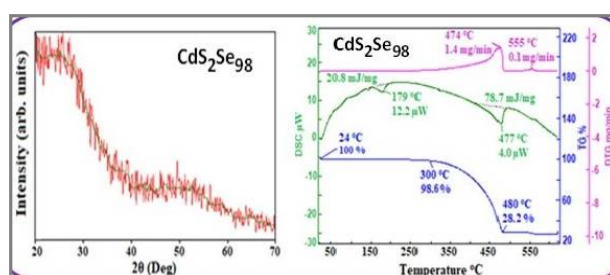
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ABSTRACT

Cadmium sulfoselenide CdS_xSe_{1-x} ($x=2, 4, 6$ and 8%) films were deposited by thermal evaporation technique under the vacuum of 3×10^{-6} Torr on the glass substrates. The structural, compositional, optical and thermal properties of the deposited CdS_xSe_{1-x} thin films were studied. X-ray diffraction studies confirmed that the deposited films are amorphous in nature. With the help of transmittance spectra, the refractive index (n), and excitation coefficient (k) are determined at room temperature in the wavelength range 800-1800 nm. Energy dispersive analysis by X-ray (EDAX) is used to investigate the compositional elements of thin films. The presence of Cd, S and Se of the CdS_xSe_{1-x} thin films and the composition of CdS_xSe_{1-x} thin films are estimated by EDAX analysis. The differential scanning calorimetry (DSC) was used to study the thermal properties of the deposited films.

Graphical Abstract



Highlights

- Cadmium sulfoselenide CdS_xSe_{1-x} ($x=2, 4, 6$ and 8%) films were deposited by thermal evaporation technique.
- X-ray diffraction studies confirmed that the deposited films are amorphous in nature.
- The presence of Cd, S and Se of the CdS_xSe_{1-x} thin films and the composition CdS_xSe_{1-x} thin films are estimated by EDAX analysis.
- DSC graph shows that on increasing the S concentration, the melting point of the glasses also increasing.

Keywords: Amorphous materials, Chalcogenides glass transitions, Optical Properties, Thin films.