



Khan, S.A., Al-Ghamdi, A.A.

Influence of laser-irradiation on the optical constants Se₇₅S₂₅ - xCd_x thin films

(2009) *Materials Letters*, 63 (20), pp. 1740-1742.

Department of Physics, Faculty of Science, King Abdul Aziz University, Jeddah, 21589, Saudi Arabia

Abstract

Amorphous thin films of glassy alloys of Se₇₅S₂₅ - xCd_x ($x = 2, 4$ and 6) were prepared by thermal evaporation onto chemically cleaned glass substrates. Optical absorption and reflection measurements were carried out on as-deposited and laser-irradiated thin films in the wavelength region of 500-1000 nm. Analysis of the optical absorption data shows that the rule of no-direct transitions predominates. The laser-irradiated Se₇₅S₂₅ - xCd_x films showed an increase in the optical band gap and absorption coefficient with increasing the time of laser-irradiation. The results are interpreted in terms of the change in concentration of localized states due to the shift in Fermi level. The value of refractive index increases decreases with increasing photon energy and also by increasing the time of laser-irradiation. With the large absorption coefficient and change in the optical band gap and refractive index by the influence of laser-irradiation, these materials may be suitable for optical disc application. © 2009.

Author Keywords

Absorption coefficient; Laser-irradiation; Optical materials and properties; Semiconductors; Thin films

ISSN: 0167577X