

Preparation and optical characterization of Cu₂ZnGeSe₄ thin filmsS. Levchenko^a, R Caballero^b, L. Dermencic^c, , E.V. Telesh^d, I.A. Victorov^d, J.M. Merino^b, E. Arushanov^c, M. Leon^b, I.V. Bodnard

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Abstract

Cu₂ZnGeSe₄ (CZGSe) films have been fabricated by ion beam sputtering onto glass substrates at a substrate temperature of 300 and 420 K. CZGSe films were characterized by X-ray diffraction (XRD), energy dispersive X-ray spectroscopy, scanning electron microscopy and by the method of normal incidence transmittance and reflectance. XRD studies reveal an improved crystallinity of the polycrystalline CZGSe films with tetragonal structure when the substrate temperature was increased. The refraction index and extinction coefficient were extracted from the optical measurements. Spectral dependence of the absorption coefficient and the energy band gaps values of CZGSe films were also determined.