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Spectroscopic ellipsometry study of $Cu_2ZnSnSe_4$ bulk crystals

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Abstract

Using spectroscopic ellipsometry we investigated and analyzed the pseudo-optical constants of Cu 2ZnSnSe4 bulk crystals, grown by the Bridgman method, over 0.8–4.5 eV photon energy range. The structures found in the spectra of the complex pseudodielectric functions were associated to E0, E1A, and E1B interband transitions and were analyzed in frame of the Adachi's model. The interband transition parameters such as strength, threshold energy, and broadening were evaluated by using the simulated annealing algorithm. In addition, the pseudo-complex refractive index, extinction coefficient, absorption coefficient, and normal-incidence reflectivity were derived over 0.8–4.5 eV photon energy range.

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Key Topics

Copper
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IPC Codes: