

文献

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Comparative study of tetragonal Cu₂In₇Se_{11.5} and trigonal CuIn₅Se₈ by spectroscopic ellipsometry
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抄録 (Abstract)

A comparative study of chalcopyrite-related Cu₂In₇Se_{11.5} and CuIn₅Se₈ crystals by spectroscopic ellipsometry is presented. Their complex dielectric function $\epsilon(\omega) = \epsilon_1(\omega) + i\epsilon_2(\omega)$ has been determined in the 0.8-4.7 eV photon energy range. The spectral dependence of $\epsilon_1(\omega)$ and $\epsilon_2(\omega)$ as well as the complex refractive index, the absorption coefficient and the normal-incidence reflectivity for tetragonal Cu₂In₇Se_{11.5} and trigonal CuIn₅Se₈ crystals have been modelled using the Adachi's model for interband transitions. The results are in a good agreement with the experimental data over the entire range of photon energies. The model parameters, including the energies corresponding to the lowest direct gap (E₀) and higher critical points (E_{1A}, E_{1B}), have been determined using the simulated annealing algorithm. The results show that the tetragonal CuIn₃Se₅, the tetragonal Cu₂In₇Se_{11.5} and the trigonal CuIn₅Se₈ crystals belong to different phases of the Cu₄In_{2n}Se_{2+3n} system, n = 6, n = 7 and n = 10, respectively. © 2010 Elsevier B.V. All rights reserved.

著者キーワード

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