

# Electronic transitions and energy band structure of $\text{CuGa}_x\text{Al}_{1-x}\text{Se}_2$ crystals

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## Abstract

Optical reflectance spectra have been investigated at photon energies higher than the band gap of  $\text{CuGa}_x\text{Al}_{1-x}\text{Se}_2$  solid solutions with  $x$  values varying from 0 to 1. The spectral dependence of the real  $\epsilon_1$  and imaginary  $\epsilon_2$  dielectric functions was calculated from experimental reflectivity spectra by means of Kramers–Kronig relations. The behavior of features observed in reflectivity spectra and in the spectral dependence of the dielectric functions was analyzed as a function of the solid solution composition. The experimentally observed peaks have been tabulated and related to the electronic band structure of materials computed in previous works.

*Keywords: solid solutions, optical reflectance spectra, photon energies, dielectric functions, band structure, Brillouin zone*

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