



# Lattice vibrations in $\text{CuIn}_{1-x}\text{Ga}_x\text{Se}_2$ crystals

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## Abstract

Infrared reflectivity spectra of  $\text{CuInSe}_2$ ,  $\text{CuGaSe}_2$  and  $\text{CuIn}_{1-x}\text{Ga}_x\text{Se}_2$  solid solutions have been investigated for the polarizations  $E|c$  and  $E \perp c$ . Reflectivity spectrum contours are calculated and phonon parameters and dielectric constant are determined. The dependence of the longitudinal-transverse splitting, the oscillator strength and the damping factor on  $x$  composition are shown. Raman scattering of  $\text{CuIn}_{1-x}\text{Ga}_x\text{Se}_2$  solid solution has been investigated. Effective ionic charges for ions of these materials are determined. Two-phonon absorption spectra in  $\text{CuGaSe}_2$  and  $\text{CuInSe}_2$  have been investigated and absorption bands have been identified in accordance with selection rules.