physica status solidi b basic solid state physics
1995, Volume 187, Number 1, pag. 83-92

# Infrared Vibrational Modes and Anisotropy of the Effective Ionic Charge in $CuAlSe_2$, $CuAlS_2$, and $CuGaSe_2$ Crystals

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https://doi.org/10.1002/pssb.2221870107

## Abstract

Reflectivity spectra of $CuAlS_2$, $CuAlSe_2$, and $CuGaSe_2$ crystals have been investigated in the wave number range 50 to 600 cm−1 for the polarizations E ∥ c and E ⊥ c. The fundamental phonon parameters, the limiting dielectric constants $\varepsilon_\infty$ and $\varepsilon_S$ and the reflectivity spectra contours have been calculated by using classical dispersion relations for both E ∥ c and E ∥ c configurations. The Szigeti effective charges and the relative ion charges of Cu, Al, Ga, Se, S anions and cations have been calculated in dependence on the incident light polarization.