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Vibrational properties of $CdGa_2S_4$

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Abstract

Polarization-dependent infrared reflectivity spectra of $CdGa_2S_4$ are measured at 300 K in the wavenumber range from 180 to 500 cm−1. The analysis of the spectra yields three E and four B modes in this frequency range. The results are compared with previously published data and a final identification of the infrared active modes in $CdGa_2S_4$ is proposed. It is shown that the two-phonon absorption spectra of $CdGa_2S_4$ can be interpreted in terms of zone-centre two-phonon combination modes. The relation between the lattice vibrational properties of chalcopyrite and defect-chalcopyrite compounds is discussed.