



Multiple-phonon resonant Raman scattering in $\text{CuGa}_x\text{In}_{1-x}\text{S}_2$ single crystals

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Abstract

In this work it is researched the Raman scattering spectra of $\text{CuGa}_x\text{In}_{1-x}\text{S}_2$ solid compounds for $x=1.0, 0.9$ and 0.8 at $10-60\text{K}$. LO-phonons, 2LO-phonons etc can be observed while going far from the excitation energy (6 phonons of the E symmetry and the phonons of the B_1 and B_2 symmetry) in the scattering process (Stokes scattering). The intensity of the resonant Raman scattering lines depends on the temperature and on the difference of the excitation energies and the energies of the polariton excitons. It was revealed that the interband Frohlich interaction is a dominant effect in the resonant scattering process $E(L)$ and is related to the multi-phonon modes.