HEAT TRANSFER BY "DIFFUSIVE" MODES AND PHONON SCATTERING IN β-PHASE OF SOLID SULFUR HEXAFLUORIDE

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S u m m a r y

The isochoric thermal conductivity of β-SF_6 is described within the framework of a model, where heat is transferred by low-frequency phonons and by "diffusive" modes migrating randomly from site to site above the phonon mobility edge. The contributions of the phonon-phonon and one- and two-phonon scatterings to the total thermal resistance of solid SF_6 are calculated in the supposition of the additive contribution of different scattering mechanisms. The mobility edge ω_0 is found from the condition that the phonon mean-free path restricted by the examined mechanisms of scattering cannot become smaller than half the wavelength. An increase of the isochoric thermal conductivity of solid SF_6 at premelting temperatures is attributed to the weakening of the one-phonon scattering by the collective rotational excitations of molecules.