317.
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摘要: The vibrational dynamics of vitreous glucose has been investigated by means of inelastic neutron scattering experiments, exploiting the coherent scattering cross section of deuterium in a fully deuterated sample and the high incoherent scattering cross section of hydrogen in a hydrogenated sample. The first part of the experiment allowed a rather detailed investigation of the collective dynamics in the THz range. The second part of the experiment was used to derive some information on the vibrational density of states of the system. The experiment confirms the presence of a propagating vibrational mode which is the natural extension at THz frequencies of the lower frequencies longitudinal sound mode. In addition, a second mode is also observed at a lower and almost constant frequency, showing an increasing intensity on reducing the wavelength. By comparing the dispersion relations of these collective modes to the experimental density of states, a possible relation between the low frequency mode and the well known excess of low frequency modes, that is, the boson peak, is identified.
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