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Coherent effects and relaxation processes in liquid potassium

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Abstract

The coherent dynamic structure factor of liquid potassium has been obtained from inelastic neutron scattering data at temperatures of 340, 440 and 550 K. The parts of dispersion curves for collective excitations have been plotted and some of their characteristics have been analysed. Represented in relative units, our experimental points are in an agreement with the ones for liquid rubidium and cesium. The molecular memory effects are described within a framework of theoretical representations of a spatial dispersion for the relaxation parameter of non-Markovian process. It has been found that molecular memory effects are important for relaxation processes which are represented in inelastic both coherent and incoherent neutron scattering.

Keywords

Dispersion curve, Liquid potassium, Non-markovian process