

Knight Shift, Magnetic Susceptibility and Electrical Resistivity of Pure Gallium and Gallium-Indium Eutectic Alloy in the Normal and the Supercooled Liquid State

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Abstract

Knight shift, magnetic susceptibility, electrical resistivity and density of pure gallium and gallium-indium eutectic alloy were measured over a wide temperature range above and below the melting point in order to study the properties of the supercooled state. From the results of the measurements of Knight shift and electronic magnetic susceptibility, a difference in the temperature dependence was detected between the supercooled liquid and the normal liquid of gallium and gallium-indium eutectic alloy. On the other hand, the measurements of electrical resistivity and density did not indicate any discontinuous change. The temperature dependences of effective mass ratio and average probability density at the nucleus for the s-electrons on the Fermi surface were calculated by using the observed results of Knight shift, magnetic susceptibility and density for liquid gallium. From these results a structural change may be expected between the supercooled and the normal liquid gallium.

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