

CALCULATION OF THE THERMODYNAMIC AND TRANSPORT PROPERTIES OF DENSE LEAD PLASMA

Shumikhin A.S.

JIHT RAS, Moscow, Russia

shum_ac@mail.ru

The paper presents the calculations of the equation of state, composition and electrical conductivity of the dense lead plasma at wide range of temperatures and densities. The virial chemical model was used for calculating the plasma properties, that previously proposed for the aluminum plasma [1] and other metals [2]. We take into account the nonideality effects in the form of virial corrections. The Debye approximation in the Grand canonical ensemble is used to take into account the interaction between free charges. We show that the interaction between charges plays a significant role in the calculation of the plasma properties. Caloric and thermal equations of state and composition of lead plasma were calculated. The calculation results obtained from the suggested model demonstrated satisfactory agreement with the experimental data on the equation of state and the electrical resistivity measured recently for a dense plasma of lead [3]. It is shown, that the jellium model [4] is necessary to use when calculating conductivity at densities higher than the critical one.

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