ON SOME HELIUM METALLIZATION PARAMETERS

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S u m m a r y

A density minimum of 5 g/cm^3, at which the insulator–metal phase transition in helium can take place, has been calculated. The corresponding temperature of this transition of about 9000 K has been estimated. For this purpose, the effective pair ion-to-ion interaction and the electrical resistivity in liquid helium in a vicinity of the transition point into the metallic state are studied in the framework of a nearly free electron model. As a small parameter of the theory, the ratio between, on the one hand, the energy of interaction between conduction electrons and a singly ionized helium atom and, on the other hand, the Fermi energy of electrons was used. The interaction between electrons is taken into account in the framework of the diffraction model of metal, i.e. considering the screening of the electron-to-ion interaction. The exchange interaction and correlations between conduction electrons are taken into account in the local field approximation.