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Mobility of the charged clusters in polarized liquid

The problem of a correct definition of the charged carrier effective mass in superfluid helium is revised. It is shown that the effective mass of such a quasiparticle can be introduced without Atkins's idea about the solidification of liquid He4 in the close vicinity of an ion (the so-called "snowball" model). Moreover, in addition to the generalization of Atkins's model, the charged carrier effective mass formation is considered within the framework of the two-fluid scenario. The physical reasons of the normal-fluid contribution divergency and the way of the corresponding regularization procedure are discussed. Agreement between the theory and the available experimental data is found in a wide range of temperatures.