

Mobility of the charged clusters in polarized liquid

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► **To cite this version:**

Ioulia Chikina, V. Shikin, A. A. Varlamov. Mobility of the charged clusters in polarized liquid. Days on diffraction 2017, Jun 2017, St Petersburg, Russia. cea-02341539

HAL Id: cea-02341539

<https://hal-cea.archives-ouvertes.fr/cea-02341539>

Submitted on 31 Oct 2019

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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.