UNIFIED TEMPERATURE SCALE FOR DESCRIPTION OF CRYSTALLIZATION KINETICS IN SUPERCOOLED LIQUIDS AND GLASSES

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At the present time, the study of nucleation processes is one of the actual tasks in condensed matter physics. Here, the one of the main tasks is detection of universal laws in the temperature dependencies of the crystal nucleation and growth characteristics. One of the main barrier in resolving of this issue is that the temperature range , (is the melting temperature), may change significantly with changing the type of systems. Therefore, the reduced temperature scales are necessary to investigate the temperature dependencies of the characteristics of systems of various types. The most common are temperature scales of the form: and , (is the glass transition temperature). However, such scales do not allow to cover a wide temperature range, which complicates the construction of universal temperature dependences.

In the present work, an original temperature scale is presented. This temperature scale allows to compare the kinetic characteristics of crystallization of the systems with different types on the basis of experimental data and simulation results [1, 2]. Universal scaling relations are obtained, which reproduce the temperature dependencies of crystal nucleation and growth characteristics in supercooled liquids and glassy materials.

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