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Initial stage of nucleation-mediated crystallization of a supercooled melt

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Abstract

The kinetic model of nucleation-mediated crystallization of a supercooled melt is presented in this work. It correctly takes into account the change in supercooling of the initial phase in the process of formation and evolution of a new phase. The model makes it possible to find the characteristic time of the process, time course of the crystal phase volume, solidified material microstructure. The distinctive feature of the model is the use of the “forbidden” zones in the volume where the formation of new nucleation centers is suppressed.

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