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A.I. Fedorchenko

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# ON THE GLASS TRANSITION OF THE ONE-COMPONENT METALLIC MELTS

A. I. Fedorchenko

*Institute of Thermomechanics, Academy of Sciences of the Czech Republic, v. v. i.,  
Dolejskova 5, 182 00, Prague 8, Czech Republic*

*S. S. Kutateladze Institute of Thermophysics, Siberian Branch of Russian Academy of Sciences,  
Novosibirsk 630090, Russia*

## ABSTRACT

In this paper, the conditions for one-component metallic melts vitrification by quenching from a liquid state were formulated. It is shown that the tendency to the glass formation drastically increases with the temperature of melting. The maximum glass layer thickness and the associated cooling rates along with the vitrification temperatures was determined for Al, Cu, and Ni melts deposited on the Cu substrate. The results are in agreement with the available experimental data. Based on analytical solution of the impinging droplet solidification, the numerical value of the early-introduced asymptotic  $\Omega$  criterion, which separates equilibrium and non-equilibrium phase transitions, was determined. Good agreement between the calculated and experimental values of the thickness of the splats shows that  $\Omega$  criterion indeed predicts a priori a scenario of solidification.

*Keywords:*

A1. Equilibrium and non-equilibrium solidification

A1. Criterion of the phase transition scenario

A2. One-component metal melts

B2. Glass transition

B2. Temperature of vitrification

Corresponding author. E-mail address: fedor@it.cas.cz

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