# The Influence of Various Thermal Loadings on the Thermal Conductivity and Emissivity of Isotropic Graphite at High Temperatures

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Numerous experimental studies, conducted according to the «HIMERT» program (novel high temperature metal-carbon eutectic fixed point for radiation thermometry, radiometry and thermocouples), examined the reproducibility of temperatures of phase transition for solid – liquid systems, using a crucible and eutectic metal – carbon (Me-C).

The comparative analysis of results of these studies for the binary eutectic Me-C has shown that a divergence in the melting temperature takes place to some degree [1]. In the given work, it is shown how to divide the problems and to investigate reproducibility of properties in the material of the crucible only.

Graphite is a material for which reproducibility of properties is poorly studied. In this work, the first results of our research on the reproducibility of properties of isotropic graphite at various thermal loadings are presented. The general direction of the research is the properties, which directly influence the reproducibility of the melting temperature for eutectic Me-C in metrology experiments: thermal conductivity and emissivity. The basic experimental method is the two-cylinder method. Parameters are chosen in view of real metrology experiments: pressure 0.1 MPa and a range of temperature 2300-3100 K. Reproducibility of the specified properties is investigated at various rates of heating and kinds of thermal loading.

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[1] A.V. Kostanovskiy and M.E. Kostanovskaya, *Pribori* **4(46)**, 31 (2004).