

Thermal expansion of refractory metals near its melting point and liquid phase

Senchenko V N[@], Belikov R S and Melnikov S A

Joint Institute for High Temperatures of the Russian Academy of Sciences,
Izhorskaya 13 Bldg 2, Moscow 125412, Russia

[@] pyrolab@ihed.ras.ru

Submillisecond electrical pulse heating is a prominent technique for investigation of thermophysical properties of refractory metals at high temperatures. Meanwhile, thermophysical properties, such as the thermal expansion coefficients and the density of refractory metals in the melting region and in high temperature region up to 5-7 kK, are still insufficiently studied. This is particularly true for rhodium, iridium and their alloys. Therefore, this paper presents the results of studies of these materials.

This work contains an experimental study of the temperature dependences of the thermophysical properties of rhodium, iridium and their alloys at high temperatures and in the melting region by the method of pulse electrical heating.

Using the experimental approach, an experimental investigation of the thermal expansion coefficient, electrical resistivity and emission spectra at premelting region of rhodium alloy and iridium have been carried out. The obtained temperature dependences of the thermophysical properties for the metals are of interest, in particular, for constructing wide-range equations of state, as well as for use in new high-temperature technology. This work is supported by the Russian Science Foundation, grant No.19-19-00713.