Physical Properties and Normal Spectral Emissivity of Iridium Up To 3500 K

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Only few techniques have been established to perform measurements on physical properties of metals and alloys up to liquid state temperatures. One of these techniques is the so-called ohmic pulse-heating technique, which has successfully been used by different institutions around the globe to obtain temperature dependent thermophysical data. At the Institute of Experimental Physics, Graz University of Technology, Austria, a constantly improved pulse-heating setup has been used for more than two decades now to determine thermophysical properties of metals and alloys in the solid and liquid states.

Furthermore, a division-of-amplitude photopolarimeter has been added to the setup with different perspectives: (i) To improve the accuracy of the optical (pyrometric) temperature measurement; (ii) To fulfil the growing need in industry for optical material information; and (iii) For scientific reasons, as, in the majority of cases, few emittance data can only be found for molten materials in literature.

The aforementioned techniques, often combined with additional DCS experiments, helped to systematically study a wide variety of pure, commercially available metals throughout the periodic system, to create a database of material information. Due to various reasons such as availability, purity, or price, some metals, such as iridium, have been excluded from investigations for a long time.

This work is dedicated to reporting our recent results on iridium for both thermophysical data in the solid and molten states, as well as the normal spectral emittance obtained at a wavelength of 684.5 nm up to 3500 K. The newly obtained values will be presented, extensively discussed, and compared with available literature data.

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