

Re-Investigation of the Normal Spectral Emissivity at 684.5 nm of Solid and Liquid Molybdenum

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When investigating thermophysical properties, i.e. temperature dependent properties, of liquid metals and alloys at high temperatures, measurements need to be performed contact- and containerless. Especially contactless temperature measurement poses manifold complications. Above a temperature of 1234.93 K, the melting point of silver, the international temperature of 1990 (ITS-90) is defined by spectral pyrometry. Knowledge of the normal spectral emissivity at the measuring wavelength of the pyrometer used is of utter importance. In this work we present normal spectral emissivity data of solid and liquid molybdenum at a wavelength of 684.5 nm. The presented results are novel measurements on molybdenum, a material, which was already measured 15 years ago by our group. The present results indicate a lower emissivity in the liquid phase. The novel measurements were done within the European Metrology Programme for Innovation and Research (EMPIR) project 17IND11 Hi-TRACE. The optimized measuring system is an ohmic pulse-heating apparatus combined with microsecond Division of Amplitude polarimetry.