

Effects of Phase and Wavelength on Spectral Emissivities of Cu, Ag and Au

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Normal spectral emissivities of Cu, Ag and Au at their melting points have been determined in the visible wavelength range. A cold crucible was used to melt the metals, and spectral radiation from the samples was measured using a spectroscope which was calibrated with fixed-point blackbodies. This measurement method allowed emissivities of both solid and liquid phases to be determined at the melting point. The emissivity of liquid Ag is greater than that of solid Ag over the wavelength range investigated. With respect to Cu and Au, the emissivities of the liquids are also greater than those of the solids in a large part of the visible region, however, the emissivities of both phases agree with each other in the wavelength range 450-506 nm for Cu and 516-517 nm for Au. The emissivity of solid Au, in particular, becomes greater than that of liquid Au when the wavelength is lower than 516 nm.