

The Optical Properties of Liquid Cerium at 632.8 nm

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The normal, spectral emissivity, $\epsilon_{\lambda}(T)$, and optical constants, n and k , of liquid cerium were measured at 632.8 nm over a temperature range of 1702 – 2171 K using rotating analyzer ellipsometry. The cerium was electromagnetically levitated to prevent contamination of the liquid metal by contact with a container. The emissivity at 0.9 μ and 1900 K was determined from the brightness temperature. The solubility of oxygen in liquid cerium at 1786 K was estimated and the effect of oxygen on the optical properties was demonstrated. Using available thermodynamic data and assumptions of ideal solution behavior, the volatilization of oxygen and nitrogen impurities is discussed.