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Thermophysical Properties of Solid and Liquid Platinum Alloys by a Pulse-Heating Technique SHAHID MEHMOOD, Institute of Experimental Physics TU Graz, Petersgasse 16, A-8010 Graz, Austria, ULRICH E. KLOTZ, fem Research Institute Precious Metals & Metals Chemistry, Katharinenstrasse 17, D-73525 Schwaebisch Gmuend, Germany, GERNOT POTTLAGHER, Institute of Experimental Physics TU Graz, Petersgasse 16, A-8010 Graz, Austria — Thermophysical properties of platinum and four platinum alloys namely, Pt-4Cu Pt96Cu4, Pt68Cu32, Pt50Cu50 and Pt25Cu75 are investigated in the solid and in the liquid phase by a fast pulse-heating technique. In this technique wire shaped samples are resistively volume heated as part of fast capacitor discharge circuit. With heating rates up to 10^8 K/s the liquid phase is achieved after about 30 μ s. Time resolved measurements with submicrosecond resolution allow the calculation of specific heat, enthalpy, electrical resistivity and temperature in the solid and liquid phase. Densities of these alloys as a function of temperature are determined by an expansion measurement using a fast and specifically designed CCD camera. Thermal conductivity and thermal diffusivity are calculated by means of the Wiedemann-Franz law using resistivity, specific heat and density data. The results are compared with available literature values, pure platinum and pure copper results.

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