Experimental Part

In order to determine the heat of the phase transformation of cerium under pressure we used the thermogram method (see /6/). The use of the thermal-analysis method at high pressures is described in /7, 8/. The essence of the method employed lies in comparing the areas of the differential records of the thermograms of the substance under examination with that of another standard substance for which the thermal effect of the phase transformation is known. Usually the standard is a substance in which a phase transformation takes place at a temperature fairly close (but not equal) to that of the phase transformation in the substance under consideration. Under these conditions (for a constant heating rate), the areas of the differential records of the thermograms are proportional to the heats of the transformations and to the amounts of the substances taken. In our method the work was carried out at constant temperature but increasing pressure ; hence our standard had to be a substance in which the phase transformation took place at a pressure not equal to but close to that of the cerium transformation. Mercury provided such a standard. The melting curve of mercury is quite well known /9, 10/. In Bridgman's paper /9/ this curve was used (together with data relating to the compressibility of solid and liquid mercury) ~~were used~~ to calculate its heat of fusion at pressures up to 12,000 kg/cm^2 (corresponding to a melting point of 22.2°).

We used cerium of 97% purity.* As will be shown later, the

* Containing 1.5% Nd, 1.3% Pr, 0.1% Pb, and 0.01% Sn.