small graphite cylinder, which at the same time had the function of the heating element. The pressure was determined with the aid of a calibration curve, plotted on the polymorphic transformation points of bismuth, thallium, caesium and barium. The temperature was measured with a platinum-platinrhodium thermocouple. It was found that the melting point of germanium is reduced throughout the pressure interval.

Experimental Part

The present work sets forth the results of measuring the melting points of aluminum and copper at temperatures up to 18,000 kg/cm^2. To obtain temperatures above 600°C in the intensifier canal in the isopentane medium is difficult, due to the fact that the isopentane cracks and the coke liberated during this process closes the turn of the heating coil.

Therefore, on carrying out the tests which combine super high pressure with high temperature, it is expedient to apply gas as a pressure transmitting medium.

Along with the intensifier mentioned above /8/, two types of apparatus, permitting the creation of super high gas pressure in conjunction with high temperature, were developed at the Institute of Crystallography.

In the first of these, carbon dioxide was the pressure transmitting medium. It was used for the study of the pressure and temperature dependence of the polymorphic transformation of black phosphor /9/. In the second apparatus, nitrogen or argon were used as pressure transmitting media. The conical high pressure vessel in this apparatus is fed by a device which permits the feeding of gas at pressures up to 2,000 kg/cm^2, and then cuts off the contents of the cone's canal from the gas supply system.

The pressure dependence of the melting point of aluminum and copper was determined in the apparatus of the second type. Pure aluminum (99.99 percent) and copper (99.995 percent) were used in the investigations.

A schematic diagram of the intensifier canal is shown in Figure 1.

The aluminum sample was fused in a graphite crucible (1) 10 millimeters in diameter and 14 millimeters high, placed within a heating element (2) of nichrome wire. To prevent the graphite from closing the turns of the nichrome coil, the crucible was separated from the latter by a thin layer of mica. The melting point of aluminum under pressure was measured with the aid of a differential platinum-platinrhodium thermocouple (3). To prevent the "hot" junction of the thermocouple from diffusing in the fused aluminum, the