Experiments with the melting of aluminum under pressure were conducted in a medium of nitrogen and argon (because of the possibility of the reaction of aluminum with nitrogen to form a nitride). The results of the measurements are shown in Figure 2. As is evident from Figure 2, the melting temperature of aluminum rises to the same extent when pressure is increased in the argon and nitrogen media.

When determining the dependence of the melting temperature of copper on pressure in order to obtain a higher temperature the Nichrome spiral was replaced by a tungsten spiral, and the quartz jacket protecting the "hot" junction of the thermocouple was replaced by a steel "pocket" with a wall thickness of 0.4 mm. The arrangement and procedure of the measurements was as before. In these experiments nitrogen was used as the medium transmitting the pressure. The results of the measurements are shown in Figure 3. The accuracy of the temperature measurements in the interval 1050-1250° we estimate to be $\pm 5^{\circ}$.

Within the limits of accuracy of the measurements the melting temperatures of aluminum and copper increase linearly with pressure. For aluminum the quantity dT/dP is 6.3×10^{-3} deg·cm^2/kg and for copper 4.6×10^{-3} deg·cm^2/kg.

Discussion of the Results

Simon and coworkers /10/ proposed the following equation expressing the dependence of the melting temperature of substances on pressure:

(1)

where P is the pressure, T and T_0 are the melting temperatures in °K at the pressure P and at atmospheric pressure respectively, and α and c are constants. For non-polar substances the quantity α turned out to be closely related to the so-called internal pressure defined on the basis of the energy of vaporization of the substance (λ)

(2)

where V is the fluid volume. For these substances the quantity c was found to lie