

IX. TEMPERATURE CALIBRATION

Each run was heated using the electrical resistance of the graphite heater. The power input was recorded from a wattmeter connected across the anvils.

Fourteen thermocouple runs were made with Pt,Pt-10 per cent Rh thermocouples (butt welded from 10 mil wire) to relate the wattmeter reading to the temperature inside the sample.

In the initial runs it was attempted to insert the thermocouple directly in the rare earth-antimony reaction mixture but the mix dissolved the thermocouple and readings could not be taken this way. It was decided to use a solid BN plug in place of the sample to hold the thermocouple.

Two geometries were used. In the first eight runs the thermocouple wires were taken out the edges of the tetrahedrons and protected by a piece of 0.022 inch O.D. by 0.013 inch I.D. hypodermic tubing 0.75 inch long as shown in figure 27. This arrangement was suggested by Carlson to protect the thermocouple from being broken as the gasket is extruded (37). The thermocouple wires were butt welded and then pulled through the larger hole until the junction bead butted against the BN plug. This made certain that the thermocouple junction was in the center of the sample.