CHAPTER III
RESULTS AND CONCLUSIONS

A total of ten runs were made on samples 1-4. The first three runs were made using carbon thermometers to measure the temperature gradient. The calibration difficulties mentioned in Chapter II prevented the acquisition of reliable data in the low temperature range. Germanium thermometers were used on run 4, but it was discovered that the crystal fractured where it clamped onto the baseplate as the apparatus cooled to liquid helium temperatures. Since there was extremely poor thermal contact with the baseplate, even a small amount of heater power would raise the crystal temperature to approximately 50 K. In addition, it proved difficult to obtain a steady state measurement under these conditions. The data reduced from measurements taken showed large scatter and were generally about 20 percent lower than that of subsequent runs. Consequently, they were not considered reliable and are therefore not reported. The development of a vacuum leak and a short circuit in the heater during run 5 made it necessary to discard the data for this run.

After sealing the low temperature leak and constructing new heaters, five more runs were made on samples 1-4. During these runs steady state measurements were taken as described in the preceding chapter. After most of the liquid helium in the Dewar had boiled away, the heaters were turned off and the outer cylinder was completely evacuated. The apparatus would then cool approximately to liquid helium temperature.