

cise corrections for friction [Cohen *et al.*, 1966a; Klement *et al.*, 1966]. By careful manipulation of the applied (i.e. ram) pressure, attempts were made to ensure that the piston was moving in on an increasing pressure cycle and out on a decreasing pressure cycle regardless of temperature cycling across the transition. By assuming friction to be symmetrical, 'true' values of pressure were obtained by averaging the applied pressures on compression and decompression cycles for given transition temperatures. The double-value of friction was, in all cases, $\lesssim 1.5$ kb. For a number of runs, failure occurred before data could be obtained on decompression, and friction corrections were made according to other runs in this investigation.

In the run with chromel-alumel thermocouples, several compression and decompression cycles were made (in an almost ideal run), and reproducibility was clearly demonstrated, even though the thermocouples were briefly taken up to 1200°C. Friction corrections were accurately determined and varied up to ~ 1.5 kb double-value at the highest pressures. The data (Figure 1) are believed precise to $\pm 6^\circ\text{C}$ and accurate to ± 0.5 kb. Because of mechanical failure on decompression, it was difficult to obtain data below ~ 5 kb.

Several runs were made with Platinel II thermocouples [Zysk, 1963] (Figure 1), but these thermocouples invariably failed on decompression.

Data from the runs with Pt versus Pt +

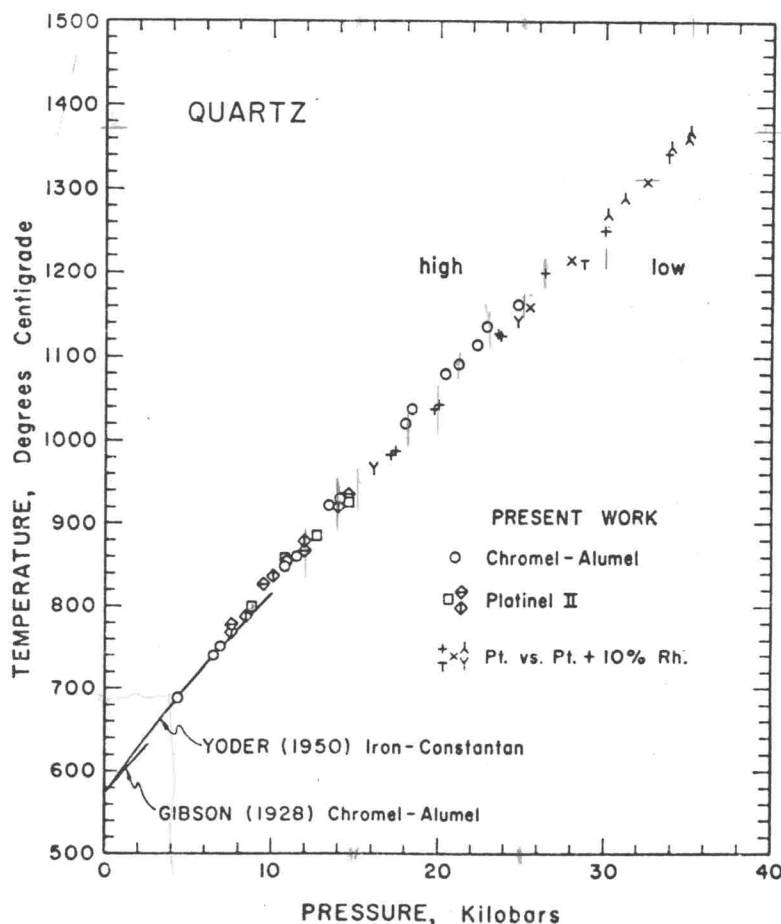


Fig. 1. Experimental data for the high-low quartz inversion. Interpolation equations given by Gibson [1928] and Yoder [1950] are used to plot their results. For the present work, each symbol represents a separate determination.

10% Rh thermocouple. Accurate values of friction were obtained in several runs. A major problem in these runs was the presence of water and carbon from the sample, or from the atmosphere of the furnace. The quartz-water system [Kennedy, 1966] does not show an inconsistent variety of behavior. Examination of small-scale runs often indicates the presence of water, but no st... temperature was detected. The present measurements of high quartz was [Schreyer and Se... detected. Examination of runs often indicate... couples; attempts made by placing denum sheet bet... sleeve, but there either.

The data (Figure 1) using Pt versus Pt + 10% Rh may be assigned $\pm 10^\circ$ and an accuracy of ± 0.5 kb. Since the thermocouple was placed near the thermocouple disks of quartz, the question as to whether the thermocouple was placed near the thermocouple disks of quartz is a question as to whether the thermocouple was placed near the thermocouple disks of quartz. All experiments were conducted in a vacuum environment, since the presence of water was placed below $\sim 330^\circ\text{C}$ [Klement *et al.*, 1965] and Grigg [1965] and Grigg [1965] that the strength of quartz decreased at elevated temperatures. The presence of anhydrous quartz