

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 +

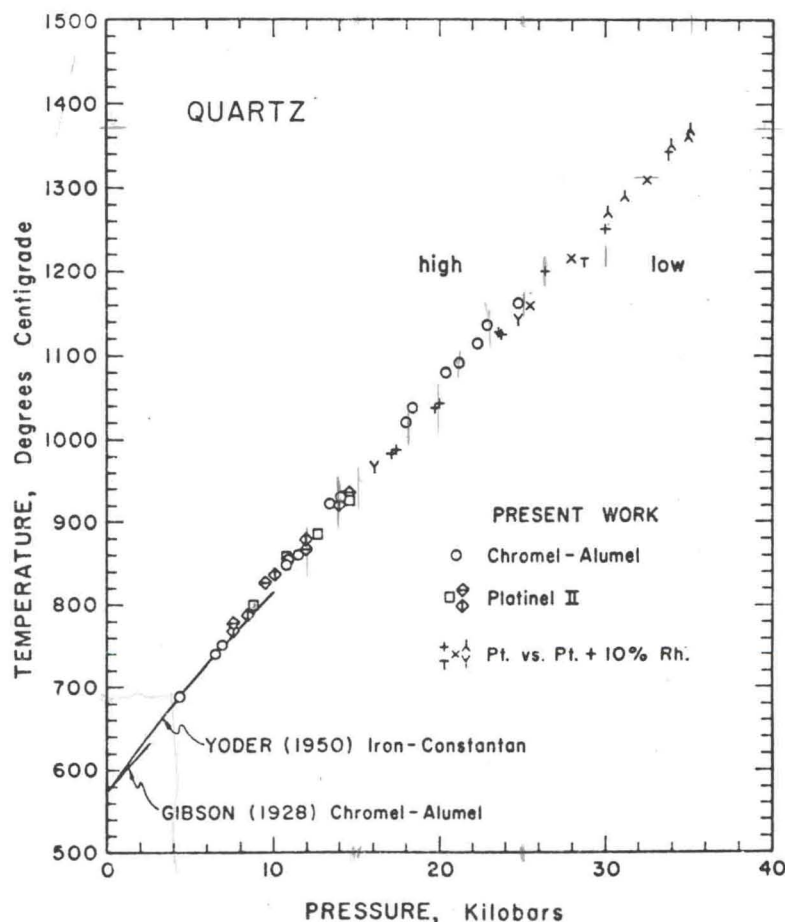


Fig. 1. Experimental data for the high-low quartz inversion. Interpolation equations given by Gibson [1928] and Yoder [1950] are used to plot their results. For the present work, each symbol represents a separate determination.

10% Rh thermocouple. Accurate data were obtained in several runs. The value of friction was a problem in these runs, and the influence of the thermocouples encountered at the transition and not yet of the sample, or such as water from the sample and carbon from the furnace. The quartz-water pressures [Kennedy, 1966] do not suggest inconsistent values of Keith and Tuttle's solution of small cause a large change in temperature was detected in the present measurements. High quartz was detected. Examination of runs often indicates that the thermocouples; attempts were made by placing a denum sheet between the sleeve, but there was either.

The data (Figure 1) using Pt versus Pt may be assigned $\pm 10^\circ$ and an accuracy of ± 0.5 kb. Since the thermocouple was placed near the quartz disks of quartz, the question as to whether the thermocouple applied pressure of thin disks readily couple. All experiments were in a dry environment, since the sample was placed in a furnace below $\sim 330^\circ\text{C}$ [Klement, 1965] and Grigg [1965] that the strength of quartz is reduced at elevated temperatures. The presence of water. The effect of anhydrous quartz.