

We have described in detail the high pressure cell and its calibration since it is imperative to establish accurately the pressure-temperature distribution within the cell before any valid interpretation of pressure emf's can be made.

Measurements
Hydrostatic Experiments

Measurements of four thermocouple materials were taken; chromel, alumel, copper, and constantan. The cold seal was maintained at 78°K and the high-temperature seal was maintained at a number of fixed temperatures between 190°K and 560°K. With the temperature interval between the seals fixed, the pressure was varied between 0 and 8 kilobars and the induced emf was measured at each pressure. In all cases, the induced emf was linear with pressure so only the slope of the emf vs. p plot is presented. To insure that spurious readings generated in the frozen gas seal were not included in the data presented, the emf generated over the smallest temperature interval (i.e., 78°K to 190°K) was subtracted from all the measurements at larger temperature intervals. This eliminated any spurious readings arising from the frozen gas seal since they would be independent of the temperature of the high-temperature seal. The reproducibility of the data showed that if spurious emf's are generated, they were consistent from run to run. The data is therefore presented in Figure 7 in terms of the emf per kilobar generated by temperature intervals of 190°K to T where T ranges to 560°K. Scatter in the data introduced an error of $\pm 0.25 \mu\text{V}/\text{kb}$ which is the total error of the measurement.