

tensile test since the piston which produces the load on the sample also pressurizes the system. This is a minor inconvenience in our experiments since the small strains to which the samples were subjected (~ 0.010 inch piston motion) produced very small pressure changes. Another feature which should be pointed out is the change of load cell output voltage (zero load level) with pressure. This variation is represented in Figure 13 where it may be seen that the rate of voltage change with pressure decreases with increasing pressure. The output voltage-pressure relationship was of approximately the same form from experiment to experiment. However, a hysteresis effect has been noted. This is characterized by a smaller zero level output voltage for a given pressure after the load cell had been subjected to the highest pressures (30 k atm.). The output-voltage for a given pressure gradually increases with subsequent experiments at moderate pressures. A similar type of behavior was also noted during the calibration experiments where on repeated loading in a given pressure range the variation with pressure of the zero level decreased markedly after the initial loading. The effect of pressure on the zero output level is accounted for by subtracting its variation with piston position from the output voltage-piston position curve representing the tensile test.

Discussion

Although the apparatus provides the required com-

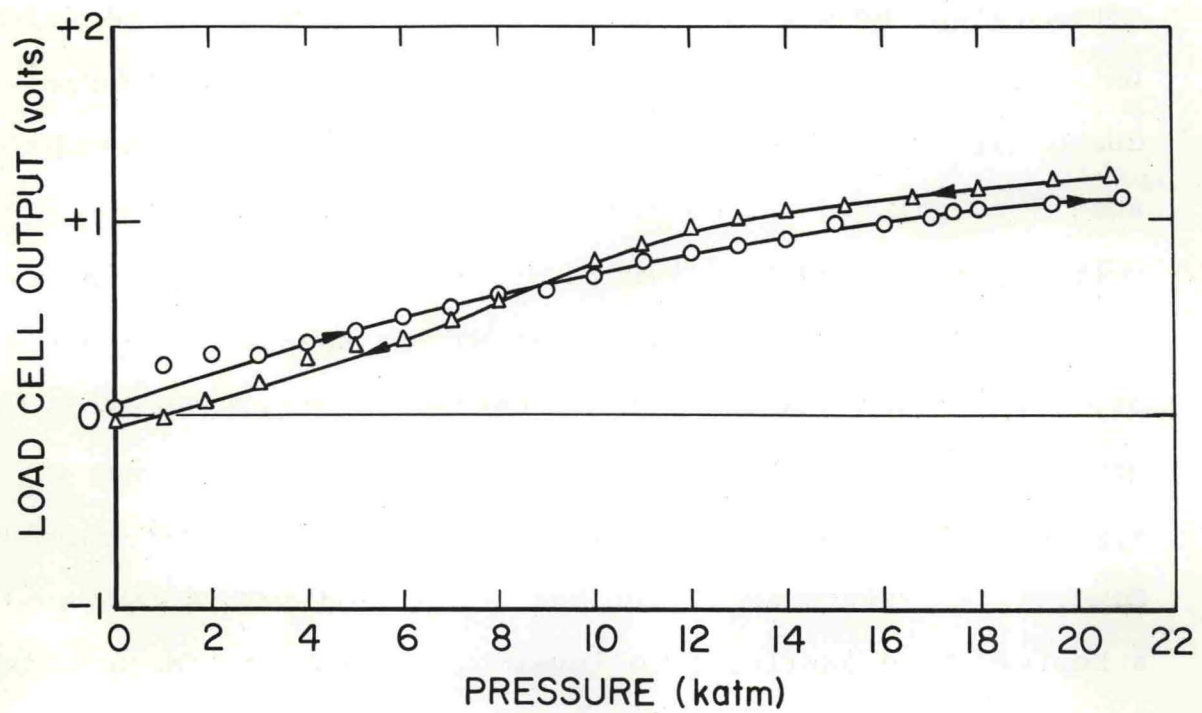


Fig. 13 Load cell output vs. pressure for unloaded cell (zero level).