

single-crystal (c_{66}). Values of c_{11} along a [100] direction are given in

hysteresis was observed for c_{44} . On cooling from 234.2°K, the hysteresis disappeared on warming to the hysteresis temperature in ammonium

elastic constants along the path lengths in the choice of c_{44} (especially for c_{44}), a wrong $n=0$ value for the internal longitudinal

bulk modulus of ammonium bromide at various temperatures obtained with the results of Balakrishnan and Balakrishnan are given in units

c_{12}	$1/\beta^8$
0.782	1.66
0.91	1.73
0.59	1.38
...	1.63

as a function of $\rho U V^2$ for (4) using the data were within 0.1% temperature possibility of a zero value for C' . reported values 7%. A propagation of the random error out $\pm 0.2\%$ at

constants of single-crystal at various temperatures have been reported by Balakrishnan¹⁹ and the bulk modulus of ammonium bromide at various temperatures are given in Table III gives a comparison of the bulk modulus of ammonium bromide with the results

of Balakrishnan, Proc. Ind.

of the present experiments. Also included is the adiabatic bulk modulus of a polycrystalline sample calculated from Bridgman's isothermal value.²¹ The large difference between the present results and those of Sundara Rao and Balakrishnan should not be taken too seriously since the latter were reported to be accurate only to within 10%. The agreement with Haussuhl's elastic constants is not very good, although the slopes of his elastic constants versus temperature agree quite well with those of the present measurements.

Constant-Temperature Data

The experimental values of c_{11} , c_{44} , and C' as functions of pressure at various constant temperatures are shown

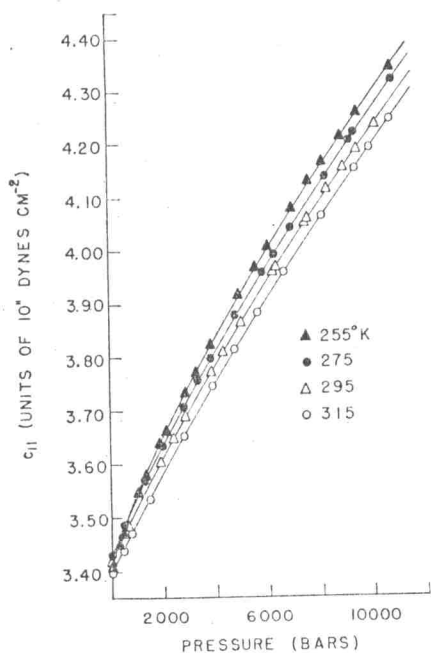


FIG. 6. Dependence of c_{11} on pressure at various temperatures.

in Figs. 6-8. Data on the shear constants were obtained with 20-Mc/sec transducers, but these showed a bad tendency to break after several high-pressure runs. Measurements of c_{11} were made at 30 Mc/sec by using a 10-Mc/sec transducer, and this did not break on repeated runs at various temperatures. A tabulation of the smooth-curve values of these elastic constants as a function of pressure is given in Table IV. The limits of error in these elastic constant values at high pressures is somewhat greater than that at 1 atm due to greater uncertainty in the phase-shift correction term. (There is an appreciable increase in γ with an increase in the pressure.)

²¹ P. W. Bridgman, Phys. Rev. **38**, 182 (1931).

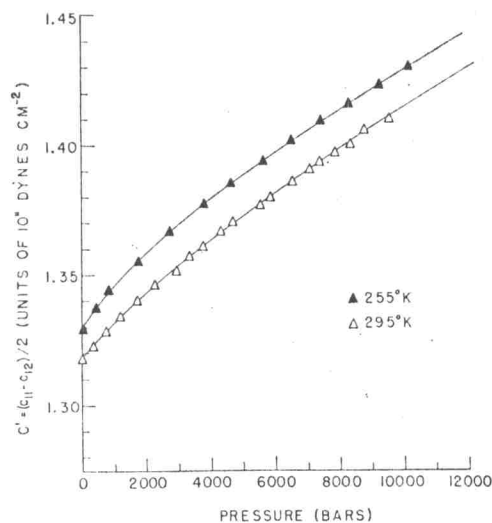


FIG. 7. Dependence of C' on pressure at two temperatures.

Bridgman²¹ has measured $\Delta V/V_0$ as a function of pressure for ammonium bromide at 0° and 75°C. A comparison of his values with the values calculated from our present data shows that his values are about 6% high. Bridgman's difference between $\Delta V/V_0$ for a given pressure interval at the two temperatures is about 3 to 4 times greater than that observed in these experiments. The explanation for this difference seems to be that Bridgman's data were taken on a pressed polycrystalline sample, which one would expect to be more

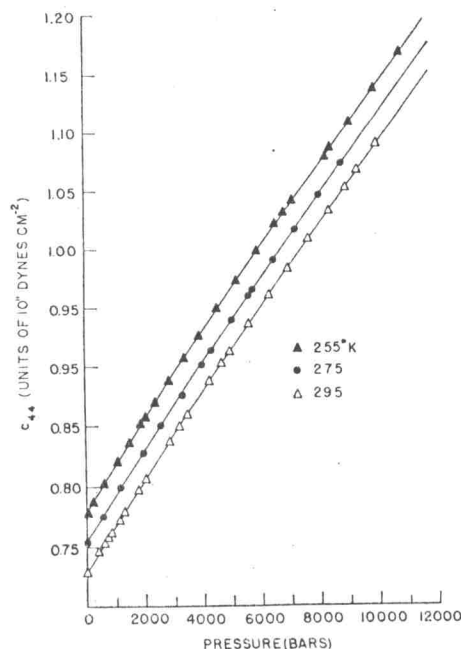


FIG. 8. Dependence of c_{44} on pressure at various temperatures.