Table 4. Comparison of the shear constants C_{44}, $C' = 1/2(C_{11}-C_{12})$, and the elastic anisotropy. Elastic constants in units of 10^{10} dyn-cm^{-2}

Temp. (°K)	C_{44}	C'	A	Source
0	5·32	0·715	7·44	Theory
78	5·78	0·688	8·40	Present
80	5·93	0·725	8·18	Quimby and Siegel
90	6·18	0·830	7·45	Bender
300	4·19	0·585	7·16	Daniels

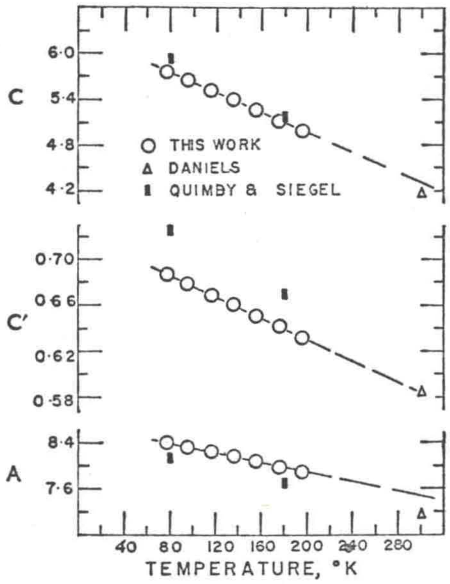

FIG. 1. The elastic constants $C = C_{44}$ and $C' = 1/2(C_{11}-C_{12})$ and the elastic anisotropy $A = C/C'$ plotted as a function of temperature. Elastic constants in units of 10^{10} dynes-cm^{-2}.

The values of the shear constants obtained in the present study are in substantial agreement with the values of these quantities obtained by Quimby and Siegel. This experiment, like that of Quimby and Siegel yields more accurately the temperature variation of the elastic constants rather than the absolute value of the elastic constants themselves. The agreement here is excellent as can be seen in Fig. 1. This experiment also yields values of C_n, C_{11}, and B_s and their temperature dependence, which were either unknown or unreliable before the present study was completed. Figure 2 shows the elastic constants C_n, C_{11}, and the adiabatic bulk modulus as a function of temperature. The C_{11} data is taken from measurements on an acoustic specimen oriented along [100].

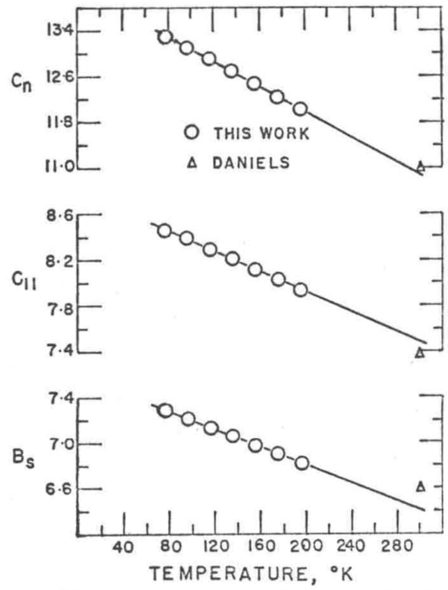

FIG. 2. The elastic constants C_n, C_{11} and B_s plotted as a function of temperature. Units are 10^{10} dynes-cm^{-2}.

The observed temperature coefficients at constant pressure of the elastic constants were obtained from Figs. 1 and 2; these are related to the pressure variation of the elastic constants by the thermodynamic relation,

$$\left(\frac{d\ln C}{dT}\right)_P = \left(\frac{d\ln C}{dT}\right)_V + \alpha\left(\frac{d\ln C}{d\ln r}\right)_T \qquad (3)$$

where α is the coefficient of linear expansion at 300°K and the quantity $(d\ln C/d\ln r)_T$ can be obtained from the pressure measurements of