

ABSTRACT

The pressure derivatives of the elastic constants of a single tantalum crystal have been measured at room temperature by the ultrasonic pulse-echo technique. The values are:

$$dC_{11}/dP = 4.54 \quad dC/dP = 1.03 \quad dC'/dP = 1.01 \quad dB_S/dP = 3.19.$$

The notation $C = C_{44}$, $C' = (C_{11} - C_{12})/2$, $B_S = (C_{11} + 2C_{12})/3$ has been used. The result expressed as the equation of state, $-\Delta V/V_0 = 0.526 \times 10^{-3}P - 0.581 \times 10^{-6}P^2$ (pressure in kbar), agrees with the Bridgman 1949, 30 kbar, compression result when this is corrected by using the ultrasonic coefficients of iron.