$$+2\Delta\Delta'\left[\left(\frac{\partial B^S}{\partial P}\right)_T - 1 - \frac{1}{\beta^2}\left(\frac{\partial \beta}{\partial T}\right)_P\right]$$

$$+\Delta^2\left[\left(\frac{\partial^2 B^S}{\partial P^2}\right)_T + \frac{2}{\beta^3 B^{T^2}}\left(\frac{\partial B^T}{\partial T}\right)_P\left(\frac{\partial \beta}{\partial T}\right)_P - \frac{1}{\beta^2 B^{T^2}}\left(\frac{\partial^2 B^T}{\partial T^2}\right)_P + \frac{2}{\beta^2 B^{T^3}}\left(\frac{\partial B^T}{\partial T}\right)_P^2\right]$$

where $\Delta = \dfrac{TV\beta^2 B^T}{C_P}$

$$\Delta' = \frac{\partial \Delta}{\partial P} = \Delta\left[\frac{1}{B^T}\left(\frac{\partial B^T}{\partial P}\right)_T - \frac{1}{B^T} + \frac{2}{\beta B^{T^2}}\left(\frac{\partial B^T}{\partial T}\right)_P\right]$$

$$+\Delta^2\left[\frac{1}{B^T} + \frac{1}{B^T\beta^2}\left(\frac{\partial \beta}{\partial T}\right)_P\right]$$

The second pressure derivative of the isothermal bulk modulus is then calculated. Since we calculate these derivatives at zero pressure, the knowledge of the pressure dependence of the thermal properties is not necessary. We have used the data of Siegel and Quimby[9] to calculate the volumetric thermal expansion coefficient β and its temperature derivative $\frac{\partial \beta}{\partial T}$, and correct the temperature variation of density. The value of specific heat C_p is from Martin's[10] work. We also neglect the small contributions from $\frac{\partial}{\partial T}\left(\frac{\partial B^T}{\partial P}\right)$ and $\left(\frac{\partial^2 B^T}{\partial^2 T}\right)_P$ at 195°K and zero pressure. The results are listed in Table I, where we extrapolate the value of B_o to 0°K using Martinson's data.[11]