where the initial bulk modulus is

$$B_0 = \left\{-V\left(\frac{\partial P}{\partial V}\right)_T\right\}_{P=0},$$

and the corresponding pressure derivative

$$B_0' = \left\{\left(\frac{\partial B}{\partial P}\right)_T\right\}_{P=0}.$$

The elastic constants of Bell and Rupprecht [5] were used to calculate $B_0 = 1{\cdot}76 \times 10^3$ kbar and the best fit to our data was obtained with $B_0' = 4{\cdot}4$.

One can determine the Grüneisen parameter for $SrTiO_3$ from the Grüneisen relation[7]

$$\gamma = \frac{\alpha V_m}{\beta C_v},$$

where α is the volume thermal expansion, V_m is the molar volume, β is the compressibility, and C_v is the specific heat at constant volume. At room temperature and atmospheric pressure, the values of the various parameters are $\alpha = 2{\cdot}6 \times 10^{-5}\,{}^\circ K$[8], $\beta = 5{\cdot}67 \times 10^{-13}$ cm²/dyne[5], $C_v = 20{\cdot}7$ cal/mole-°K[9] and $V_m = 35{\cdot}7$ cm³/mole; using these values, one calculates $\gamma = 1{\cdot}89$. The B_0' obtained from the least squares fitted Murnaghan equation can be used to calculate the Grüneisen parameter by an independent method; Anderson[10] has shown that

$$\gamma = \frac{B_0' - 1}{2}.$$

As mentioned previously, the data was best fit with $B_0' = 4{\cdot}4$, and thus $\gamma = 1{\cdot}7$, in reasonable agreement with the value calculated above.

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