where

$$s = (C_{11} - C_{44})/(C_{12} + C_{44}), \quad t = (C_{12} - C_{44})/C_{44}.$$

N is the total number of atoms, V is the volume, ρ is the density, and the remaining symbols have their usual meanings. $f(s, t)$ is presented in tabular form. From reference 2 one can obtain

$$\frac{d \ln \Theta_0}{d \ln V} = \frac{1}{2}\frac{d \ln C_{44}}{d \ln V} + \frac{1}{6} + \frac{1}{3}\frac{d \ln f(s, t)}{d \ln V},$$

which can be evaluated using the tables and the known values of C_{ij} and $d \ln C_{ij}/d \ln V$ for Ge[6] and Si.[7] Term by term the results are, for Ge and Si,

Ge: $d \ln \Theta_0/d \ln V = -\gamma_0 = -0.751 + 0.167 + 0.092 = -0.492;$

Si: $-\gamma_0 = -0.490 + 0.167 + 0.073 = -0.250.$

Note that the third term, involving the interpolation in the table and arising from the change of elastic anisotropy and Poisson ratios with volume, is a relatively small correction for these materials. The values of γ_0 so obtained are indicated by ×'s on the $T/\Theta_\infty = 0$ ordinate of Fig. 1. A possible interpolation of the data is indicated by a dotted line, whence the γ of Ge does exhibit the same behavior as that of Si and InSb. It seems probable that Gibbons' extrapolation given by the dashed line is incorrect in the case of Ge and that the similarity of behavior of Ga, Si, and InSb is preserved.

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[1]D. F. Gibbons, Phys. Rev. 112, 136 (1958).

[2]See, for example, C. Kittel, Introduction to Solid-State Physics (John Wiley & Sons, New York, 1956), 2nd ed., pp. 153-155.

[3]J. C. Phillips, Phys. Rev. 113, 147 (1958).

[4]F. W. Sheard, Phil. Mag. 3, 1381 (1958).

[5]J. de Launay, in Solid-State Physics, edited by F. Seitz and D. Turnbull (Academic Press, Inc., New York, 1956), Vol. 2, p. 219.

[6]H. J. McSkimin, J. Acoust. Soc. Am. 30, 314 (1958).

[7]J. C. Chapman, Masters thesis, Case Institute of Technology, Cleveland, Ohio (unpublished).