$(\partial S/\partial V)_T$  can be obtained from the experimental results by numerical differentiation. By using Mills & Grilly's p-V-T data and equation (7) we can then obtain the pressure at constant molar volume as a function of temperature, i.e. the isochores

$$p(T) = p_m - \int_{T}^{T_m} (\partial S/\partial V)_T dT,$$

$$p_m = p(T_m), \quad V = \text{const.}$$
(8)

The isochores are given in tables 6 and 7 for rounded values of the molar volume. The columns of these tables give immediately the isotherms, i.e. p = p(V) at constant temperature.

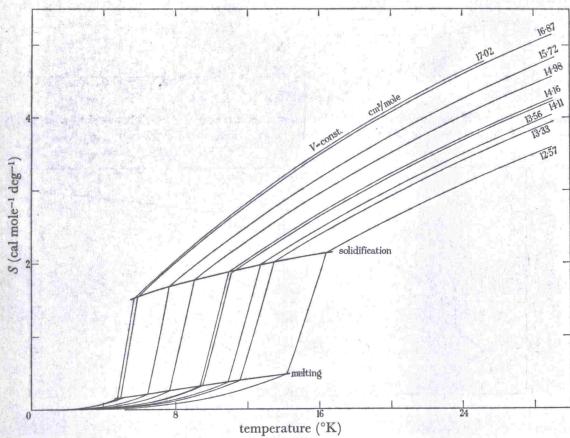


FIGURE 10. The lattice entropy of <sup>3</sup>He. The numbered lines are lines of constant volume.

## 3.6.2. Compressibility

We have calculated the compressibility of solid <sup>4</sup>He and <sup>3</sup>He at 0 °K from the 0 °K isotherm

$$\beta = -\frac{1}{V} \left( \frac{\partial V}{\partial p} \right)_{T=0}. \tag{9}$$

 $\beta$  is given at rounded values of molar volume in table 8.

## 3.6.3. Thermal expansion coefficient

The volume thermal expansion coefficient,  $\alpha$ , can be obtained from the thermodynamical relation  $\alpha = \beta(\partial p/\partial T)_{V}. \tag{10}$ 

 $\alpha$  for solid <sup>4</sup>He and <sup>3</sup>He is given as a function of temperature and molar volume in table 9.

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