

melting curve data by means of the Clausius–Clapeyron equation) and by Keesom & Keesom (1936) and Dugdale & Simon (1953) (from calorimetric data). It appears that the present data are from 1 to 2% lower than Grilly & Mills's data, but show the same temperature-dependence. This deviation is probably within the combined limit of error. The agreement with the earlier data of Keesom & Keesom, and of Dugdale & Simon is not so close.

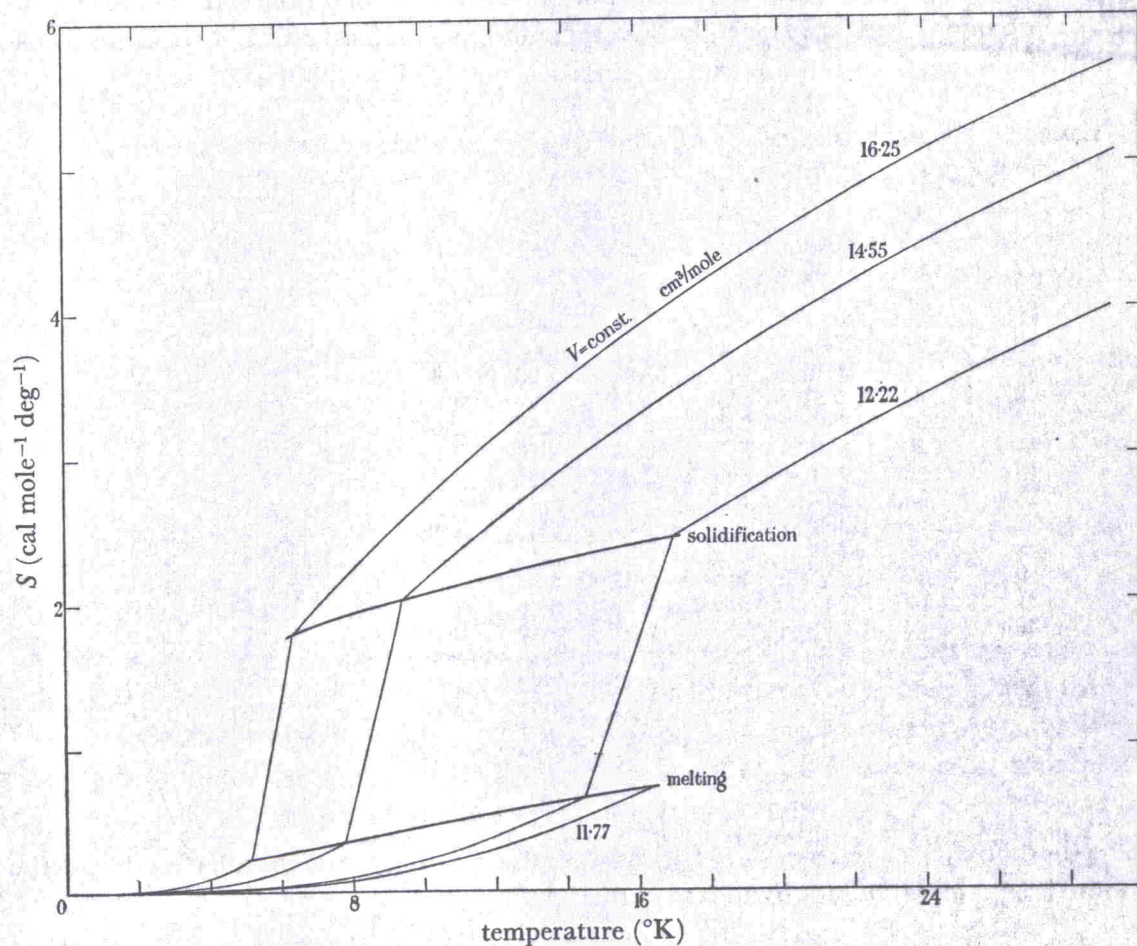


FIGURE 9. The entropy of  ${}^4\text{He}$ . The numbered lines are lines of constant volume.

### 3.6. Calculation of related thermodynamic properties

The results given in the previous sections were derived by using the present experimental information only. A complete thermodynamic description, however, cannot be obtained from specific heat data alone. In addition to this one  $p$ - $V$ - $T$  relation over the experimental range covered has to be known. For this relation we took the melting curve,  $p$  against  $T$  and  $V$  against  $T$  as given by Mills & Grilly (1955), and Grilly & Mills (1959).

#### 3.6.1. Isochores and isotherms of solid ${}^4\text{He}$ and ${}^3\text{He}$

According to one of the Maxwell thermodynamic relations

$$(\partial S/\partial V)_T = (\partial p/\partial T)_V. \quad (7)$$