

The quantity of helium in the calorimeter was determined after each experiment by releasing the helium contained in it and the associated 'dead' volume into an evacuated vessel of known capacity. This 'dead' volume consisted of the gauge, *J*, the capillaries leading to the calorimeter and the high-pressure valve, *H*. Effectively all the gas in it was at room temperature. Under the conditions of the experiments, the gas in the 'dead' volume constituted about 7% of the total. Its quantity was determined directly by connecting the gauge to the valve by a capillary equal in volume to those on the apparatus and measuring the helium contained in this system as a function of pressure.

RESULTS

(a) *Melting*(i) *Entropy*

The general information obtained from the experiments is summarized in figures 3 and 4. Figure 3 shows the entropy of solid helium along the melting curve and the entropy of fluid helium along the solidification curve. Four lines of constant volume are drawn, and for completeness the diagram is extended into the liquid-solid equilibrium region. Below 4°K the entropy of the solid is taken from the measurements of Keesom & Keesom (1936) and the entropy of melting from the measurements of Swenson (1950, 1951). Extrapolation of the values of the melting entropy found in these experiments agreed with those due to Swenson rather than those reported earlier by Keesom & Keesom (1936). The values of the melting entropy are estimated to be accurate to 3%.

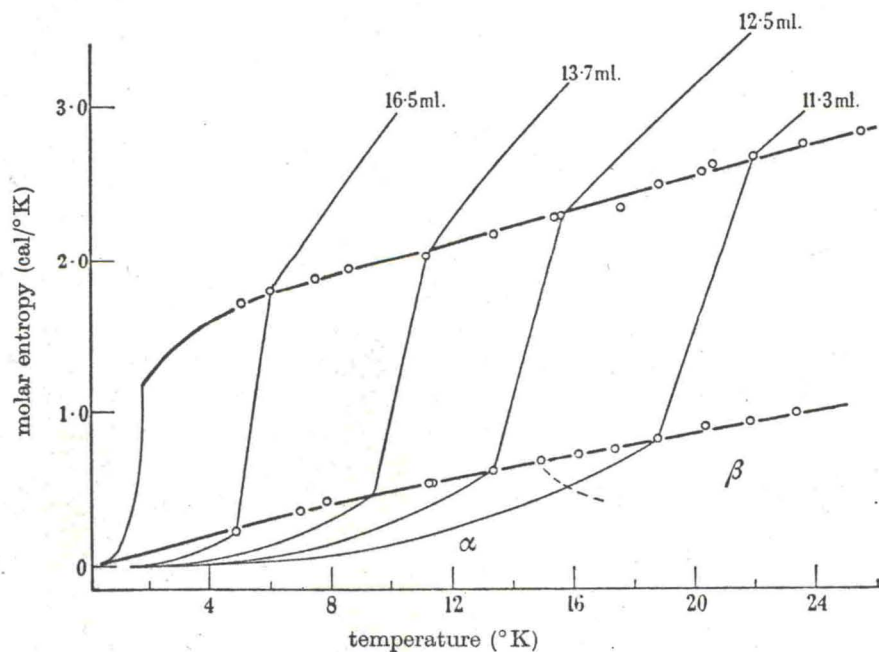


FIGURE 3. The entropy of helium on melting and solidification. — (fine lines), lines of constant volume; ----, transition line in the solid.