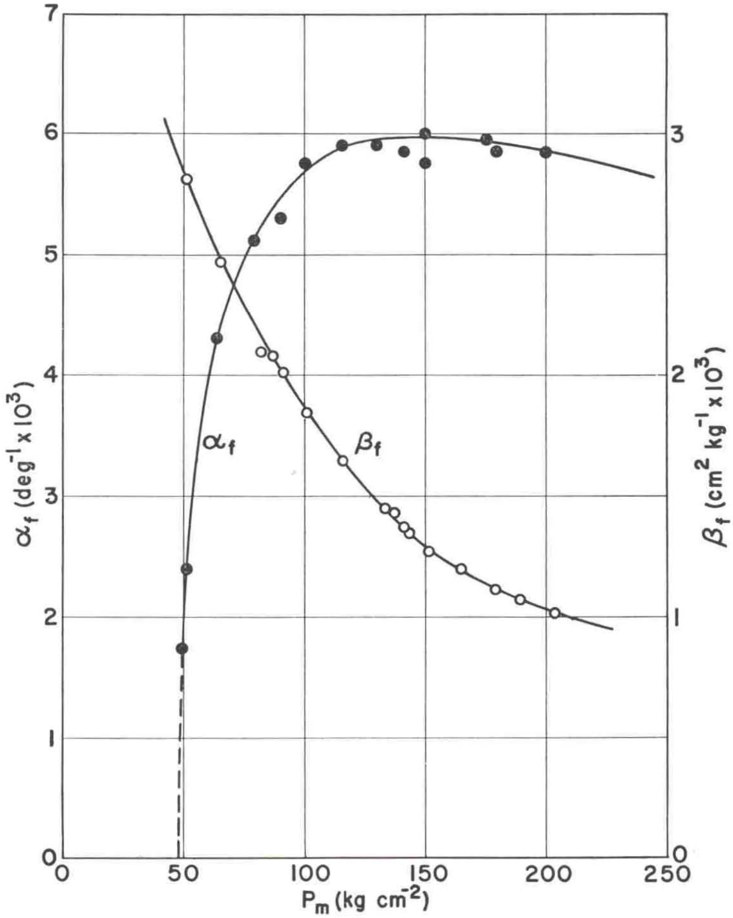

FIG. 4. The thermal expansion coefficient, α_f, and the compressibility coefficient, β_f, of fluid He^3 along the melting curve.

sented by an equation of the type

$$V_f = d' + b'(P_m + a')^{c'}. \quad (4)$$

A similar equation, with $d' = 0$, had been used for N_2 measurements (*15*). The constants of Eq. (4), obtained by a least-squares fit of the experimental data for He^4 and He^3, are given in Table VII together with the range of applicability and rms deviation in V_f. Equation (4) applied to He^3 and He^4 I probably does not fully reflect the accuracy of the measurements but is useful in making interpolations.

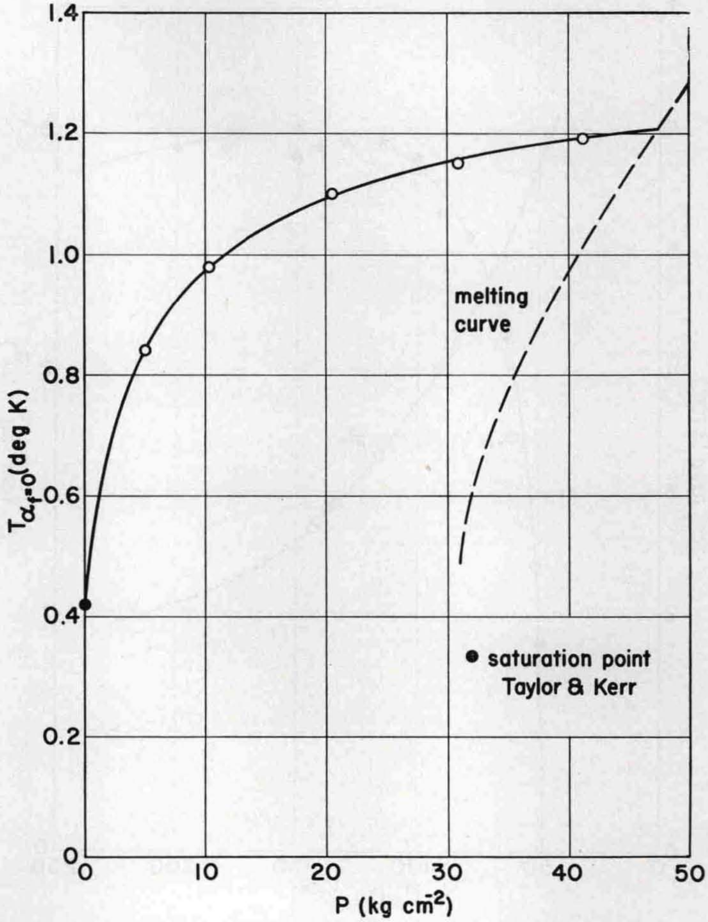

FIG. 5. Pressure-temperature diagram of $\alpha_f = 0$ for fluid He^3.

IV. DISCUSSION

A. Discussion of He^4 Results

Values of ΔV_m derived from molar volumes of solid and fluid measured by Dugdale and Simon (*3*), agree within 2 percent with the present determinations at pressures below 300 kg/cm^2 and above 2000 kg/cm^2. At intermediate pressures, however, their values are consistently lower than those reported here. A maximum deviation of -7 percent occurs at 1000 kg/cm^2.

Below 250 kg/cm^2 a plot of the present ΔV_m data in Fig. 2 shows a sharp break in the curve at about 32 kg/cm^2, corresponding to a melting temperature of