

heat, C_v , below and above the transition forms a continuous curve within the experimental scatter of about 1% the excess energy consumption of the transition could be calculated from

$$\Delta E = (C_v^* - C_v) \Delta T$$

where ΔT is the temperature interval for which C_v^* had been measured and C_v is the interpolated specific heat at the centre of the heating interval. Within the experimental accuracy different heating intervals led to the same values of ΔE . This proves that the observed C_v^* data correspond to a real transition. The latent heat, L , of a transition is defined as the enthalpy change for the transition at constant pressure. As ΔE has been observed at constant volume a correction has to be applied to obtain L . This correction to ΔE turns out to be small for both ^3He and ^4He so that ΔE can be taken as virtually L . In table 3 we include values of the transition entropy $\Delta S = L/T$ and of the volume change ΔV calculated from the Clausius-Clapeyron equation.

The pressure at the transition temperature could be obtained from the pressure at the beginning of melting (as calculated from the data of Mills & Grilly) by the relation

$$p_{\text{tr.}} - p_m = \int_{T_m}^{T_{\text{tr.}}} (\delta p / \delta T)_v dT = \int_{T_m}^{T_{\text{tr.}}} (\delta S / \delta V)_T dT. \quad (3)$$

For ^3He we obtain the phase separation line as

$$p_{\text{tr.}} = 1609 + 1133(T - 17.80) \text{ Kg/cm}^2, \quad (4)$$

where the triple point is at $T = 17.80$ °K. It has been assumed here that the phase line is linear.

3.4. The fluid range

Measurements in the fluid range were extended up to 29 °K. The results for some selected molar volumes are included in figures 5 and 6. Smooth curves have been drawn through the experimental points and values of C_v read from these curves are given at rounded temperatures in tables 4 and 5. The scatter in the fluid range is much more pronounced

TABLE 4. SPECIFIC HEAT OF FLUID ^4He AT ROUNDED VALUES OF TEMPERATURE

T (°K)	$V = 16.25$	14.55	12.22	11.77
	C_v	C_v	C_v	C_v
7	1.84	—	—	—
8	1.99	—	—	—
9	2.13	—	—	—
10	2.25	2.12	—	—
11	2.36	2.22	—	—
12	2.47	2.32	—	—
13	2.56	2.42	—	—
14	2.65	2.51	—	—
15	2.72	2.59	—	—
16	2.79	2.67	—	—
17	2.85	2.75	—	—
18	2.90	2.81	2.64	—
19	2.93	2.87	2.72	—
21	2.99	2.98	2.85	2.79
23	3.02	3.05	2.95	2.90
25	3.04	3.10	3.04	3.00
27	3.04	3.12	3.11	3.09
29	3.04	3.13	3.16	3.16

Units: V (cm^3/mole); C_v ($\text{cal mole}^{-1} \text{deg}^{-1}$).