single measurement of T_1 on the same constant-volume curve as that of Fig. 3 was about 40 minutes at 0.1°K. This is shorter by about 50 orders of magnitude than it would have been if it had continued to follow the exponential curve T_1 $=3\times10^{-4}\exp(14/T)$ of Fig. 3. One complete set of T_1 measurements has been obtained between 0.7 and 0.14°K at a relatively low density (starting temperature and pressure 0.8°K and 500 psi). In this case T_1 was about 20% higher at 0.14°K and 0.7°K than at intermediate temperatures but seemed roughly constant at 0.55 ± 0.05 second between these limits.

In summary, the following information about solid He^3 is obtained from the results: (1) In the cases where there is a volume change associated with the α-β transition there are also large changes in the relaxation times. Since the relaxation in the α phase in these cases is primarily due to diffusion, there must also be changes in the diffusion coefficient across the phase boundary. (2) In the cases where the volume change approaches zero, there are no changes in the relaxation time across the boundary and, consequently, if there are changes in the diffusion coefficients, there must be compensating changes in other relaxation mechanisms. Even in these cases there remains a discontinuity in the rate of change with pressure of the relaxation times at the phase boundary. (3) For temperatures above 1.37°K the α phase behaves as an ordinary solid with a large diffusion coefficient.

That is, the relaxation is determined by an activated diffusion of the atoms through the lattice. However, at temperatures somewhat below 1°K the relaxation is much too fast to be explained by the classical diffusive motion of the Bloembergen, Purcell, and Pound theory.

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SPECIFIC HEAT OF INDIUM BELOW 1°K*

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(Received March 16, 1960)

Heat capacity measurements on two indium specimens indicate that the T^3 term in the specific heat is smaller in the superconducting than in the normal state, contrary to the usual assumption that it is the same in both states. The expected temperature dependence in the normal state is

$$C_n = C_q + \gamma T + \alpha_n T^3 + \beta_n T^5, \quad (1)$$

and in the superconducting state,

$$C_s = C_q + a\gamma T_c \exp(-bT_c/T) + \alpha_s T^3 + \beta_s T^5,$$

$$T < 0.7T_c. \quad (2)$$

In each case, the first term, C_q, is the contribution from the nuclei due to an electric quadrupole interaction similar to that found in rhenium.[1] From the microwave resonance measurements of Hewitt and Knight[2] it follows that $C_q = 9.0\times10^{-4}$ millijoule/mole deg, which is 11% of C_s at 0.35°K, the lowest temperature reached in the measurement, and decreases to less than 1% of C_s at 0.6°K. The second term in C_s is the electronic specific heat, C_{es}, of a superconductor at temperatures below $0.7T_c$, and is less than 1% of C_s below half a degree. In this term, a and b are quasi-universal constants, and T_c is the transition temperature of indium (3.4°K). A