

DISCUSSION

The measured enthalpy change at the critical temperature is 170 cal/mole. The total energy, W_o , required to disorder the alloy is related to the critical temperature by

$$R T_c = C W_o$$

where C is a constant whose numerical value depends on the assumptions made in each particular theory of ordering. However, W_o cannot be compared directly with H_t because of the partial disordering which occurs below T_c and the presence of short range order above T_c . An experimental range of H_t is indicated by Sykes and Jones¹⁷ who measured the energy of transformation of Cu_3Au as a function of temperature. From their calorimetric data they found that $124 < H_t < 182$ cal/mole, which encompasses the value found in these experiments. An attempt to measure dT_c/dP was made some years ago by Wilson¹⁸ who found a value of 1.2°K/kbar; this leads to an unreasonably large H_t .

The results in Fig. 8 show that Eq. 3 gives an adequate representation of the pressure dependence of the ordering rate below T_c . Since V_t is about 0.02 cm³/mole, the term $1/2 PV_t$ can be neglected in comparison with PV^* in Eq. 3. Within the accuracy attained in these experiments, no pressure variation in V^* could be detected; more accurate determination of the sample pressure would be required for this purpose.