

storage (see Figure 9). This was the case for many of the early samples. Figures 4 through 8, on the other hand, show that the penetration in the latter runs was sufficient to render the extraneous diffusion negligible.

The high degree of consistency of the plotted and tabulated results indicate that the major sources of error were satisfactorily overcome.

2. Activation Energies and Activation Volumes

Figure 10 shows that our system has a temperature dependence of the type suggested by equation 6 for all pressures covered in this study. The values for the activation energies (Q) given in Table 1 tend to increase with increasing pressure from 15.8 kcal/mole at atmospheric pressure to 21.0 kcal/mole at 38 kb. This is in accord with the interpretation of Q being an energy of activation, it being expected that energy required to form an activated state would increase with pressure.

Figure 11 shows that, for our system, the term ΔV_a defined by equation 10 is independent of pressure for pressures below 23 kilobars; but it tends to decrease at higher pressures. There is not enough data at these higher pressures to be certain that this effect is real. However, Hudson and Hoffman⁶ reported a similar effect in the case of self-diffusion in lead. For their pressure calibration, Hudson and Hoffman apparently used Bridgman's resistance scale which assigns much higher pressures to the calibration transitions than does Decker's³⁸ sodium chloride scale, which was used in this study. However, the reported effect persists, though to a lesser degree, when corrections are made for the difference in calibration.