silver-lead system. It is thought that this dependence might help in the interpretation of the mechanisms involved.

Empirically, Q is usually obtained from a plot of log D vs 1/T, and D_o by extrapolation of this plot. Another way of obtaining Q, used by many authors for comparison, is to calculate Q from the Dushman-Langmuir equation;[7]

$$D = \frac{d^2 Q}{N h} \exp\left(\frac{-Q}{RT}\right) \tag{7}$$

consequently,

$$D_o = \frac{d^2 Q}{N h} \tag{8}$$

where N is Avogadro's number, h is Plank's constant, and d is the interatomic spacing. The two approaches agree quite well in most cases.[27] However, Van Liempt[28] points out that this agreement is no proof of equation 7 due to the insensitivity of values of Q obtained to changes as large as a factor of 10 in D_o. This objection may not be too serious in light of the statement made by Nowick[29] in defense of a similar equation by Zener " that values of D_o obtained from conventional plots of ln D vs 1/T often appear to be in error by factors as great as 10^8. "

Braun and Van Liempt, using Lindemann's theory of melting, derived an equation relating the activation energy to the melting temperature (T_m) of the solvent;

$$Q = 3 b^2 R T_m \tag{9}$$

where b is a number characteristic of the solvent material, approximately equal to 2 for all materials. This equation shows fairly good agreement