
Prob. 19.17 - Arrhenius form of t-T shifting equation

General Arrhenius expression for relaxation time:

$$\tau = \tau_0 \exp \frac{E^*}{RT}$$

Base-10 logarithmic form:

$$\log \tau = \log \tau_0 + \frac{E^*}{2.303RT}$$

Logarithmic form at reference temperature:

$$\log \tau_{ref} = \log \tau_0 + \frac{E^*}{2.303RT_{ref}}$$

Subtracting these two expressions:

$$\log \tau - \log \tau_{ref} \equiv \log a_T = \frac{E^*}{2.303R} \left(\frac{1}{T} - \frac{1}{T_{ref}} \right)$$

Prob. 19.18 - Time-temperature equivalence



