

- The rate constant of a polymer cross-linking reaction was established as a function of temperature. How can we demonstrate that the kinetics of this reaction follow Arrhenius behaviour? If it does follow Arrhenius behaviour, how can we derive the activation energy for the reaction and the pre-exponential factor A ?

The Arrhenius equation relates the rate constant to the temperature, $k = Ae^{-E_a/RT}$

Taking natural logarithms of this gives $\ln k = \ln A - \frac{1}{T} \left(\frac{E_a}{R} \right)$

A plot of $\ln k$ (on y -axis) versus $\frac{1}{T}$ (on x -axis) will be a straight line if Arrhenius

behaviour is followed. If so, it has a gradient of $-\frac{E_a}{R}$ and a y -intercept of $\ln A$.