

— SAMPLE of style —

Analysis

From Data in Tables I through III, a graph for each temperature was obtained of $\ln(Q-Q_z)$ versus Times (see Figures 1 through 3). From each of these graphs a value for k' , the rate constant, was determined as follows with the equation representing the form of $y=mx + b$.

$$\ln[Q-Q_z] = -k't + \ln[Q_0-Q_z] \quad (1)$$

$$\text{slope} = -k' = -0.000425 \text{ 1/s}$$

$$k' = 0.000425 \text{ 1/s}$$

A value for k' was obtained for each graph and was then used along with the hydrogen ion concentration of 0.500 M to calculate k , the overall rate constant, for each graph.

$$k = k'/[H^+] \quad (2)$$

$$k = 0.000425 \text{ 1/s} / 0.500$$

$$k = 0.000850 \text{ s}^{-1}$$

Data in Table IV was used to construct a graph of $\ln k$ versus $1/T$ (Figure 4). From this graph the values for the energy of activation and the frequency factor for the sucrose reaction were determined with the energy of activation, E_a , being equivalent to the slope of the line divided by the gas constant, R (in units of energy) and the frequency factor, A , being equivalent to the natural base e raised to the y-intercept.

$$\ln k = \ln A + (-E_a/R)(1/T) \quad (3)$$

$$y = (-E_a/R)x + \ln A$$

$$\text{slope} = -E_a/R = -13,100 \text{ K}$$

$$\text{y-intercept} = \ln A = 35.539$$

$$E_a = \text{slope} \times -R \quad (4)$$

$$E_a = -13,100 \text{ K} \times -8.31447 \text{ J/K mol} / (1 \text{ kJ} / 1000 \text{ J})$$

$$E_a = 109 \text{ kJ/mol}$$