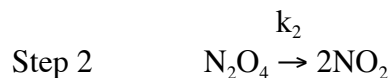
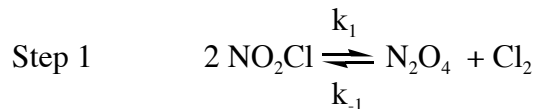


LECTURE 32

1. (a) Write the rate law that corresponds to the following reaction mechanism using the steady-state approximation. **Do not** make any assumptions about rates of step 1 and step 2.

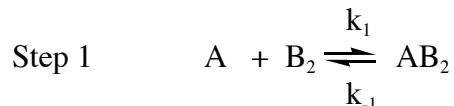


- (b) Write the rate law if the first step is in fast equilibrium and the second step is slow.

$$\text{(a) rate} = \frac{2k_2k_1[\text{NO}_2\text{Cl}]^2}{(k_{-1}[\text{Cl}_2] + k_2)}$$

$$\text{(b) rate} = \frac{2k_2k_1[\text{NO}_2\text{Cl}]^2}{(k_{-1}[\text{Cl}_2])} \text{ or rate} = \frac{2k_2K_1[\text{NO}_2\text{Cl}]^2}{[\text{Cl}_2]}$$

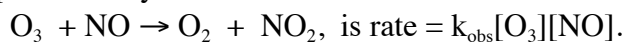
2. For the reaction: $2\text{A} + \text{B}_2 \rightarrow 2\text{AB}$, a proposed mechanism is:



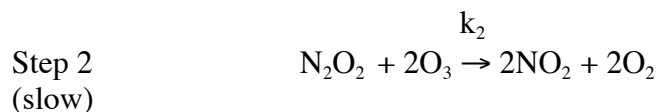
If the consumption of AB_2 by reaction with A is slower than the decomposition of AB_2 , write the rate law for this mechanism using the steady-state approximation.

$$2k_2K_1[\text{A}]^2[\text{B}_2] \text{ or } 2k_2k_1[\text{A}]^2[\text{B}_2]/k_{-1}$$

3. It has been experimentally determined that the rate law for the reaction,



Write the rate law that corresponds to the following reaction mechanism, and state whether this reaction mechanism is consistent with the experimental rate law.



$$\text{rate} = k_2K_1[\text{O}_3]^2[\text{NO}]^2 \text{ or } k_{\text{obs}}[\text{O}_3]^2[\text{NO}]^2$$

No the above mechanism is not consistent with the experimental rate law.

LECTURE 32

Additional Book Problems:

Atkins and Jones, Chemical Principles, fifth edition:

Chapter 14.7 and 14.8, problem 14.48, 14.49

Chapter 14.7 and 14.8, problem 14.51, 14.52

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