

Name _____

Period _____

Chemical Kinetics Homework #4
Rate Laws and Reaction Mechanisms

1) What is a rate law?

2) What is a rate constant?

3) How do you determine the rate law for a typical reaction?

4) What does the rate constant tell us about a reaction?

Consider the rate law:

$$R = k[\text{NO}][\text{O}_2]^2$$

5) What is the order of the reaction with respect to NO, O₂, and overall?

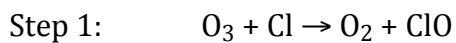
6) What is a reaction mechanism?

7) What is meant by the “Rate Determining Step”?

8) What is an “intermediate” in a reaction mechanism?

9) What is a transition state?

An environmental concern is the depletion of Ozone (O_3) in Earth's upper atmosphere.
A proposed mechanism for this is:

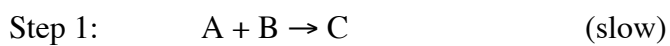


10) Write a balanced equation for the overall reaction represented by Step 1 and Step 2.

11) Explain why Cl is a catalyst in this mechanism.

12) Explain why ClO is an intermediate in this mechanism.

Consider the following mechanism which is totally pretend and does not exist:



13) Identify any species that is an intermediate. Explain why it is an intermediate.

14) Identify any species that is a catalyst. Explain why it is a catalyst.

15) Which step is the rate determining step? Explain why it is the rate determining step.

16) Write the overall equation for the reaction.

17) What is an everyday practical example of this subject matter? How do we use it in the real world?