

Chapter 17

Study Guide

Name: _____

Date: _____ Per: _____

DIRECTIONS: Answer the following in the space provided.

Define the following:

1. Collision Theory: _____

2. Activation Energy: _____

3. Activated Complex: _____

4. Transition State: _____

5. Reaction Mechanism: _____

6. Intermediate (Product) : _____

7. Multistep Mechanism: _____

8. Reaction Rate: _____

9. Rate Law: _____

10. Rate-Determining Step: _____

11. Reactant Order: _____

12. Reaction Order: _____

13. Unimolecular: _____

14. Bimolecular: _____

15. []: _____
16. Describe collision theory: _____

17. List the two things that make a collision "effective".
 - a. _____
 - b. _____

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18. There are 5 factors that affect the rate of reaction. List each and describe why/how they affect the rate.

<i>Factor</i>	<i>Why/How it Affects Reaction Rate</i>
a. _____	
b. _____	
c. _____	
d. _____	
e. _____	

DIRECTIONS: Calculate the average rate of reaction for the following.

19. A reaction occurs in which the concentration of Reactant A is reduced from 6.0 M to 3.2 M in 35.0 seconds.

20. The following reaction occurs: $A + B \rightarrow C$. Reactant B was made by dissolving 1.2 moles of solute to make 2.3L of aqueous solution. At the end of the reaction, there are only .3 moles remaining in the solution. The reaction required 30 seconds to complete.

DIRECTIONS: Use the diagram to answer the following.

21. The activated complex of the reaction occurs at what point? _____

22. What does C represent? _____

23. E represents the _____

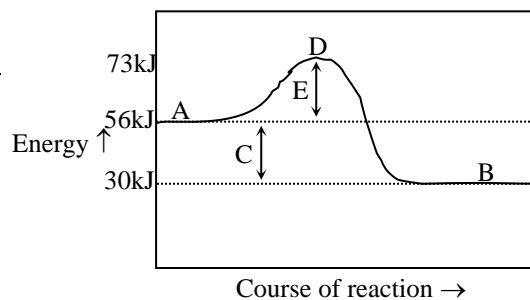
24. The activation energy is _____

25. The energy change (ΔH) in the system is _____

26. What occurs as the products are formed? _____

27. Why must activation energy be present for a chemical reaction to occur? _____

28. How would the use of a catalyst appear on this graph? _____



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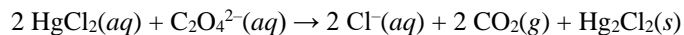
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DIRECTIONS: Answer the following in the space provided.

29. The initial rate of the following reaction in aqueous solution is monitored by measuring the number of moles of Hg_2Cl_2 that precipitate per liter per minute. The data obtained are listed in the table.



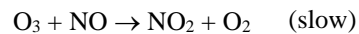
Trial	$[\text{HgCl}_2]_0$	$[\text{C}_2\text{O}_4^{2-}]_0$	Initial rate [M/(L·min)]
1	0.105	0.15	1.8×10^{-5}
2	0.105	0.15	1.8×10^{-5}
3	0.052	0.30	7.1×10^{-5}
4	0.052	0.15	8.9×10^{-6}

- a. Determine the rate law for the reaction using the initial rates method.

- b. What is the value of the rate constant k ?

- c. Are all four trials necessary to answer parts a. & b.? Explain. _____

30. One method for the destruction of ozone in the upper atmosphere is:



- a. Write the equation for the overall reaction: _____
- b. Which species is an intermediate? _____
- c. Which species is a catalyst? _____
- d. Which is the rate-determining step? _____
- e. Write the rate law for the reaction: _____

31. A reaction has the rate law,

$$\text{rate} = k[\text{A}]^3[\text{B}][\text{C}]^2$$

- a. What happens to the reaction rate if the concentration of A is doubled? _____
- b. What happens to the reaction rate if the concentration of B is doubled? _____
- c. What happens to the reaction rate if the concentration of C is doubled? _____
- d. What happens to the reaction rate if the concentration of A is halved? _____
- e. What happens to the reaction rate if the concentration of C is tripled? _____
- f. What happens to the reaction rate if the concentration of C is halved? _____