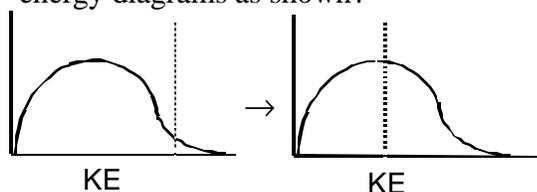


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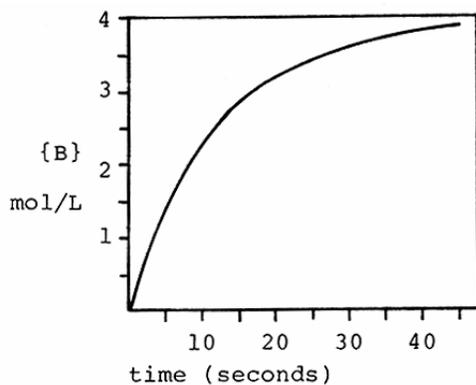
PRACTICE TEST

1. Which of the following does NOT influence the speed of a chemical reaction?
- concentration of reactants
 - nature of reactants
 - temperature
 - presence of a catalyst
 - none of these

2. What would cause the change in the kinetic energy diagrams as shown?



- increasing the ΔH
 - decreasing the temperature
 - increasing the surface area
 - addition of a catalyst
 - increasing the concentration of reactant
3. A time vs. concentration graph is presented below for the reaction $A \rightarrow B$. What is the rate of appearance of 'B' 20 seconds after the start of the reaction?



- 0.050 mol/L·s
- 3.2 mol/L·s
- 2.2 mol/L·s
- 0.010 mol/L·s
- 9.8 mol/L·s

4. The reaction $3O_2 \rightarrow 2O_3$ is proceeding with a rate of disappearance of O_2 equal to 0.60 mol/L·s. What is the rate of appearance of O_3 , in mol/L·s?
- 0.60
 - 0.40
 - 0.10
 - 0.90
 - 1.20

5. A reaction has the rate law $\text{Rate} = k[A]^2[B]$. What is the overall order of the reaction?
- 0
 - 2
 - 1
 - 4
 - 3

6. What are the correct units for a second order rate constant?
- mol/L·s
 - 1/s
 - L/mol·s
 - $L^2/mol^2 \cdot s$
 - $mol^2/L^2 \cdot s$

7. The reaction $I^- + OCl^- \rightarrow IO^- + Cl^-$ is first order with respect to I^- and first order with respect to OCl^- . The rate constant is $6.1 \times 10^{-2} \text{ L/mol}\cdot\text{s}$. What is the rate of reaction when $[I^-] = 0.10 \text{ M}$ and $[OCl^-] = 0.20 \text{ M}$?
- $2.4 \times 10^{-4} \text{ M/s}$
 - $1.2 \times 10^{-3} \text{ M/s}$
 - $6.1 \times 10^{-3} \text{ M/s}$
 - $1.2 \times 10^{-4} \text{ M/s}$
 - $2.4 \times 10^{-5} \text{ M/s}$

8. A reaction and its rate law are given below. When $[C_4H_6] = 2.0 \text{ M}$, the rate is 0.106 M/s . What is the rate when $[C_4H_6] = 4.0 \text{ M}$?
- $$2 C_4H_6 \rightarrow C_8H_{12} \quad \text{Rate} = k[C_4H_6]^2$$
- 0.053 M/s
 - 0.212 M/s
 - 0.106 M/s
 - 0.424 M/s
 - 0.022 M/s

9. The rate law for the reaction
 $2\text{NO}(\text{g}) + \text{O}_2(\text{g}) \rightarrow 2\text{NO}_2(\text{g})$
 is $\text{Rate} = k[\text{NO}]^2[\text{O}_2]$. What happens to the rate when the concentration of NO is doubled?

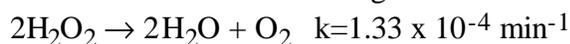
- a) the rate doubles d) the rate is halved
 b) the rate triples e) none of these
 c) the rate quadruples

10. Below is some rate data for the hypothetical reaction, $2\text{A} + \text{B} \rightarrow \text{C}$. What is the rate law for this reaction?

Experiment	$[\text{A}]_0$	$[\text{B}]_0$	Rate ($\underline{\text{M}}/\text{s}$)
1	2.0 $\underline{\text{M}}$	1.0 $\underline{\text{M}}$	0.100
2	2.0 $\underline{\text{M}}$	2.0 $\underline{\text{M}}$	0.400
3	4.0 $\underline{\text{M}}$	1.0 $\underline{\text{M}}$	0.100

- a) $\text{Rate} = k[\text{A}][\text{B}]$ d) $\text{Rate} = k[\text{A}]^2[\text{B}]^2$
 b) $\text{Rate} = k[\text{A}]^2[\text{B}]$ e) $\text{Rate} = k[\text{B}]^2$
 c) $\text{Rate} = k[\text{A}][\text{B}]^2$

11. The acid catalyzed decomposition of hydrogen peroxide is a first order reaction with the rate constant given below. For an experiment in which the starting concentration of hydrogen peroxide is 0.110 $\underline{\text{M}}$, what is the concentration of H_2O_2 450 minutes after the reaction begins?



- a) 0.0961 $\underline{\text{M}}$ d) 0.00658 $\underline{\text{M}}$
 b) 0.104 $\underline{\text{M}}$ e) 0.0156 $\underline{\text{M}}$
 c) 0.117 $\underline{\text{M}}$

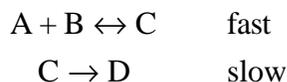
12. What is the rate constant for a first order reaction for which the half-life is 85.0 sec?

- a) 0.00814 sec^{-1} d) 0.0118 sec^{-1}
 b) 4.44 sec^{-1} e) 58.9 sec^{-1}
 c) 0.170 sec^{-1}

13. What fraction of a reactant remains after 3 half-lives of a first order reaction?

- a) 1/2 d) 1/8
 b) 1/3 e) 1/12
 c) 1/6

14. Assume a reaction occurs by the mechanism given below. What is the rate law for the reaction?

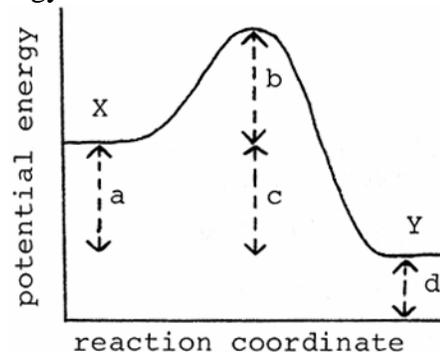


- a) $\text{Rate} = k[\text{A}][\text{B}][\text{C}]$
 b) $\text{Rate} = k[\text{A}]^2$
 c) $\text{Rate} = k[\text{A}][\text{B}]$
 d) $\text{Rate} = k[\text{A}][\text{B}]/[\text{D}]$
 e) $\text{Rate} = k[\text{A}]$

15. According to collision theory, which of the following factors does NOT influence the rate of reaction?

- a) collision frequency
 b) collision energy
 c) collision orientation
 d) collision rebound direction
 e) none of these

16. What distance corresponds to the activation energy for the reaction of X to Y?



- a) a d) d
 b) b e) e
 c) c

