

Name: _____ Entry No.: _____ A

Section 1. Fill in the blanks

1. A radioactive isotope of copper, ^{64}Cu , decays according to $^{64}\text{Cu} \longrightarrow ^{64}\text{Zn} + \beta$. The half-life for the reaction is 12.8 hours. Starting from 100 g of ^{64}Cu , the amount of ^{64}Zn produced in 25.6 hours is _____.
2. If the elementary step $\text{A} \longrightarrow \text{B}$ has a reaction enthalpy of -50 kJ and an activation energy of 10 kJ , the activation energy for the reverse step is _____.
3. A plot of reactant concentration as a function of time gives a straight line. The order of the reaction is _____.
4. The reaction $\text{A} + \text{B} \longrightarrow \text{C} + \text{D}$ is first order in A and second order in B. If [A] is halved and [B] is doubled, the rate of the reaction is _____.
5. If the integrated rate law for a reaction is $\frac{1}{[\text{A}]} = \frac{1}{[\text{A}]_0} + kt$, the expression for the half-life is _____.
6. Under certain conditions, the average rate of appearance of oxygen gas in the reaction $2\text{O}_3(\text{g}) \longrightarrow 3\text{O}_2(\text{g})$ is $1.2 \times 10^{-3} \text{ atm/sec}$. The average rate, expressed in atm/sec , for the disappearance of O_3 is _____.
7. If the collisional dissociation of I_2 proceeds by the elementary process $2\text{I}_2(\text{g}) \longrightarrow 2\text{I}(\text{g}) + \text{I}_2(\text{g})$, the expression for rate of formation of $\text{I}(\text{g})$ is _____.
8. For the reaction $\text{A} \longrightarrow \text{B}$, the rate of formation of B is directly proportional to the molar concentration of A. The integrated rate expression is _____.
9. Many enzyme reactions follow the Michaelis-Menten rate law, $\text{rate} = \frac{V[\text{S}]}{K_m + [\text{S}]}$, where V and K_m are constants and $[\text{S}]$ is the concentration of the substrate that is reacting. When $[\text{S}] \gg K_m$, the apparent order of the reaction is _____.
10. For the mechanism $\text{A} \longrightarrow \text{B} \longrightarrow \text{C}$, the expression for rate of formation of B, $\frac{d[\text{B}]}{dt}$, is _____.

Section 2. True/False

_____ The relationship between the equilibrium constant (K_c) of a reaction and the rate constants of the forward (k_f) and reverse (k_r) reactions is $K_c = k_f - k_r$.

_____ If the half-life of a reaction is independent of concentration, the reaction is of zero order.

_____ The rate of a chemical reaction is an intensive property.

_____ The activated-complex (or transition state) theory assumes that an equilibrium exists between the reactants and transition state, and between the transition state and the products.

Name: _____ Entry No.: _____ B

Section 1. Fill in the blanks

1. A plot of reactant concentration as a function of time gives a straight line. The order of the reaction is _____.
2. If the elementary step $A \longrightarrow B$ has a reaction enthalpy of -50 kJ and an activation energy of 10 kJ , the activation energy for the reverse step is _____.
3. If the collisional dissociation of I_2 proceeds by the elementary process $2I_2(g) \longrightarrow 2I(g) + I_2(g)$, the expression for rate of formation of $I(g)$ is _____.
4. For the reaction $A \longrightarrow B$, the rate of formation of B is directly proportional to the molar concentration of A . The integrated rate expression is _____.
5. The reaction $A + B \longrightarrow C + D$ is first order in A and second order in B . If $[A]$ is halved and $[B]$ is doubled, the rate of the reaction is _____.
6. A radioactive isotope of copper, ^{64}Cu , decays according to $^{64}\text{Cu} \longrightarrow ^{64}\text{Zn} + \beta$. The half-life for the reaction is 12.8 hours. Starting from 100 g of ^{64}Cu , the amount of ^{64}Zn produced in 25.6 hours is _____.
7. Many enzyme reactions follow the Michaelis-Menten rate law, $\text{rate} = \frac{V[S]}{K_m + [S]}$, where V and K_m are constants and $[S]$ is the concentration of the substrate that is reacting. When $[S] \gg K_m$, the apparent order of the reaction is _____.
8. If the integrated rate law for a reaction is $\frac{1}{[A]} = \frac{1}{[A]_0} + kt$, the expression for the half-life is _____.
9. For the mechanism $A \longrightarrow B \longrightarrow C$, the expression for rate of formation of B , $\frac{d[B]}{dt}$, is _____.
10. Under certain conditions, the average rate of appearance of oxygen gas in the reaction $2O_3(g) \longrightarrow 3O_2(g)$ is $1.2 \times 10^{-3} \text{ atm/sec}$. The average rate, expressed in atm/sec , for the disappearance of O_3 is _____.

Section 2. True/False

_____ The activated-complex (or transition state) theory assumes that an equilibrium exists between the reactants and transition state, and between the transition state and the products.

_____ The relationship between the equilibrium constant (K_c) of a reaction and the rate constants of the forward (k_f) and reverse (k_r) reactions is $K_c = k_f - k_r$.

_____ If the half-life of a reaction is independent of concentration, the reaction is of zero order.

_____ The rate of a chemical reaction is an intensive property.

Name: _____ Entry No.: _____ C

Section 1. Fill in the blanks

1. The reaction $A + B \longrightarrow C + D$ is first order in A and second order in B. If [A] is halved and [B] is doubled, the rate of the reaction is _____.
2. For the reaction $A \longrightarrow B$, the rate of formation of B is directly proportional to the molar concentration of A. The integrated rate expression is _____.
3. If the collisional dissociation of I_2 proceeds by the elementary process $2I_2(g) \longrightarrow 2I(g) + I_2(g)$, the expression for rate of formation of I(g) is _____.
4. Under certain conditions, the average rate of appearance of oxygen gas in the reaction $2O_3(g) \longrightarrow 3O_2(g)$ is 1.2×10^{-3} atm/sec. The average rate, expressed in atm/sec, for the disappearance of O_3 is _____.
5. For the mechanism $A \longrightarrow B \longrightarrow C$, the expression for rate of formation of B, $\frac{d[B]}{dt}$, is _____.
6. A radioactive isotope of copper, ^{64}Cu , decays according to $^{64}\text{Cu} \longrightarrow ^{64}\text{Zn} + \beta$. The half-life for the reaction is 12.8 hours. Starting from 100 g of ^{64}Cu , the amount of ^{64}Zn produced in 25.6 hours is _____.
7. Many enzyme reactions follow the Michaelis-Menten rate law, $\text{rate} = \frac{V[S]}{K_m + [S]}$, where V and K_m are constants and $[S]$ is the concentration of the substrate that is reacting. When $[S] \gg K_m$, the apparent order of the reaction is _____.
8. If the integrated rate law for a reaction is $\frac{1}{[A]} = \frac{1}{[A]_0} + kt$, the expression for the half-life is _____.
9. A plot of reactant concentration as a function of time gives a straight line. The order of the reaction is _____.
10. If the elementary step $A \longrightarrow B$ has a reaction enthalpy of -50 kJ and an activation energy of 10 kJ, the activation energy for the reverse step is _____.

Section 2. True/False

_____ If the half-life of a reaction is independent of concentration, the reaction is of zero order.

_____ The relationship between the equilibrium constant (K_c) of a reaction and the rate constants of the forward (k_f) and reverse (k_r) reactions is $K_c = k_f - k_r$.

_____ The rate of a chemical reaction is an intensive property.

_____ The activated-complex (or transition state) theory assumes that an equilibrium exists between the reactants and transition state, and between the transition state and the products.

Name: _____ Entry No.: _____ D

Section 1. Fill in the blanks

1. The reaction $A + B \longrightarrow C + D$ is first order in A and second order in B. If [A] is halved and [B] is doubled, the rate of the reaction is _____.
2. If the collisional dissociation of I_2 proceeds by the elementary process $2I_2(g) \longrightarrow 2I(g) + I_2(g)$, the expression for rate of formation of I(g) is _____.
3. Many enzyme reactions follow the Michaelis-Menten rate law, $\text{rate} = \frac{V[S]}{K_m + [S]}$, where V and K_m are constants and [S] is the concentration of the substrate that is reacting. When $[S] \gg K_m$, the apparent order of the reaction is _____.
4. A plot of reactant concentration as a function of time gives a straight line. The order of the reaction is _____.
5. Under certain conditions, the average rate of appearance of oxygen gas in the reaction $2O_3(g) \longrightarrow 3O_2(g)$ is 1.2×10^{-3} atm/sec. The average rate, expressed in atm/sec, for the disappearance of O_3 is _____.
6. A radioactive isotope of copper, ^{64}Cu , decays according to $^{64}\text{Cu} \longrightarrow ^{64}\text{Zn} + \beta$. The half-life for the reaction is 12.8 hours. Starting from 100 g of ^{64}Cu , the amount of ^{64}Zn produced in 25.6 hours is _____.
7. For the reaction $A \longrightarrow B$, the rate of formation of B is directly proportional to the molar concentration of A. The integrated rate expression is _____.
8. If the integrated rate law for a reaction is $\frac{1}{[A]} = \frac{1}{[A]_0} + kt$, the expression for the half-life is _____.
9. If the elementary step $A \longrightarrow B$ has a reaction enthalpy of -50 kJ and an activation energy of 10 kJ, the activation energy for the reverse step is _____.
10. For the mechanism $A \longrightarrow B \longrightarrow C$, the expression for rate of formation of B, $\frac{d[B]}{dt}$, is _____.

Section 2. True/False

_____ The relationship between the equilibrium constant (K_c) of a reaction and the rate constants of the forward (k_f) and reverse (k_r) reactions is $K_c = k_f - k_r$.

_____ The activated-complex (or transition state) theory assumes that an equilibrium exists between the reactants and transition state, and between the transition state and the products.

_____ The rate of a chemical reaction is an intensive property.

_____ If the half-life of a reaction is independent of concentration, the reaction is of zero order.

Name: _____ Entry No.: _____ E

Section 1. Fill in the blanks

1. The reaction $A + B \longrightarrow C + D$ is first order in A and second order in B. If [A] is halved and [B] is doubled, the rate of the reaction is _____.
2. For the reaction $A \longrightarrow B$, the rate of formation of B is directly proportional to the molar concentration of A. The integrated rate expression is _____.
3. If the integrated rate law for a reaction is $\frac{1}{[A]} = \frac{1}{[A]_0} + kt$, the expression for the half-life is _____.
4. A plot of reactant concentration as a function of time gives a straight line. The order of the reaction is _____.
5. Under certain conditions, the average rate of appearance of oxygen gas in the reaction $2\text{O}_3(\text{g}) \longrightarrow 3\text{O}_2(\text{g})$ is 1.2×10^{-3} atm/sec. The average rate, expressed in atm/sec, for the disappearance of O_3 is _____.
6. A radioactive isotope of copper, ^{64}Cu , decays according to $^{64}\text{Cu} \longrightarrow ^{64}\text{Zn} + \beta$. The half-life for the reaction is 12.8 hours. Starting from 100 g of ^{64}Cu , the amount of ^{64}Zn produced in 25.6 hours is _____.
7. For the mechanism $A \longrightarrow B \longrightarrow C$, the expression for rate of formation of B, $\frac{d[B]}{dt}$, is _____.
8. If the collisional dissociation of I_2 proceeds by the elementary process $2\text{I}_2(\text{g}) \longrightarrow 2\text{I}(\text{g}) + \text{I}_2(\text{g})$, the expression for rate of formation of $\text{I}(\text{g})$ is _____.
9. Many enzyme reactions follow the Michaelis-Menten rate law, $\text{rate} = \frac{V[S]}{K_m + [S]}$, where V and K_m are constants and $[S]$ is the concentration of the substrate that is reacting. When $[S] \gg K_m$, the apparent order of the reaction is _____.
10. If the elementary step $A \longrightarrow B$ has a reaction enthalpy of -50 kJ and an activation energy of 10 kJ, the activation energy for the reverse step is _____.

Section 2. True/False

- _____ The activated-complex (or transition state) theory assumes that an equilibrium exists between the reactants and transition state, and between the transition state and the products.
- _____ The relationship between the equilibrium constant (K_c) of a reaction and the rate constants of the forward (k_f) and reverse (k_r) reactions is $K_c = k_f - k_r$.
- _____ The rate of a chemical reaction is an intensive property.
- _____ If the half-life of a reaction is independent of concentration, the reaction is of zero order.