

Multiple Choice Questions

1. Conversion of FeCl_3 to FeCl_2 is called :
 (a) Oxidation (b) Reduction
 (c) Dissociation (d) Addition
2. The reaction in which a complex compound breaks into two simple compounds is called :
 (a) Dissociation (b) Replacement
 (c) Oxidation (d) Addition
3. The substance which loses electrons is called :
 (a) Oxidizing agent (b) Catalyst
 (c) Reducing agent (d) None of the above
4. The reaction which takes place in both forward and backward directions is called as :
 (a) Oxidation (b) Reduction
 (c) Irreversible (d) Reversible
5. The substance which increases the rate of a reaction is called :
 (a) Catalyst (b) Oxidizing agent
 (c) Reducing agent (d) None of the above

What are enzymes?

- (a) Negative catalyst (b) Positive catalyst
 (c) Auto catalyst (d) Biocatalyst



In this reaction, magnesium is getting _____

- (a) Oxidized (b) Reduced
 (c) Dissociated (d) Replaced

Which symbol is used for an irreversible reaction?

- (a) \rightarrow (b) \uparrow (c) \downarrow (d) \rightleftharpoons

The reaction in which the product itself acts as a catalyst is called :

- (a) Biochemical (b) Reversible
(c) Autocatalysis (d) Irreversible

10. In exothermic reaction, heat,
(a) is evolved (b) is absorbed
(c) remains constant (d) none of the above

Answer

1. (b), 2. (a), 3. (c), 4. (d), 5. (a),
6. (d), 7. (a), 8. (a), 9. (c), 10. (a).

Very Short Answer Questions

Q.11. What do you mean by a chemical change?

Ans. A change in which one or more new substances are formed is called a chemical change.

Q.12. Which catalyst helps in converting vanaspati oil into vanaspati ghee?

Ans. Finely divided nickel or copper.

Q.13. How many types of catalysis are there? Mention their names.

Ans. There are two types of catalysis :

1. Heterogeneous catalysis
2. Homogeneous catalysis

Q.14. $\text{Zn} + \text{CuSO}_4 \longrightarrow \text{ZnSO}_4 + \text{Cu}$

This is an example of which type of reaction?

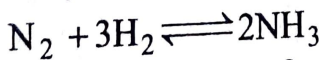
Ans. Displacement Reaction

Q.15. Give an example of a redox reaction?

Ans. $\text{ZnO} + \text{C} \longrightarrow \text{Zn} + \text{CO}$

Q.16. What is a reversible reaction?

Ans. The reaction which takes place in both directions is known as reversible reaction. Examples; formation of ammonia from nitrogen and hydrogen.



Q.17. What is the function of a catalyst promoter and a catalyst poison?

Ans. A catalyst promoter increases the efficiency of a catalyst while a catalyst poison destroys the activity of a catalyst.

Q.18. What is the reaction of an acid and a base called?

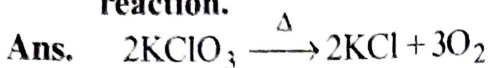
Ans. Neutralization reaction

Q.19. How many types of chemical reactions are there on the basis of the time taken by the reactions to get completed?

Ans. On the basis of the time taken for the reactions to get completed, there are two types of reactions:

1. Slow reactions
2. Fast reactions

Q.20. Give an example of thermal dissociation reaction.



Q.21. What is the work of a catalyst in a reaction?

Ans. A catalyst alters the rate of a reaction without itself getting involved in it. It may decrease or increase the rate of a reaction.

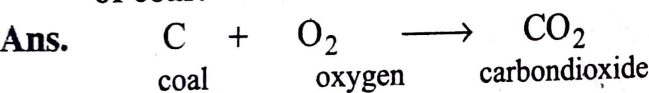
Q.22. What is the basic principle of balancing a chemical equation?

Ans. Law of Conservation of mass.

Q.23. What is a redox reaction?

Ans. The reactions in which one reactant gets reduced and other gets oxidized are called redox reactions.

Q.24. Which type of reaction is the combustion of coal?



Q.25. What will be the pH of a solution which is formed when a strong acid is mixed with a strong base?

Ans. When a strong acid is mixed with a strong base, the resulting solution has a pH of 7.

◆ Short Answer Type Questions

Q.26. Write the differences between a physical and a chemical change.

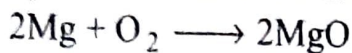
Ans. The differences between a physical and a chemical change are as follows :

	Physical Change	Chemical Change
1.	It is a temporary change.	It is a permanent change.
2.	It does not form a new product.	It forms a new product.
3.	This change involves the change in the physical states of the substance.	This change involves the change in the chemical composition of the substance.

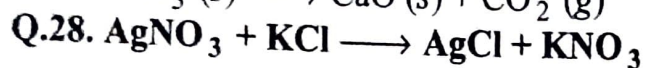
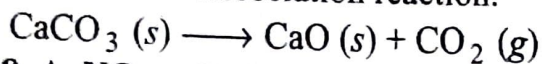
Q.27. Write about addition and dissociation reactions giving one example of each.

Ans.

Addition Reaction : A reaction in which two or more substances combine together to form a single new product is called an addition reaction.



Dissociation Reaction : A reaction in which a substance breaks into two or more simpler substances is called a dissociation reaction.



Which type of a reaction is this? Explain this reaction.

Ans. This is an example of a double displacement reaction. A reaction which involves the exchange of ions between the reactants is called a double displacement reaction.

Q.29. Explain oxidation and reduction in terms of gain or loss of electrons.

Ans. A substance which loses electrons is said to be oxidized and undergoes oxidation reaction. A substance which gains electrons is said to be reduced and undergoes reduction reaction.

Q.30. How many types of catalysts are there? Explain.

Ans. On the basis of the physical state of catalyst, it is of two types :

Homogeneous Catalyst : A catalyst which is in the same physical state as the reactants and products.

Heterogeneous Catalyst : A catalyst which is not in the same physical state as the reactants or products.

On the basis of action of a catalyst, it is of four types :

1. **Positive Catalyst :** It increases the rate of a reaction.

2. **Negative Catalyst :** It decreases the rate of a reaction.

3. **Auto Catalyst :** The product of the reaction itself acts as a catalyst.

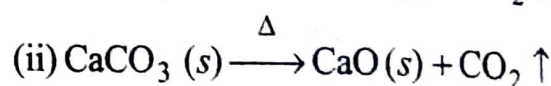
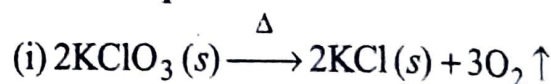
4. **Biocatalyst :** Certain catalyst that produced by the living organisms and catalyze biochemical reactions.

Q.31. How many types of dissociation reactions are there? Explain.

Ans. A reaction in which a substance breaks into two or more simpler substances is called dissociation reaction. These reactions require energy in the form of heat, light and electricity. They are of three types :

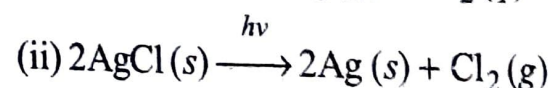
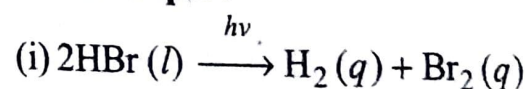
1. **Thermal dissociation :** A reaction in which a substance breaks into two or more simpler substances by the application of heat is called thermal dissociation reaction.

For example :

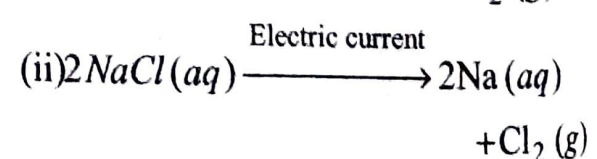
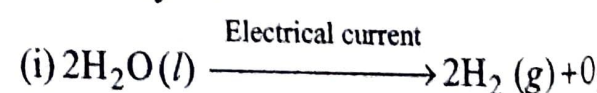


2. **Photolysis :** A reaction in which a substance breaks into two or more simpler substances by the application of light is called photolysis.

For example :



3. **Electrolysis :** A reaction in which a substance breaks into two or more simpler substances by the application of electric current is called electrolysis.



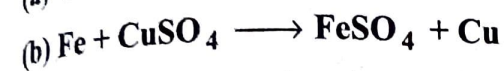
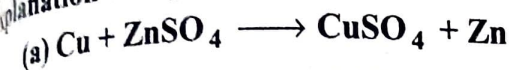
Q.32. Why a small amount of ethyl alcohol is added to chloroform?

Ans. Chloroform quickly gets oxidized in presence of air and forms a poisonous phosgene. To avoid this reaction, a small amount of ethyl alcohol is added to chloroform.

Q.33. The nature of the solution formed as a result of mixing a weak acid with a strong base is basic. Why?

Ans. When a weak acid is mixed with a strong base, the weak acid dissociates partially while the strong base dissociates completely. As a result of this, the number of hydrogen ions produced by a weak acid are lesser as compared to the number of hydrogen ions produced by a strong base. All the hydrogen ions combine with the same number of hydroxyl ions and form water molecules. The solution now is left with free hydroxyl ions due to which the solution is basic.

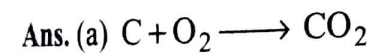
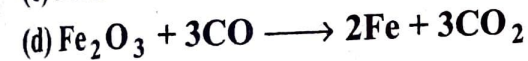
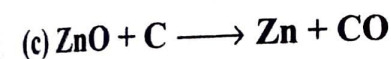
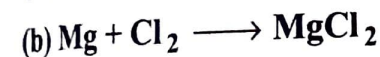
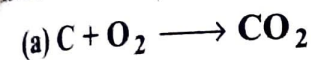
Q.34. Are these reactions feasible? Give explanation to support your answer.



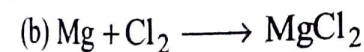
Ans. (a) This reaction is not feasible as copper is less reactive than zinc.

(b) This reaction is feasible as iron being more reactive than copper readily displaces it from solution and forms iron sulphate.

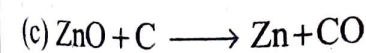
Q.35. Identify the oxidation and reduction reactions in the following :



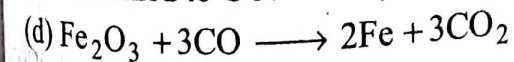
In this reaction carbon is oxidized to CO_2 and oxygen is reduced.



In this reaction magnesium is oxidized and chlorine is reduced.



In this reaction ZnO is reduced to Zn and carbon is oxidized to CO .



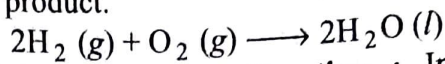
In this reaction Fe_2O_3 is reduced to Fe and CO is oxidized to CO_2 .

◆ Long Answer Type Questions

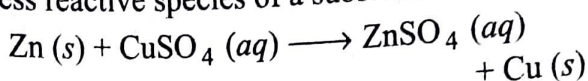
Q.37. Explain the different type of chemical reactions.

Ans. There are following types of chemical reactions :

(i) **Addition Reaction** : In such a chemical reaction, two or more substances combine to form a single product.

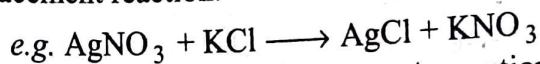


(ii) **Replacement Reaction** : In such a chemical reaction, more reactive species replaces the less reactive species of a substance.

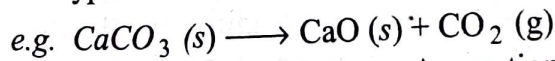


Here, zinc is more reactive than copper.

(iii) **Double Displacement Reaction** : A reaction which involves the exchange of ions between the reactants is called a double displacement reaction.



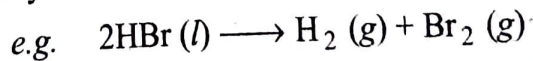
(iv) **Dissociation Reaction** : A reaction in which a substance breaks into two or more simpler substances is called a dissociation reaction. There are three types of dissociation reactions :



(a) **Thermal dissociation** : A reaction in which a substance breaks into two or more simpler substances by the application of heat is called a thermal dissociation reaction.



(b) **Photolysis** : A reaction in which a substance breaks into two or more simpler substances by the application of light is called photolysis.



(c) **Electrolysis** : A reaction in which a substance breaks into two or more simpler substances by the application of electric current is called a electrolysis.



(v) **Slow Reaction** : The reactions which take a long period of time (days, months or years) to get completed are called slow reactions.

e.g. Rusting of Iron

(vi) **Fast Reaction** : The reactions which get completed in a short period of time are called fast reactions.



(vii) **Reversible Reaction** : The reactions which occur in both the directions (forward and backward) are called reversible reactions.



(viii) **Irreversible Reaction** : The reactions which occur in a single direction are called as irreversible reactions.



(ix) **Oxidation-Reduction Reaction** : The reactions which involve gain of oxygen or loss of hydrogen are called oxidation reactions. Oxidation reactions also involve addition of an electronegative element or loss of electrons. The reactions which involve loss of oxygen or gain of hydrogen are called reduction reactions. Reduction involves removal of electronegative element or gain of electrons. The substance which undergoes oxidation is said to be oxidized and the one which undergoes reduction is said to be reduced.

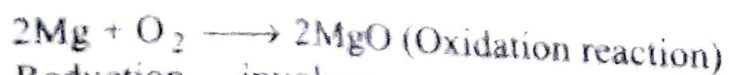


(x) **Neutralization Reaction** : When an acid reacts with base it forms salt and water. This reaction is called neutralization reaction



Q.38. What do you mean by oxidation-reduction reactions? Explain with examples.

Ans. The reactions which involve gain of oxygen or loss of hydrogen are called as oxidation reactions. Oxidation reactions also involve addition of an electronegative element or loss of electrons. The reactions which involve loss of oxygen or gain of hydrogen are called reduction reactions.



Reduction involves removal of an electronegative element or gain of electrons. The

substance which undergoes oxidation is said to be oxidized and the one which undergoes reduction is said to be reduced



(Reduction reaction)

Q.39. What do you know about characteristics of a catalyst and catalysts?

Ans. Characteristics of a Catalyst

(i) It alters the rate of a reaction without getting involved in the reaction.

(ii) A very small amount of catalyst is used to catalyse the reaction.

(iii) A specific catalyst is used in a reaction and a single catalyst cannot be used in different reactions.

(iv) It does not start the reaction.

(v) Its efficiency is maximum at a certain temperature.

(vi) In a reversible reaction, both forward and backward rate of reactions are altered by a catalyst.

Functions of a catalyst: It alters the rate of a reaction without itself undergoing any change in composition.

Types of catalyst : Refer to Short Answer Type Questions no. 30.

Q.40. Write the steps to write a chemical equation and its characteristics.

Ans. Steps to write a chemical equation

(a) Write the reactants on the left hand side, then an arrow and then the products on the right hand side. More than one reactants are separated by a "+" sign.

(b) According to Law of Conservation of Mass, the number of atoms in both reactant and product side are equal.

(c) The reaction is balanced by Hit and Trial method.

(d) To balance a chemical equation, the number of atoms are balanced on both the sides of the reaction. Hydrogen and oxygen.

(e) After the reaction is balanced, the physical states of each reactant and product are mentioned like (s), (l), (g) and (aq).

(f) The temperature, pressure and the catalyst used are mentioned above the arrow in a chemical reaction.

(g) Amount of heat released or absorbed is also mentioned in the reaction as follows :



Characteristics of a chemical equation :

(i) In a chemical equation, we get full information about reactants and products, their physical states, and their atomic masses.

(ii) It gives information about the temperature, pressure and the catalyst used in the reaction.

(iii) It also tells whether the reaction is exothermic or endothermic.

Q.41. Give differences between :

(a) Reversible and Irreversible reactions

(b) Catalyst promoter and Catalyst poison,

(c) Homogeneous Catalysis and Heterogeneous Catalysis, (d) Oxidation and Reduction

Ans. (a)

	Reversible Reaction	Irreversible Reaction
1.	It occurs in both the directions.	It occurs in a single direction.
2.	The concentration of reactants over a period of time will never be 0.	The concentration of reactants over a period of time becomes 0.
3.	It is represented by " \rightleftharpoons " arrow.	It is represented by " \rightarrow " arrow.

(b) **Catalyst promoter** : Substances which themselves are not catalysts, but when mixed in small quantities with the catalysts increase their efficiency are called as promoters or activators. For example, in Haber's process for the synthesis of ammonia, traces of molybdenum increases the activity of finely divided iron which acts as a catalyst.

Catalyst poison : Substances which destroy the activity of the catalyst by their presence are known as catalytic poisons. For example: The platinum catalyst used in the oxidation of hydrogen is poisoned by CO. In this reaction CO acts as catalytic poison.

(c)

	Homogeneous Catalysis	Heterogeneous Catalysis
1.	The reaction in which the physical state of the catalyst is same as that of reactants and products.	The reaction in which the physical state of the catalyst is not same as that of reactants or products.
2.	$2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \longrightarrow 2\text{SO}_3(\text{g})$ Catalyst used-NO (g)	$\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \longrightarrow 2\text{NH}_3(\text{g})$ Catalyst used-Fe (s)

(d)

	Oxidation	Reduction
1.	Involves loss of electrons.	Involves gain of electrons.
2.	Involves loss of hydrogen.	Involves gain of hydrogen.
3.	Involves gain of oxygen.	Involves loss of oxygen.

Other Important Questions and their Answers

◆ Multiple Choice Questions

1. Identify a physical change.

- (a) Melting of ice (b) Rusting of iron
 (c) Combustion of Coal
 (d) Ammonia formation

2. Identify a chemical change.

- (a) Ammonia formation
 (b) Rusting of iron
 (c) Dissolving sugar in water
 (d) Both (a) and (b)