Chapter - 1

Chemical Reactions and Equations

MULTIPLE CHOICE QUESTIONS

1. When Ag is exposed to air it gets a black coating of

(a) $AgNO_3$

(b) Ag_2S

(c) Ag_2O

(d) Ag_2CO_3

2. Which of the reactions is used in black and white photography?

(a) Combination Reaction

(b) Decomposition Reaction

(c) Displacement reaction

(d) Oxidation reaction

$MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$

3. Identify the substance oxidized in the above equation.

(a) $MnCl_2$

(b) HCl

(c) H_2O

(d) MnO_2

4. Zinc reacts with silver nitrate to form which compounds?

(a) $Zn(NO_3)_2 + Ag$

(b) $ZnNO_3 + Ag$

(c) $AgNO_3 + Zn(NO_3)_2$

(d) $Ag + Zn(NO_3)_3$

5. In the double displacement reaction between aqueous potassium iodide and aqueous lead nitrate, a yellow precipitate of lead iodide is formed. While performing the activity if lead nitrate is not available, which of the following can be used in place of lead nitrate?

(a) Lead sulphate (insoluble)

(b) Lead acetate

(c) Ammonium nitrate

(d) Potassium sulphate

6. The brown gas evolved on heating of copper nitrate is

(a) O_2

(b) NO_2

(c) N_2

(d) NO

7. Electrolysis of water is a decomposition reaction. The mole ratio of hydrogen and oxygen gases liberated during electrolysis of water is:

(a) 1: 1

(b) 2:1

(c) 4:1

(d) 1:2

8. A substance 'X' is used in white-washing and is obtained by heating limestone in the absence of air. Identify 'X'.

(a) $CaOCl_2$

(b) $Ca(OH)_2$

(c) CaO

(d) $CaCO_3$

9. $2HNO_3 + Ca(OH)_2 \rightarrow Ca(NO_3)_2 + 2H_2O$; is an example of

(i) displacement reaction

(ii) double displacement reaction

(iii) neutralisation reaction

(iv) combination reaction.

(a) (i) and (ii)

(b) (ii) and (iii)

(c) (iii) and (iv)

(d) (i) and (iv)

10. A substance X which is a group 2 element is used intensively in the cement industry. This element is present in bones also. On treatment with water, it forms a solution which turns red litmus blue. Element X is

(a) Cu

(b) Ca

(c)Na

(d) Al

ASSERTION- REASON TYPE QUESTIONS

DIRECTION: *Each of these questions contains an assertion followed by reason. Read them carefully and answer the question on the basis of following options. You have to select the one that best describes the two statements.*

(a) If both Assertion and Reason are correct and reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are correct, but reason is not the correct explanation of Assertion.

(c) If Assertion is correct but Reason is incorrect.

(d) If Assertion is incorrect but Reason is correct.

Q1. Assertion (A): Photosynthesis is considered as an endothermic reaction.

Reason (R): Energy gets released in the process of photosynthesis

Q2. Assertion (A): $MnO_2 + 4HCl \rightarrow MnCl_2 + Cl_2 + 2H_2O$ is redox reaction.

Reason (R): MnO_2 oxidises HCl to Cl_2 and gets reduced to $MnCl_2$.

Q3. Assertion (A): When HCl is added to zinc granules, a chemical reaction occurs.

Reason (R): Evolution of a gas indicates that the chemical reaction is taking place.

Q4. Assertion (A): White silver chloride turns grey in sunlight.

Reason (R): Decomposition of silver chloride in presence of sunlight takes place to form silver metal and chlorine gas.

Q5. Assertion (A): Chemical reaction changes the physical and chemical properties of a substance

Reason (R): Chemical change involves a change in the chemical composition of matter, and a new substance is formed

CASE STUDY QUESTIONS

1. A chemical reaction is a representation of chemical change in terms of symbols and formulae of reactants and products. There are various types of chemical reactions like combination, decomposition, displacement, double displacement, oxidation and reduction reactions. Reactions in which heat is released along with the formation of products are called exothermic chemical reactions. All combustion reactions are exothermic reactions.

(i) The massive force that pushes the rocket forward through space is generated due to the

(a) combination reaction

(b) decomposition reaction

(c) displacement reaction

(d) double displacement reaction

(ii) A white salt on heating decomposes to give brown fumes and yellow residue is left behind. The yellow residue left is of

(a) lead nitrate

(b) nitrogen oxide

(c) lead oxide

(d) oxygen gas

(iii) Which of the following reactions represents a combination reaction?

(a) $CaO\ (s) + H_2O\ (l) \rightarrow Ca\ (OH)_2\ (aq)$

(b) $CaCO_3\ (s) \rightarrow CaO\ (s) + CO_2(g)$

(c) $Zn(s) + CuSO_4\ (aq) \rightarrow ZnSO_4\ (aq) + Cu(s)$

(d) $2FeSO_4(s) \rightarrow Fe_2O_3\ (s) + SO_2(g) + SO_3(g)$

(iv) Complete the following statements by choosing correct type of reaction for X and Y.

Statement 1: The heating of lead nitrate is an example of 'X' reaction.

Statement 2: The burning of magnesium is an example of 'Y' reaction.

(a) X-Combination,Y-Decomposition

(b) X-Decomposition,Y-Combination

(c) X-Combination,Y-Displacement

(d) X- Displacement, Y-Decomposition

2. Those reactions in which two compounds react by an exchange of ions to form two new compounds are called double displacement reactions. A double displacement reaction usually occurs in solution and one of the products, being insoluble, precipitate out (separates as a solid). Any reaction in which an insoluble solid (called precipitate) is formed that separates from the solution is called a precipitation reaction. The reaction in which acid or acidic oxide reacts with base or basic oxide to form salt and water is called neutralisation reaction.

For example, $2NaOH + H_2SO_4 \longrightarrow Na_2SO_4 + 2\ H_2O$

(i) When hydrogen sulphide gas is passed through a blue solution of copper sulphate, a black precipitate of copper sulphide is obtained, and the sulphuric acid so formed remains in the solution. The reaction is an example of a

(a) combination reaction

(b) displacement reaction

(c) decomposition reaction

(d) double displacement reaction

(ii) Barium chloride on reaction with ammonium sulphate forms barium sulphate and ammonium chloride. Which of the following correctly represents the type of the reaction involved?

(I) Displacement reaction

(II) Precipitation reaction

(III) Combination reaction

(IV) Double displacement reaction

(a) (I) only

(b) (II) only

(c) (III) and (IV) only

(d) (II) and (V) only

(iii) Identify A in the following reaction.

$AlCl_3(aq) + 3NH_4OH\ (aq) \longrightarrow A + 3NH_4Cl(aq)$

(a) $Al(OH)_3$

(b) Al_2O_3

(c) AlH_3

(d) AlN

(iv) Consider the following reaction, $BaCl_2 + Na_2SO_4 \longrightarrow BaSO_4 + 2NaCl$.

Answers Key

MULTIPLE CHOICE QUESTIONS

1. b
2. b
3. b
4. a
5. b
6. b
7. b
8. c
9. b
10. b

ASSERTION - REASON TYPE QUESTIONS

1. c
2. a
3. a
4. a
5. a

CASE STUDY QUESTIONS

1. (i) (b) The massive force that pushes the rocket forward through space is generated due to the decomposition reaction. Hydrogen peroxide decomposes and provides it with a considerable reaction force thrust.

(ii) (c) Lead nitrate decomposes to give brown fumes of nitrogen dioxide gas and yellow residue of lead oxide is left behind.

(iii) (a) A reaction in which two or more reactants combine to form a single product is known as a combination reaction.

2. (i) (d), (ii) (d), (iii) (a), (iv) (b)