CLASS-X

Chemistry

Topic – Question - Ans-2

Chapter-1

Q- What is a balance chemical equation? Why should chemical equations be balanced?

Ans- The chemical equation in which no. of atoms of various elements in the reactants and products are equal is called balanced chemical equation.

$$Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$$

It is a balanced chemical equation which represents the reaction between Zinc and sulphuric acid in which Zinc sulphate and hydrogen are formed. In this equation no. of atoms in reactants is 8 which is equal to no. of atoms of products.

The law of conservation of mass tells that matter can neither be created nor destroyed in a chemical reaction. Due to this total mass of elements of products must be equal to total mass of elements of reactants. So, a chemical equation should be balanced.

Q. Translate the following statements into chemical equation and then balance them.

(a) Hydrogen gas combines with nitrogen to form ammonia.

$$3H_2 + N_2 \longrightarrow 2NH_3$$

(b) Hydrogen sulphide gas burns in air to give water and sulphur dioxide.

$$2H_2S + 3O_2 \rightarrow 2H_2O + 2SO_2$$

(c) Barium chloride reacts with aluminium sulphate to give aluminium chloride and a white precipitate of barium sulphate.

$$3BaSO_4 + Al_2(SO_4)_3 \rightarrow 2ACl_3 + 3BaSO_4$$

(d) Potassium metal reacts with water to give potassium hydroxide and hydrogen gas.

$$2K + 2H_2O \longrightarrow 2KOH + H_2$$

Q. What does one mean by exothermic endothermic reactions? Give example.

Ans – The chemical reaction in which heat is evolved is called exothermic reaction.

Ex. When calcium oxide reacts with water, calcium hydroxide is formed with the evolution of heat.

$$CaO + H_2O \longrightarrow Ca(OH)_2 + Heat$$

The chemical reaction in which heat is absorbed is called endothermic reation.

Ex. When nitrogen and oxygen are heated to a very high temp. (about 3000°C) they combine to form nitrogen monoxide. A lot of heat is absorbed.

$$N_2(g) + O_2(g) \longrightarrow 2NO(g)$$

Q. Why is respiration considered an exothermic reaction? Explain

Ans - Respiration is a biochemical process taken place in cells to released energy. During the process glucose, obtained from the digestion of food, combines oxygen inside cells to produce carbon dioxide, water and energy. Since energy is released during the process respiration, so it is an exothermic reaction.

$$C_6H_{12}O_6(aq) + 6O_2(g) \longrightarrow 6CO_2(g) + H_2O(l) + \text{Energy}$$

Q. Why decomposition reactions called the opposite of combination reactions? Write equations for these reactions.

Ans. The reactions in which two or more substances combine to form a single substance are called combination reactions, whereas, the reactions in which a single substance splits up to form two or more simple substances are called decomposition

reactions. Due this decomposition reactions are considered as opposite of combination reactions.

Example –

Carbon burns in air to form carbon dioxide.

$$C(s) + O_2(g) \longrightarrow CO_2(g)$$

It is combination reactions.

On heating calcium carbonate splits up into calcium oxides and ~~carbon~~ carbon dioxide. It is a decomposition reaction.

$$CaCO_3(s) \xrightarrow{Heat} CaO(s) + CO_2(g)$$

Q. What is the difference between displacement and double displacement reactions? Write equations.

Ans- In displacement reaction, more reactive ~~metal~~ element displaces less reactive element from its salt solution.

Iron displaces copper from copper sulphate solution.

$$CuSO_4(aq) + Fe(s) \longrightarrow FeSO_4(aq) + Cu(s)$$

In double displacement reaction, two compounds react together by exchanging their ions to form new compounds.

When silver nitrate sol. is added to sodium chloride sol., white ppt. of silver chloride is formed with sodium nitrate.

$$AgNO_3(aq) + NaCl(aq) \longrightarrow \underset{\text{white ppt.}}{AgCl(s)} + NaNO_3(aq)$$