Work sheet

Chapter-1

Chemical Reactions and Equation

"Facts are not science — as the dictionary is not literature." Martin H. Fischer

Balancing of chemical equations:

1.	Balance the following chemical equations including the physical states. a) $C_6H_{12}O_6 \rightarrow C_2H_5OH + CO_2$ b) $Fe + O_2 \rightarrow Fe_2O_3$ c) $NH_3 + Cl_2 \rightarrow N_2H_4 + NH_4cl$ d) $Na + H_2O \rightarrow NaOH + H_2$
2.	Write the balanced chemical equation for the following and indentify the type of reaction in each case. a) Calcium hydroxide $_{(aq)}$ + Nitric acid $_{(aq)} \rightarrow$ Water $_{(l)}$ + Calcium nitrate $_{(aq)}$ b) Magnesium $_{(s)}$ + Iodine $_{(g)} \rightarrow$ Magnesium Iodide. $_{(s)}$ c) Magnesium$_{(s)}$ + Hydrochloric acid$_{(aq)} \rightarrow$ Magnesium chloride$_{(aq)}$ + Hydrogen$_{(g)}$ d) Zinc$_{(s)}$ + Calcium chloride $_{(aq)} \rightarrow$ Zinc Chloride $_{(aq)}$ + Ca$_{(s)}$
3.	Write the balanced chemical equations for the following reactions. a) Zinc + Silver nitrate → Zinc nitrate + Silver. b) Aluminum + copper chloride → Aluminum chloride + Copper. c) Hydrogen + Chlorine. → Hydrogen chloride. d) Ammonium nitrate → Nitrogen + Carbon dioxide + water.
4.	Balance the following chemical equations. a) $NaOH + H_2SO_4 \rightarrow Na_2SO_4 + H_2O$ b) $Hg(NO_3)_2 + KI \rightarrow HgI_2 + KNO_3$ c) $H_2 + O_2 \rightarrow H_2O$ d) $KClO_3 \rightarrow KCl + O_2$ e) $C_3H_8 + O_2 \rightarrow CO_2 + H_2O$
5.	Balance the following chemical equations. **(i)** $BaCl_2 + H_2SO_4 \longrightarrow BaSO_4 + HCl$ **(ii)** $Ca(OH)_2 + HNO_3 \longrightarrow Ca(NO_3)_2 + H_2O$ **(iii)** $Pb(NO_3)_2 \longrightarrow PbO + NO_2 + O_2$ **(iv)** $MnO_2 + HCl \longrightarrow MnCl_2 + H_2O + Cl_2$
6.	Write balanced equations for the following reactions: a. Aluminium + Bromine ⟶ Aluminium bromide b. Calcium carbonate $\xrightarrow{\text{Heat}}$ Calcium oxide + Carbon dioxide c. Silver chloride $\xrightarrow{\text{sunlight}}$ Silver + Chlorine
7.	Write balanced chemical equation for the following statements: a. NaOH solution is heated with zinc granules.

	b. Excess of carbon dioxide is passed through lime water. c. Dilute sulphuric acid is added to sodium carbonate. d. Egg shell is dropped in hydrochloric acid, e. Copper (II) oxide reacts with dilute hydrochloric acid.
8.	Write balanced chemical equations for the following reactions: a. Hydrogen sulphide gas burns in air to give water and sulphur dioxide. b. Barium chloride reacts with zinc sulphate to give zinc chloride and barium sulphate. c. Natural gas bums in air to form carbon dioxide and water.
9.	An aqueous solution of metal nitrate 'P' reacts with sodium bromide solution to form yellow precipitate 'Q' which is used in photography. 'Q' on exposure to sunlight undergoes decomposition to form metal present along with a reddish brown gas. Identify 'P' and 'Q' write the balanced chemical equation for the chemical reaction.
10.	Write chemical equations for the reactions taking place when a. Iron reacts with steam b. Magnesium reacts with dil. HCl c. Copper is heated in air
11.	Write the balanced chemical equations for the following chemical reactions: a. Hydrogen + Chlorine $\longrightarrow$ Hydrogen Chloride b. Lead + Copper Chloride $\longrightarrow$ Lead chloride + Copper c. Zinc oxide + Carbon $\longrightarrow$ Zinc + Carbon Monoxide
12.	Write the balanced chemical equation for the following reactions: (i) Natural gas burns in air to form carbon dioxide and water. (ii) During respiration, glucose combines with oxygen and forms carbon dioxide and water along with the release of energy.
13.	What happens when an aqueous solution of sodium sulphate reacts with an aqueous solution of barium chloride? State the physical conditions of reactants in which the reaction between them will not take place. Write the balanced chemical equation for the reaction.

14.	Translate the following statements into chemical equations and then balance them: a. Hydrogen gas combines with nitrogen to form ammonia. b. Hydrogen sulphide gas burns in air to give water and sulphur dioxide. c. Barium chloride reacts with aluminium sulphate to give aluminium chloride and a precipitate of barium sulphate. State the two types in which this reaction can be classified. d. Potassium reacts with water to give potassium hydroxide and hydrogen gas.
15.	Write balanced equation for the reaction between Mg and hydrochloric acid.
16.	Translate the following statement into chemical equation and then balance it. "A metal in the form of ribbon burns with a dazzling white flame and changes into white powder."
17.	Write balanced chemical equations for the following reactions: a. Silver bromide on exposure to sunlight decomposes into silver and bromine. b. Sodium metal reacts with water to form sodium hydroxide and hydrogen gas.
18.	Balance the following chemical equation: $Pb(NO_3)_2 \longrightarrow PbO + NO_2 + O_2$
19.	Write a balanced chemical equation for the reaction between sodium chloride and silver nitrate indicating the physical state of the reactants and the products.
20.	Write a balanced chemical equation to represent the following reaction: carbon monoxide reacts with hydrogen gas at 340 atm to form methyl alcohol.
21.	Write the balanced equation for the following chemical reactions: (i) Hydrogen + Chlorine → Hydrogen Chloride (ii) Barium Chloride + Aluminium Sulphate → Barium Sulphate + Aluminium Chlorie (iii) Sodium + Water → Sodium Hydrogen + Hydrogen
22.	Write balanced chemical equation with state symbols for the following reaction: (i) Solution of barium chloride and sodium sulphate in water react to give insoluble barium sulphate and the solution of sodium chloride. (ii) Sodium hydroxide solution (in water) reacts with hydrochloric aid solution (in water) to produce sodium chloride solution and water.
23.	White the balanced reactions for the following (i) Potassium Bromide (aq) + Barium iodide (aq) → Potassium iodide (aq) + Barium Bromide(aq) (ii) Zinc carbonate (s) →Zinc oxide (s) + carbon dioxide (g) (iii) Hydrogen (g) + chlorine (g) →Hydrogen chloride
24.	Balance the following chemical equation and identify the type of reaction they represent $KClO_3 \longrightarrow KCl + O_2$ $NH_3 + O_2 \longrightarrow NO + H_2O$ $Na_2O + H_2O \longrightarrow NaOH$ $Na + H_2O \longrightarrow NaOH + H_2$ $FeCl_3 + NaOH \longrightarrow Fe(OH)_3 + NaCl.$