

DAYAWATI MODI ACADEMY
MODIPURAM, MEERUT
CLASS - X
REVISION NOTES – CHEMISTRY
ACIDS BASES AND SALTS
NOTES

Their definitions in term of furnishing of H⁺ and OH⁻ ions, General properties, examples and uses, Concept of pH scale (Definition relating to logarithm not required), Importance of pH in everyday life; Preparation and uses of Sodium hydroxide, Bleaching powder, Washing soda and Plaster of Paris.

Facts that Matter

Acids : Acids are sour in taste, turn blue litmus to red, dissolve in water to release H⁺ ions.

E.g., vinegar, hydrochloric acid and sulphuric acid.

- Reaction with Metal

Acid + Metal → Salt + Hydrogen gas

e.g., $2\text{HCl} + \text{Zn} \rightarrow \text{ZnCl}_2 + \text{H}_2$

- Reaction with Metal carbonate

Acid + Metal carbonate → Salt + CO₂ + H₂O

e.g., $2\text{HCl} + \text{Na}_2\text{CO}_3 \rightarrow 2\text{NaCl} + \text{CO}_2 + \text{H}_2\text{O}$

- Reaction with Metal hydrogen carbonate

Acid + Metal hydrogen carbonate → Salt + CO₂ + H₂O

e.g. $\text{HCl} + \text{NaHCO}_3 \rightarrow \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$

- Reaction with Metallic oxide

Acid + Metal oxide → Salt + Water

e.g. $2\text{HCl} + \text{CuO} \rightarrow \text{CuCl}_2 + \text{H}_2\text{O}$

- Acids in water:

Acids produce H⁺ ions when dissolved in water. H⁺ ions cannot exist alone. They combine with water molecule (H₂O) to form H₃O⁺ (hydronium ions). It conducts electricity.

- Decrease in H_3O^+ ions concentration per unit volume results in formation of dilute acids.

- It is a highly exothermic reaction.

Acids when dissolved in water release large amount of heat. If water is added to concentrated acid then the heat generated may cause the mixture to splash out and cause burns. Hence to avoid burns acid must be added drop wise into water with constant stirring. So that the heat generated spreads over in water.

strong acids \rightarrow release more H^+ ions \rightarrow HCl

weak acids \rightarrow releases less number of H^+ ions \rightarrow acetic acid

strong base \rightarrow give more OH^- ions \rightarrow NaOH

weak base \rightarrow gives less OH^- ions \rightarrow CH_3COOH

Bases: Bases are bitter in taste, turns red litmus to blue and when dissolved in water releases OH^- ions;

e.g., NaOH and KOH.

- Reaction with metal



e.g., $2NaOH + Zn \rightarrow Na_2ZnO_2 + H_2$

This reaction is possible only with reactive metals like sodium and potassium.

- Reaction with non-metallic oxide



Bases in water \rightarrow Bases produce OH^- ions when dissolved in water. Bases soluble in water are called alkalis. It conducts electricity.

- Decrease in OH^- ions single concentration per unit volume results in formation of dilute bases.

- It is a exothermic reaction.

To make basic solution, base must be added drop wise into water with constant stirring, so that the heat generated spreads over in water.

Indicators: Indicators are those substances which tell us whether a substance is acidic or basic by change in colour. For e.g., litmus solution.

- Olfactory indicators: Those substances whose odour changes in acidic or basic media are called lfactory indicators. For e.g., clove, vanilla, onion.

- Natural indicators: Turmeric, litmus (obtained from lichen)

- Synthetic indicators: Methyl orange, phenolphthalein.

Indicator	Acids	Bases
1. Red litmus	remains red	turns blue
2. Blue litmus	turns red	remains blue
3. Phenolphthalein	colourless	pink
4. Methyl orange	red	yellow

CHEMICAL REACTIONS AND EQUATIONS

CHAPTER1

NOTES

1. Chemical reactions- The transformation of chemical substance into a new chemical substance by making and breaking of bonds between different atoms is known as Chemical Reaction.

2. Signs of a chemical reaction- These factors denote that a chemical reaction has taken place- change of state of substance, change of color of substance, evolution of heat, absorption of heat, evolution of gas and evolution of light.

3. Chemical Equation: The representation of chemical reaction by means of symbols of substances in the form of formulae is called chemical equation. E.g. - $H_2 + O_2 \Rightarrow H_2O$

4. Balanced Chemical Equation: A balanced chemical equation has number atoms of each element equal on both left and right sides of the reaction.

*Note- According to Law of Conservation of Mass, mass can neither be created nor destroyed in a chemical reaction. To obey this law, the total mass of elements present in reactants must be equal to the total mass of elements present in products.

5. Types of Chemical Reactions-

I. Combination- When two elements or one element and one compound or two compounds combine to give one single product.

II. Decomposition- Splitting of a compound into two or more simple products.

III. Displacement- It takes place when a more reactive metal displaces a less reactive metal.

IV. Double displacement- Reactions in which ions are exchanged between two reactants forming new compounds are called double displacement reactions.

V. Precipitation- The insoluble compound called precipitate forms in this reaction.

VI. Exothermic- Reactions which produce energy are called exothermic reaction. Most of the decomposition reactions are exothermic.

VII. Endothermic- Reactions which absorb energy are called endothermic reaction. Most of the combination reactions are endothermic.

VIII. Oxidation: Gain of oxygen or removal of hydrogen or metallic element from a compound is known as oxidation.

IX. Reduction: Addition of hydrogen or removal of oxygen from a compound is called reduction.

X. Redox- A chemical reactions where oxidation and reduction both take place simultaneously are also known as redox reaction.



6. Rusting- When iron reacts with oxygen and moisture forms a red substance called rust.

7. Rancidity- Oils and fats when get oxidized on exposure to air show a change in taste and smell.

8. Corrosion- Metals when attacked by oxygen, water, acids, gases, present in air changes its surface which is called corrosion.