Class 10 Acids, Bases, and Salts Notes

Chapter Outline

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2. Bases and Their Properties

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4. Salts and Their Preparation

5. Importance of pH in Daily Life

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Acids and Their Properties

Definition: Acids are substances that release hydrogen ions (H+) in water, giving solutions a sour taste.

Properties of Acids:

- Sour in taste.
- Turn blue litmus red.
- Conduct electricity in aqueous solutions.
- React with metals to release hydrogen gas.
- React with bases to form salt and water.

Types of Acids:

- Strong Acids: HCl, H_2SO_4, HNO_3 (completely ionize in water).
- Weak Acids: CH_3COOH (partially ionize in water).

Examples of Acids in Daily Life:

- Citrus fruits (lemon, orange) contain citric acid.
- Vinegar contains acetic acid.

Bases and Their Properties

Definition: Bases are substances that release hydroxide ions (OH-) in water and feel slippery.

Properties of Bases:

- Bitter in taste.
- Turn red litmus blue.
- Slippery to touch.
- React with acids to form salt and water.

Types of Bases:

- Strong Bases: NaOH, KOH (completely ionize in water).

- Weak Bases: NH4OH (partially ionize in water).

Examples of Bases in Daily Life:

- Soap and detergents contain basic substances.

- Baking soda (sodium bicarbonate) is a mild base.

pH Scale and Universal Indicator

pH Scale: Measures the acidity or basicity of a solution, ranging from 0 to 14.

- Acidic Solutions: pH < 7

- Neutral Solutions: pH = 7

- Basic Solutions: pH > 7

Universal Indicator: A mixture of indicators that shows different colors at different pH levels, used to determ

Salts and Their Preparation

Definition: Salts are formed when acids react with bases, metal oxides, or metal carbonates, resulting in a

Types of Salts:

- Neutral Salts: NaCl (formed from strong acid + strong base)

- Acidic Salts: NH4Cl (formed from strong acid + weak base)

- Basic Salts: CH3COONa (formed from weak acid + strong base)

Methods of Salt Preparation:

1. Neutralization Reaction: Acid + Base -> Salt + Water

2. Reaction with Metal: Acid + Metal -> Salt + Hydrogen gas

3. Reaction with Carbonate/Bicarbonate: Acid + Carbonate -> Salt + CO2 + H2O

Importance of pH in Daily Life

- Human Body: Blood pH around 7.4, critical for body functions.

- Plants: Soil pH affects crop growth.

- Stomach: Gastric juice has a pH of around 1.2, aiding digestion.

- Tooth Decay: Bacteria produce acids, lowering mouth pH; brushing helps maintain pH.

Common Salt and Its Compounds

Common Salt (NaCl): Essential in daily life, used in food and as a raw material for various chemicals.

Compounds of Common Salt:

1. Sodium Hydroxide (NaOH): Used in soaps and detergents.

2. Bleaching Powder (CaOCl2): Used for disinfection and bleaching.

3. Baking Soda (NaHCO3): Used in baking as a leavening agent.

4. Washing Soda (Na2CO3.10H2O): Used in laundry and cleaning.

Water of Crystallization

Definition: Water molecules that are chemically bound within crystals of salts.

Example: Copper Sulfate ($CuSO_4 \cdot 5H_2O$) contains 5 molecules of water of crystallization, giving it a blue co

Heating Effect: Heating hydrated salts removes the water of crystallization, changing their color and form.