

Acid, Base and Salt

These notes are your ultimate revision weapon to revise Acid, Base and Salt. We've distilled years of previous exam questions (PYQs) into one powerful, concise resource. Everything you need to know, nothing you don't.

- **PYQs, Decoded:** All key concepts from past exams, organized and simplified.
- **Revise in Record Time:** Short, precise, and designed for last-minute review.
- **Focus on What Matters:** Master high-probability topics and boost your confidence.

Acids, Bases, and Salts

Definitions and Nature



- **Antacids** are bases that neutralise excess acid in the stomach.
- A solution that turns **red litmus paper blue** is **basic**.
- **Soda water** (water with dissolved CO_2) is **acidic** in nature.
- **Ammonia gas (NH_3)** is basic, dissolves quickly in water, and produces white fumes with hydrogen chloride.
- **Salts and Hydrolysis:** A salt, like **copper sulphate**, forms an **acidic aqueous solution** due to **hydrolysis**.

pH Scale and Concentration

- The **pH value** is a numeric value that indicates the acidic or basic nature of a solution.
- A **pH of 7** indicates a **neutral solution** (e.g., pure water).
- An **acidic solution** has a **pH value less than 7** (e.g., 6 or 5).
- A **basic solution** has a **pH value greater than 7** (e.g., 8 or 9).

- **Concentration Change:** When pH increases from 3 to 6, the H^+ ion concentration decreases by **1000 times** (each pH unit represents a 10-fold change).

Types of Acids

- **Lewis Acids** are electron-pair acceptors (e.g., $AlCl_3$, BF_3 , $FeCl_3$).
- **Ammonia (NH_3) is not a Lewis acid;** it is a Lewis base.
- **Classification by Composition:**
 - **Oxyacids** contain oxygen (e.g., Nitric Acid - HNO_3 , Sulphuric Acid - H_2SO_4).
 - **Hydracids** do not contain oxygen (e.g., Hydrochloric Acid - HCl).

Important Acids and Their Uses

- **Sulphuric Acid (H_2SO_4)** is considered a **basic chemical in industry**.
- **Aqua regia**, a mixture of **nitric acid and hydrochloric acid**, is used to dissolve gold.
- **Safety Precaution:** Concentrated sulphuric acid must be diluted by **adding acid to water** (not water to acid) because the reaction is highly exothermic.

Common Chemical Compounds

Common Names and Chemical Identities

- **Bleaching Powder:** Calcium oxychloride.
- **Baking Soda:** Sodium bicarbonate ($NaHCO_3$).
- **Washing Soda:** Sodium carbonate (Na_2CO_3).
- **Plaster of Paris:** Calcium sulphate hemihydrate.
- **Blue Vitriol / Neela Thotha:** Copper Sulphate ($CuSO_4$).
- **Caustic Soda:** Sodium Hydroxide ($NaOH$).
- **Hypo** (used in photography): Sodium Thiosulphate.
- **Epsom Salt:** Magnesium Sulphate ($MgSO_4$).

Properties and Specific Uses

- **Bleaching Powder (Calcium Oxychloride):**
 - It is an **oxidising agent (oxidant)**.
 - It reacts with dilute acids to **release chlorine gas**.
 - **Untrue Statements:** It is **not** highly soluble in water (only partially soluble). Its colour is white or pale yellow, not a distinct light yellow.
- **Copper Sulphate (CuSO₄):**
 - Used for **destroying fungi in water tanks**.
- **Baking Soda (Sodium Bicarbonate, NaHCO₃):**
 - Used in **fire extinguishers**.
- **Sodium Thiosulphate (Hypo):**
 - Used in photography as a "**fixer**" to dissolve unexposed silver bromide.
 - Also used as an **antichlor** (removes excess chlorine).

Chemical Processes and Applications



Chemical Tests and Reactions

- **Gas Identification: Carbon Dioxide (CO₂)** gas turns limewater milky.
- **Eno Salt Reaction:** When poured into water, the bubbles formed are due to **Carbon Dioxide (CO₂)** gas.
- **Ionic Compounds:**
 - Generally **insoluble in alcohol**.
 - In the solid state, they are **poor conductors of electricity** (they conduct only in molten or aqueous solution state).

Salt Formation and Setting

- **Table Salt:** Sodium Chloride (NaCl) is a product of a strong acid (HCl) and a strong base (NaOH).
- **Cements and Settling:**
 - The presence of **NaCl increases the rate of setting** of Plaster of Paris.

- **Gypsum** is added to cement to **slow down its rate of setting**.

Industrial and Household Applications

- **Food and Agriculture:**
 - **Ethylene** is used for the **artificial ripening of fruits**.
 - **Carbon Dioxide** is used in **soft drinks**.
- **Pottery and Glass:**
 - **Zinc oxide** is used in glazing pottery.
 - **Cobalt oxide** imparts a deep blue colour to glass.
- **Photography:**
 - The useful element is **Silver Bromide** (coated on photographic plates).

Environmental Chemistry

Acid Rain

- The main components of acid rain are **Nitric Acid (HNO_3)** and **Sulphuric Acid (H_2SO_4)**.
- **Sulphuric Acid (H_2SO_4)** is present in the **maximum amount** in acid rain.

Minerals and Composition

Silicates

- **Quartz** crystals are made of **Silicon Dioxide (SiO_2)**.
- **Sodium Silicate** is a related compound.

Alkaline Earth Metals

- All alkaline earth metals form **hydrated salts**.
- **Barium and Strontium** are **not found free in nature** (always found in compounds).

Table Salt (Iodisation)

- **Iodised salt** contains **Potassium Iodide (KI)** to provide iodine.
- Common forms of salt include sea salt, rock salt, and processed common salt. (The data implies one should not be used as table salt, but the specific answer is not provided in the excerpts).
- The predominant salt in the ocean is **Sodium Chloride**.

Know More About Acid, Base and Salt:

- [Acid, Base and Salt – Old Year Questions](#)
- [Acid, Base and Salt One Liner Questions & Answers](#)

