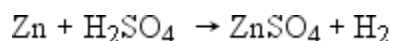


Acids, Bases and Salts

- **Acid:** Turns blue litmus colour to red
- **Base:** Turns red litmus colour to blue
- Bases which are soluble in water are called alkalis. Example KOH, Mg(OH)₂
- Turmeric is a natural indicator
- **Reaction of acid with metals**
- In most cases, metals replace hydrogen from acids.

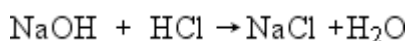


- **Metal oxide + Acid**
- Metal oxide + Acid → Salt + Water
- **Reaction of base with metals**
- $2\text{NaOH} + \text{Zn} \rightarrow \text{Na}_2\text{ZnO}_2$ (sodium zincate) + H₂

- **Acids with metal carbonate and hydrogen carbonate**
- Carbonate + Acid → Salt + Water + CO₂
- $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$
- Further on passing the carbon dioxide gas evolved through lime water.
- $\text{Ca(OH)}_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$

- **Acid - Base reaction**

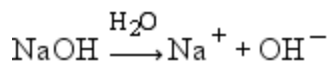
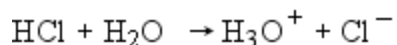
Acid + Base → Salt + Water



- **In water solution**

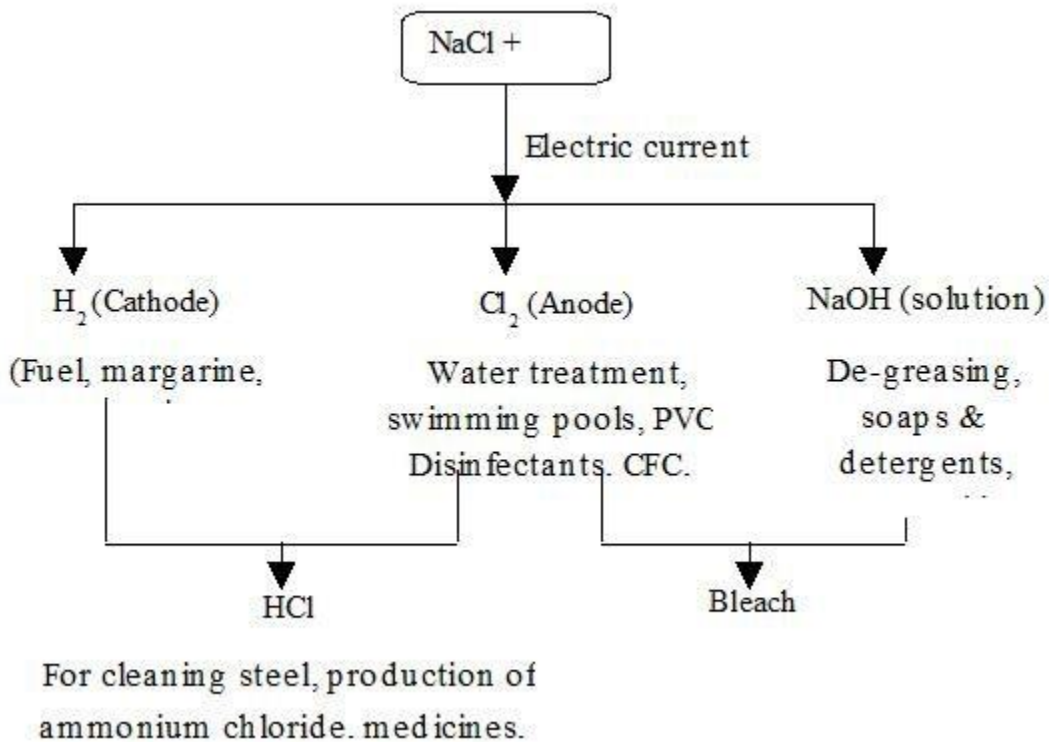
Acid → H⁺ ion ; H⁺ + H₂O → H₃O⁺

Base → OH⁻ ion

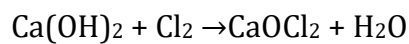


- Higher H⁺ concentration → Strong acid
- Lower H⁺ concentration → Weak acid
- Higher the OH⁻ concentration → Stronger the base
- **pH Measure**
- pH → Measure of acidity → Measure H⁺ concentration on the scale (0 - 14)

- pH 7 → Neutral solution
- pH < 7 → Acidic solution
- pH > 7 → Basic solution
- **Salts' pH = 7**
- Human body pH = 7.0 – 7.8
- Change in pH in body causes → Tooth decay, stomach pain, burning pain (Honey bee sting)
- Plants and animals are sensitive to pH change
- Self defence by animals and plants through chemical warfare
- **Common salt** → NaCl



- **Bleaching powder** → CaOCl₂
- **Preparation-**



- **Use -**

Bleaching of {

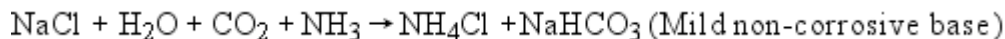
- cotton in textile industry
- wood pulp
- Clothes in laundry

Oxidising agent

Disinfecting material

Baking soda – (NaHCO₃) Sodium hydrogen carbonate

- **Preparation** –



- **Use** –

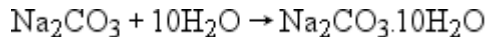
Making baking powder (Baking soda + Mild acid, like tartaric acid)

Ingredient for antacids

Soda-acid fire extinguisher

Washing soda – Na₂CO₃. 10H₂O

- **Preparation**–



- **Use** –In glass, soap, paper industries

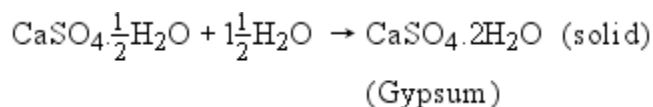
Making sodium compounds such as borax

As domestic cleaning agent

- **Removing permanent hardness of water**

- **Water of crystallisation** : It refers to a fixed number of water molecules present in one formula unit of salt.

- **Example** - In gypsum, the water of crystallisation is 2.



- **Hydrated substances**: Substances containing water of crystallisation for example, hydrated copper sulphate (CuSO₄.5H₂O).
- **Anhydrous substances**: Substances either not containing water of crystallisation or from which water of crystallisation is removed, for example, sodium chloride (NaCl) and anhydrous copper sulphate (CuSO₄).
- **Drying agents**: Substances that absorb moisture without undergoing a chemical reaction, for example, anhydrous calcium chloride (CaCl₂).
- **Dehydrating agents**: Substances that remove chemically bonded water from a compound, for example, concentrated sulphuric acid (H₂SO₄).