

# Acids, Bases and Salts

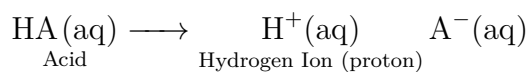
## Acids

Acids furnish  $\text{H}^+$  ions or  $\text{H}_3\text{O}^+$  ions when dissolved in water. Acids have one or more replaceable H atoms

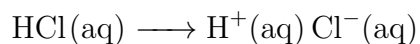
### Arrhenius Concept of Acids

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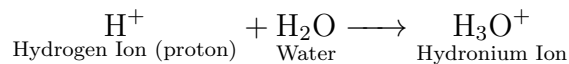
Acid is capable of producing hydrogen ion  $\text{H}^+$  by dissociating in aqueous solution. This reaction can be represented by



For example: Hydrochloric Acid (HCl)

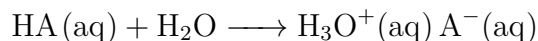


The proton or hydrogen ion binds itself to a water molecule to form a **hydronium ion** ( $\text{H}_3\text{O}^+$ )



The **hydronium ion** is also known as **oxonium ion** or **hydroxonium ion**.

The first equation can be rewritten as



**Note:**  $\text{H}^+$  ions are protons.

- Acids generally have sour taste.
- Acids change Blue litmus Red.
- They are colorless with **phenolphthalein** and pink with **methyl orange**.
- Acids show acidic nature in their aqueous form.

### Classification of Acids

- **Based on Source:**
  - **Organic Acids** are present in plants and animals (living beings).  
Eg:  $\text{HCOOH}$  (Formic Acid),  $\text{CH}_3\text{COOH}$  (Acetic Acid)

- **Inorganic Acids** are found from rocks and minerals.

Eg: HCl (Hydrochloric Acid), HNO<sub>3</sub> (Nitric Acid), H<sub>2</sub>SO<sub>4</sub> (Sulphuric Acid)

- **Based on their Basicity**

Basicity = The number of H atoms replaceable by a base in a particular acid.

- **Monabasic Acid** gives one H<sup>+</sup> ion per molecule of the acid in solution.

Eg: HCl, HNO<sub>3</sub>

- **Dibasic Acid** gives two H<sup>+</sup> ions per molecule of the acid in the solution.

Eg: H<sub>2</sub>SO<sub>4</sub>, H<sub>2</sub>CO<sub>3</sub>

- **Tribasic Acid** gives three H<sup>+</sup> ions per molecule of the acid in the solution.

Eg: H<sub>3</sub>PO<sub>4</sub>

- **Based on Ionisation**

- **Strong Acids** ionise completely in water.

Eg: HCl

- **Weak Acids** ionise partially in water.

Eg: CH<sub>3</sub>COOH

- **Based on Concentration**

- **Concentrated Acid** has a relatively high percentage of acid in its aqueous solution.

- **Dilute Acid** has a relatively low percentage of acid in its aqueous solution.