

CH-2 Acids Bases & Salts

❖ Imp Key-Points -1

- Acids are the chemical compounds which turn the blue litmus to red, e.g., HCl, H₂SO₄, HNO₃ (Nitric Acid), CH₃COOH (Ethanoic/ acetic Acid commonly found in Vinegar).
- Bases are the chemical compounds which turn the red litmus to blue, e.g., NaOH, KOH, Ca (OH)₂.
- Physical properties of acids and bases. (Note: *It is not comparison or difference*).

Acid	Base
<ul style="list-style-type: none">• Acids are sour in taste.• All acids are soluble in water.• Dil. Sol. of acids conduct electricity.• Turn blue litmus to red.• Corrosive in Nature	<ul style="list-style-type: none">• Bases are bitter in taste.• Water soluble bases are called Alkalis.• Dil. Sol. of bases(alkalis) conduct electricity.• Turn red litmus to blue.• Water soluble base (Alkalis) are corrosive in nature.

- Indicators are the chemical substances that indicate the presence of other substance by changing their colour or smell/odour.
- Indicator that indicates by changing in colour are termed as Chroma indicators, and indicates by changing in smell are the as Olfactory indicators.
- Indicator are of two types i.e., Natural and Artificial.
- More about few commonly known indicators;

Natural Indicator	Artificial Indicators
Litmus: litmus is a purple colour sol. that obtained from Lichen plant. Acid – Turn purple sol. to Red. Base – Turn purple sol. to Blue.	Methyl Orange: As the name suggests it is orange in colour. Turns into pinkish red with acid. Turns to yellow with bases.
Turmeric (Haldi): A Yellow colour ingredient found in kitchen. Base + Turmeric → deep pinkish-red or brown colour Acid + Turmeric → No Change	Phenolphthalein: A colourless chemical substance. Remains colourless with Acid. Change to pink with Bases. Note: Phenolphthalein cannot be used to test salts and acids simultaneously as it does not change its colour.
Onion: No change in smell with Acids. Change in smell when juice or paste is added to base.	
Vanilla: Smell vanishes with bases. No change in smell with acid.	

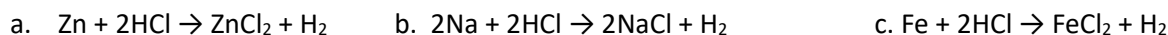
- Various reaction of acids and bases.

1. Reaction of Acids & Bases with Metal

➤ Reaction with Acid

Acid + Metal → Salt + H₂(g) which is a displacement reaction where high reactive metal displaces the hydrogen.

Examples;



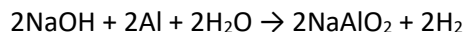
Note: All acids react with metal, but not all metal reacts with acids such as Copper (to some extent), Gold, Silver, Platinum because these are less reactive than Hydrogen.

➤ **Reaction with Bases**

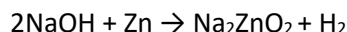


Examples:

- ♦ Sodium aluminate and hydrogen gas are formed when sodium hydroxide reacts with aluminium metal.

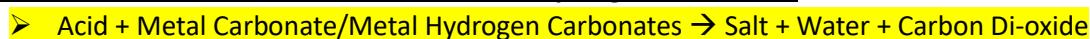


- ♦ Sodium hydroxide gives hydrogen gas and sodium zincate when reacts with zinc metal.

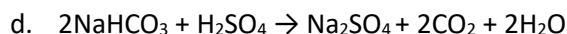
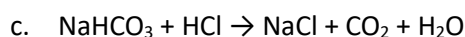
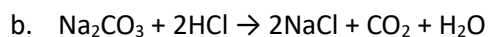
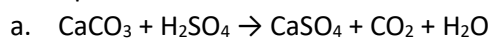


Note: *Only water-soluble bases i.e., Alkalis reacts with metal.*

2. Reaction of Acid with Metal Carbonates/Metal Hydrogen Carbonates



Examples:



Note: Sodium bicarbonate (NaHCO_3) is also known as sodium hydrogen carbonate, baking soda, baking powder, bread soda and bicarbonate of soda.

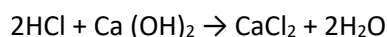
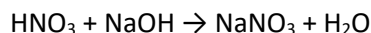
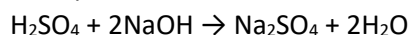
Note: Marble and Egg shell are made of calcium carbonate, hence when acid is poured over marble or egg shell, bubbles of carbon dioxide are formed.

Note: Bases + Metal Carbonates/Metal Hydrogen Carbonates \rightarrow NO REACTION

3. Reaction of Acid and Base

- **Acid + Base \rightarrow Salt + Water**, this reaction is also known as Neutralisation reaction as both acid and base neutralise each other.

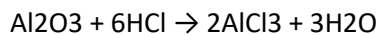
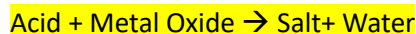
Examples:



Note: *When a strong acid and weak base reacts it forms acidic salt & water, similarly when a weak acid reacts with strong base it forms a basic salt and water.*

4. Reaction of Metal Oxides with Acid

- Metal oxides are basic in Nature. Therefore



$2\text{HCl} + \text{CaO} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O}$ Here Calcium Oxide (CaO) is metallic oxide react with HCl and forms CaCl_2 (Salt).

5. Reaction of Non-Metallic Oxide With Base

- Non-metallic oxides are acidic On Nature. Therefore

