



NCERT – GRADE 10 CHEAT SHEET ACIDS, BASES AND SALTS

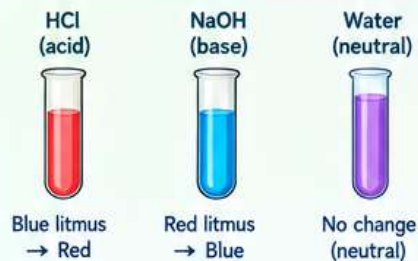
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Part A – Understanding the Chemical Properties of Acids and Bases

Acids and Bases in the Laboratory

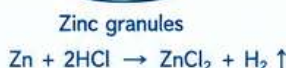
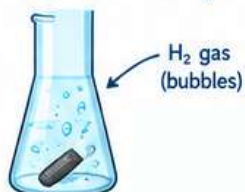
- Acids turn blue litmus red.
- Bases turn red litmus blue.
- Indicators help us identify acids and bases.



Common indicators: Litmus, methyl orange, phenolphthalein.

How do Acids and Bases React with Metals?

- Dilute acids react with metals to form a salt and hydrogen gas.
- Example: $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2 \uparrow$



Result: Hydrogen gas is evolved and a salt is formed.

How do Metal Carbonates and Metal Hydrogencarbonates React with Acids?

- They produce a salt, water and carbon dioxide gas.
- Example: $\text{CaCO}_3 + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2 \uparrow$
 $\text{NaHCO}_3 + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O} + \text{CO}_2 \uparrow$



Gas evolved:
CO₂
(turned limewater milky)

How do Acids and Bases React with each other?

- Acid + Base → Salt + Water (Neutralisation)
- Example: $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$



Result: The solution becomes neutral (pH 7).

Reaction of Metallic Oxides with Acids

- Metallic oxides react with acids to form a salt and water.
- Example: $\text{CuO} + 2\text{HCl} \rightarrow \text{CuCl}_2 + \text{H}_2\text{O}$



Result: Salt and water are formed.

Reaction of a Non-metallic Oxide with Base

- Non-metallic oxides react with bases to form a salt and water.
- Example: $\text{CO}_2 + 2\text{NaOH} \rightarrow \text{Na}_2\text{CO}_3 + \text{H}_2\text{O}$

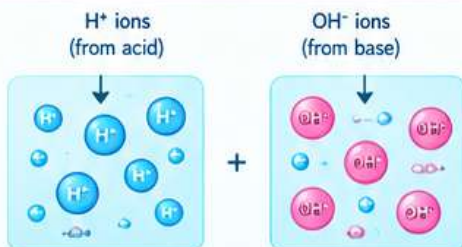
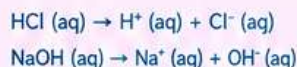


Result: Salt and water are formed.

What Happens to an Acid or a Base in a Water Solution?

- Acids ionise to give H⁺ ions.
- Bases ionise to give OH⁻ ions.

Examples:



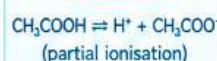
How Strong are Acids or Bases Solutions?

- Strength depends on the extent of ionisation in water.
- Strong acids/bases ionise completely.
- Weak acids/bases ionise partially.

Strong Acid (e.g., HCl)



Weak Acid (e.g., CH₃COOH)



The concentration of H⁺ or OH⁻ ions in a solution determines its strength.

Quick Facts

- ✓ Litmus: blue → red (acid), red → blue (base).
- ✓ Phenolphthalein: colourless → pink (base).
- ✓ Methyl orange: red → yellow (base).
- ✓ Acids & bases conduct electricity (in solution).
- ✓ Acids react with metals, carbonates, metal hydrogencarbonates, metal oxides.

Common Mistakes

- ✗ Thinking all oxides are acidic or basic.
- ✗ Confusing metallic with non-metallic oxides.
- ✗ Assuming all acids/bases are strong.
- ✗ Forgetting that neutralisation forms salt and water.

★ KEY TAKEAWAY

- ✓ Acids release H⁺ ions in water.
- ✓ Bases release OH⁻ ions in water.
- ✓ They react with metals, carbonates, oxides and each other.
- ✓ Indicators help identify them.
- ✓ Strength depends on the degree of ionisation.



Acids and bases may be different in nature, but they always bring balance through neutralisation!



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Small changes in pH...
make a big difference!

