Acids

Acids are defined as the one which produces hydrogen ions(H^+) in water.

Example: Sulphuric Acid(H_2SO_4), Hydrochloric Acid (HCl) etc.

Properties of Acids

- The term 'acid' has been derived from the Latin word, 'acidus' which means sour.
- Acids have sour taste.
- They turn blue litmus solution red.
- They give H+ ions in aqeous solutions.

Bases

Bases are the one that produces hydroxide (OH^-) ions in aqueous solutions.

Example: Sodium hydroxide (NaOH), Ammonium hydroxide (NH_4OH)

Properties of Bases

- These are the substances which are bitter in taste and soapy in touch.
- They turn red litmus solution blue.
- They give OH- ions in aqueous solution.

Indicators:

Indicators are substances which indicate the acidic or basic nature of the solution by the colour change.

Types of Indicator: There are many types of indicators. Some common types of indicators are:

1. Natural Indicators: Indicators obtained from natural sources are called Natural Indicators. Litmus, turmeric, red cabbage, China rose, etc., are some common natural indicators used widely to show the acidic or basic character of substances.

Litmus: Litmus is obtained from lichens. The solution of litmus is purple in colour. Litmus paper comes in two colours- blue and red.

An acid turns blue litmus paper red.

A base turns red litmus paper blue.

2. Olfactory Indicator: Substances which change their smell when mixed with acid or base are known as Olfactory Indicators. For example; Onion, vanilla etc.

Onion: Paste or juice of onion loses its smell when added with base. It does not change its smell with acid.

Vanilla: The smell of vanilla vanishes with base, but its smell does not vanish with an acid.

Olfactory Indicators are used to ensure the participation of visually impaired students in the laboratory.

3. Synthetic Indicator: Indicators that are synthesized in the laboratory are known as Synthetic Indicators. For example; Phenolphthalein, methyl orange, etc.

Left Page: Activity-1: "Colour Quest: The Indicator Adventure"

Aim: To differentiate acids and bases by the colour change with indicator

Observation:

Indicator	Original Colour	Acid	Base
Red litmus	Red	No Change	Blue
Blue litmus	Blue	Red	No change
Turmeric	Yellow	No Change	Reddish brown
Red cabbage juice	Purple	Reddish	Greenish yellow
Phenolphthalein	Colourless	Colourless	Pink

Methyl Orange	Orange	Red	Yellow
Onion	n/a	No change	Smell vanishes
Vanilla	n/a	No change	Smell vanishes

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Types of Acids:

Acids are divided into two types on the basis of their occurrence i.e., Natural acids and Mineral acids.

(i) Natural Acids: Acids which are obtained from natural sources are called Natural Acids or Organic Acids.

(ii) **Mineral Acids:** Acids that are prepared from minerals are known as Mineral Acids Example; Inorganic acids, man-made acids or synthetic acid are also known as Mineral Acids.
Example:
Hydrochloric acid (HCl)
Sulphuric acid (H_2SO_4)
Nitric acid (HNO_3)
Carbonic acid (H_2CO_3)
Phosphoric acid (H_3PO_4) etc.

Investigatory Project:(left)

To investigate the presence of natural acids in various natural resources .