



1) Acids

Acids are chemicals that dissolve in water to give **hydrogen ions (H⁺)**.



Acids usually taste sour e.g. lemon juice (citric acid) and vinegar (ethanoic acid). These are both weak acids.

Examples of strong acids include hydrochloric acid, sulfuric acid and nitric acid.



2) Bases

Bases are **substances that neutralise acids**. Many bases are insoluble (don't dissolve in water) such as metal oxides and metal carbonates.

Bases that are **soluble** in water (dissolve) are called **alkalis**. Alkalis are substances that dissolve in water to give **hydroxide ions (OH⁻)**.



Bases usually taste bitter e.g. baking powder. When alkalis get on your skin they feel soapy.



Strong bases, such as sodium hydroxide and ammonia, are found in household cleaning products.

3) Hazard Symbols

Dilute acids and alkalis are moderate hazards – they can irritate your skin.



Concentrated acids and alkalis are corrosive – they can destroy skin and surfaces.

4) Indicators

Indicators are substances that **change colour** when added to acids or alkalis. A substance that is neither acidic or alkaline is **neutral**.



Examples of indicators:

- **Litmus paper** – turns red in acids and blue in alkalis

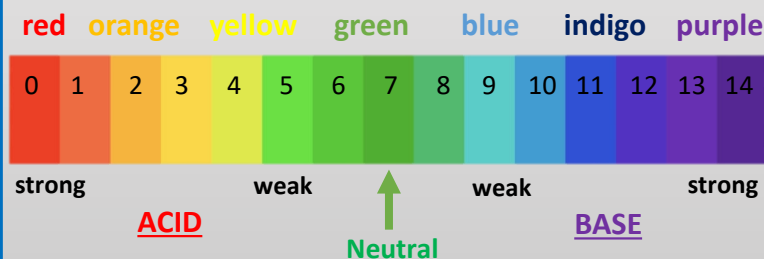


- **Universal indicator** – has many different colours and shows us how strong or weak the acid/alkali is.

5) The pH Scale

The **strength of an acid or a base** is measured using the pH scale which runs from **pH 0 – pH 14**.

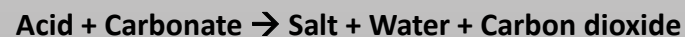
- **Acids** have a pH lower than 7
- **Neutral** substances have a pH of 7
- **Bases** have a pH higher than 7



6) Neutralisation

When a **base and acid** are **mixed together** they react and make a **neutral substance** called a **salt and water**.

The general equations are:



7) Naming Salts

Salts are named from the acid and the base they are made from.

- The first part of the name is the name of the metal inside the base (or just ammonia)
- The second part of the name is taken from the acid
 - **Hydrochloric acid** → **chloride**
 - **Nitric acid** → **nitrate**
 - **Sulfuric acid** → **sulfate**

8) Neutralisation Equations

Acid + Base → Salt + Water

hydrochloric acid + sodium hydroxide → sodium chloride + water

sulfuric acid + ammonia → ammonium sulfate + water

Acid + Carbonate → Salt + Water + Carbon dioxide

nitric acid + calcium carbonate → calcium nitrate + water + carbon dioxide

9) Indigestion Remedies

Indigestion is caused when there is **too much acid** made our stomach. Indigestion **remedies contain a base** to **neutralise the excess acid**.

E.g. Gaviscon, Rennies, Antacid tablets



Investigation Keywords:

- **Independent** variable – what you **change** e.g. type of indigestion remedy
- **Dependent** variable – what you **measure** e.g. number of spatulas of remedy needed
- **Control** variable – what you **keep the same** e.g. volume of acid, concentration of acid, mass of remedy on each spatula