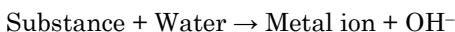
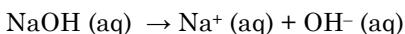


BASES

According Arrhenius theory any substance that can produce hydroxide ions when dissolved in water is called as a base.



Example:



A base is said to be an alkali if it is soluble in water. In general hydroxides of alkali metals and alkaline earthmetals are considered as alkalies.

Example:



It is not a necessary that a base should contain hydroxide ion.

There are some bases even they does not contain hydroxide ion, can be considered as bases.

Example: Ammonia (NH_3)

Ammonia when dissolved in water forms ammonium hydroxide which is a weak base.



Oxides of alkali metals and alkaline earthmetals are also considered as basic in nature.

Example: CaO , MgO , Na_2O , K_2O ...etc

Classification of bases:

Classification based on the strength:

Based on the extent of ionisation bases are classified into strong bases and weak bases.

Strong bases:

The bases which undergoes complete ionisation in aqueous solution are called as strong bases.

Example: NaOH , KOH ...etc

Weak bases:

The bases which undergoes partial ionisation in aqueous solution are called weak bases.

Example: NH_4OH , NH_3 ...etc

Classification of bases on acidity:

Based on acidity bases can be classified into different types. They are:

Mono acidic base

Di acidic base

Tri acidic base

Mono acidic bases:

Bases which produces only one hydroxide (OH^-) ion in aqueous solutions are called mono acidic bases.

Example: NaOH , KOH ...etc

Di acidic bases:

Bases which produces two hydroxide ions in aqueous solutions are called di acidic bases.

Example: Ca(OH)_2 , Mg(OH)_2 ...etc

Tri acidic bases:

Bases which produces three hydroxide ions in aqueous solutions are called tri acidic bases.

Example: Al(OH)_3 , Fe(OH)_3 ...etc

Physical properties of bases:

- Bases are bitter to taste, soapy to touch.
- Bases are good conductors of electricity in aqueous solution. In aqueous solution, they release ions, which conduct electricity.
- Bases liberates heat on dilution.

Indicators in presence of bases:

Bases turns red litmus to blue.

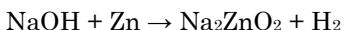
Phenolphthalein turns pink in presence of bases.

Methyl orange turns to yellow in presence of bases.

Chemical properties:**Reaction with active metals:**

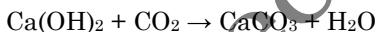
Bases react with metals to liberate hydrogen gas

Example: Sodium hydroxide react with zinc and liberate hydrogen and sodium zincate.

**Reaction with non-metal oxides:**

Bases react with non-metallic oxides to form salt and water. This is similar to a neutralization reaction between an acid and a base.

Example: Calcium hydroxide reacts with carbon dioxide to form calcium carbonate and water



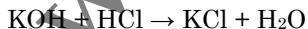
From this reaction, it can be concluded that non-metallic oxides are acidic in nature.

Reaction with acids:

Bases reacts with acids to form salts and water.

Example:

Potassium hydroxide reacts with hydrochloric acid to form potassium chloride and water.

**Uses of Bases:**

- Mild bases neutralise the acidity in the stomach.
- Sodium hydroxide is used in the manufacture of soaps, paper and synthetic fibres like rayon.
- Calcium hydroxide is used in the manufacture of bleaching powder. Bleaching powder is used as a disinfectant.
- Magnesium hydroxide is used as an antacid to neutralize the acid in the stomach.
- Ammonium hydroxide is used in the preparation of fertilizers like ammonium phosphate and ammonium sulphate.