

Acids, Alkali And Titration

- a) Atomic Structure
- b) Periodic Table
- c) Structure and Bonding
- d) Quantitative Chemistry
- e) Chemical Changes
- f) Energy Changes

- Reactivity of Metals
- Reactivity Series
- Extraction of Metals
- Acids and Bases
- Neutralization
- Making Soluble Salts
- Making Insoluble Salts
- Titration
- Electrolysis
- Electrolysis of molten compounds
- Electrolysis of aqueous solutions
- Electrolysis of Aluminium

ACIDS , BASES and ALKALI

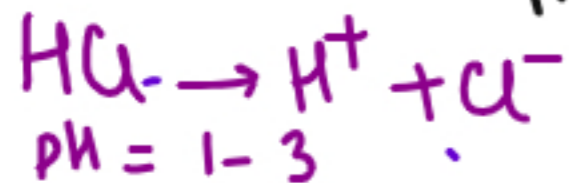
The substance which have pH less than 7

The substance which have pH greater than 7.

Strong Acids

They are completely dissociated in water to release H⁺ ions

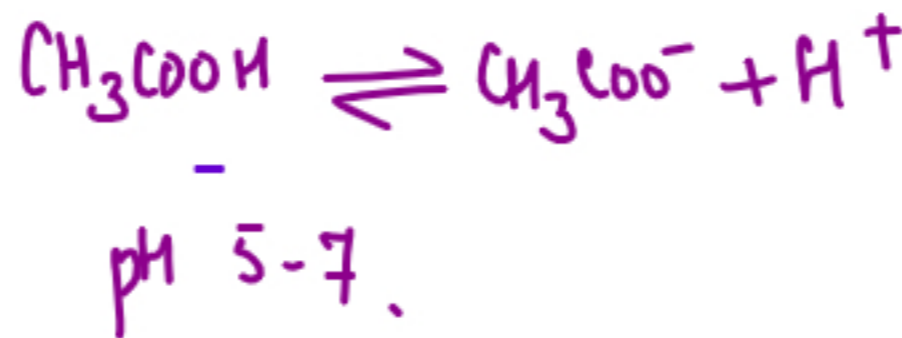
- Hydrochloric Acid - HCl
- Sulphuric Acid - H₂SO₄
- Nitric Acid - HNO₃
- Phosphoric Acid - H₃PO₄



Weak Acids

They are partially dissociated in water to released H⁺ ions

Vinegar: Ethanoic Acid
Lemon: Citric Acid



Metal Oxides, Metal Hydroxides
Metal Carbonates

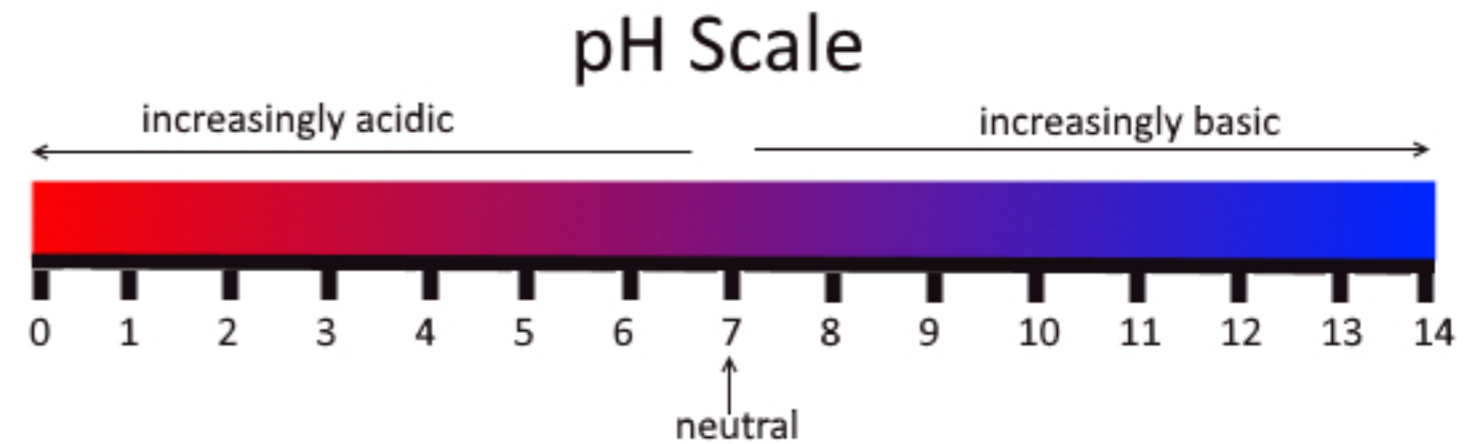
Lithium Oxide, Lithium Carbonate,
Lithium Hydroxide

Alkali are the soluble bases. So bases that can dissolve in water.

eg- Alkali metal hydroxide
They release hydroxide ions when dissolved in water.

INDICATORS

Acids	Bases
pH less than 7	pH greater than 7
Taste Sour	Taste Bitter
Not soapy	Feels soapy
have pungent smell	do not have a pungent smell
When ionize give hydrogen ions	Give hydroxide ions
Turns blue litmus red	Turns red litmus Blue
eg Hydrochloric Acid Sulphuric Acid	eg Sodium Hydroxide



Acid + Base \longrightarrow Salt + Water

Metal

Acid

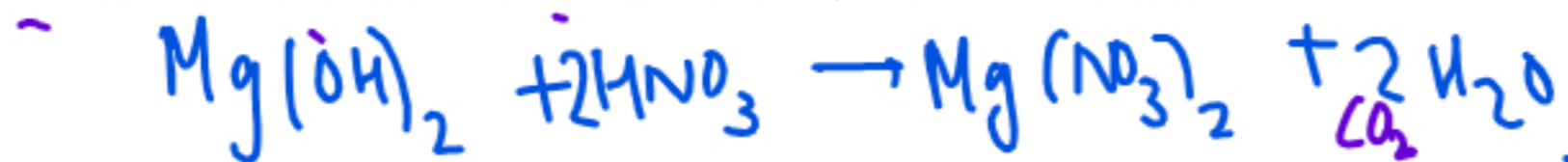
$\frac{1}{2}$ Sodium Hydroxide + Hydrochloric Acid \longrightarrow Sodium Chloride + Water



Potassium Oxide + Sulphuric Acid \longrightarrow Potassium Sulphate + Water



Magnesium Hydroxide + Nitric Acid \longrightarrow Magnesium Nitrate + Water



Calcium Carbonate + Sulphuric Acid \longrightarrow Calcium Sulphate + Carbonate + Water



Hydrochloric Acid

makes chloride salt

Sulphuric Acid

makes sulphate salt

Nitric Acid

makes nitrate salt

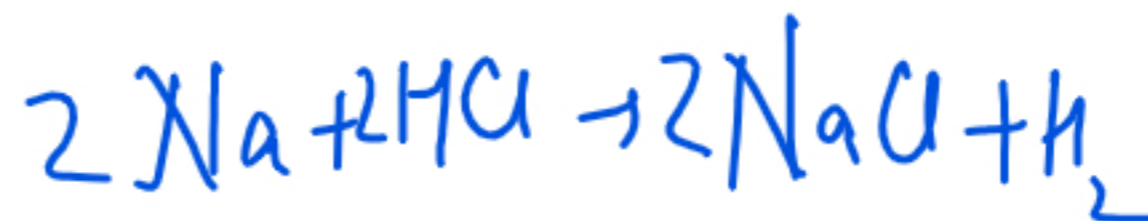
Metal + Acid = Salt + Hydrogen

Metal Oxide + Acid = Salt + Water


Metal Hydroxide + Acid = Salt + Water

Metal Carbonate + Acid = Salt + Water

+ CO₂



Making Insoluble salts



Na ⁺ , K ⁺ , NH ₄ ⁺ salts	All soluble
Nitrates – NO ₃ ⁻	All soluble
Chlorides, bromides, iodides – Cl ⁻ , Br ⁻ , I ⁻	All soluble, except for Pb ²⁺ and Ag ⁺
Sulfates – SO ₄ ²⁻	All soluble, except for Pb ²⁺ , Ba ²⁺ , and Ca ²⁺
Carbonates – CO ₃ ²⁻	All insoluble, except for Na ⁺ , K ⁺ , and NH ₄ ⁺
Hydroxides – OH ⁻	All insoluble, except for Na ⁺ , K ⁺ , and NH ₄ ⁺

Source: Vimeo

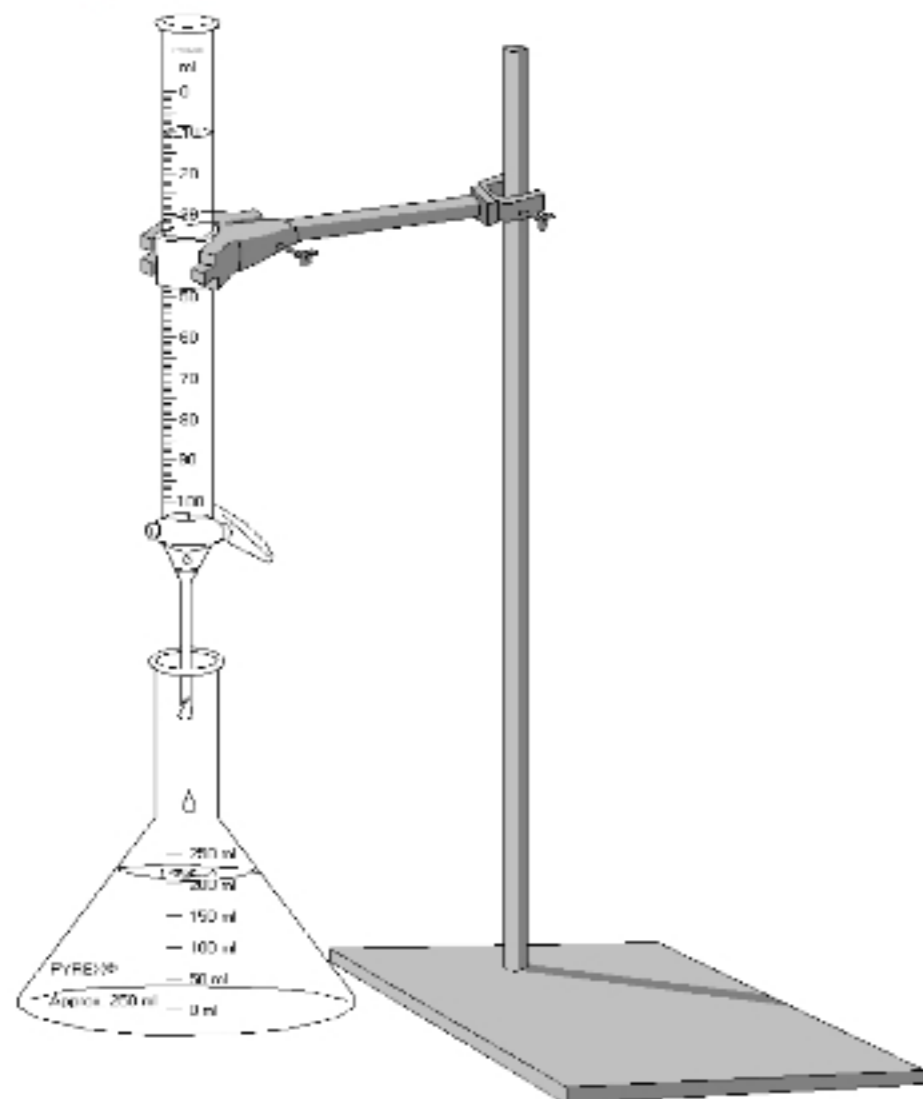
Mix two soluble acids and Bases

The salt will come out as a precipitate

The precipitate is then filtered and dried.

The filter paper will contain an insoluble salt.

To determine the exact volume of acid and base required to make the salt, titration is carried out.



Source: Wikimedia Commons

Making Soluble Salts

Mix the insoluble base into the aqueous solution of the acids.

Dissolve the base into the acid until no base can be dissolved.

filter the solution to remove excess undissolved base.

The run off is then crystallized to remove all the water.

After evaporation the crystals will collect at the size of the vessel.

The crystals can then be dried.

Acids

Bases

Metals

Reactivity Series

Reduction

Oxidation

Alkali

Salt

Neutralization Reaction

Indicators

KEY TERMS

pH scale

Soluble Salts

Insoluble Salts

Electrolysis

Electrode

Anode

Cathode

Electrolyte

Ionic compounds

Cryolite

Bauxite

Ore

Metal Extraction

TEST

YOURSELF