Metals

- Have shining surface in pure form called metallic lusture
- All the metals are hard except some alkali metals.
- Convert into thin sheet when hammered called malleability
- Metals can be drawn into thin wires is called ductility
- Metals have high m.p. and b.p. except gallium and caesium.
- Metals are very good conductors of heat and electricity
- Eg : Sodium, copper, potassium, silver, uranium etc.
- Metals make sound on beating called ~~sonority~~ sonority

Non Metals

- All the non metals are non-lusturous except iodine
- Usually soft but Diamond is the hardest substance.
- Non-malleable.
- Non-ductile
- Have high mp and bp except diamond.
- Non metals are non ~~very~~ good conductors of heat and electricity except graphite.
- Eg: Phosphorous, nitrogen, carbon, ~~silicon~~ etc.
- They don't make sound on beating.

Chemical properties of Metal :

- Reaction with air : forms metal oxide.

Metal + Oxygen ⟶ Metal oxide.

Metal oxides → Basic eg. → copper oxide
→ Amphoteric (reacts with base and acid both) eg → aluminium oxide

Some Metal oxides dissolve in waters to form alkalis.

- Reaction with water : forms Metal oxide and release hydrogen gas.

Metal + Waters ⟶ Metal oxide + H_2

and further dissolving gives Metal hydroxide.

Metal oxide + Water ⟶ Metal Hydroxide + H_2

Alkali metals react very violently that released H_2 catch fire.

Calcium reacts not so violently but get easily reacted with cold waters

Magnesium reacts with hot waters; Aluminium, zinc and iron reacts with steam to give their oxide.

lead, coppers, silver and gold do not react with waters at all.

- Reaction with acids : Metal + Dil. acids ⟶ salt + Hydrogen
- Reaction with other metals $\xrightarrow{\text{salt}}$: Most reactive metal displaces other metal from their salts.

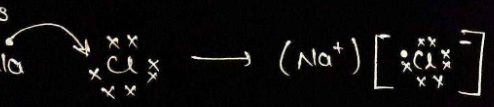
Metal A + Salt of Solution B → Salt of Solution A + metal B

Reactivity Series

Lithium > Potassium > Barium > Calcium > Sodium > Magnesium > Aluminium > CARBON > Zinc > Iron > Nickel > Tin > lead > HYDROGEN > Copper > Tungsten > Mercury > Silver > Gold > Platinum

- Reaction with non metals : They form ionic compound By loosing and gaining of electrons

like :



Properties of Ionic Compounds :

- Hard due to strong attraction form
- Have high m.p. and b.p.
- Soluble in water and insoluble in kerosene petrol etc.
- Conduct electricity in aqueous or molten form as movement of electrons get active.

- Metal
- Elements or compounds which occur naturally in earth crust are called minerals
- Mineral from which metal can be extracted out profitably are called ores
- The impurities with metal in ores are called gangue.

Extraction of Metals :

Steps : 1) Enrichment of ores : Gangue is removed from the ore before extraction.

2) Extraction : a) low reactive → Usually metals ores are found in oxide form and can be extracted by simply heating.

b) moderatly reactive → All the sulphide and carbonate ores are converted into oxide ores. Sulphide by roasting (heating in excess air) and Carbonate by calcination (heating in limited air).

$$ZnS_{(s)} + 3O_2 \longrightarrow 2ZnO_{(s)} + 2SO_{2(g)}$$

$$ZnCO_{3(s)} \longrightarrow ZnO_{(s)} + CO_{2(g)}$$

All then get reduced by carbon.

$$ZnO_{(s)} + C_{(s)} \longrightarrow Zn_{(s)} + CO_{(g)}$$

Also oxides get converted into metals by displacing with the metals of high reactivity

e.g. highly reactive → get extracted only by electrolysis of their molten salts. like sodium get extracted by molten sodium chloride.

At Cathode (-ve electrode) $Na^+ + e^- \longrightarrow Na$

At anode (+ve electrode) $2Cl^- \longrightarrow Cl_{2(g)} + 2e^-$

3.) Refining : Extracted impure metal get refined to make it pure by widely using the method of electrolytic refining.

Corrosion :— Oxidation of metal in presence of moist air is called Corrosion.

Prevention from Corrosion :

1.) Rusting of iron can be prevented by painting, oiling .etc.

2.) Galvanisation is process in which steel and iron get protected by coating with thin layer of zinc.

3.) Making alloy (homogenous mixture of two, or three or more metals) also prevents corrosion.

- The alloy of mercury with other metals is called amalgam