

Board –CBSE

Class –8th

Topic – Metal and Non Metal

- **Metals**

Those materials which possess the characteristic of being hard, shiny, malleable, ductile, etc. are termed as metal. Few examples of metals are iron, gold, silver, aluminium, copper, etc.

- **Physical Properties of Metals**

**(a) Malleability**

It is that property of metals which allows them to be beaten into the thin sheets.

Due to presence of this property, the shape of iron nail and aluminium wire can be changed on beating.

The silver foils used for decorating sweets and the aluminium foil used for wrapping food are possible because of malleability property of metals.

**(b) Conductivity**

It is that property of metals which allows the current and heat to pass through them easily.

Example- Metals like iron rod, nail, copper wire, etc. are good conductors of electricity.

**(c) Ductility**

It is that property of metals which allows them to be drawn into the wires.

Example: Metals like aluminium and copper wires are used in electric connection.

**(d) Sonorous**

It is that property of metals which produces ringing sounds on hitting.

Generally metals are sonorous and non metals are not sonorous.

**(e) Lustrous**

It is that property of metals which makes them shine and their structures are capable of reflecting incident light.

**Exceptions:** Metals like sodium and potassium are soft and can be cut with a knife. Mercury is the only metal which is found in liquid state at room temperature.

- **Non - Metals**

Those materials which do not possess the characteristics of metals are termed as non-metal.

Materials like coal and sulphur are soft and dull in appearance.

They break down into powdery mass on tapping with hammer.

They are non-sonorous and are poor conductors of heat and electricity.

Few examples of non-metals are sulphur, carbon, oxygen etc.

- **Chemical Properties of Metals & Non-Metals**

### **Reaction with Oxygen**

#### **(a) For Metals**

When metals are reacted with oxygen they will form metallic oxides. And these metallic oxides are generally basic in nature.

Example: Rusting of Iron. Iron ( $Fe$ ) + Oxygen ( $O_2$ ) + Water ( $H_2O$ ) → Iron Oxide ( $Fe_2O_3$ )

#### **(b) For Non-metals**

Non-metals also produce oxides when reacted with oxygen. But, in contrast to metals, these oxides are acidic in nature.

Example: Sulphur dioxide ( $SO_2$ ) + Water ( $H_2O$ ) → Sulphurous acid ( $H_2SO_3$ )

The sulphurous acid turns blue litmus paper red.

### **Reaction with Water**

#### **(a) For Metals**

Some metals react vigorously with water like in case of sodium. It is stored in kerosene. While, some metals reacts very slowly with water like in case of iron.

#### **(b) For Non-metals**

Most non-metals do not react with water but some non-metals which are quite reactive in air like phosphorous, which is very reactive & is kept in water to prevent

explosion.

## Reaction with Acids

### (a) For Metals

Presence of  $H_2$  is confirmed by bringing a burning matchstick or candle near the gas & when the burning matchstick or candle produces pop sound then it means that hydrogen gas has evolved. It is found that, copper does not react with hydrochloric acid while it reacts with a sulphuric acid.

### (b) For Non-metals

Non-metals do not react with acids.

## Reaction with Bases

**(a) For Metals** Reactions of metals with bases release hydrogen gas, like in case of many metals they react with sodium hydroxide to produce hydrogen gas.

**(b) For Non-metals:** Reactions of non-metals with bases are complex.

**Displacement Reaction:** During reaction if a metal replaces another metal from its compound then such reactions are called displacement reaction.

A more reactive metal will always displace a less reactive metal from its compound but a less reactive one cannot replace a more reactive metal

Example: Copper Sulphate ( $CuSO_4$ ) + Zinc ( $Zn$ ) → Zinc Sulphate ( $ZnSO_4$ ) + Copper ( $Cu$ )

- **Applications of Metals**

(i) Metals are generally used in making of machines, automobiles, airplanes, cars, satellites, etc.

(ii) Some metals are used in making wires like copper, etc.

(iii) Some metals are used for making ornaments like gold, silver, etc.

- **Applications of Non - Metals**

(i) The oxygen necessary for all living beings to survive is a non-metal.

(ii) Some non-metals are used as fertilizers to enhance the growth of plants.

(iii) Some non-metals are used for water-purification.

(iv) Some non-metals are used as antiseptic.

(v) Non-metals used in crackers.