7th – Acid, Base And Salt II

Salts : salt term is used for the substances that are formed when an acid and a base react with each other. This reaction is called neutralization reaction.

E.g.:

Hydrochloric acid + sodium hydroxide ⟶ sodium chloride + water

Acid **Base** **salt**

a. $HCl + NaOH \dashrightarrow NaCl + H_2O$

b. $2KOH + H_2SO_4 \dashrightarrow K_2SO_4 + 2H_2O$

c. $Mg(OH)_2 + 2HNO_3 \dashrightarrow Mg(NO_3)_2 + 2H_2O$

Salt can be acidic, basic or natural.

Application of neutralization reaction.

1) In indigestion: Our stomach releases hydrochloric acid which helps in digestion. But sometimes overproduction of this acid takes place which causes acidity in our stomach. This acidity is painful and hence must be removed. Thus antacid tablets containing magnesium hydroxide are given o the person to neutralize the effect of excess acid in the stomach.
2) Insect stings: the sting of ants and bees contain formic acid. This can be cured by rubbing soap(which is a base). The acid base neutralisation reaction takes place which results in reduced pain
3) Soil treatment: Sometimes due to acid rain or due to excess fertilizers the soil become acidic in nature which can damage the crops. Thus farmers reduce acidity of the soil by adding calcium hydroxide to it. Thus the acidic content of soil gets neutralised with the base and crops get saved from being destroyed.
4) Factory waste: the waste of many factories contain acid. If they are allowed to flow into the water bodies, the acid will kill fish and other organisms. Hence, before disposing off, the factory wastes are neutralised by adding basic solution.

Properties of salts:

1) Melting and boiling points: salts are mostly solid which melt as well as boil at high temperature.
2) Solubility in water: salts are soluble in water. Eg: sodium chloride, potassium sulphlate, lead chloride, copper carbonate etc are insoluble in waste.
3) Water of crystallization: salts are found as crystals with water molecules present in them. This water is called water of crystallization and such salts are called hydrated salts.

E.g.: copper sulphate $CUSO_4.5H_2O$

On heating, hydrated salts lose their water of crystallization, crystals lose their shape, color and change to a powdery substance.

The hydrated salt that have lost their water of crystallization are called anhydrous salts.

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Uses of some salts:

Sr. No	Name of the salt/chemical formula	Uses
1	Calcium Carbonate(Marble, Limestone, Chalk) / $CaCO_3$	Flooring in the form of marble, to make lime (CaO), cement, and for extraction of iron.
2	Sodium Carbonate(washing soda)/$Na_2CO_3.10H_2O$	In cleaning ,detergents, water softening, and manufacture of glass
3	Sodium Bicarbonate(baking soda) / $NaHCO_3$	In bakery and medicines
4	Silver Nitrate/$AgNO_3$	In photography for developing films
5	Ammonium Nitrate /NH_4NO_3	Fertilizers and explosives
6	Potash Alum (phitkari) / $K_2SO_4.Al_2(SO_4)_3.24H_2O$	In purification of water
7	Sodium Chloride (Common Salt) / NaCl	As seasoning for food, in manufacture of chlorine and sodium carbonate

Classification of Salts :-

1 Neutral Salts :- Salts formed by the reaction of strong acid with a strong base are called neutral salts. For example KNO_3, Na_2SO_4

2. Acidic Salts :- Salts formed by reaction of a strong acid and weak base are called acidic salts. For example Aluminum Chloride $AlCl_3$ is an acidic salt.

3. Basic Salts :- Salts formed by the reaction of a weak acid with a strong base are called basic salts. [CH_3COONa] Sodium acetate is a basic Salt.