

CLASS- IX

CHAPTER- 3

SUBJECT- CHEMISTRY

TEACHER- ANAMIKA

Acids & bases are differentiated by indicators (An indicator is a chemical which indicates by means of a sharp change in colour, the nature of solution)

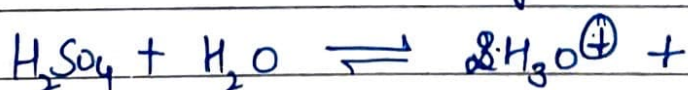
All acids compulsorily have hydrogen as their constituent element in the form of proton ( $H^+$ ) e.g.  $HCl$ ,  $H_2SO_4$ ,  $HNO_3$

All bases are either metallic oxide ( $O^{2-}$ ) or metallic hydroxide ( $OH^-$ ) or ammonia solution.

e.g. Copper Oxide,  $NaOH$ ,  $NH_4OH$

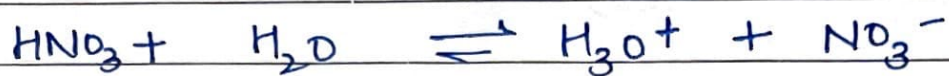
All salts are chemical compounds. They are formed by the interaction of acid and base replacing  $H^+$  present in an acid by metallic ion ( $NH_4^+$ )

Acid:- Acids are defined as compound which contain one or more hydrogen atom and when dissolved in water produces  $H_3O^+$  the only positively charged ion.



Hydrogen is common in all acids.

Other examples of acids are sulphuric acid, nitric acid and acetic acid.



Classification of Acids:-

1. Depending on their sources

(i) Organic acids:- Acids which are usually obtained from plants called organic acid e.g.  $(\text{COOH})_2$ ,  $\text{CH}_3\text{COOH}$

They are weak acids & they do not consist completely in solution.

(ii) Inorganic acid:- Acids which are obtained usually from minerals called inorganic acid. They do not contain carbon. e.g.  $\text{HCl}$ ,  $\text{H}_2\text{SO}_4$ ,  $\text{HNO}_3$ .

They are strong acid. They consist completely in solution.

Acids which contain oxygen along with hydrogen & some other element are oxy acid. e.g.  $\text{HNO}_3$ ,  $\text{H}_2\text{SO}_4$

Hydroacids contain hydrogen & non metallic element. They do not contain oxygen. e.g.  $\text{HCl}$ ,  $\text{HBr}$ .

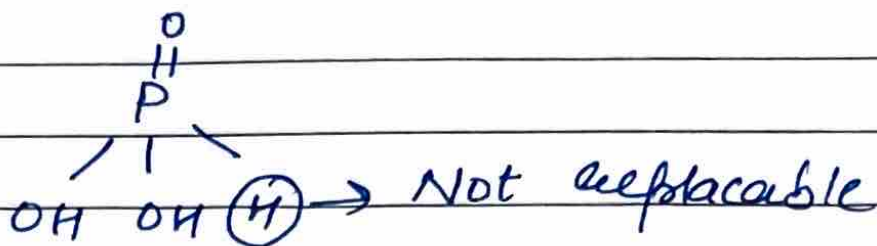
Depending on their basicity

The basicity of acid is defined as no. of Hydronium ion ( $\text{H}_3\text{O}^+$ ) that can be produced by ionisation of one molecule of that acid.

- (i) Monobasic acid:- Acids which on ionisation in water produces one hydronium ion per molecule of acid.  
e.g.  $\text{HBr}$ ,  $\text{HNO}_3$ ,  $\text{HI}$ ,  $\text{CH}_3\text{COOH}$
- (ii) Dibasic acid:- Acid which on ionisation in water produces two hydronium ion per molecule of acid. is known as dibasic acid. e.g.  $\text{H}_2\text{SO}_4$ ,  $(\text{COOH})_2$ ,  $\text{H}_2\text{SO}_3$ ,  $\text{H}_2\text{CO}_3$ .

Note:-  $\text{H}_3\text{PO}_3$  is dibasic acid because in oxyacid of phosphorus, hydrogen atom which are attached to oxygen atom are replaceable.

Hydrogen atom directly bonded to phosphorus atom is not replaceable.



**Tribasic Acid:-** Acid which on ionisation in water, produces three hydronium ion per molecule of acid is called tribasic acid. e.g.  $\text{H}_3\text{PO}_4$ , Citric acid  $\text{C}_3\text{H}_5\text{O}(\text{COOH})_3$