Date :

30/7/24

Chapter : 2

Acid, bases and salt

- All the chemical can be classified on the basis of their chemical properties as acid bases and salt

- How to check whether a given substance is acidic or basic in nature

Indicator

Indicator is a thing which help us to know whether the given substance is acidic or basic in nature

* Types of Indicator

Natural

Synthetic

Olfactory

- Natural indicator are indicator which occurs naturally
eg Turmaric

- ~~Synthetic fiber / Manmade fiber :~~
~~Synthetic fiber are~~

- Synthetic indicator / Manmade indicator.
Sythetic indicator are manmade indicator
eg : Methyl orange :
Phenopthalyn

Date :

- Olfactory indicator
these are the indicator which help us to to check the given substance is acidic or Basic. by smell
eg: vanilla, onion, cloves.

* Acids *.
- Acids has H^+ ions
- generally corrosive in nature
- Sour in test
- blue litmus to red.

* Bases *
- Bases have OH ions
- Basically soapy in texture
- Bitter in taste
- red litmus to blue.

* Types of acids

Organic acids
- tartaric acid.
- citric acid
- Oxyallic acid
- methonic acid.
- Acetic acid.
- Lactic acid.

Inorganic acids
Minital acids.
(HCL), (H_2SO_4), (H_2NO_3)

Date :

* Bases *

Bases are generally prepared in laboratories and are strong and needed to be diluted when to use.

Some examples are:

- Magnesium hydroxide [$Mg(OH)_2$]
- Calcium hydroxide [$Ca(OH)_2$]
- Sodium hydroxide [$NaOH$]
- potasium hydroxide [KOH]
- ammonia hydroxide [NH_4OH]

* Reaction of Acid with metals *.

When acid reacts with Metal it result in to formation of salt & plus evolution Hydrogen (H_2) is evolved.

Acid + Metal $\longrightarrow$ Salt + $H_2\uparrow$

Eg: $H_2SO_4 + Zn \longrightarrow ZnSO_4 + H_2\uparrow$

{Sulphuric acid} {Zinc} {Zinc Sulphate} {Hydrogen gas}

The acid and metal reaction is single displacement reaction

* How do metal carbonate and metal Hydrogen carbonate reacts with acids.

Metal carbonate or metal hydrogen carbonate reacts with acids. to form salt + carbon-di oxid and water.

Date : _____

metal carbonate / metal bicarbonate + Acid → salt + H_2O + CO_2

$Na_2CO_3 + 2HCL \longrightarrow 2NACL + H_2O + CO_2$

* Test of Hydrodin gas.*
The gas evolve during any reaction collect it and make it contact with Burning candle it burn with pop sound it assuree the presense of Hydrogen gas.

* Test of CO_2 *
The gas evolved during any a reaction. collect it and pass it through lime water which will form a white precipitate of Calcium carbonate

$Ca(OH)_2 + CO_2 \longrightarrow CaCO_3 + H_2O$
↓
whit
ppt.

* Reaction of Acid with Bases.

Acid + Bases → salt + water.
(neutralization Reaction)

$NaOH + HCl \longrightarrow NaCl + H_2O$
{Sodium hydroxide} {Hydrochloric acid} {Sodium Chloride} {water}

Date :

— This reaction is also called neutralization reaction

* Reaction of metallic oxids with acids *.

metal oxide + acid → water + salt.
(Basic in nature).

* Reaction of non-metallic oxides with acids

non metal oxide + ~~acid~~ → salt + water.
(acidic in nature) Base.

Example:

$Ca(OH)_2 + CO_2 \longrightarrow CaCO_3 + H_2O$
(Base) (non metal) (salt) + (water)

* Existance of H_2

Hydrogen gas cannot exist alone in the enviornment it combine with water molequle for existance The seperation of H^+ ions from HCL molequele cannot occure in absense of water.

$HCL + H_2O \longrightarrow H_3O^+ + Cl^-$

$H^+ + H_2O \longrightarrow H_3O^+$

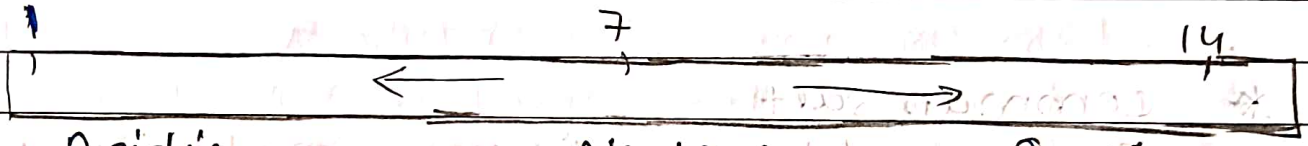
Did you know?
Alkali are ~~substances~~ bases which dissolve completly in water.

Date : _____

- The process of dissolving an acid or base in water is highly exothermic one.
- care must be taken while ~~con~~ mixing concentrated nitric acid or sulphuric acid.

* How we come to know that acid are strong *

power of Hydrogen.



Acidic Neutral Basic.

The strength of acids and bases depends on H^+ or OH^- ions produced.

* PH in daily life.
- acidic soil ensure fruiting and flowering of plant
- it play as important in our digestion
- it can cause tooth ~~dec~~ decay.
- causes acid rain

* chlorine is used as disinfecting agent.

Date :

* More about salt *

- Strong acid + weak Base → acidic salt + water.

- weak acid + strong Base → Basic salt + water.

- weak acid + weak Base → Neutral salt + water

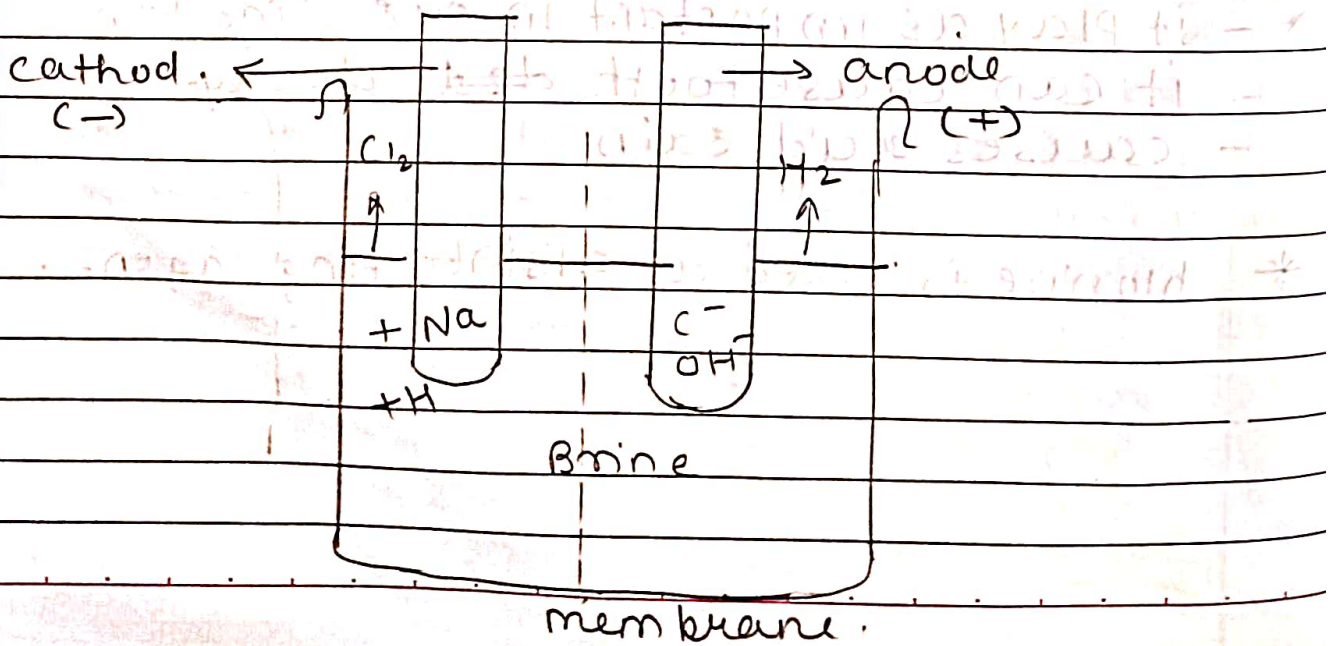
- Strong acid + strong Base → Neturel salt + water

* comman salt

Sodium chloride is raw material is used in various sectors.

* sodium Hydroxide :

when electricity is passed through an aqueous solution of sodium chloride [called Brine] it decomposes to form sodium Hydroxide. the process is called chlor - alkali process.



1/8/24

Date :

* Sodium chloride.

comman name : comman salt

chemical name : NaCl

occurance and Extraction.

a) Seawater.

Inland lakes

b) Rock salt

uses:

- it is essential constituent for our diet.
- it is important raw material to manufacture. Sodium hydroxide, Bleaching power, baking soda and more.

* Sodium Hydroxide.

comman name: caustic soda.

chemical name: NaOH

Manufactured by: chlor alkali process.

Chlorine gas [By-product]

NaOH. [Main product]

[diagram drawn above]

This process is also called electrolysis of Aqueous Sodium Chloride or electrolysis of Brine Solution (water + NaCl).

Date :

~~* uses of chlor alkali~~

* uses of caustic soda:
  - it is used to manufature soaps and detergent
  - it is used ~~to~~ ~~ma~~ for degresing metals
  - it is used as drain cleaner.

* uses of Hydrogen gas*
  a) Liquid hydrogen is used as rocket fuel
  b) it is used to produce amonnia as fertiliz
  c) it is used to produce margarine.

* uses of chlorine gas*.
  - it is used to manufacture 'pesticide'
  - it is used to manufacture CFCs for refrigarator
  - it is used as disinfectant in swimming pool.

* Bleaching powder*
  chemical formula : $CaOCl_2$
  chemical name: Calcium oxychloride
  [Yellowish white pow
  chlorine gas is obtained as by product fro chlor-alkali process when react with dry slaked lime produces Bleaching powder.

  - it is used in textile industries for bleaching of cottan
  - it is used as oxidising agent..