

Date 02/04/2025

Ch-2

## Acid, Base and salts

### \* [Properties of acid]:-

- (i) Sour taste
- (ii) Produce hydrogen ions  $[H^+]$ .
- (iii) Turn blue litmus to red.
- (iv) Acts as electrolytes in solution.
- (v) Neutralise solution carrying hydroxide ions  $[OH^-]$ .
- (vi) Destroy body tissue.
- (vii) Corrode metal surface quickly.

### Acid:-

#### On the basis of (origin):-

##### i) (Organic acids) →

→ derived from living organisms like plant and animal.

Ex = Citric acid in fruits.

Acetic acid in vinegar.

Oxalic acid in tomato.

Tartaric acid in tamarind.

Lactic acid in Curd.

Ethanoic / Formic acid in Urine  
bees and ants

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(iii) Inorganic acid →

→ They are dangerous.

Ex = Sulphuric acid ( $H_2SO_4$ )

Hydrochloric acid (HCl)

Acid

On the basis of strength :-

(i) weak →

→ Weak acids do not completely dissociate into its ions in aq. solution.

Ex = Carbonic acid ( $H_2CO$ )  
Acetic acid ( $CH_3COOH$ )

(ii) Strong →

- Strong acids do completely dissociate into its ions in aq. solution.

Ex =  $HNO_3$  (Nitric acid)

$H_2SO_4$  (Sulphuric acid)

Ques

On the basis of concentration of acids

**Acid** →

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On the basis of concentration →

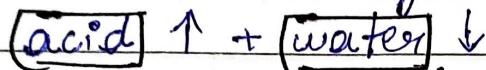
(i) Dilute acid →

→ Low concentration of acid in aq solution.



(ii) Concentrated acid →

→ High concentration of acid in aq solution.



**[Acid]**

On the basis of no. of hydrogen ions →

(i) Monoprotic acid →

- Which acid produce one mole of  $\text{H}^+$  ions per mole of acid.

Ex =  $\text{HCl}$

(ii) Diprotic acid →

- They produce two mole of  $\text{H}^+$  ions per mole of acid.

Ex =  $\text{H}_2\text{SO}_4$ .

(iii) Triprotic acid →

- They produce ~~more~~ three mole of  $\text{H}^+$  ions per mole of acid.

Ex =  $\text{H}_3\text{PO}_4$

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#### iv) Polyprotic acid →

- They produce more than three of  $H^+$  ions per mole of acid.

### \* Properties of base:-

- i) Bitter taste.
- ii) Produce  $[OH^-]$  ions.
- iii) Turns Red litmus to Blue.
- iv) Act as electrolytic in solution.
- v) Neutralize solution containing  $H^+$  ions.
- vi) Have slippery, soapy feel.
- vii) Dissolve fatty materials.
- viii) Water soluble bases are called alkalis.

Base

On the basis of strength →

i) weak →

- Which do not completely dissociate into ions in aq. solution.

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Ex =  $\text{NH}_4\text{OH}$ .

(strong)

ii) Strong  $\rightarrow$

- Which completely dissociate into its ions in aq. solution.

Ex =  $\text{NaOH}, \text{KOH}$ .

Base

On the basis of concentration  $\rightarrow$

i) Dilute  $\rightarrow$

- Low concentration of base in aq. solution.

ii) Concentrated  $\rightarrow$

- High concentration of base in aq. solution.

\*\*\* Indicator :-

- These are the substance which change their smell and colour in different type of substance.

\*\*\* Type of indicator :-

i) Natural indicator :-

Indicator that are found in nature are called natural indicators.

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Ex = [ Litmus (Plant)  
Red cabbage leaf  
Turmeric  
Flower of hydronated plant.

	Acid	base
Litmus	Red	Blue
Red cabbage	Red	yellowish
Turmeric	Yellow	Red

(ii) Synthetic indicator :-

These are chemical substance.

Ex = Methylorange  
Phenolphthalein

	Acid	base
Methylorange	Red	Yellow
Phenolphthalein	colourless	Pink

(iii) Olfactory indicator :-

These substance have different odour in acid and base.

Ex = Onion, garlic, etc., etc.  
Vanilla Essense, etc., etc.  
Clove oil

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	Acid	base
Onion	Same smell	Smell ↓
Vanilla Essence	Small ↑	No smell
Clove oil	Smell ↑	Smell ↓

## ★ Chemical properties of acid and base:

### ① Reaction ~~with~~ metal →

with acid

with base

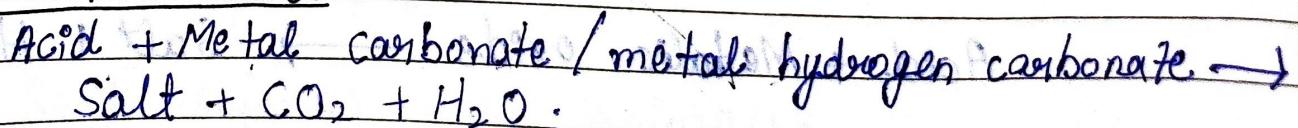


## ★ Testing of hydrogen gas

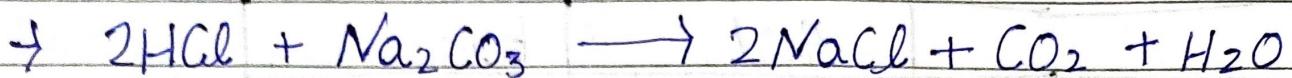
→  $\text{H}_2$  gas released can be tested by bringing burning candle near gas bubble it burns with pop sound.

### ② Reaction ~~with~~ metal carbonate and metal hydrogen carbonate →

~~With acid~~ →



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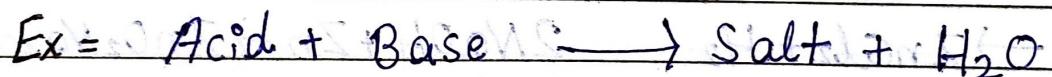
With base  $\rightarrow$

Base do not react with metal carbonate and metal hydrogen carbonate.

Testing of carbon dioxide gas  $\rightarrow$

- $\text{CO}_2$  can be tested by passing it through lime water. and the lime water turns milky.
- $\text{Ca}(\text{OH})_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$
- $\text{CaCO}_3 + \text{H}_2\text{O} + \text{CO}_2 \rightarrow \text{Ca}(\text{HCO})_3$

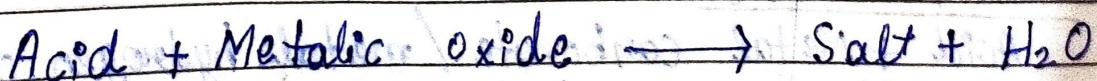
(3) Reaction of acid and base with each other



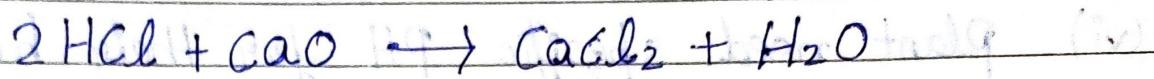
Neutralise Reaction  $\rightarrow$

$\rightarrow$  When an acid and base react with each other to form water and salt is called Neutralise Reaction.

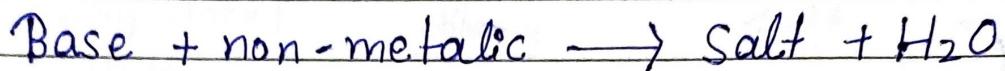
(4) Reaction of metallic oxide with acid  $\rightarrow$



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⑤ Reaction of non-metallic oxide with base.  $\rightarrow$



※ [Universal indicator]: -

It is a mixture of several indicators.

It shows different colour at different concentration of  $\text{H}^+$  ions in the solution.

[PH scale]: -

A scale for measuring hydrogen ions concentration in solution is called PH. scale.

※ [Uses of PH scale] -

(i) Human body works between PH (7-7.8).

(ii) PH of rain less than 5-6 called acid rain.

(iii) Our stomach produce HCl.

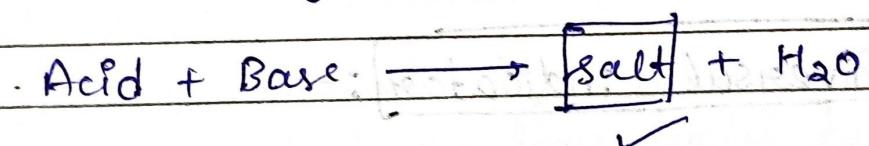
(iv) Tooth decay start when PH of mouth less than 5.5.

(v) Self defence by animals.

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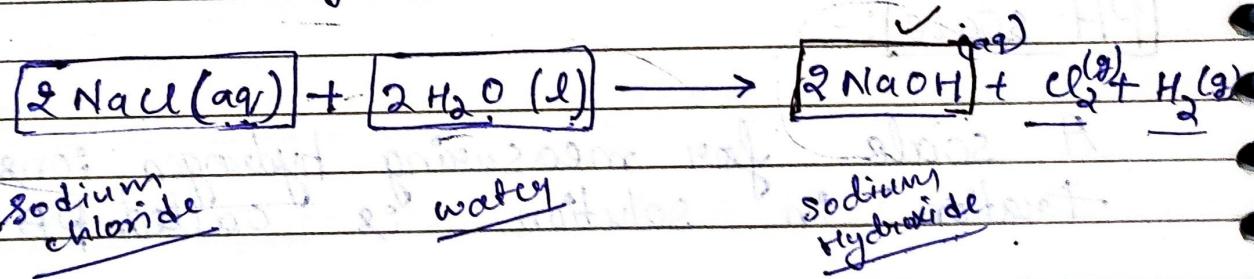
(vi) Plant need specific PH for their healthy growth. ( $\text{C}_7$ )  $\rightarrow$  pH value

Salts  $\rightarrow$  Salts are ionic compound formula formed by neutralization reaction.



④ sodium Hydroxide  $\rightarrow$  (NaOH)

$\rightarrow$  Formed by (Chlor-Alkali Process)



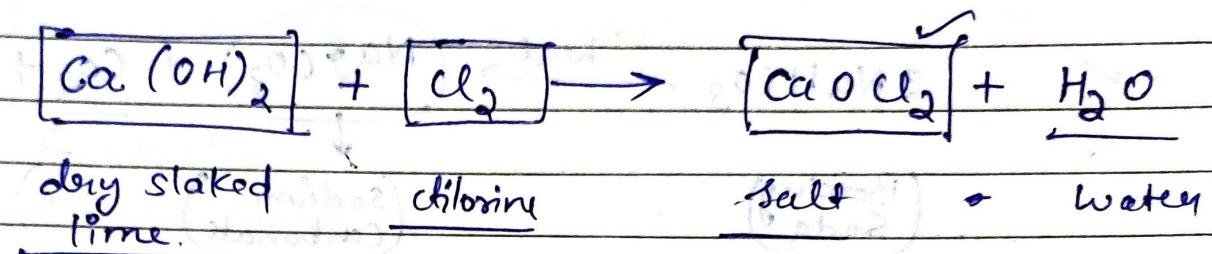
- Uses  $\rightarrow$
- i) used to prepare soap and detergents.
  - ii) used in paper making.
  - iii) used in oil refining.
  - iv) used in PVC manufacturing.
  - v) used as pesticides.

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## Bleaching Powder $\rightarrow$ (CaOCl<sub>2</sub>)



Uses  $\rightarrow$

- i
- ii
- iii
- iv

Bleaching cotton, and linens

Bleaching wood pulp in paper factory

Oxidising agent in chemical industry

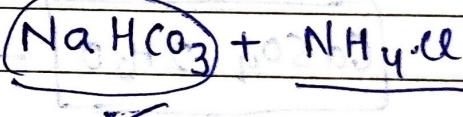
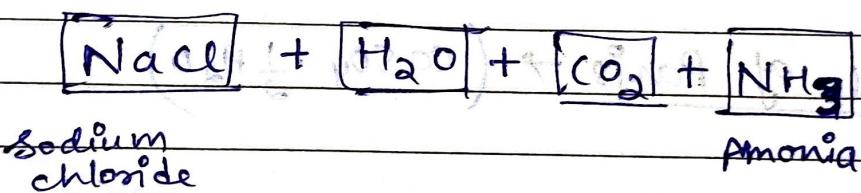
Disinfecting drinking water

R.O  $\rightarrow$

Reverse Osmosis

(3)

## Baking Soda $\rightarrow$ [NaHCO<sub>3</sub>]



Uses  $\rightarrow$

- i
- ii
- iii
- iv

Used in Baking and cooking.

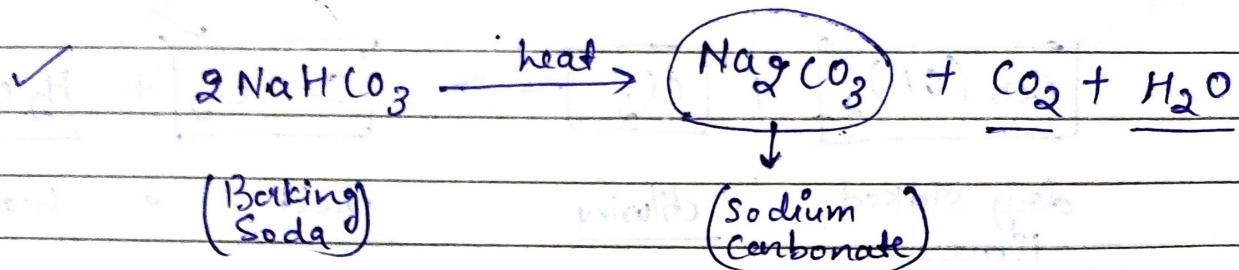
Antacid for relieving indigestion.

Fire extinguisher.

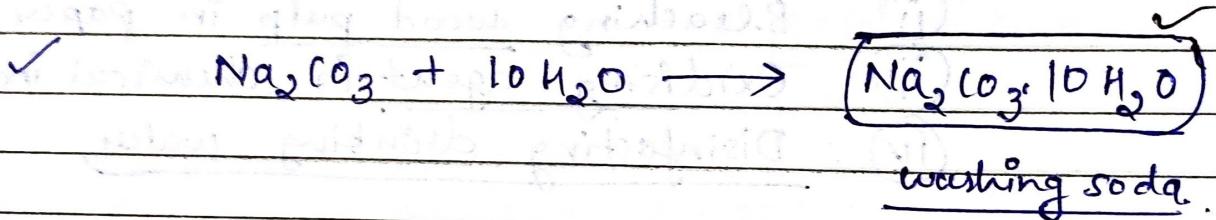
Baking powder.

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(4) washing soda  $\rightarrow$   $(Na_2CO_3 \cdot 10H_2O)$

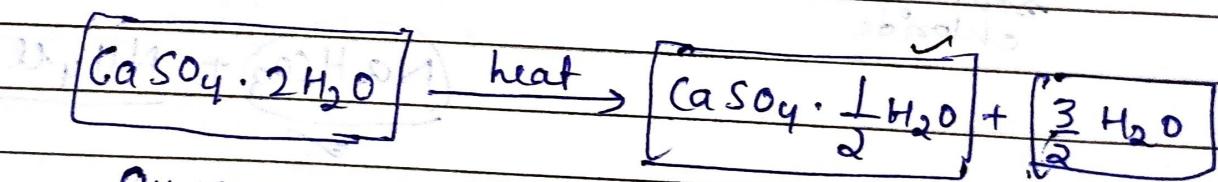


Recrystallisation  $\rightarrow$   $Na_2CO_3$



- uses  $\rightarrow$
- i) glass, soap, paper industry.
  - ii) softening hard water.
  - iii) cleaning agent.
  - iv) manufacturing of Borax.

(5). Plaster of Paris  $\rightarrow$   $(CaSO_4 \cdot \frac{1}{2}H_2O)$



Gypsum

POP

- uses  $\rightarrow$
- i. used in surgical plaster.
  - ii. casting statue.
  - iii. construction for wall finishing.

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→ When base increases in human body it  
is called alkalosis.

→ Confusion

Muscles cramp

→ Irregular heartbeat