

# Acid base and salt- 3



# Importance of pH in everyday life

**Plants and animals are pH sensitive =**

Our body work efficiency pH 7.0 to 7.8 and Industrial Area pH of rain water become less due to the dissociation of some acid gases like  $\text{SO}_2$  and  $\text{NO}_2$  and the pH of rainwater is less than 5.6 is called acid rain

**PH in our digestive system=**

In our body stomach produce hydrochloric acid and help to digest food in our stomach when stomach produce too much acid it cause pain and irritation and this stage is called acidity and we take antacid tablets to neutralize it

**pH of Soil :** Most of the plants grow best when the pH of the soil is close to 7. If the soil is too acidic or basic, the plants grow badly or do not grow at all. The soil pH is also affected by the use of chemical fertilisers in the field. Chemicals can be added to soil to adjust its pH and make it suitable for growing plants.

If the soil is too acidic then it is treated with materials like quicklime or slaked lime.

If the soil is too alkaline then alkalinity can be reduced by adding decaying organic matter.



**Tooth decay** can occur when the **pH** level in the mouth is 5.5. ... When we consume acidic foods and drinks, the **pH** within the mouth decreases and can cause the **pH** in the **dental** plaque to fall rapidly below 5.0. This happens through the production of acids as the bacteria metabolize the ingested nutrients.



## pH value and tooth decay



pH > 5.5



## Self defence by animals and plants through chemical warfare

- ▶ **Have you ever been stung by a honey-bee?**  
Bee-sting leaves an acid which causes pain and irritation.
- ▶ Stinging hair of nettle leaves inject **methanoic acid** causing burning pain.
- ▶ Use of a mild base like **baking soda** on the stung area gives relief.



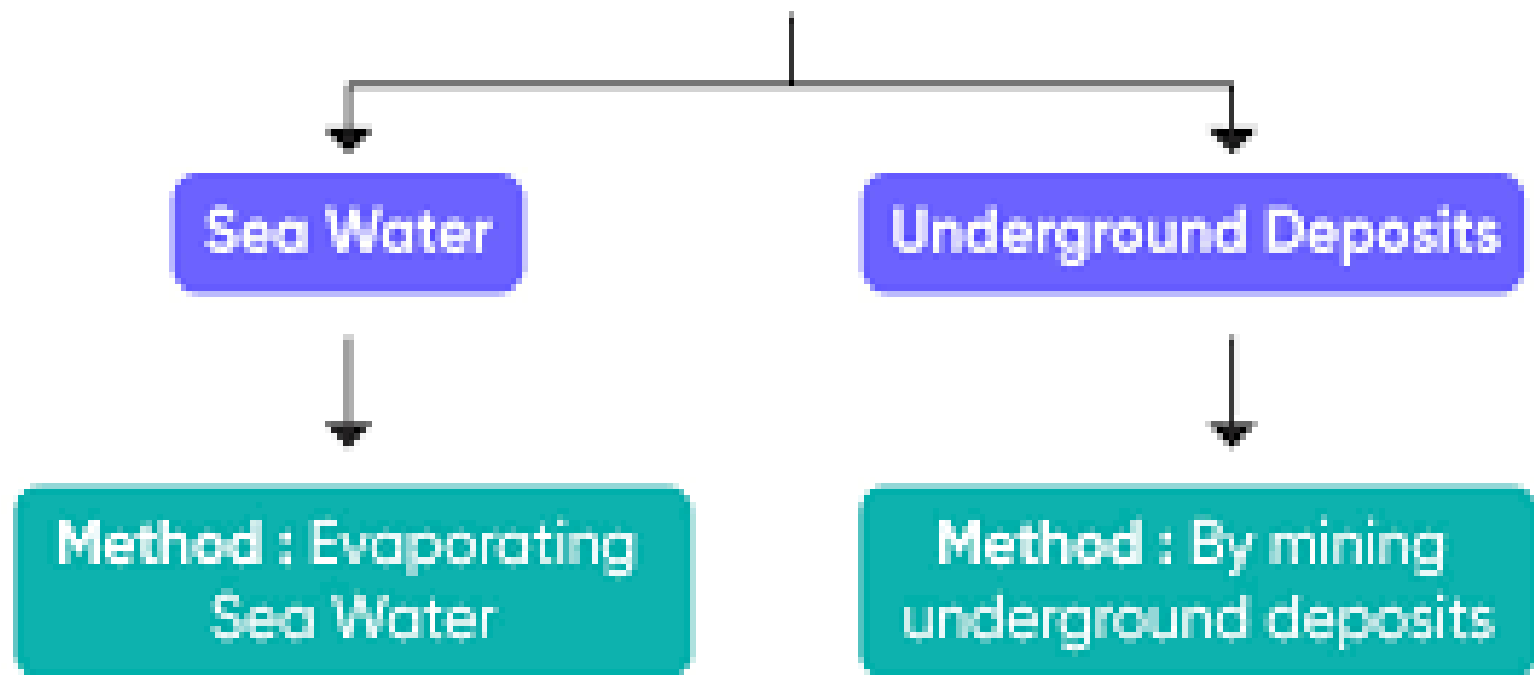
Importance of Acids & Bases.



Don't mess with me,  
I have formic acid

How to treat sting of Bee &  
wasp.

# Source of Common Salt





# Common Salt

- It acts as a raw material for various materials of daily use, such as:-
  1.  $\text{NaOH}$  (caustic Soda)
  2.  $\text{NaHCO}_3$  (Baking Soda)
  3.  $\text{Na}_2\text{CO}_3$  (Washing Soda)
  4.  $\text{CaOCl}_2$  (Bleaching powder)

## Bleaching Power

Chemical Name: Calcium oxychloride

Chemical Formula:  $\text{CaOCl}_2$

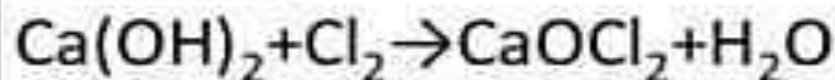
Process:



Bleaching Powder.mp4

- Electrolysis of aqueous sodium chloride (Brine);
- Chloride on dry slake lime  $[\text{Ca}(\text{OH})_2]$  gives bleaching power  $[\text{CaOCl}_2]$

Reaction:



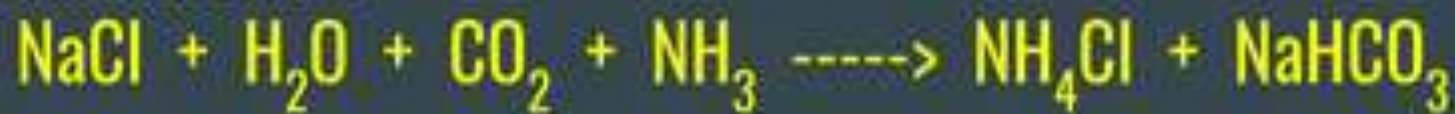
## **23. Uses of Bleaching Powder :**

- (i) It is used for bleaching cotton, linen in textile industries, for bleaching washed clothes in laundry.
  - (ii) It is used as oxidizing agent in many chemical industries.
  - (iii) It is used for disinfecting drinking water to make water free from micro-organisms.
  - (iv) it is used for manufacture of chloroform.
  - (v) It makes wool unshrinkable.
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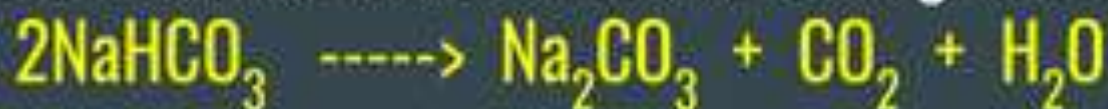
# Baking Soda

**Manufacture:** The chemical name of the compound is sodium hydrogencarbonate ( $\text{NaHCO}_3$ ). It is produced using sodium chloride as one of the raw materials.



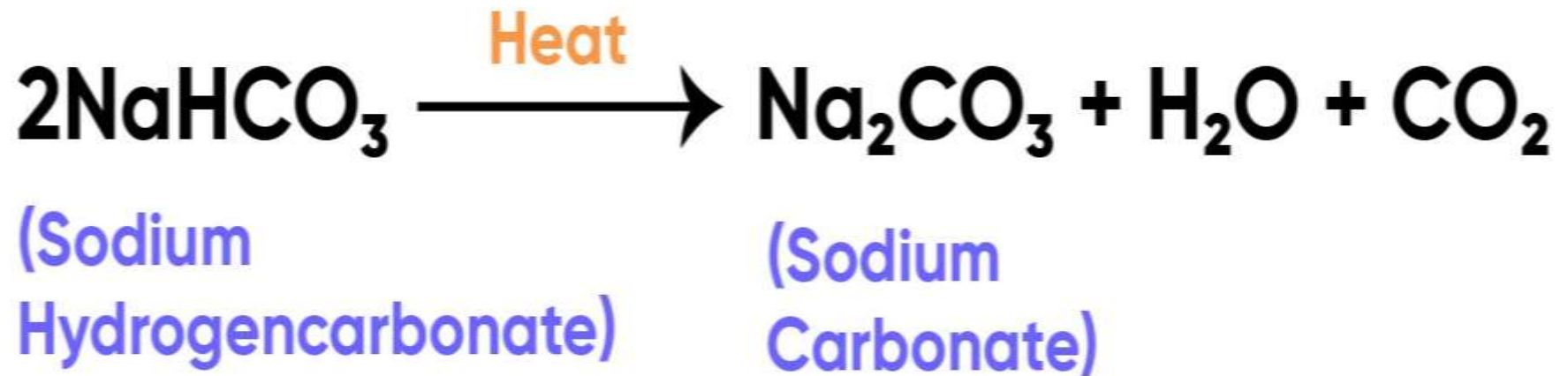
## Properties :

- It is white crystalline solid.
- It is sparingly soluble in water.
- On heating it loses Carbon dioxide and water forming sodium carbonate





# What happens when Baking Soda is heated



# Washing soda $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$

- Another chemical that can be obtained from sodium chloride is  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$  (washing soda).
- We have seen above that sodium carbonate can be obtained by heating baking soda;



- recrystallization of sodium carbonate gives washing soda.
- It is also a basic salt.

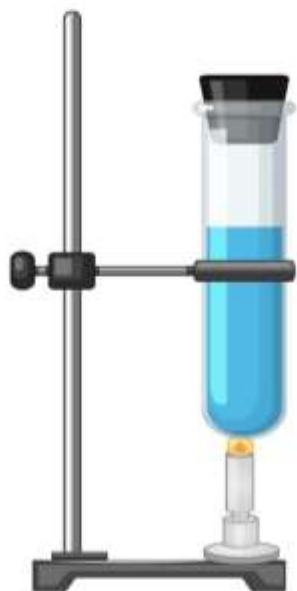


# Uses of washing soda

- (i) Sodium carbonate (washing soda) is used in glass, soap and paper industries.
- (ii) It is used in the manufacture of sodium compounds such as borax.
- (iii) Sodium carbonate can be used as a cleaning agent for domestic purposes.
- (iv) It is used for removing permanent hardness of water.

Water of crystallization is the number of water molecules that combine chemically in definite molecular proportion, with the concerned salt in the crystalline state.

## WATER OF CRYSTALLIZATION



Hydrated Salt  
copper (II) sulfate  
pentahydrate  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$



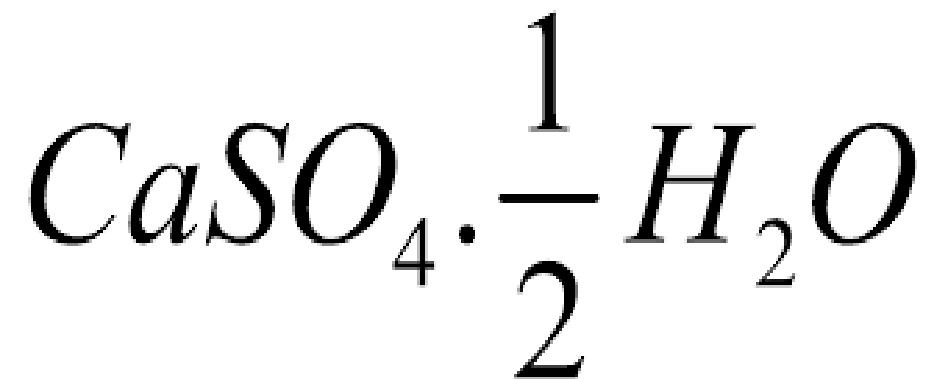
Anhydrous Salt  
copper (II) sulfate  
 $\text{CuSO}_4$



The water of crystallisation is present in ferrous sulphate crystals.  $7 H_2O$  )  
 . Ferrous sulphate crystals



Plaster of Paris



## Reaction between Plaster of Paris and Water

