

# ACIDS, BASES AND SALTS

BY REKHA CHOUDHARY T.G.T SCIENCE





# Water of Crystallisation



If a solid material has been made from an aqueous solution, the product will frequently contain water. This is called the **Water Of Crystallisation**. It is the fixed no. of water molecules present in one formula unit of a salt.

# WATER OF CRYSTALLISATION



Hydrated copper sulphate  
 $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$



Copper sulphate (anhydrous)  
 $\text{CuSO}_4$  (no water)

**Hydrated:** a compound that contains water molecules

**Anhydrous:** a substance that contains no water molecules



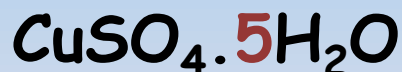
# Water of Crystallisation



The **hydrated** form of a compound is written in a special way;

- The empirical formula of the compound is separated from the water of crystallisation by a dot.
- The number of water molecules in the formula is shown after the dot.

Hydrated copper sulphate has 5 water molecules for each formula unit:



When we heat the crystals, the water is removed and salt turns white ( becomes anhydrous ).



# Water of Crystallisation



## Other examples:

- Sodium Carbonate **deca**hydrate ( washing soda ) -  $\text{Na}_2\text{CO}_3 \cdot \mathbf{10}\text{H}_2\text{O}$
- Copper sulphate **di**hydrate ( gypsum ) -  $\text{CuSO}_4 \cdot \mathbf{2}\text{H}_2\text{O}$
- Copper sulphate **hemi**hydrate ( plaster of paris ) -  $\text{CuSO}_4 \cdot \mathbf{1/2}\text{H}_2\text{O}$

# WASHING SODA



CHEMICAL FORMULA -  $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$



CHEMICAL NAME - SODIUM CARBONATE  
DECAHYDRATE



THIS SALT IS PREPARED BY  
RECRYSTALLISATION OF SODIUM  
CARBONATE ( WHICH IS OBTAINED FROM  
HEATING BAKING SODA ).

# WASHING SODA



 **CHEMICAL PROPERTY - IT IS A BASIC SALT**

 **USES :**

- USED IN GLASS, SOAP AND PAPER INDUSTRIES
- MANUFACTURE OF SODIUM COMPOUNDS SUCH AS BORAX
- AS A CLEANING AGENT FOR DOMESTIC PURPOSES
- FOR REMOVING PERMANENT HARDNESS OF WATER

# PLASTER OF PARIS

 CHEMICAL FORMULA -  $\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$

 CHEMICAL NAME - CALCIUM SULPHATE  
HEMIHYDRATE

 THIS SALT IS PREPARED BY HEATING  
GYPSUM AT 373 K .



# PLASTER OF PARIS



## CHEMICAL PROPERTY -

- IT IS A WHITE POWDER.
- ON MIXING WITH WATER, IT CHANGES TO GYPSUM AGAIN GIVING A HARD SOLID MASS.



## USES :

- DOCTORS USE IT AS PLASTER FOR SUPPORTING FRACTURED BONES IN RIGHT POSITION.
- USED FOR MAKING TOYS, DECORATIVE MATERIALS AND FOR MAKING SMOOTH SURFACES