

Compounds of Calcium :

Gypsum :

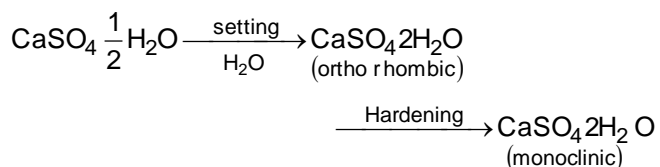
- i) Calcium sulphate dihydrate is called gypsum. Finely divided naturally available form of CaSO_4 is called Alabaster.
- ii) Anhydrous CaSO_4 is called anhydrite.
- iii) Gypsum is prepared by the action of dil. H_2SO_4 on CaO or CaCO_3 . Gypsum is slightly soluble in water and its solubility decreases on heating.
- iv) CaSO_4 is readily soluble in hot. conc. Solution of ammonium sulphate due to the formation of double salt $(\text{CaSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot \text{H}_2\text{O})$
- v) When gypsum is heated to 120°C , plaster of paris is formed.
- vi) On heating gypsum to 200°C gives "dead burnt" due to complete dehydration.

Uses of Gypsum :

- i) In the preparation of plaster of Paris, in agriculture, in the impregnation of filter paper.
- ii) Gypsum increases the setting time of cement. Therefore it is used for the manufacture of cement.
- iii) Anhydrous CaSO_4 is used as drying agent.

Plaster or Paris:

- i) Calcium sulphate hemihydrate or half hydrate is called Plaster of Paris.
- ii) When gypsum is heated to 120°C , plaster of Paris is obtained
$$\text{CaSO}_4 \cdot 2\text{H}_2\text{O} \xrightarrow{120^\circ\text{C}} \text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O} + \frac{3}{2}\text{H}_2\text{O}$$
- iii) Plaster of Paris combines with little water (half to its weight) and sets to a hard mass.
- iv) Setting of plaster of Paris involves hydration and it is exothermic reaction.
- v) Setting of plaster of paris is catalyzed by NaCl and retarded by borax and alum.
- vi) Setting of plaster of Paris.



- vii) Hardening of plaster of paris is due to conversion of orthorhombic form to monoclinic form.
- viii) Plaster of paris on heating to 200°C gives anhydrous CaSO_4 . It is called dead plaster (or) dead burnt Calcium sulphate.

Plaster of Paris is used :

- i) In surgery for setting bones.
- ii) In making casts or moulds for statues and toys.
- iii) In dentistry
- iv) In making black board chalks.
- v) In making models, crucibles.

Mortar :

- i) A mixture of 3 parts of sand, 1 part of slaked lime and water is called lime mortar.
- ii) A mixture of cement, and mortar is called cement mortar. It is much harder than lime mortar.
- iii) The presence of sand in mortar prevents cracks due to excessive shrinkage.
- iv) Lime stone and clay (containing 10% Aluminum silicate) when heated together, it gives hydraulic mortar.
- v) Hydraulic mortar is used as bleaching agent and antiseptic.
- vi) Mortar hardness is due to formation of CaCO_3 and CaSiO_3 .
- vii) $\text{Ca(OH)}_2 + \text{SiO}_2 \rightarrow \text{Ca SiO}_3 + \text{H}_2\text{O}$
 $\text{Ca(OH)}_2 + \text{CO}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$
 Setting of mortar to hardness may be due to evaporation of water.