

⇒ Sodium Chloride (NaCl)

* Occurrence: → Sea water is the main source and also found in salt lakes.

* Preparation: →

(i) Sea water NaCl (2.7-2.9%) $\xrightarrow[\text{by solar heat}]{\text{Evaporation}}$ Crude NaCl.

(ii) It contains impurities → Na_2SO_4 , MgCl_2 , CaCl_2 etc.

(iii) Insoluble impurities removed by filtration.

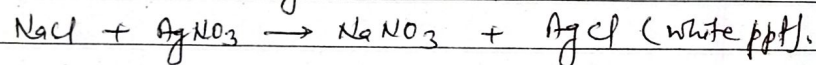
(iv) Filtrate $\xrightarrow{\text{HCl gas passed}}$ Pure NaCl precipitation (Common ion effect)

(v) MgCl_2 and CaCl_2 are more soluble in water so left in solution.

* Properties: →

(i) Table salt is slightly hygroscopic due to the presence of magnesium and calcium chlorides in small amounts.

(ii) Reaction with AgNO_3



* Uses: → (i) As a preservative for pickles, meat and fish.

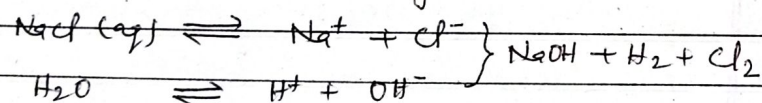
(ii) For making freezing mixture with ice.

(iii) In medicinal & laboratories.

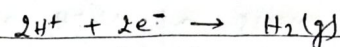
⇒ Sodium Hydroxide [Cauter Soda (NaOH)]

Manufacture: → By electrolysis of NaCl.

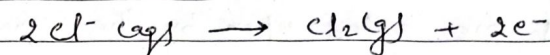
(i) Nelson Cell or Diaphragm Cell: →



At cathode (perforated steel): →



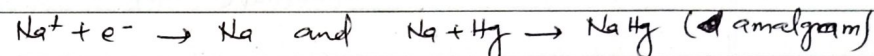
At anode (Carbon): →



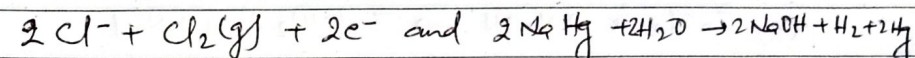
(b) Castner - Kellner Cell: → (Hg - Cathode Process)

Electrolyte (Brine) $\text{NaCl} \rightleftharpoons \text{Na}^+ + \text{Cl}^-$

On electrolysis: → (At cathode) (Hg)



At anode (Graphite)

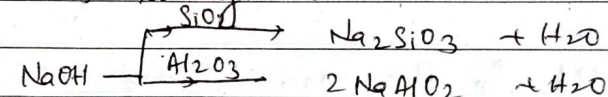


* Properties: →

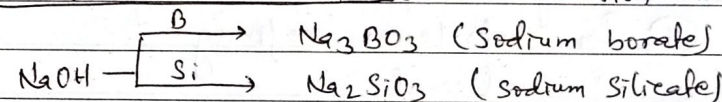
(i) It is deliquescent white crystalline solid.

(ii) It absorbs CO_2 from air forming Na_2CO_3 .

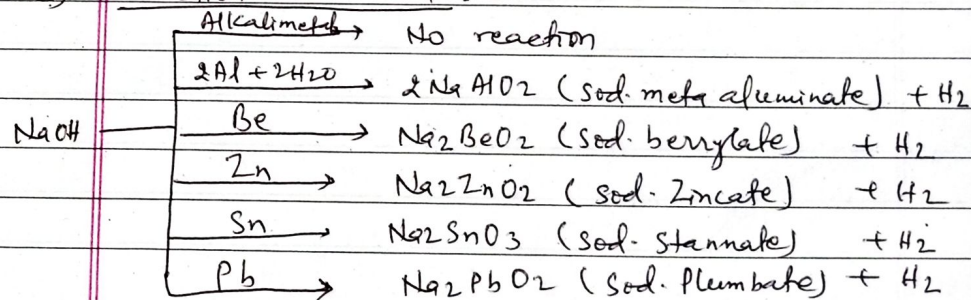
(iii) NaOH is strong base.



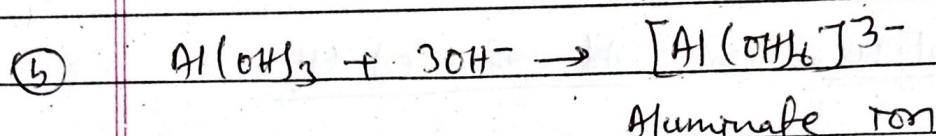
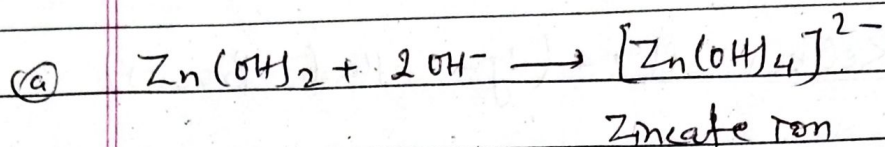
(iv) Reaction with non metals: → No reaction with H_2 , N_2 and C



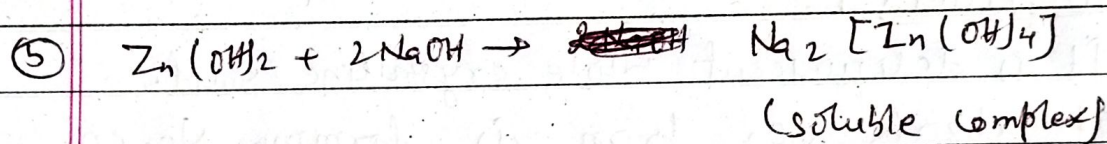
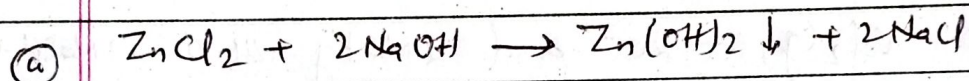
(v) Reaction with metal: →



(vii) The hydroxides of aluminium, zinc, lead and tin, however, dissolve in excess of NaOH giving clear solⁿ which can also be obtained when these metals are acted upon by the conc. NaOH solⁿ.



(viii) Reaction with ZnCl_2 or ZnSO_4 :



Uses :

- (i) In the manufacture of soap, rayon, dyes, paper and drugs.
- (ii) In petroleum refining.
- (iii) In medicinal
- (iv) In laboratories