

Minor Methods of Treatment:

(i) Treatment with Activated Carbon.

→ Activated carbon in powdered form is added in water to remove taste, colour, odour, phenol, flowid, Cl^- , H_2S , Fe^{2+} , Mn^{2+} etc from water by absorbing it over the surface.

→ It is added either during coagulation or during filtration

→ Its normal dose varies between 5 to 20 mg/lit.

(ii) Treatment with CuSO_4

→ Due to its strong ~~algae~~ algacidal property, it is used to remove algae from the water.

→ It is added just before water is fed into the distribution system.

→ Its normal dose is 0.5 - 0.6 mg/lit.

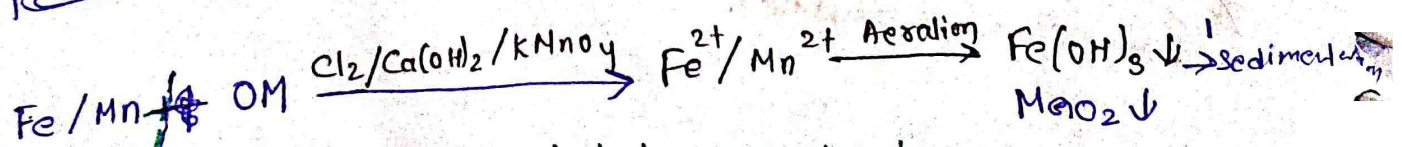
→ It is ~~just~~ added just in the water just before water is fed into distribution system.

Note:- Algae is also removed by addition of chlorine & lime.



(iii) Removal of Fe and Mn

Iron and manganese are generally present in conjunction with organic matter in water. Hence in order to remove iron manganese by aeration, bond between Fe/Mn and OM is first broken by addition of lime, ~~potassium~~ KMnO_4 or Cl_2 .



(Fe and Mn are removed during aeration process.)

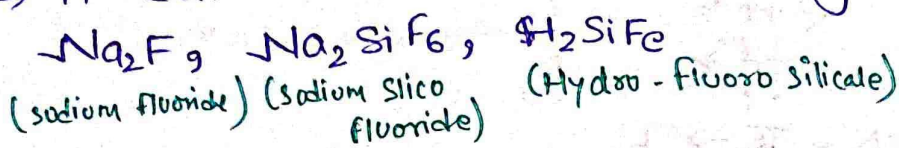
→ It is also known as De-ferrization (removal of Fe)

- Fe/Mn can also be removed with the help of magnese zeolite. which is a natural green sand, Coated with the magnese dioxide.
- After magnese zeolite becomes exhausted it is regenerated by addition of potassium permagnet (KMnO_4)

4) Fluoridation fluoride (1 ppm - 1.5 ppm)

→ It is the process of addition of fluoride in water. if less than 1 ppm.

→ It can be achieved by following chemicals,



5) De-fluoridation

→ The process of removal of excess fluoxine from water if its concentration is greater than 1.5 ppm.

→ It can be achieved by any of following chemicals: -

(i) Calcium Phosphate ($\text{Ca}_3(\text{PO}_4)_2$),

(ii) Bone charcoal

(iii) Activated carbon.

(iv) (Alum + $\text{Ca}(\text{OH})_2$) = Nallaconda technique.

(v) Activated Alumina = Prashanti method.

6) Desalination

→ It is process of removal of salts from water.

→ It can be achieved by any of the following method.

(a) Reverse Osmosis.

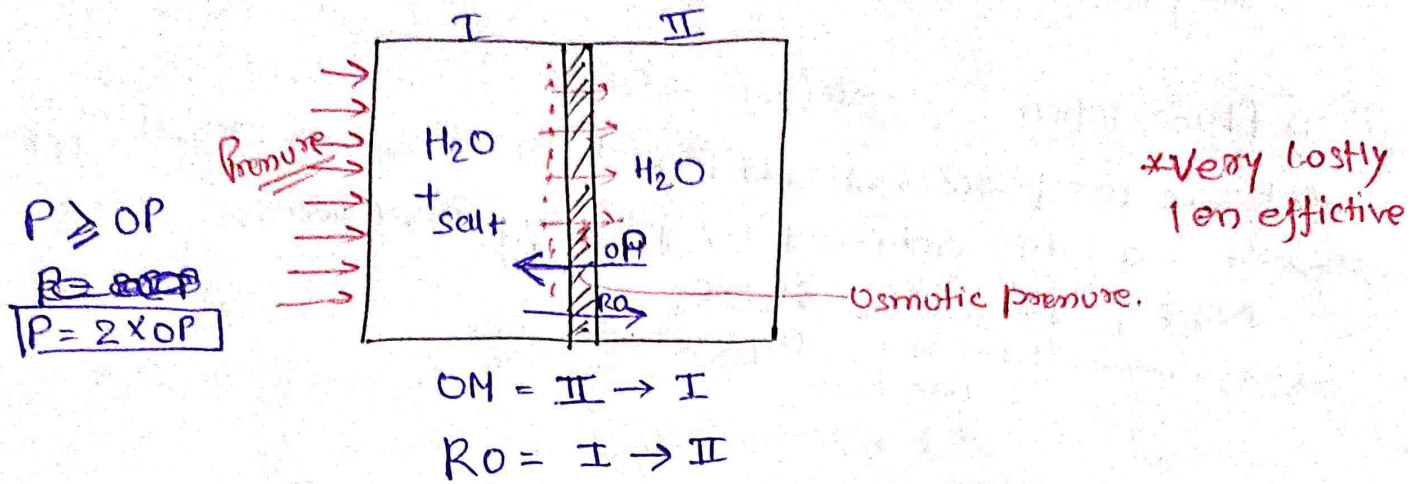
(b) Evaporation

(c) Freezing

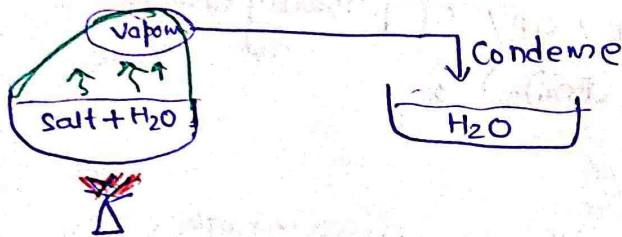
(d) ~~Electrolysis~~
Electrodialysis.

Reverse osmosis

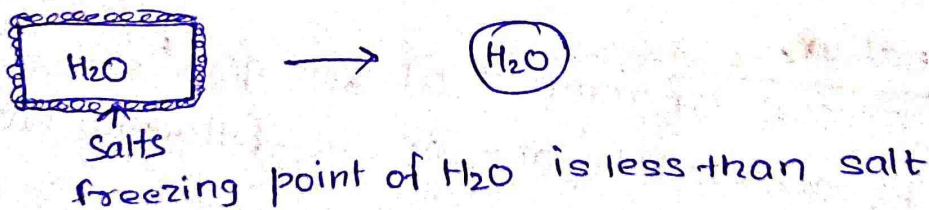
- It is just opposite of osmosis process.
- Osmosis is the movement of water through a semi permeable membrane from a region of high concentration to a region of low concentration.



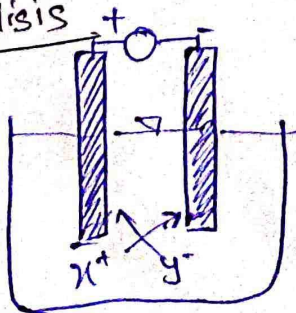
Evaporation (distillation)



Freezing



Electrolysis



Service Reservoir

- The main and primary function of distribution reservoir is to meet the fluctuating demand with a constant rate of supply from the treatment plant.
- The quantity of water required to be stored in the reservoir for equalising or balancing this variable demand against constant supply is termed as "Balancing reserve" or "Balancing storage" or storage capacity.
- This Balancing storage can be computed by any of the following:-
 - (i) Utilizing hydrograph of inflow and outflow.
 - (ii) By Mass curve method.
 - (iii) Analytical method.

→ Service reservoir are also provided ^{storage} to meet fire demand and emergency storage.

