

L.No:05

Topic: Desalination of Brackish Water - Reverse Osmosis

The process of removing common salt (sodium chloride) from the water is known as **Desalination**.

The water containing dissolved salts with a peculiar salty (or) brackish taste is called **Brackish Water**.

Depending upon the quantity of dissolved solids, water is graded as

\* Fresh water - Contains  $< 1000$  ppm of dissolved solids.

\* Brackish water - Contains  $> 1000$  but  $< 35,000$  ppm of dissolved solids.

\* Sea water - Contains  $> 35,000$  ppm of dissolved solids.

Sea water and brackish water can be made available as drinking water through desalination process.

Water with high levels of dissolved salt is not suitable for domestic, industrial or irrigation uses.

Sea water can be desalinated to separate into fresh water by the process called desalination.

Desalination can be performed by two process a) Membrane process b) Thermal process

Reverse Osmosis (RO) and Electrodialysis are two membrane processes for desalination.

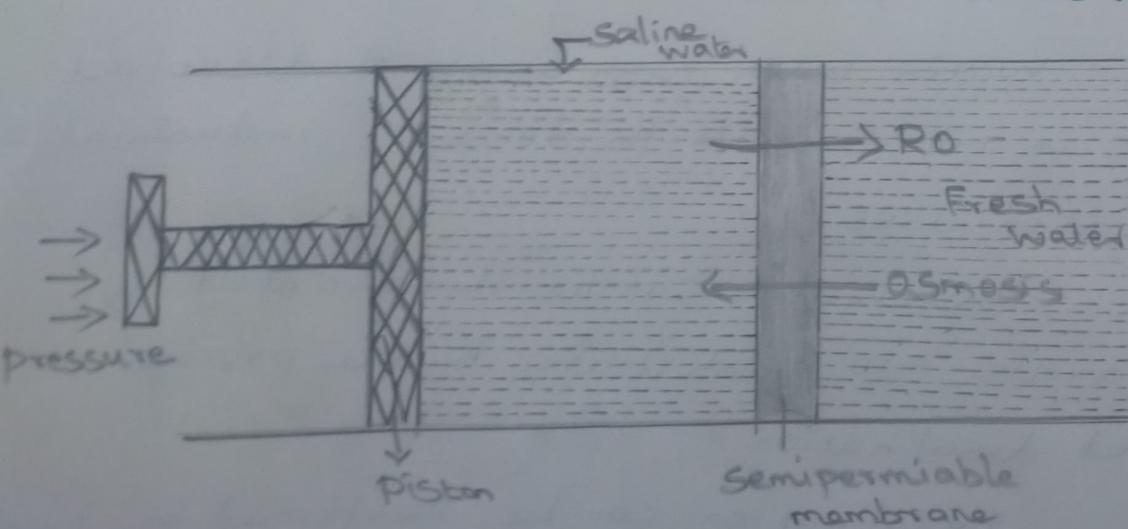
Desalination is carried out by Reverse Osmosis.

## Reverse Osmosis (RO)

When two solutions of different concentrations are separated by a semi-permeable membrane, solvent (water) flows from a region of lower concentration to higher concentration. This process is called Osmosis.

If a hydrostatic pressure in excess of osmotic pressure is applied on the higher concentration side, the solvent flow is reversed. i.e) Solvent flows from higher concentration to lower concentration. This process is called reverse osmosis.

Thus in the process of reverse osmosis pure water is separated from salt water.



This process is also known as Super filtration.

The membranes used are cellulose acetate, Cellulose butyrate.

### Advantages

- \* The life time of the membrane is high, and it can be replaced within few minutes.
- \* It removes ionic as well as non-ionic Colloidal impurities.
- \* Due to low Capital Cost, Simplicity, low operating, this process is used for Converting Sea water into drinking water.