

Desalination:

Desalination is a process that extracts minerals from saline water. More generally, desalination refers to the removal of salts and minerals from a target substance, as in soil desalination, which is an issue for agriculture. The process of removing dissolved salts from water, thus producing fresh water from seawater or brackish water.

Methods of Desalination

1. Desalination by evaporation & distillation
2. Electro dialysis method
3. Reverse Osmosis method
4. Freezing process
5. Solar distillation method

1. Desalination by evaporation & distillation

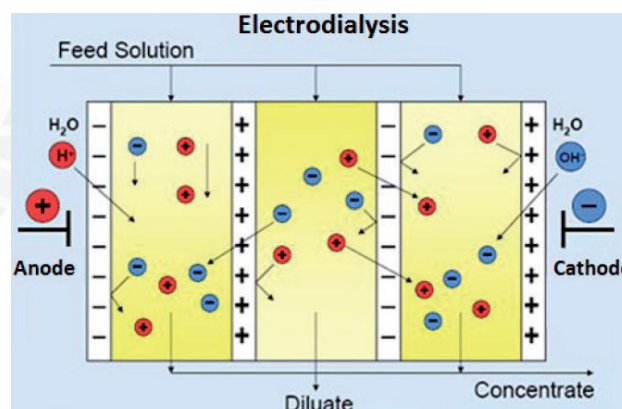
In this process, the liquids are separated by evaporating and capturing them at various points in their cooling cycle, and then immediately channeled into a condenser.

- Simple distillation is used for a mixture in which the boiling point of the components differ by at least 158°F (70°C).
- It is also followed for the mixtures contaminated with nonvolatile particles (solid or oil), and those that are nearly pure with less than 10 percent contamination.

2. Electro dialysis method

Electrodialysis desalination process is in some way similar to “ion exchange” treatment process, but it differs in utilizing both cation and anion selective membranes to separate charged ions.

Electrodialysis (ED) is used to transport salt ions from one solution through ion-exchange membranes to another solution under the influence of an applied electric potential difference.

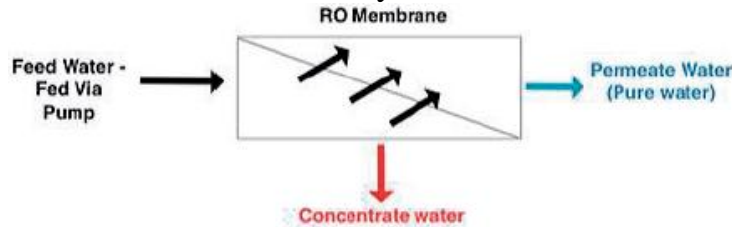


Water is handed between a negative electrode and a high-quality electrode. Ion exchange membranes permit solely high-quality ions to transfer toward the negative electrode from the feedwater and negative ions to the positive electrode.

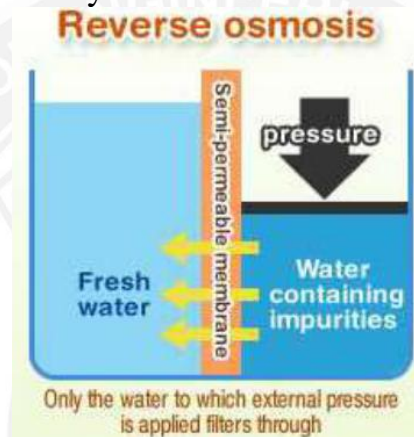
3. Reverse Osmosis method

Reverse osmosis (RO) membrane is known as hyper filtration and is the supreme filtration known. Reverse osmosis allows the removal of small particles and dissolved organic matter. It is also employed to purify different fluids including glycol and

ethanol, rejecting other ions and contaminants preventing them from passing through the membrane. Reverse osmosis is commonly used in water treatment.



Reverse osmosis membrane is a semipermeable membrane allowing fluid that is to be purified to pass through the membrane and rejecting contaminants in the reject stream. Most reverse osmosis systems use cross flow mechanism to decrease membrane cleaning periods. As the fluid flows through the reverse osmosis membranes, the downstream, remove the reject away from in concentrated reject water (brine).



When a semipermeable membrane is used to separate two water (or other solvent) volumes, water is going to flow from the low solute concentration side to the high solute concentration side. By applying an external pressure on the higher concentration side, the flow could be stopped or reversed. In such a case, the phenomenon is called “reverse osmosis.” If there are solute molecules only on one side of the system, then the pressure that stops the flow is called the osmotic pressure. The movement of a “solute molecule” within a solvent is overdamped by the solvent molecules that surround it.

4. Freezing process

5. Solar distillation method

