Aim: What is the process of osmosis?

Osmosis rap

What is osmosis?

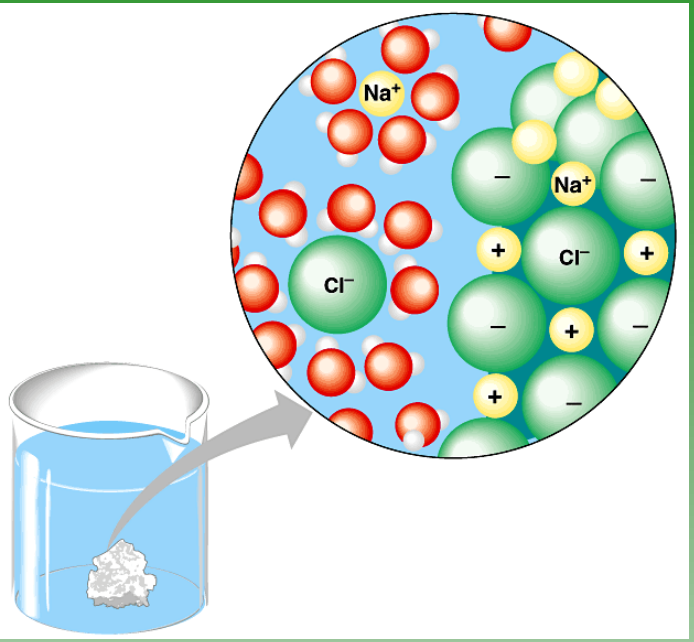
- This diffusion of water across a selectively permeable membrane is a special case of passive transport called ***osmosis***.
- Osmosis is dependent upon the osmotic concentrations of the two solutions on either side of the membrane.
- Osmotic concentration refers to the total solute concentration in a solution. A solute is the substance that has dissolved in the solvent (water).

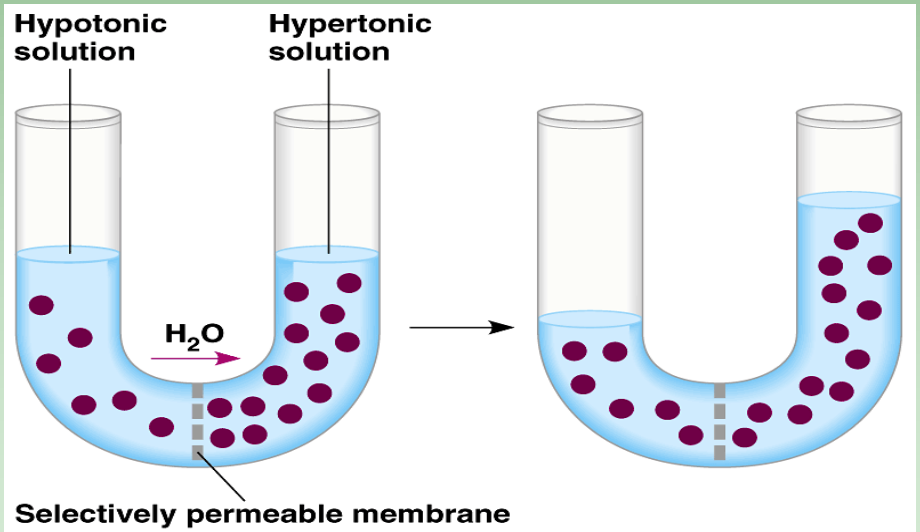
Types of osmotic concentration

When comparing solutions on both sides of a selectively permeable membrane:

- Hypertonic = solution with the high concentration of solute (more salty)
- Hypotonic = solution with the lower concentration of solute (less salty)
- Isotonic = solution with the same concentration of solute

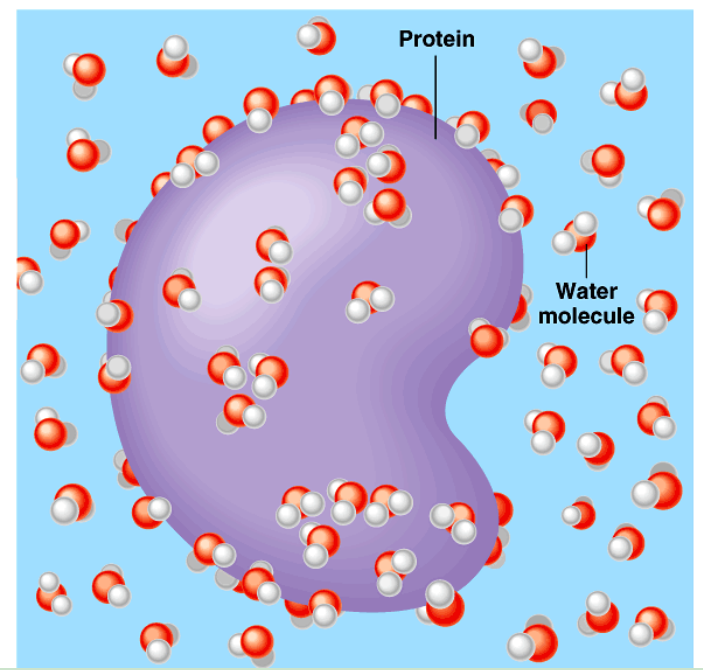
Water will diffuse from the hypotonic solution (solution with the lower osmotic concentration) to the hypertonic solution (solution with the higher osmotic concentration).





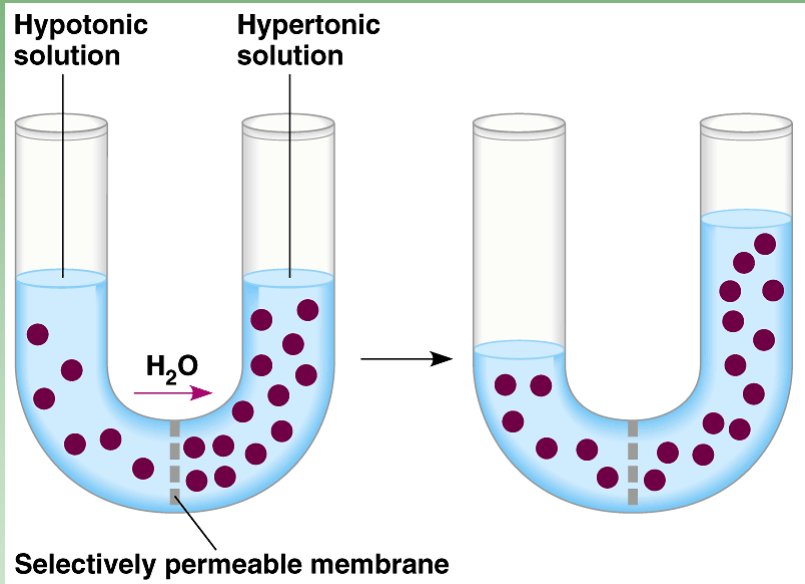
Example of osmosis

- The hypertonic solution has a lower water concentration than the hypotonic solution.
- More of the water molecules in the hypertonic solution are bound up in hydration shells around the substrate molecules, leaving fewer unbound water molecules



Example of osmosis

- Unbound water molecules will move from the hypotonic solution where they are abundant to the hypertonic solution where they are rarer.
- Osmosis continues until the solutions are isotonic.



- The direction of osmosis is determined only by a difference in ***total*** solute concentration.
  - The ***kinds*** of solutes in the solutions do not matter.
  - This makes sense because the total solute concentration is an indicator of the abundance of bound water molecules (and therefore of free water molecules).
- When two solutions are isotonic, water molecules move at equal rates from one to the other, with no net osmosis.