

# Osmosis of potato cells assignment



**ASSIGN  
BUSTER**

Osmosis of a Potato cell. Hypothesis is that the potato in saltwater is going to show that it will break down the cells of the potato. Osmosis is the diffusion of a solvent through a semi-permeable membrane, from a solution of low solute concentration to a solution with high solute concentration, up a solute concentration gradient. Net movement of solvent is from the less-concentrated to the more-concentrated, which tends to reduce the difference in concentrations.

This effect can be countered by increasing the pressure of the hypertonic solution, with respect to the hypotonic. Osmosis is important in biological systems as many biological membranes are semipermeable. In general, these membranes are impermeable to organic solutes with large molecules, such as polysaccharides, while permeable to water and small, uncharged solutes. When the membrane is in a volume of pure water on both sides, water molecules pass in each direction at the same rate.

Osmosis can also be explained using the notion of entropy, from statistical mechanics. As above, suppose a permeable membrane separates equal amounts of pure solvent and a solution. Since a solution possesses more entropy than the pure solvent, the second law of thermodynamics states that solvent molecules will flow into the solution until the entropy of the combined system is maximized. Notice that, as this happens, the solvent loses entropy while the solution gains entropy. Osmotic pressure is the main cause of support in many plants.

The osmotic entry of water raises the turgor pressure exerted against the cell wall, until it equals the osmotic pressure, creating a steady state. When a

plant cell is placed in a hypertonic solution, the water in the cells moves to an area higher in solute concentration, and the cell shrinks and so becomes flaccid. (This means the cell has become plasmolysed - the cell membrane has completely left the cell wall due to lack of water pressure on it; the opposite of turgid. )