

Imagine you have a cup that has 100ml water, and you add 15g of table sugar to the water. The plasma membrane pulls away from the cell wall as it shrivels, a process called plasmolysis. You now add the two solutions to a beaker that has been divided by a selectively permeable membrane, with pores that are too small for the sugar molecules to pass through, but are big enough for the water molecules to pass through. In comparing two solutions of unequal solute concentration, the solution with the higher solute concentration is hypertonic, and the solution with the lower solute concentration is hypotonic. Osmosis is the diffusion of water molecules across a selectively permeable membrane from an area of higher concentration to an area of lower concentration. The sugar dissolves and the mixture that is now in the cup is made up of a solute (the sugar) that is dissolved in the solvent (the water). The hypertonic solution has a lower water concentration than the hypotonic solution, so a concentration gradient of water now exists across the membrane. If a cell is in a hypertonic solution, the solution has a lower water concentration than the cell cytosol, and water moves out of the cell until both solutions are isotonic. Cells placed in a hypotonic solution will take in water across their membrane until both the external solution and the cytosol are isotonic. The mixture of a solute in a solvent is called a solution.