Osmosis: concentration

Science, Biology

OSMOSIS and TONICITY IN POTATO STRIPS The purpose of this experiment was to make observations and conclusions about the ability of cells to adjust to varying chemical concentrations in theenvironmentand to observe the effect of isotonic, hypotonic and hypertonic solutions on cells. Hypothesis If a solution is Hypotonic, then water will move from the beaker into the potato because water outside the cell will be in higher concentration than water inside the cell. If a solution is Hypertonic, then the solution will move into the cell from the beaker and water will move out of the cell into the water because of a difference in concentration.

If a solution is isotonic, then the cells will remain the same because the solution concentration is the same as in the cell. Materials Fresh potato, knife or scalpel, three test tubes, test tube rack, dropper pipette, paper towels, electronic balance, timer, three provided solutions labeled A, B, and C. Procedure Obtain three test tubes and a test tube rack. Label the test tubes A, B, C using a wax pencil. Cut three French fry type strips of potato 7cm in length, no thicker than 5mm. Pat each potato with a paper towel. Measure the initial mass of each strip and record it before putting each in a test tube.

Use a dropper pipette to cover the potato strip in test tube A with solution A, the potato strip in test tube B with solution B, and the potato strip in tube C with solution C. Place the tubes in a test tube rack and wait one hour. Remove the strips from the test tubes after one hour and pat dry with a paper towel. Measure the final mass of each strip and record it. 10. Examine each potato strip and observe any changes in texture. Results In Solution A, the potato slice in the water did not change, indicating the solution contained an equal amount of concentration.

In Solution B, the potato slice in the water is larger, indicating that more molecules went into the potato than came out, because there was a higher concentration of water outside the potato. The potato slice from Solution C is much smaller indicating that more water molecules came out of the potato than went in because there was a higher concentration of water inside the potato. Conclusion In conclusion, the hypothesis was found to be correct. Solution A was Isotonic because the final mass of the potato slice was 2. 9 as opposed to 2. 8 at initial mass, which basically stayed the same.

Solution B was Hypotonic because the initial mass for the potato slice was 3. 3 then expanded and weighed 3. 6 at final mass. Solution C was Hypertonic because the potato slice lost water and became much smaller in which the initial mass was 2. 8 and the final mass weighed in at 2. 2. In all three solutions, water is moving across the membrane to establish equilibrium. Based on the Diffusion-Osmosis Review on page 26, and not knowing the definite solution in each tube I am going to conclude that there was Saline in Solution A 0. 9% Sodium Chloride which makes cells neutral.

In Solution B, therewas a small percentage of salt predicting . 9%. In Solution C, salt was higher than . 9%. All had salt in the tubes but different tonicity. The water could go in or out of the potato to equalize the concentration of salt in the solution. Based on this experiment and using this in real life, it taught me that when mixing the intravenous fluid for a patient to make sure only 0. 9 percent of salt is added in order for the saline to be isotonic to the red blood cells. If not, the red blood cells will expand and complications will arise.