Potato salt water osmosis lab report pdf

Osmosis can be easily detected in biological systems using potato strips, water and salt or sugar solution. Remember that osmosis is defined a net movement of particles of solvent along its concentration gradient, across a selectively permeable membrane until equilibrium is established. In this experiment, the solvent particles are water particles, the selectively permeable membrane being the cell membranes of the cells of the potato tissue. The degree of concentration is the result of the difference in the concentration of dissolved in the cytoplasm of potato cells and the solutions. 3 potato strips (5 x 1 x 1) cm (or potato cylinders/cores of the same length, e.g. 5 cm in diameter, made with cork drills) 2 Petri dishes of the same volume solutions A and B; A = sucrose or saline solution (hypertonic solution); B = distilled water (hypotonic solution)1 empty petri dish (control)Stop clock or timing device Observe each strip by feeling it, and notice whether it is squeaky or slack. Record this. Weigh and measure each potato strip, taking the original mass and length Place a strip in each petri dish, taking care not to mix the strips. Start the timer. Remove the strips after 15 minutes and dab on the tissues. Each strip is weighed and measured each potato strip, recording the final mass and length. Observe each strip by feeling it, noticing whether it is snaresed or slack. Record this. Perform % difference calculations for the mass and length using the formula:(final - initial) x 100% / initial Record your results in a table like the one below: TABLE SHOWING THE RESULTS OF THE EXPERIMENT TO DEMONSTRATE OSMOSIS USING POTATO STRIPS Define osmosis and identify the semimeal membrane in the experimental osmosis is the movement of solvent particles, for example. In this experiment, the semime permeable membrane is the cell membrane (surface). Take into account any changes in the mass and length of the strips in water, saline solution and air. Strips in waterDescription - TurgidMass - The increase in the mass of the potato strip in water is due to the movement of water molecules in the plant cells via osmosis. Water molecules in the petri dish are at a higher concentration than water pelemics in the cytoplasm of cells and therefore move along their concentration gradient into the cells. As more water molecules are present in cells - and water has mass - the final mass of the potato strip will be greater than the first. Length - the decrease in length is also due to the movement of water molecules via osmosis. More water molecules take up more space - volume - and push against the cell membrane and the immediate cellulose cell wall. Pushing of water molecules result in expansion in all dimensions, including length. Enlargement is limited - and regulated by the cellulose cell is inelastic. The pressure/force produced on the surface of the rigid cell (recall pressure is force that trades per unit range) and therefore the strips are down. Strips in Salt SolutionMass - the decrease in the mass of the potato strip is due to the movement of water molecules outside the plant cells. Water molecules in the cytoplasm are at a higher concentration than in the saline solution in the petri dish and therefore move along their concentration gradient out of the cells. Water molecules have mass and so the reduced number of water molecules results in decreased mass. Length - the decrease in the number of water molecules results in loss of volume. The turgor pressure exerted by the water molecules against the cell membrane and thus the cellulose cell wall is less. The cell can even shrink if turgor pressure dminishes further. Strips in AirDescription - A little slack. This strip as control and theoretically does not change in texture. But in reality it loses water by evaporation via the cut surfaces and becomes dehydrated. At the end of the experiment the strip in the air is a little slack, but certainly not so much as the strip of saline solution. Mas - mass changes are minimal as minimal water was lost. Length - Length changes were minimal as minimal water was lost. Osmosis and Diffusion: Percentage Difference in Mass Based on Sucrose Solution ConcentrationAP Biology, Mod 5Abstract The process of osmosis was studied through this experiment using dialysis tubes and potato nuclei. By filling dialysis tubes with different concentrations of sucrose solution and leaving them in water over a period of time, a pattern can be observed. Using this information, another experiment was conducted with potato kernels immersed in sucrose solution to further investigate osmosis. There was no direct correlation between the results of both trials. Therefore, the effect of osmosis is not correlated with the kind dissolved, but only with the water content of the two solutions. Initiation Both laboratories performed tested percentage change in mass when osmosis occurred. The first laboratory used dialysis with a number of sucrose concentrations. When placed in a cup of water, the pipes were expected to swell with water. This is known as a hypotonic solution. The second laboratory tested osmosis from a cup of water to a small wedge of potatoes with different concentrations of water. The concentrations were unknown and it was up to us to infer which one was there. Diffusion is the movement of particles from an area of high concentration to low concentration. A more specified form of diffusion is osmosis, which was primarily focused on in this laboratory, and that is the movement of water over a membrane, again from an area of high concentration to low concentration. The main purpose of this laboratory was to gain a better understanding of osmosis by seeing it in action. Our hypothesis was that if a dissolved one has a high concentration, it will get more water than if dissolved had a lower concentration. Methods Both experiments in this was conducted at New Tech High @ Coppell in Mrs Wootton's AP Biology class. Our experiment was completed with the use of the cup, dialysis tubes, sucrose solvents and potatoes from Mrs Wootton. When the data came in, it was immediately inserted into our data tables to ensure that there was no missing data. After the data was finished and submitted, the class data was available to compare the results for different groups in the class. Results Overall for the first laboratory our hypothesis was correct when we submerged dialysis tubes filled with different solvent concentrations the water would go inside the bag. Our results from distilled water and 0.4 moles seem to be our only outliers in terms of mass decreasing. After pulling distilled water dialysis hoses we observed a small defect in the binding of the knot, which may have destroyed our results and allowed water to pass through the top. Besides our two outliers data almost forms a linear trend, as sucrose increases so does the final mass of the bag. Our results may also be a little skewed because of the time constraints we faced. In the Potato Core experiment, most of our trials were fairly consistent. Align with our predictions the potato in the Cup #4 taken at 0.24 g therefore subtract that beaker #4 is filled with distilled water. Beaker #1 was the most significant change with a percentage difference of 42.5 making it almost half the potato mass. Based on the data collected, we can agree that the most likely outcome of the mass loss is due to the water leaving the potato. Discussion Osmose is the spread of water, where the water moves to areas with high dissolved concentrations. This result agrees with our hypothesis that the semi permeable bag of 1 mole sugar will have the most water movement, and will gradient down to 0 moles (distilled water), which will have no water movement. All water movement will be water going into the bag. Our results were not what we expected though. The highest percentage of the mass change was in the distilled water. But we realized that we had a few errors occurring in tying our dialysis tubes correctly, which is what caused some of the results to be skewed. Conclusion The purpose of this laboratory was to test osmosis through two media. Although the results contained errors the original hypothesis remains true. The degree to which osmosis occurs is directly related to the cheek toothiness of the substances in question. Water molecules transfer through permeable membranes until both sides are straight, this means that the hypotonic to hypertonic flow is directly proportional to the mass increase. Lab #1 - Dialysis Hoses Content in BagInitial MassFinal MassMass Difference% Change in MassClass AverageWootton's% Change Distilled Water 17.0 g13.6 g3.4 g-20.0%3.75%2.8%0.2 M19.2 g21.1 g1.9 g-9.89%4.1 68%16%0.4 M11.4 g11.3g ,1 g -0.877% 4.70%14%0.6 M2 0.3 g21.6 g1.3 g6.40%6.12%19%0.8 M22.0 M22.3 g24.2 g1.9 g8.52%6.85%28%Lab #2 - Kartoffelkerner Bægerglas #Initial MasseFinal MassMass Skift% Forskel11.2 g,69 g0.51 g-42.5%21.0 g,92 g,08 g-0 8%31.0 g,72 g,28 g-28%41.2 g1.44 g+.24 g+20%50.50. 9 g,78 g,12 g-13.3%61.1 g,77 g,33 g-30% g-30% g-30% g-30%