

Osmosis Lab

Purpose: To determine the biological changes that occurs over a period of time in different solutions and to relate these changes to osmosis and diffusion.

Materials: The materials used in this experiment were:

1. 15 cm dialysis tubing (6)
2. sucrose solutions
3. beaker (6)
4. triple beam balance
5. paper towels
6. distilled water

Procedures: The procedures used in this experiment were:

1. Obtain six 15 cm strip of presoaked dialysis tubing.
2. Tie off one end of each piece of dialysis tubing to from a bag. Pour 10 mL of one of the following solutions into this bag.
 - a. distilled water
 - b. 0.2 M sucrose
 - c. 0.4 M sucrose
 - d. 0.6 M sucrose
 - e. 0.8 M sucrose
 - f. 1.0 M sucrose
3. Remove most of the air from each bag by drawing the dialysis bag between two fingers. Tie off the other end of the bag leaving sufficient space for the expansion of the contents in the bag. (The solution should fill only about $\frac{1}{3}$ to $\frac{1}{2}$ of the piece of tubing.)
4. Rinse each bag gently with tap water to remove any sucrose spilled during filling.
5. Carefully blot the outside of the bag and record its initial mass (grams in Table 1).
6. Label a 100 mL beaker to indicate the molarity of each solution in the dialysis bag.
7. Fill each beaker $\frac{2}{3}$ full with distilled water.
8. Immerse each bag in the appropriately labeled beaker of distilled water.
9. Let each beaker stand for 30 minutes.
10. At the end of 30 minutes remove the bags from the water one at a time. Carefully blot and determine the mass of the bag.
11. Record date in Table 1.
12. Graph the results.

Data:

Table 1: Dialysis Bag Results – Individual Results

Contents in Dialysis Bag	Initial Mass	Final Mass	Mass Difference	% Change in Mass*
distilled water				
0.2 M sucrose				
0.4 M sucrose				
0.6 M sucrose				
0.8 M sucrose				
1.0 M sucrose				

*To calculate:

$$\% \text{ Change in Mass} = \frac{\text{Final Mass} - \text{Initial Mass}}{\text{Initial Mass}} \times 100$$

Graph the results for your data and the class average. For the graph you will need to determine the following:

1. The independent variable using this to label the X – axis.
2. The dependent variable using this to label the y – axis.

Analysis:

1. Explain the relationship between the increase in mass and the molarity of sucrose within the dialysis bag.
2. Predict what would happen in an experiment if all the bags were placed in a 0.4 M sucrose solution instead of distilled water.
3. Why did you calculate the % change in mass rather than simply using the change in mass?
4. A dialysis bag is filled with distilled water and then placed in a sucrose solution. The bag's initial mass is 20 g, and its final mass is 18 g. Calculate the % change in mass, showing your calculations.