

Aiyanna Jack
BIO2311
Prof. Niloufar Haque

LAB REPORT- OSMOSIS & DIFFUSION THROUGH NONLIVING MEMBRANES

Introduction: The purpose of osmosis and diffusion is to understand how chemicals pass through cell membranes. Both diffusion and osmosis aim to equalize forces inside cells and organisms as a whole, spreading water, nutrients and the necessary chemicals from areas that contain a high concentration to areas that contain a low concentration.

Purpose: How will the movement of water and solutes pass through a selectively permeable membrane?

Hypothesis: If glucose is considered a simple sugar then the sac will allow passage. Therefore, sucrose and NaCl will not allow passage through the sac because they are larger molecules. I believe that osmosis will occur slowly since the movement of osmosis is affected by whether the concentration is low or high.

Materials:

- 4 Beakers
- 4 Dialysis sacs
- Distilled water
- Glucose solution
- NaCl solution
- Sucrose solution

Procedure:

1. Label the beakers 1-4, label the test tubes 1B-4B and each sac 1A-4A
2. Fill beaker 1,3 and 4 with $\frac{1}{2}$ of distilled water and fill beaker 2 with $\frac{1}{2}$ of 40% glucose solution.
3. Put 40% glucose into sac 1A, put 40% of glucose into sac 2A, put 10% of NaCl into sac 3A, put 40% of sucrose solution into sac 4A
4. Record the initial weight of each sac before placing them inside the beakers
5. Place sac 1A in beaker 1, sac 2A in beaker 2, sac 3A in beaker 3 and sac 4A in beaker 4. Leave each sac inside of the beakers for 45 minutes.
6. After 45 minutes, remove the sacs from the beakers and record their weight. Determine the difference in weight from before and after the sacs were placed in the beakers.

7. Perform Benedict's test for glucose by placing 5 drops of benedict's solution in test tubes 1B, 2B, and 4B. Take test tubes 3A and 3B and add 5ml of solution, then add one drop of AgNO₃ to test for sodium.

Results/Data: After 45 minutes of the sacs being inside of the beakers, sac 1,3 and 4 increased in weight which shows that osmosis did occur, while sac 2 showed no change in weight. For sac fluid test 1A-4A, they all tested positive for glucose or sucrose except for beaker fluid test 3B

Beaker	Contents of sac	Initial Weight	Final Weight	Weight Change	Tests-Beaker fluid	Tests-Sac fluid
Beaker 1 ½ filled with distilled water	Sac 1, 20ml of 40% glucose solution	7.1 gm.	8.0 gm	+0.9	Benedict's test: Positive	Benedict's test: Positive
Beaker 2 ½ filled with 40% glucose solution	Sac 2, 20ml of 40% glucose solution	6.9 gm.	6.9 gm	0gm	Positive	Positive
Beaker 3 ½ filled with distilled water	Sac 3, 20ml of 10% NaCl solution	7.2 gm.	7.8 gm	+0.6	AgNO ₃ test Positive	Positive
Beaker 4 ½ filled with distilled water	Sac 4, 20ml 40% sucrose solution	7.1 gm	8/0 gm	+0.9	Benedict's test: Negative	Positive

Conclusion: Osmosis is the movement of solvent particles across a semipermeable membrane from a less concentrated solution into a more concentrated solution into a more concentrated solution. Whereas diffusion is the movement of particles from an area of higher concentration to a lower concentration. Diffusion can happen whether a semipermeable membrane is present or not.. This lab made it possible to identify and investigate osmosis and diffusion through nonliving membranes.