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Bio 2311

Lab Report

Title

Diffusion and Osmosis Through Nonliving Membranes

Introduction

Diffusion is the movement of a substance from an area of high concentration to an area of lower concentration. Diffusion occurs in liquids and gases when their particles collide randomly and spread out. Diffusion is an important process for living things, it is how substances move in and out of cells. The way they passively move in and out through the cell is through the plasma membrane, and in order to do so they must dissolve through the lipid bilayer of the membrane. Osmosis is the same process, but the particles moving in this case are water molecules.

Purpose

The purpose of this Lab is to observe and investigate whether or not Osmosis and/or Diffusion has occurred in the nonliving membranes, and what has caused the change.

Materials

- 4 Dialysis Sacs
- 4 Beakers
- Distilled Water
- Glucose Solution
- Sucrose Solution
- Sodium Chloride Solution
- Benedict Solution
- 8 Test Tubes
- Test Tube Holder

Procedure

- 1) Label all 4 sacks, #1A, 2A, 3A, 4A and beakers, #1B, 2B, 3B, 4B.
- 2) In sack 1A fill it with 20ml of 20% Glucose Solution. Fill sack 2A with 20ml of 40% Glucose Solution. Fill sack 3A with 20ml of 10% NaCl Solution, and fill sack 4A with 20ml of 40% Sucrose Solution.
- 3) You will then half fill each beaker with the following. Beaker 1B, 3B, 4B with distilled water. Only Beaker 2B will be filled with 40% Glucose Solution.
- 4) Take the initial weight of each sack, before adding it inside the beakers and tie the free end.
- 5) Place the sack in the respective beaker for 45 mins, ex: solution of sack 1A added into 1B, 2A and 2B, 3A and 3B, and 4A into 4.
- 6) After 45 mins, take the weight of each sack again and record your observations.
- 7) You will then do the Benedict's test, for sugar for all sacks and all the beakers, except sack 3A and beaker 3B which you will test for sodium chloride.

Results

Beaker Contents	Sack Contents	Initial Weight of Sack	Final Weight of Sack	Change in Weight of Sacks	Benedicts Test (beakers)	Benedicts Test (sacks)
(1B) Half full of distilled water	(1A) 20ml of 40% glucose solution	7.1gm	8.0g	0.9gm	(1B) Positive	(1A) Positive
(2B) Half full of 40% glucose solution	(2A) 20ml of 40% glucose solution	6.9gm	6.9gm	0gm	(2B) Positive	2A) Positive
(3B) Half full of distilled water	(3A) 20 ml of 10% NaCl solution	7.2gm	7.8gm	0.6gm	NaCl Test (3B) Positive	NaCl Test (3A) Positive
(4B) Half full of distilled water	(4A) 20ml of 40% sucrose solution	7.1gm	8.0gm	0.9gm	(4B) Negative	(4A) Positive

Conclusion

In conclusion the results confirm that osmosis and diffusion has occurred in all the beakers and sacs except for sac 2A and beaker 2B because both of the contents contain the same solution concentration inside and outside the sac. Benedict's test and NaCl test results show that the selective permeation and diffusion took place, based on the observation of the change in color when using both tests. Benedict's solution first started off light blue and when exposed to sugar it changed to a yellow/brownish color which means it's positive for sugar. For the NaCl test, you add silver nitrate solution which is a brown color, and because it was positive it turned into a milky white substance, so therefore you know there was salt. In beaker 4B, due to the contents in the sac, 40% sucrose; it was too large of a molecule that wasn't able to permeate through the membrane of the sack, thus giving a negative result.