Osmosis & Diffusion Lab – Dialysis Tubing

Name:

Date:

Period:

Background:

The movement of molecules through a cell membrane is termed osmosis or diffusion. Such movement is principally possible because nutritive molecules are smaller than membrane micropores. If the molecules are too large, no molecular transfer, or diffusion occur.

Thus, some membranes may transmit selectively and are termed semi-permeable membranes. In the following experiment, cellophane dialysis tubing serves as an excellent representation of the cell membrane. The enclosed tube may, for the purpose of this experiment, be considered a single living cell in greatly enlarged form.

Purpose: In this lab, you will observe the diffusion of a substance across a selectively permeable membrane.

Hypothesis:

Materials:

7 cm piece of dialysis tubing, one jar or beaker, tap water, sugar water solution, paper towels, 10 cc syringe, 2 7cm pieces of string, scale, pencil and paper,

Procedure:

- 1. Wet the dialysis tubing.
- 2. Remove the tubing from the water and rub one of the ends between your thumb and pointer finger to open.
- 3. Tie one end of the tubing in a knot
- 4. Fill a 10cc syringe with sugar water solution and fill half of the tubing.
- 5. Tie the second end of the tubing in a knot and rinse it under the faucet.
- 6. Set your "cell" on a clean surface. Dry the dialysis bag by blotting
- 7. Mass the dialysis bag filled on scale.
- 8. Fill the 400 ml beaker ³/₄ full with tap water. Add 10 drops of food coloring and stir well.
- 9. Place dialysis tube in the beaker.
- 10. Complete the Initial Status information on your data table.
- 11. Next day, take the dialysis tube out of the beaker.
- 12. Reweigh the bag, and write your observations and mass in the table.
- 13. Remove the tubing from the beaker and record your observations in the data table for final status of the solution and the bag.
- 14. Answer analysis and conclusion questions

Data:

	Initial Contents	Initial Solution Observations	Final Solution Observations
Bag	Sugar Water Solution		
Beaker	H ₂ O		

Analysis of Results

- 1. Which substance(s) are entering the bag and which are leaving the bag?
- 2. What experimental evidence supports your answer?
- 3. Explain the results you obtained. Include he concentration differences and membrane pore size in your discussion.
- 4. Quantitative data uses numbers to measure observed changes. How could this experiment be modified so that quantitative data could be collected to show that water diffused into the dialysis tubing?
- 5. Based on your observations, rank the following by relative size, beginning with the smallest: glucose molecules, water molecules, KI molecules, membrane pores, and starch molecules.
- 6. What results would you expect if the experiment started with glucose and KI solution inside the bag and only starch and water outside? Why?