

Models of Movement

Introduction: In a living cell, the cell membrane acts as a gatekeeper, allowing some substances inside the cell and moving others out. This is called “semipermeable” and it allows some large molecules in and keeps some small ones out. In this activity you will use a non-living membrane to model both diffusion and osmosis. The membrane is called “dialysis tubing” and it has very tiny holes in it that allows small molecules through and not large ones. Dialysis tubing is not able to perform active transport so particle size is the only thing that allows substances to move in or out.

Materials: 2 beakers, starch solution, sugar solution, dialysis tubing, iodine solution, funnel, balance, distilled water

Procedure:

#1 bag

1. Dip a piece of dialysis tubing in the “cleaning” beaker to wet.
2. Tie the end of your **WET** piece of dialysis tubing. Pour 7-10mL of starch solution inside and tie off the other end **tightly**.
3. Rinse the outside of the bag with “cleaning” water and “roll” on paper towel to dry.
4. Mass the bag on a balance (in grams) and record on “before”. Draw it in the “before” column.
5. Place the bag in an iodine solution and wait at least 30 minutes.
6. Dry the bag and reweigh. Draw it in the “after” column.
7. Find the change in mass by subtracting the “after” mass from the “before”.

#2 bag

1. Tie the end of a wet piece of dialysis tubing. Pour in 5mL of sugar solution so that the bag is only HALF full (leave some air) and tie off the other end.
2. Rinse in cleaning water and dry the bag.
2. Weigh the bag on a balance, and draw in the “before” column.
3. Place in a beaker with distilled water and wait at least 30 minutes. Reweigh the bag after drying it
4. Record your results in the data.

Data: Draw the bags in the squares provided:

Bag	Before	After	Change in Mass
	Mass_____	Mass_____	
#1			
	Mass_____	Mass_____	
#2			

Analysis:

1. What color does iodine turn in starch?
2. Did the iodine or starch move through the membrane in bag #1?
3. What evidence do you have to prove that?
4. Is iodine moving through a membrane osmosis or diffusion? Why?
5. Did the water or sugar move through the membrane in bag #2?
6. What is your evidence?
7. Is the movement of water osmosis or diffusion?
8. What can you assume about the size of sugar molecules?
9. What can you assume about the size of the starch molecules?

Conclusion: 2 things you learned

- 1.
- 2.