

DIFFUSION/OSMOSIS INVESTIGATION

Semi-permeable Membrane Demonstration

<https://www.southernbiological.com/osmosis-and-diffusion/>

Materials

- Dialysis tubing
- String
- Glucose/starch solution
- Iodine solution
- Pipettes
- Spoon or stirring rod
- 1 beaker
- Graduated cylinder
- 2 small containers
- Glucose test strips
- Gloves and goggles

Instructions

1. Add 100mL of distilled water to a beaker.
2. Use a glucose test strip to check for the presence of glucose in the beaker.
3. Add 1mL of the iodine to the beaker and stir well.
4. Use a glucose test strip to confirm the presence of glucose in this glucose/starch solution your teacher provided.
5. Get a piece of wet dialysis tubing. Tie off one end with a piece of string. Be sure it is knotted tightly so that it does not leak.
6. Use a pipette to fill the tube up halfway with the glucose/starch solution.
7. Leaving some air space in the tube, tie off the other end with a piece of string to create a "cell." Be sure that it is knotted tightly so that it does not leak.
8. Rinse off the cell, lightly pat it dry, and weigh it.
9. Put the cell into the beaker of iodine solution and wait for 15 minutes.
10. After 15 minutes, record any visible changes observed in the cell and in the solution.
11. Remove the cell from the iodine solution, lightly pat it dry, and weigh it.
12. In a separate, small container, add 1mL of the iodine solution and 9 mL of distilled water. Stir well.

13. Use a glucose test strip to check for the presence of glucose in the iodine solution

	Before	After
Mass of cell		
Color of cell		
Color of solution		
Presence of starch		
Presence of glucose		
Presence of iodine		

- What substances moved into the dialysis tube? How do you know?
- What substances moved out of the dialysis tube? How do you know?

Dialysis Experiment

https://biologycorner.com/worksheets/diffusion_lab_AP_teachers_guide.html

Materials

- Digital scale
- Gloves and goggles
- Deionized or distilled water (*Do not use tap water!*)
- Dialysis tubing
- String
- Glucose (powdered)
- Transfer pipettes
- Spoon/stirring rod
- Beakers (250 mL, 500 mL)
- Graduated cylinder
- Glucose test strips

Instructions

1. Fill beakers with 100 mL of distilled water. Label one “control” and the other “0% glucose.”
2. Fill 3 more beakers each with 100 mL of distilled water. Label each of them with the concentrations of glucose you have decided to use.
3. Measure the appropriate amount of glucose powder for each concentration and add it to the appropriate beakers. Stir until the glucose is dissolved.
4. Use a glucose test strip to measure the amount of glucose in each beaker. Follow the timing directions exactly. If the strip is checked too soon or too long, the measurement will not be accurate.

5. Get 5 pieces of wet dialysis tubing. Tie off one end of each one with a piece of string. Be sure to knot them tightly so that they do not leak.
6. Add approximately 10 mL of distilled water to one tube for your control.
7. Leaving some air space in the tube, tie off the other end of with a piece of string to create a "cell." Be sure to knot it tightly so that it does not leak.
8. Add approximately 10 mL of the 10% glucose solution that your teacher made into the next tube.
9. Leaving some air space in the tube, tie off the other end of with a piece of string to create a "cell." Be sure it is knotted tightly so that it does not leak.
10. Rinse off each cell, lightly pat it dry, and weigh it.
11. Repeat steps 8-10 for the remaining cells.
12. Put each cell into a beaker and wait for 15-20 minutes. Be sure your cell with only distilled water inside goes in your control beaker.
13. After 15-20 minutes, rinse off a cell, lightly pat it dry, and weigh it.
14. Use a glucose test strip to measure the amount of glucose in the beaker.
15. Repeat steps 13-14 for the remaining cells and beakers.

% glucose conc.	Glucose conc. (mg/L)	Initial Glucose	Final Glucose
Control	0		
0%	0		

	% glucose conc.	Glucose Conc. (mg/L)	Initial Mass (mg)	Final Mass (mg)	Initial Glucose	Final Glucose
Tube A	0%					
Tube B	10%					
Tube C	10%					
Tube D	10%					
Tube E	10%					

- How do you know that water has moved between the beaker and dialysis tube?
- How do you know that glucose has moved between the beaker and dialysis tube?