

Passive Transport: Diffusion Lab

When providing the best possible answer to the following questions please apply all learned scientific techniques and procedures, do not use abbreviations, use proper scientific terminology, show work for all mathematical calculations, use all significant figure and scientific notation rules, apply appropriate writing strategies, and note that at all times spelling counts. Your ability to meet these and all established classroom expectations, including labeling of BINs, providing heading information, and your ability to follow directions may be included in computation of grade.

Diffusion Lab

- In this lab you will observe, through the use of an indicator, the diffusion of a substance across a semi-permeable membrane.
- An indicator is a substance that changes color in the presence of the substances it indicates. It is not harmful to your skin, however it will stain your skin (temporarily) and your clothes permanently!
- Iodine is a known indicator for starch. Iodine turns a blue-black color in the presence of starch.

Procedure:

1. Add 150 mL of water to a 250mL beaker.
2. Using a clean pipette, add 1.5mL (approximately one pipette) of iodine solution to the beaker.
3. Discard pipette immediately.
4. Set beaker aside.
 - a. Describe the iodine solution in the beaker.
5. In a small beaker (50mL) place half a teaspoon of cornstarch. Use plastic spoons. Fill spoon approximately half way.
6. Add water to create a 25mL starch solution.
7. Mix the solution using the spoon to dissolve the cornstarch.
8. Wipe spoon dry and replace in bin.
9. Set beaker aside.
 - a. Describe the starch solution in the beaker.
10. Obtain a piece of dialysis tubing from Mrs. Averett.
 - a. Define dialysis.
 - b. Why do you think this material is called dialysis tubing?

11. Tie one end of the dialysis tubing shut by tying the dialysis tubing on itself. Make sure the knot is near the end of the tubing but not so close to the end that it will easily come undone.
12. Rub the other end of the tubing between your fingers to open the tubing. BE CAREFUL. Do not rip the tubing.
13. Using a clean pipette, transfer 3mL (approximately two pipettes) of starch solution into the tubing.
14. Discard the used pipette immediately.
15. Tie the tubing shut on this end also. Be careful not to spill the starch solution.
16. Using a paper towel, carefully wipe any extra starch solution from the outside of the tubing. Place the tubing containing the starch solution on a paper towel.
 - a. Describe the contents of the dialysis tubing.

17. Answer the following questions.
 - a. Is the tubing or the beaker more concentrated in starch?
 - b. Is the tubing or the beaker more concentrated in iodine?
 - c. Is the tubing or the beaker hypertonic in regards to the iodine solution?
 - d. Is the tubing or the beaker hypertonic in regards to the starch solution?

18. Carefully place the dialysis tubing containing the starch solution into the beaker containing the iodine solution and begin timer.
 - a. Fill in the appropriate part(s) of the Solution Color Change Data Table.

19. Answer the following questions:
 - a. If the tubing was permeable to starch, which way would the starch move, into the tubing or out of the tubing?
 - b. If the tubing was permeable to iodine, which way would the iodine move, into or out of the tubing?
 - c. If the tubing was permeable to iodine, what color would you expect the solution in the tubing to turn?
 - d. If the tubing was permeable to iodine, what color would you expect the solution in the beaker to turn?
 - e. If the tubing was permeable to starch, what color would you expect the solution in the tubing to turn?
 - f. If the tubing was permeable to starch, what color would you expect the solution in the beaker to turn?

g. Make a prediction about what you think will happen. Use complete sentences.

20. Once 7 minutes have passed and you have answered all of the above questions, remove the dialysis tubing from the iodine solution and place it on a paper towel.

a. Describe the iodine solution in the beaker.

b. Describe the starch solution in the dialysis tubing.

c. Fill in the appropriate part(s) of the Solution Color Change Data Table.

SOLUTION COLOR CHANGE DATA TABLE		
	STARTING COLOR	COLOR AFTER 7 MINUTES
SOLUTION IN BEAKER		
SOLUTION IN TUBING		

21. Begin cleaning up work area.

a. Make sure used pipettes have been discarded.

b. Discard dialysis tubing into garbage can.

c. Clean and dry both beakers and replace into bucket.

d. Use paper towels to clean area; discard paper towels.

22. Check lab basket to make sure it is ready for next group.

23. Check side counters to make sure they are clean and ready for next group.

24. When you are sure your area is clean and organized see Mrs. Averett for a copy of your Post Lab Questions.