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Lab 2

09/28/2023

Title: Measurement of diffusion and osmosis

Purpose: To observe and record how diffusion and osmosis works. Learn how to share findings with lab partners.

Procedures:

2-C Diffusion

1. Petri dishes have been filled with agar. Two holes have been made in the agar. Into one hole, place two drops of methylene blue. Into the other hole, place two drops of potassium permanganate. Record the time and immediate diameter of each spot. This will be your time zero measurement.

2. Measure the diameter of each spot in millimeters once every minute for fifteen minutes. Calculate the averages from the data collected by all groups doing this exercise. Summarize these data.

3. Construct a graph of average diffusion diameter versus time for both chemicals.

4. Determine the diffusion rate of each chemical. Which has the fastest diffusion rate, methylene blue or potassium permanganate? Record these results.

5. Look up the molecular formula and structure of methylene blue and potassium permanganate in a Merck Index. Make note of this information.

6. Interpret your result with respect to the information obtained from the Merck Index.

2-F Osmosis

1. Attach dialysis bags filled as much as possible with sucrose solutions securely to the bottom of two open, thin glass tubes. One bag should be filled with a 25% sucrose solution and

the other should be filled with a 50% sucrose solution. Make sure ends of the tubes are immersed in the solutions.

NOTE: reliable results depend on your ability to tightly seal the dialysis bags.

2. Insert both bags into separate beakers of distilled water making sure the dialysis bags are fully submersed but not touching the bottom of the beakers, and suspend each by gently applying a ring stand clamp to the glass tubes. Check for solution leaking out of the bags.

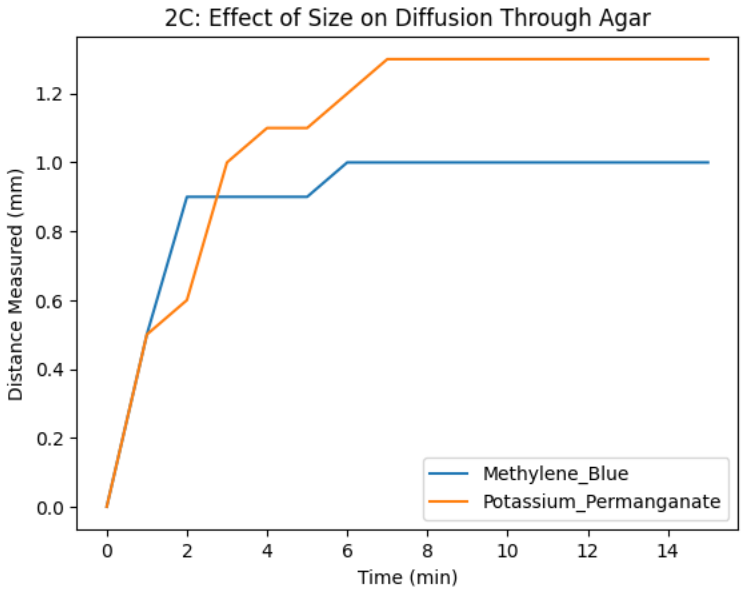
3. Allow five minutes for the systems to equilibrate. Then, mark the fluid levels of each glass tube with a felt pen. Record the time.

4. Record the fluid level of the glass tubes in millimeters every 10 minutes for 50 minutes.

5. If the fluid level rises to the top of the glass tube sooner than 50 minutes, record the time it took to get there, measure the length in millimeters from the equilibration line to the top of glass tube. Divide that length by the number of minutes to get your rate in mm/min.

6. Determine the rate of osmosis for each system. Which system had the fastest osmotic rate, the 25% or 50% sucrose solution? Explain these results.

Results:



2-F Osmosis

Minutes	44.93 grams	42.80 grams
5	48.30g	45.39g
10	50g	46.13g
20	52.74g	48.82g
30	55.85g	50.98g
40	58.66g	52.63g
50	60.58g	53.35g

Discussion:

For 2-C my lab partner and I used a Petri dishes filled with agar, then filled with two drops of methylene blue in one and 2 drops of potassium permanganate to determine the measurement of diffusion. For 2-F we got our results from the lab across from us. For me that was a little challenging as I enjoy seeing how the experiments work first hand.

Conclusion:

For lab two we measured for diffusion and the lab across from us measured for osmosis. Measuring for diffusion was fun and I really enjoyed watching the Methylene blue the most. It was really neat to see the rates at which the solution spread. For the measurement of osmosis my lab partner and I got our results from another lab group. I really wish I could have seen the experiment being performed, however it was fun to share our results and describe the procedures that we did.