WJEC England Biology GCSE

SP2.1: Osmosis

Practical notes

Osmosis

Aim

Investigation into the effect of solute concentration on osmosis in potato chips.

Equipment list

- Plant tissue eg. potato
- A cork borer
- A ruler
- A measuring cylinder
- Labels
- Boiling tubes
- A test tube rack
- Paper towels
- A sharp knife
- A while tile
- Blackcurrant squash (not sugar free)
- Distilled water
- A top-pan balance

Method

1. Use a cork borer to cut 5 potato cylinders.
2. Trim the cylinders using a sharp knife and a ruler to the same length (about 3 cm)
3. Accurately measure and record the length and mass of each cylinder.
4. Label 6 boiling tubes with the concentration of blackcurrant squash (0, 20, 40, 60, 80, 100%).
5. Make simple dilutions of the blackcurrant squash by mixing with water in suitable proportions and transfer into the corresponding boiling tube.
6. Repeat step 4 for other concentrations of the solution and distilled water.
7. Add one potato cylinder (of known mass and length) to each boiling tube
8. Prepare a table as seen below.
9. Add one potato cylinder to each boiling tube, making sure the length and mass of each cylinder is known.
10. Leave the cylinders in the boiling tubes overnight in a test tube rack.
11. Remove the cylinders from the boiling tubes and dry them by carefully blotting with paper towels.
12. Measure the length and mass of each cylinder and record your measurements in the table.
13. Calculate the percentage changes for each cylinder.
14. Plot a graph of change in mass (in g) against the concentration of sugar solution.
15. Plot a graph of change in length (in mm) against the concentration of sugar solution.

	100%	80%	60%	40%	20%	0%
Initial length (mm)						
Final length (mm)						
Change in length (mm)						
Initial mass (g)						
Final mass in (g)						
Change in mass in (g)						

Concentration of squash / %	Volume of blackcurrant squash / cm^3	Volume of distilled water / cm^3
100	30	0
80	24	6
60	18	12
40	12	18
20	6	24
0	0	30

Safety precautions

Take care when handling cork borer and sharp knife.

Sources of error

Plant tissue taken from different parts of the plant may have different water potentials.