

Edexcel Biology GCSE

CP 04: Osmosis

Practical notes

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Osmosis

Aim

Immerse plant tissue in a range of concentrations of salt or sugar solution, find the change in mass of the plant tissue to investigate the movement of water by osmosis into or out of the plant tissue.

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 white tile
- A range of salt or sugar solutions
- 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 mass of each cylinder.
4. Measure 10 cm³ of the 1.0M sugar solution and transfer to the first boiling tube and label.
5. Repeat step 4 for other concentrations of the solution and distilled water.
6. Add one potato cylinder (of known mass) to each boiling tube.
7. Prepare a table as seen below.
8. Add one potato cylinder to each boiling tube, making sure the mass of each cylinder is known.
9. Leave the cylinders in the boiling tubes for at least 15 minutes in a test tube rack.
10. Remove the cylinders from the boiling tubes and carefully blot them dry with paper towels.
11. Measure the mass of each cylinder and record your measurements in the table. Calculate the percentage changes for each cylinder.
12. Plot a graph of change in mass (in g) against the concentration of sugar solution. Find the x-intercept to determine the concentration of sugar solution that is isotonic to the potato cells.



	1.0 M sugar solution	0.75 sugar solution	0.5 M sugar solution	0.25 M sugar solution	Distilled water
Initial mass (g)					
Final mass in (g)					
Change in mass in (g)					
Percentage change in mass (%)					

Controlled variables

- Temperature
- Amount of drying
- Type of potato
- Age of potato

Sources of error

Discs from different parts of the potato may have different water potentials.

Risk assessment

Take care when handling cork borer and sharp knife.

