

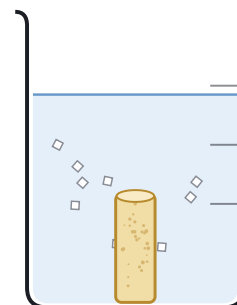
Osmosis in potato

Investigate the effect of different salt concentrations on the mass of potato tissue.

You will need

a potato
cork borer
scalpel and tile
ruler
top-pan balance

5 boiling tubes and rack
salt solutions: 0, 0.2, 0.4, 0.6, 0.8
mol/dm³
measuring cylinder
paper towels



*Same potato,
same size,
same time!*

Variables

Variable	In this practical
Independent	Concentration of the salt solution
Dependent	Change in mass of the potato, as a percentage
Control	Volume of solution, size and surface area of each cylinder, time left in solution, temperature, type of potato

Method

- 1 Use the cork borer to cut five potato cylinders. Trim them to the same length with the scalpel.
- 2 Blot each cylinder dry with a paper towel, then measure and record its mass.
- 3 Measure 10 cm³ of each salt solution into a labelled boiling tube.
- 4 Put one cylinder into each tube and leave them for the same amount of time, e.g. 24 hours.
- 5 Remove each cylinder, blot it dry in the same way, and measure its mass again.
- 6 Calculate the percentage change in mass: **(final mass – initial mass) ÷ initial mass × 100**
- 7 Repeat the investigation and calculate a mean for each concentration.
- 8 Plot a graph of percentage change in mass against concentration.

*Blot every cylinder
the same way, or
your masses won't
be comparable.*

Hazards and risks

Hazard	Risk	How to reduce it
Sharp scalpel and cork borer	Cuts to fingers	Cut downwards onto a tile, away from your body
Glass boiling tubes	Cuts from broken glass	Keep tubes in a rack; report breakages

Improving accuracy

Use a balance that reads to 0.01 g, and repeat each concentration at least three times.

Use more concentrations close to where the line crosses zero, e.g. 0.20, 0.25, 0.30 mol/dm³.

*Always cut away
from your body, onto
a tile.*

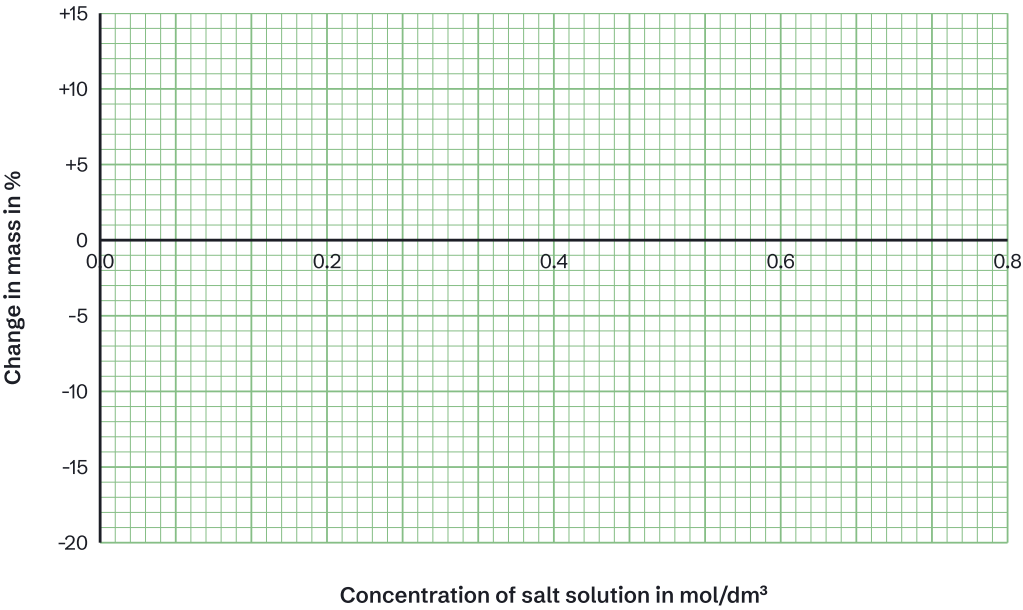


Use a minus sign for mass lost!

Results

Concentration in mol/dm ³	Mass at start in g	Mass at end in g	Change in mass in g	Change in mass in %
0.0				
0.2				
0.4				
0.6				
0.8				

Graph



Circle any anomalous points and ignore them for the line.

Where the line crosses zero is an exam favourite.

Analysis

1 At which concentration did the potato not change mass? What does this tell you?

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2 Why do you calculate the percentage change in mass instead of the change in grams?

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3 Explain why the potato lost mass in the 0.8 mol/dm³ solution. Use the word osmosis.

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