

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

Introduction

In this investigation, you will investigate osmosis in potato cells. You will prepare a range of dilutions of blackcurrant squash and allow osmosis to occur. The concentration of the blackcurrant squash will affect osmosis.

Apparatus

100 cm³ beaker containing approximately 95 cm³ of blackcurrant squash
50 cm³ measuring cylinders
6 × boiling tubes
white tile
scalpel
ruler
cork borers
distilled water
marker pen for labelling of boiling tubes

Access to:

blackcurrant squash
electronic balance ± 0.1 g

Method

1. Label boiling tubes with the concentrations of blackcurrant squash (0, 20, 40, 60, 80 and 100 %).
2. Using a measuring cylinder, transfer the relevant quantities of water and blackcurrant squash into the boiling tubes to produce the solutions shown. Use the table below to help you.

Concentration of blackcurrant squash (%)	Volume of blackcurrant squash needed to make 30 cm ³ solution (cm ³)	Volume of water needed to make 30 cm ³ solution (cm ³)
0	0	30
20	6	24
40	12	18
60	18	12
80	24	6
100	30	0

3. Place the boiling tubes in a test tube rack.
4. Cut six chips from a potato using a cork borer and cut into 5cm lengths. Cut off any potato skin.
5. Dry the chips on a paper towel.
6. Record the mass of each chip and place one chip in each of the boiling tubes. The solutions should completely cover the chips.
8. Leave for 25 minutes.
9. Remove the chip from the 0% solution boiling tube.
10. Dry the chip on a paper towel.
11. Record the final mass of the chip.
12. Repeat steps 9 -11 for the other solutions.

Analysis

1. Calculate the percentage change in mass for each chip.
2. Plot a graph of concentration against percentage change in mass.
3. Determine the concentration when there was no change in mass.