B1 L9 Challenge worksheet: Osmosis

Name: _____ Class: _____

A. Carrot cylinders

Help: online screen 11 [6]

A student did the practical with carrot instead of potato. Figure 1 shows the mean percentage change in mass at each concentration of sugar solution.

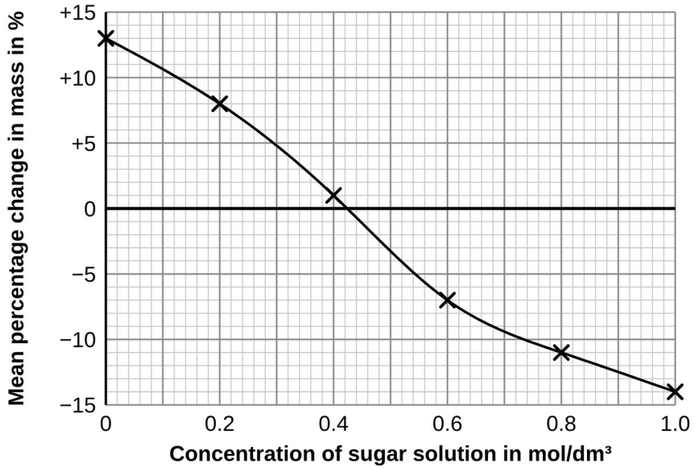


Figure 1

(a) Use Figure 1 to find the concentration at which there is no net movement of water. [1]

_____ mol/dm³

(b) Explain why the carrot gained mass in the 0.0 mol/dm³ solution. [2]

_____

_____

(c) A student says: “At this concentration, water stops moving in and out of the carrot.” Explain why this is wrong. [1]

_____

_____

(d) For potato, the line crossed 0 % at 0.30 mol/dm³. Which vegetable's cells had the more concentrated contents? Give a reason. [2]

_____

_____

B. Unit conversions and a rate

Help: online screen 10 [5]

A cylinder's starting mass was 2400 mg. After 24 hours in pure water, its final mass was 2.70 g.

(a) Convert 2400 mg into grams. [1] _____ g

(b) Calculate the percentage change in mass. [2]

_____ %

(c) Calculate the mean rate of water uptake in mg per hour. [2]

_____ mg per hour

C. Spot the problem

Help: online screens 8 and 9 [3]

A student took the cylinders out of the tubes and left them on the bench for 20 minutes before finding their final masses.

Suggest how this affects the percentage change in mass. Explain your answer. [3]

_____

_____

_____

_____

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D. Extended response

Help: online screens 5 and 6 [6]

A student puts plant cells and animal cells into pure water and into a concentrated salt solution. Describe and explain what happens to each type of cell in each solution. [6]

Use the words osmosis, turgid, flaccid and plasmolysis in your answer.

E. Too much fertiliser

Help: online screens 5 and 6 [4]

A gardener puts far too much fertiliser on a lawn. The fertiliser dissolves in the water in the soil. A day later the grass wilts, even though the soil is wet.

Explain why the grass wilts. [4]