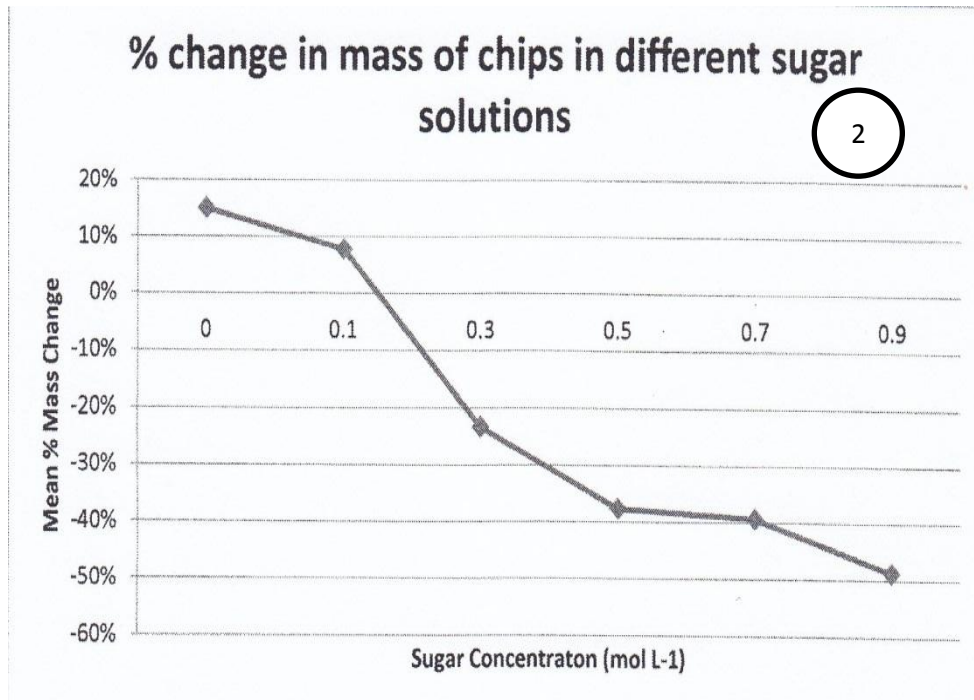


Please note – These are extracts from one student's response

Purpose: to investigate the effect of the concentration of sugar solutions on the mass of potato chips.

1 Hypothesis: when chips are placed in solutions with high concentrations of sugar e.g. 0.9 mol L⁻¹, then the potato chips will lose mass as the chip will lose water because of osmosis.



Analysing my data that I have collected I can see that my hypothesis is correct. With an increasing amount of sugar in the solutions, the mass of the potatoes has decreased because the water molecules moved outside the cell due to osmosis (diffusion through a semi-permeable membrane).

3

Osmosis is the term describing the movement of water molecules from high concentrations to lower concentrations through a semipermeable membrane. I used pieces of potato because the potato provided the semipermeable membranes. The direction of movement of water through the semipermeable membrane depends on the relative concentrations of water on each side of the membrane. At 0.5 mol L⁻¹ there is more water inside the potato than outside, so the water moves out.

4

3 From the graph we can see that as the sugar concentration goes up, the weight changes from increasing to decreasing, with the level close to being balanced when it gets to the 0.2 mol L⁻¹. This is called the isotonic point.

We looked at another finding the teacher gave us from a group that studied *Nereis* sp (worms). These worms live under large rocks near the high tide in the sea. The salt concentration can change due to the weather (rain and sun) meaning that there is sometimes less salt and sometimes more.

5

The group used three different beakers, each with 50 worms in different concentrations of salt. Their hypothesis was correct as they found that in the seawater/distilled water mixture the worms gained weight, whereas in the seawater/salt mix they lost weight but then

regained it, which shows a similar but different pattern to our potato investigation. The normal seawater had no effect.

5

These worms have a system to re-establish the water balance. Our potatoes don't use a mechanism against osmosis like the worms do, so they do not regain their normal weight.

The trend in the data from the kumera chips investigation was almost the same as mine but they did not use distilled water.