

Safety Assessment: It was the responsibility of the group to critically analyse an experiment before commencing and to identify hazards associated with the practical and suggest a safe procedures of operation. Annalise was the designated safety monitor of the group as she ensured that the safety procedures, such as wearing eye protection and aprons and taking care when handling the sodium chloride (acid?) where carried out in order to prevent spillage of the solution or any splashes of the skin, eyes or clothing. We carried out the experiment near sinks in the biology lab so that the acid was able to be safely poured down the drain and if any acid spills or splashes were to occur, the acid could be quickly cleaned up using the water and paper towel. The use of the small knife was also a safety hazard due to the sharp blade and caution had to be taken to prevent people from cutting their hands when slicing the agar cubes to fit the required dimensions. It was also advised not to eat the agar cubes or drink the sulphuric acid due to toxicity of both. Care needed to be taken when dealing with the agar cubes as they contain phenolphthalein, an acid/base indicator that turns pink in the presence of a base such as sodium hydroxide which is the substance the clear cube is composed of. The beaker containing the sulfuric acid is fragile glassware so care was taken to prevent the hazard of broken glass during the practical.

Data Interpretation: If the water content of solute in the beaker is higher than the concentration of water molecules within the potato then the water will diffuse into the cell and cause the potato to gain weight such as in the case of distilled water. The closer the water molecules approach an equal concentration inside and outside the cell, the closer the smaller the change of mass. If the concentration is equal then the mass will stay the same as osmosis will not occur.

The average of the integrated group data (the line of best fit) shows that as the cube size is increased (therefor surface area: volume ratio is decreased), the rate of diffusion is slower however the decrease in the amount of exchange is more drastic as can be seen from the graph from the results recorded from the cube of 20mm to the cube of 30mm dimensions. On the flipside as stated in the hypothesis, the smaller the cube size, the faster the rate of diffusion and the more gradual the increase in percentage of diffusion (amount of exchange) as can be seen from the cube of 20mm to 10mm dimensions. This observation clarifies the need for cells to be microscopic as having the smallest surface area to volume ratio as possible will enable cells to exchange substances at a fast enough rate to aid their survival. The line of best fit is exponential as the rate of diffusion gradually but never quite reaches zero as the size of the cube (x-value of SA:V).

Evaluation:

Although no obvious sources of error were identified to have taken place during the investigation, random errors that may have occurred during the investigation include: possible inconsistency in the measurements of the amount of coloured cube which would