

Edexcel B Biology A-Level

Core Practical 6

Determine the water potential of plant cells





Plasmolysis is when the protoplasm of a plant cell begins to shrink away from the cell wall. **Incipient plasmolysis** is the point at which this first begins to occur. This occurs when **water potential and osmotic potential are equal** - at the point where the contents of the plant cell are **isotonic** to the surrounding environment. Because incipient plasmolysis is very difficult to observe with a microscope, it can also be interpreted as the point at which **50% of cells** in a tissue are plasmolysed.

Equipment

- Plant tissue, cut one cell thick
- Mineral salt solution, diluted to 0.1M, 0.3M, 0.5M, 0.7M and 0.9M
- Distilled water
- Six watch glasses
- Measuring cylinders
- Syringe
- Pipette
- Filter paper
- Scalpel
- Forceps
- Optical microscope
- Microscope slides and cover slips
- Iodine solution

Method

1. Transfer a small set volume of each mineral salt solution into a **watch glass**. Place one of the sections of plant tissue into the watch glass and leave for **20 minutes**.
2. Remove each section using forceps. Mount in a drop of the corresponding solution on a microscope slide and cover with a coverslip.
3. Observe **25 cells** and record how many are **plasmolysed**.

Risk Assessment

Hazard	Risk	Safety Precaution	In emergency	Risk Level
Scalpel	Cuts from sharp object	Cut away from fingers; use forceps to hold sample whilst cutting; keep away	Elevate cuts; apply pressure; seek medical assistance	Low





		from edge of desk		
Broken glass	Cuts from sharp object	Take care when handling glass objects; keep glassware away from edge of desk	Elevate cuts; apply pressure; do not remove glass from wound; seek medical assistance	Low

Graph

- Plot a graph of **mineral salt concentration** against **number of cells plasmolysed**.

Conclusion

- The point on the graph at which the line of best fit **crosses the x axis** (zero change in mass) indicates the point at which the solution is **isotonic**. This is when the water potential of mineral salt solution solution is the **same** as the water potential of the plant tissue, so there is **no net movement of water in or out** of the potato.

