



4 questions · 14 marks · mark scheme at the back

For Cambridge IGCSE Combined Science 0653, **Supplement** is Extended content, only examined on Papers 2 and 4.

Total / 14

- | Change in mass of potato | |
|-------------------------------------|--------------------|
| Concentration / mol/dm ³ | Change in mass / % |
| 0.0 | +18 |
| 0.2 | +7 |
| 0.4 | -4 |
| 0.6 | -13 |
| 0.8 | -20 |

[illegible]

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3

Supplement

[5 marks]

A piece of onion epidermis is placed in a concentrated sugar solution. When viewed under a microscope the cell membranes have pulled away from the cell walls. Use the terms plasmolysis, flaccid and water potential to explain what has happened.

4

Supplement

[4 marks]

A red blood cell and a plant cell are each placed in distilled water. The red blood cell bursts but the plant cell does not. Explain these results.

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [4]

- between 0.30 and 0.35 mol/dm³ (1) allow 0.3 mol/dm³
- water entered the potato cells (1)
- by osmosis through the (partially permeable) cell membrane (1)
- any one from: temperature / volume of solution / time in solution / size (surface area) or mass of cylinder / same type of potato (1) ignore 'amount of potato'

2. [1] **Supplement**

B B (1)

3. [5] **Supplement**

- the sugar solution has a lower water potential than the cell contents (1)
- water leaves the cell by osmosis (1)
- through the partially permeable cell membrane (1)
- the cell loses turgor pressure and becomes flaccid (1)
- the cytoplasm shrinks and the cell membrane pulls away from the cell wall: this is plasmolysis (1)

4. [4] **Supplement**

- distilled water has a higher water potential than the cells / cell contents (1)
- water enters both cells by osmosis (1)
- the red blood cell has no cell wall, so it swells and bursts (1)
- the plant cell wall resists the expansion, so the cell becomes turgid (1) allow 'turgor pressure stops more water entering'