

Edexcel (B) Biology A-level

1.6 - Inorganic ions

1.7 - Water

Flashcards

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Explain the role of nitrate ions in plants.



Explain the role of nitrate ions in plants.

used to make:

- DNA
- amino acids
- NADP for photosynthesis
- NAD for respiration



Explain the role of calcium ions in plants.



Explain the role of calcium ions in plants.

Used to make calcium pectate, which adds stability to middle lamella of cell wall (layer that joins adjacent cells).



Explain the role of magnesium ions in plants.



Explain the role of magnesium ions in plants.

Component of chlorophyll, which absorbs light energy for photosynthesis.



Explain the role of phosphate ions in plants.



Explain the role of phosphate ions in plants.

Component of:

- ADP & ATP, which are involved in energy release for metabolic reactions.
- NADP for photosynthesis.



State 5 biologically important properties of water.



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- reaches maximum density at 4°C
- high specific heat capacity
- high surface tension
- acts as polar solvent
- incompressible



Why do water molecules have a permanent dipole?



Why do water molecules have a permanent dipole?

O is more electronegative than H, so attracts the electron density in the covalent bond more strongly.

forms O δ^- (slight negative charge) & H δ^+ (slight positive charge).



Describe the intermolecular bonding
between water molecules.



Describe the intermolecular bonding between water molecules.

Hydrogen bonds form between lone pair on O of one molecule & H $\delta+$ on neighbouring molecule.



Why is the high specific heat capacity of water important for organisms?



Why is the high specific heat capacity of water important for organisms?

Acts as a temperature buffer which enables endotherms to resist fluctuations in core temperature to maintain optimum enzyme activity.



Why is water an important solvent for organisms?



Why is water an important solvent for organisms?

Polar universal solvent dissolves & transports charged particles involved in intra & extracellular reactions.



Why is the high surface tension of water important for organisms?



Why is the high surface tension of water important for organisms?

Slows water loss due to transpiration in plants.

Water rises unusually high in narrow tubes, lowering demand on root pressure.

Some insects can 'skim' across the surface of water.



Why is the incompressible nature of water important for organisms?



Why is the incompressible nature of water important for organisms?

Provides turgidity to plant cells.

Provides hydrostatic skeleton for some small animals e.g. earthworms.



Explain why ice floats on water. Why is this important for organisms?



Explain why ice floats on water. Why is this important for organisms?

Ice is less dense than water because H-bonds hold molecules in fixed positions further away from each other.

Insulates water in arctic climates so aquatic organisms can survive.

