

Photosynthesis

Chapter 6: Photosynthesis · Topic 1

Key Concept

The overall photosynthesis equation is: $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{light energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$, occurring mainly in chloroplasts containing chlorophyll.

The light reaction occurs in the thylakoid membranes, capturing light energy and splitting water to release oxygen and produce ATP and NADPH.

The dark reaction (Calvin cycle) occurs in the stroma, using ATP and NADPH from the light reaction to convert carbon dioxide into glucose.

Factors affecting the rate of photosynthesis include light intensity, carbon dioxide concentration, and temperature, each acting as a potential limiting factor.

Quick Revision Notes

- Equation: $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{light} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$.
- Occurs in chloroplasts, containing chlorophyll.
- Light reaction: in thylakoid membranes.
- It splits water, releases O_2 , makes ATP/NADPH.
- Dark reaction (Calvin cycle): in the stroma.
- It uses ATP/NADPH to make glucose from CO_2 .
- Factors: light, CO_2 , temperature.
- Each can be a limiting factor.

Practice Questions

- 1 Write the overall photosynthesis equation.
- 2 Explain the difference between light and dark reactions.
- 3 Discuss factors that limit the rate of photosynthesis.
- 4 Research an experiment demonstrating photosynthesis.
- 5 Explain why chlorophyll is essential for photosynthesis.
- 6 Explain photosynthesis in your own words.