9.1 THE COMPOSITION AND EVOLUTION OF THE EARTH'S ATMOSPHERE

Earth's early atmosphere

- Limited evidence for the Earth's early atmosphere as it was 4.6 billion years ago
- Initially Earth was covered in volcanoes which erupted and released lots of gases
  - Carbon dioxide dissolved in the oceans – produced sediments which reduced the amount of carbon dioxide in the atmosphere
  - The gases formed the early atmosphere and water vapour condensed to form oceans
    - Atmosphere similar to that of Venus and Mars today
    - Mainly CO_2

Gases in the atmosphere

- Approximately 80% nitrogen, 20% oxygen, and small amounts of gases like carbon dioxide, water vapour and noble gases
- Remained the same for about 200 million years

Increase in oxygen

- Algae started producing oxygen 2.7 billion years ago
  - Plants evolved over the next billion years
- Algae and plants produce oxygen in photosynthesis
  - Carbon dioxide + water → glucose + oxygen
    - $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$
- The increase in oxygen levels in the atmosphere allowed animals to evolve

Decrease in carbon dioxide

- Algae and plants reduced the amount of carbon dioxide by photosynthesis
- Formation of fossil fuels which have carbon trapped within them
- Carbon dioxide dissolved in oceans forming carbonates – precipitated as sedimentary rock

AQA

PMT resources • tuition • courses
www.pmt.education PMTEducation
CC BY NC ND