

Chemistry GCSE: Atmospheric Chemistry

Composition of the Atmosphere

- ~**78% nitrogen** (N₂)
- ~**21% oxygen** (O₂)
- **Small amounts: CO₂, water vapour, noble gases**

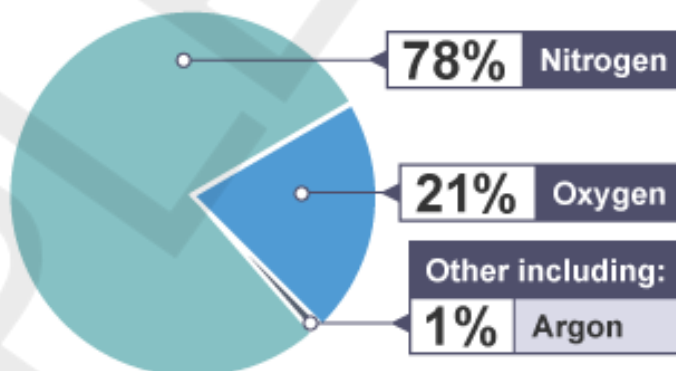
This composition has been roughly constant for ~200 million years as natural processes remain in balance.

Earth's Early Atmosphere: Early Earth had **intense volcanic activity which released gases:**

- CO₂ (main gas)
- N₂
- small amounts of CH₄ and NH₃
- almost no oxygen

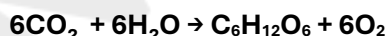
So what changed the atmosphere?

1. Water vapour condensed as it cooled, forming oceans
2. CO₂ decreased because:
 - Dissolved in oceans
 - Formed carbonate rocks (e.g. limestone)
 - Locked in fossil fuels



How Oxygen Increased:

Produced by **photosynthesis**:



Plants use CO₂ + water + light
→ produces glucose
→ releases oxygen

Consider the timeline:

- ⇒ First algae ~2.7 billion years ago
- ⇒ Oxygen gradually built up
- ⇒ allowed animals to evolve

How Carbon Dioxide Decreased:

- Used up in **photosynthesis**
- Locked away in **carbonate rocks** and **fossil fuels**



Remember that **carbon is removed from the atmosphere and stored in the Earth.**

Measuring Oxygen in Air (Practical)

Method (copper example):

- Pass air over heated copper
- Oxygen reacts → forms copper oxide
- Volume of gas decreases

Measure the drop in volume to calculate the amount of oxygen removed (~21%)