

Cambridge IGCSE Chemistry

Topic 11: air and water

Carbon dioxide and methane

Notes





State that carbon dioxide and methane are greenhouse gases and explain how they may contribute to climate change

- Greenhouse gases maintain temperatures on Earth high enough to support life. They include: water vapour, CO_2 & CH_4 (methane)
- Explanation of the greenhouse gas effect:
 - Electromagnetic radiation at most wavelengths from the sun passes through the Earth's atmosphere
 - The Earth absorbs some radiation and thus warms up (essential for life on Earth). But some heat is radiated from the Earth as infrared radiation.
 - Some of this IR radiation is absorbed by greenhouse gases in the atmosphere
 - Atmosphere warms up leading to the greenhouse effect and global warming
- An increase in average global temperature (i.e. global warming) is a major cause of climate change
- There are several potential effects of global climate change
 - Extinction of species
 - Raising sea levels due to the melting of polar ice caps
 - Increased risk of skin cancer due to more dangerous UV rays hitting the surface of the Earth

State the formation of carbon dioxide as a product of...

- The complete combustion of carbon-containing substances
- Respiration
- The reaction between an acid and a carbonate
- The thermal decomposition of a carbonate

(Extended only) Describe the carbon cycle, in simple terms, to include the processes of combustion, respiration and photosynthesis





- Carbon cycle
 - CO_2 is emitted from respiration and combustion
 - CO_2 is absorbed to make carbohydrates in photosynthesis
 - Animals eat these plants and the carbon consumed is released as CO_2 formed during respiration
 - These animals and plants eventually die and decomposers feed on these dead organisms, the carbon is returned to the atmosphere as CO_2

State the sources of methane, including...

- Production and use of fossil fuels
- Livestock farming
- Decomposition of vegetation

