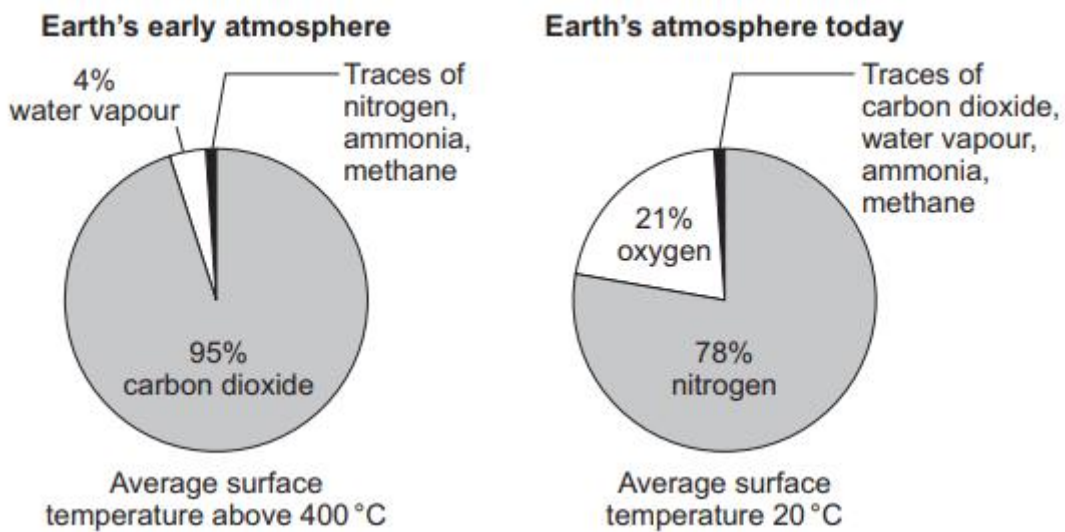


THE ATMOSPHERE 7

Q1. Scientists have suggested that:

- the Earth formed as a molten ball of rock and minerals
- the rock and minerals cooled slowly
- the surface of the Earth was covered by volcanoes
- the volcanoes released gases that formed the Earth's early atmosphere.

The pie charts show the approximate percentages of gases in the Earth's early atmosphere and in the Earth's atmosphere today.



(i) Explain what has happened to most of the water vapour in the Earth's early atmosphere.

(2 marks)

(ii) Give two reasons why the percentage of carbon dioxide in the Earth's early atmosphere decreased.

(2 marks)

Q2. The table shows the main gases in the Earth's atmosphere.

Gas	Percentage (%) in the atmosphere
Nitrogen	78.0
Oxygen	21.0
Argon	
Carbon dioxide	0.03

Use information in the table to help you to complete the sentences.

(i) Draw a ring around the correct answer to complete the sentence.

The percentage of argon in the Earth's atmosphere is

0.97
9.7
97.0

 %.

(1 mark)

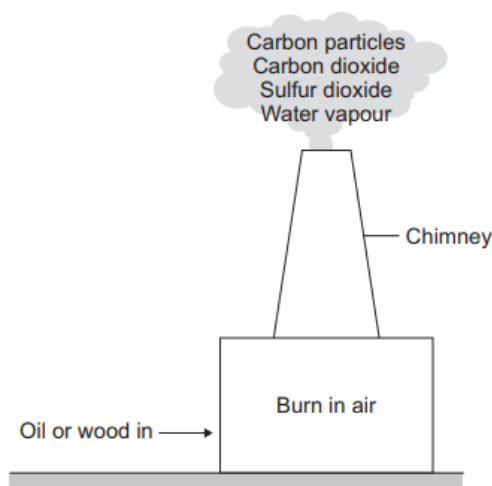
(ii) Complete the sentence.

The gas in the Earth's atmosphere that is a compound is _____.

(1 mark)

Q3. In the future:

- there will be fewer oil burning power stations
- there may be more wood burning power stations



(a) Which one of the emissions from the chimney can cause acid rain?

(1 mark)

(b) Draw a ring around the correct answer to complete the sentence.

Carbon particles in the Earth's atmosphere cause

acid rain.
global dimming.
global warming.

(1 mark)

(c) Which gas in the air is needed for oil or wood to burn?

(1 mark)

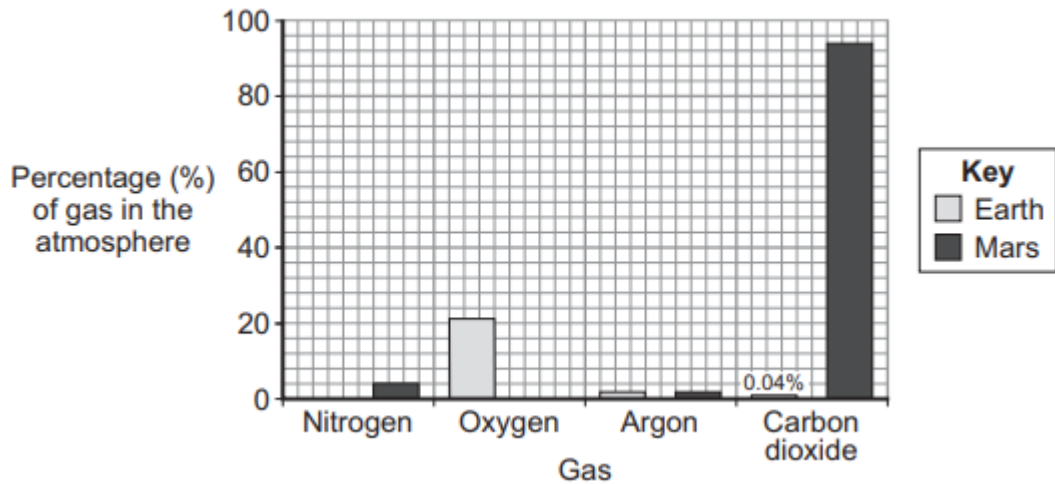
(d) Suggest why there will be fewer power stations burning oil in the future.

(1 mark)

(e) Some power stations burn wood. The wood comes from trees grown in forests. Suggest why burning wood in power stations is said to be 'carbon-neutral'.

(2 marks)

Q4. The bar chart shows some of the gases in the atmospheres of Earth today and Mars today.



(a) Complete the bar chart to show the percentage of nitrogen in the Earth's atmosphere today.

(1 mark)

(b) Some scientists suggest that the Earth's early atmosphere was like the atmosphere of Mars today.

(i) There is not much oxygen in the atmosphere of Mars. Suggest why.

(1 mark)

(ii) The percentage of argon in the Earth's atmosphere today is the same as it was in the Earth's early atmosphere. Suggest why.

(1 mark)

(c) Compared with the percentage of carbon dioxide in the Earth's early atmosphere there is not much carbon dioxide in the Earth's atmosphere today. Give one reason for this change.

(1 mark)

Q7. Fuel oil is one of the fractions from crude oil.

Power stations burn fuel oil to generate electricity. The waste gases from the combustion of fuel oil contain carbon dioxide, water vapour, sulfur dioxide and oxides of nitrogen.

The waste gases are passed through a suspension of limestone in water. Limestone is mainly calcium carbonate. Suggest how the use of a suspension of limestone decreases one of the environmental impacts that the waste gases would cause.

(3 marks)

Q8. Billions of years ago, the Earth's early atmosphere was probably like the atmosphere of Venus today. The table shows the temperature and the percentage composition of the atmospheres of the Earth and Venus today.

Name of gas	Percentage (%) composition of atmosphere	
	Earth today	Venus today
Nitrogen	78	3.5
Oxygen	20.6	a trace
Argon	0.97	a trace
Carbon dioxide	0.03	96.5
Water vapour	0.4	a trace
Average surface temperature	20°C	460°C

(a) Use information from the table to help you to answer each part.

(i) In the Earth's atmosphere today, the main gas is

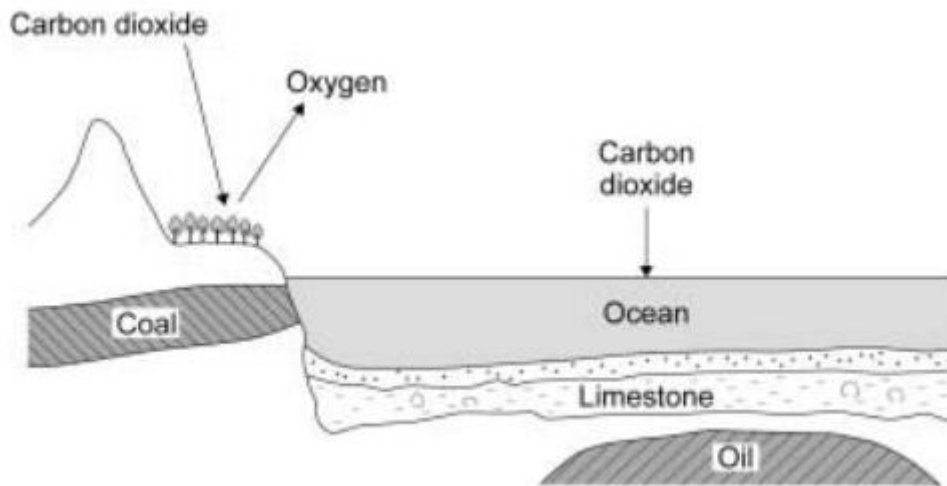
(1 mark)

(ii) In the Earth's atmosphere billions of years ago the main gas was
(1 mark)

(iii) The Earth's surface is mainly covered with water. There is no water on the surface of Venus. Suggest why.

(2 marks)

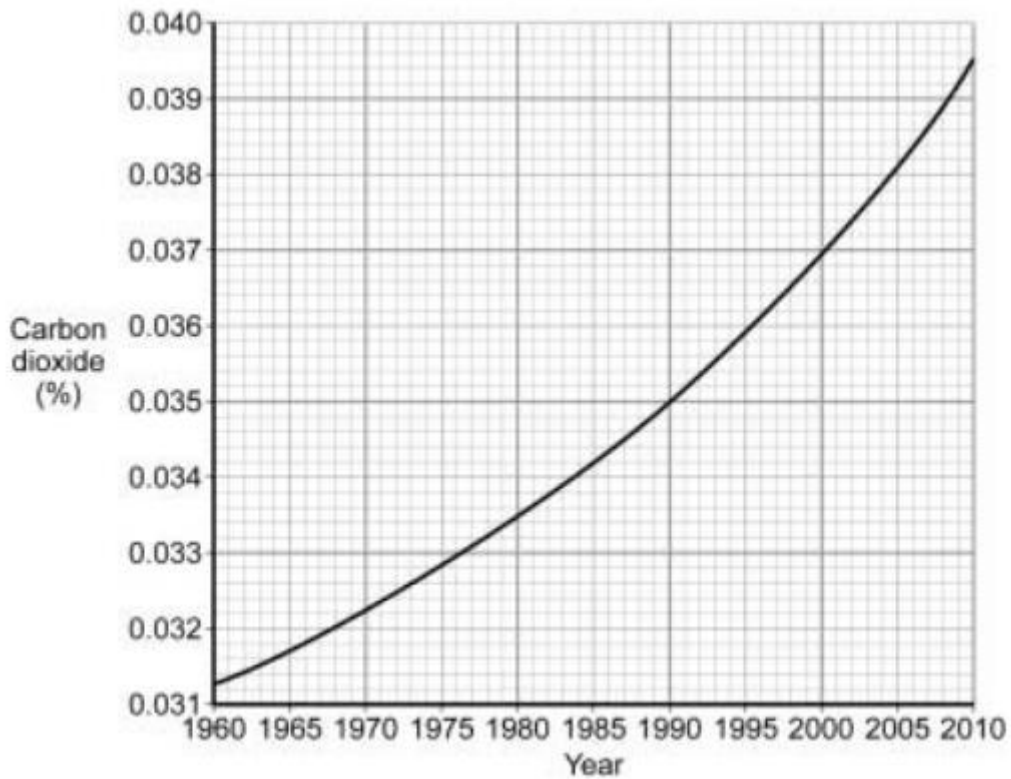
(b) The diagram shows part of the Earth and ways that carbon dioxide can be removed from the Earth's atmosphere.



Give three ways that carbon dioxide can be removed from the Earth's atmosphere.

(3 marks)

- (c) In the Earth's atmosphere the percentage of carbon dioxide has remained at about 0.03% for many thousands of years. The graph shows the percentage of carbon dioxide in the Earth's atmosphere over the last 50 years.



- (i) What was the percentage of carbon dioxide in the Earth's atmosphere in 1965?

..... %

(1 mark)

- (ii) What change has happened to the percentage of carbon dioxide in the Earth's atmosphere over the last 50 years?

(1 mark)

- (iii) Suggest one reason for this change.

(1 mark)

Total marks (40)