

Comp + Evolution of the Earth atm

Question Paper

| | |
|-------------------------|---------------------------------------|
| Level | GCSE (9-1) |
| Subject | Combined Science: Trilogy - Chemistry |
| Exam Board | AQA |
| Topic | 5.9 Chemistry of the Atmosphere |
| Sub-Topic | Comp + Evolution of the Earth atm |
| Difficulty Level | Bronze Level |
| Booklet | Question Paper |

Time Allowed: 42 minutes

Score: /40

Percentage: /100

Grade Boundaries:

Q1. This question is about gases in the Earth’s atmosphere.

- (a) The amount of carbon dioxide in the Earth’s atmosphere decreased during the first billion years of the Earth’s existence.

Complete the sentences. Use words from the box.

| | | | | | |
|-------------------|------------------|-------------------|---------------|-----------------|-----------------|
| carbonates | dissolved | evaporated | melted | nitrates | sulfates |
|-------------------|------------------|-------------------|---------------|-----------------|-----------------|

The amount of carbon dioxide in the Earth’s atmosphere decreased because the carbon dioxide..... in the oceans.

Sediments were formed when were produced.

Algae and plants use carbon dioxide and water to produce oxygen.

(2)

- (b) What is the name of this process?

Tick **one** box.

- | | |
|----------------|--------------------------|
| Carbon capture | <input type="checkbox"/> |
| Combustion | <input type="checkbox"/> |
| Photosynthesis | <input type="checkbox"/> |
| Polymerisation | <input type="checkbox"/> |

(1)

- (c) Complete the word equation for this process.

carbon dioxide + → glucose +

(1)

- (d) Draw **one** line from each gas to the approximate percentage of the gas in the Earth's atmosphere today.

| Gas | Approximate percentage of gas in the Earth's atmosphere today |
|----------------|---------------------------------------------------------------|
| | <1 |
| | 5 |
| Carbon dioxide | 10 |
| Nitrogen | 20 |
| | 50 |
| Oxygen | 80 |
| | >90 |

(3)

- (e) Carbon dioxide is a greenhouse gas.

Why does increasing the amount of carbon dioxide change the global climate?

.....

(1)

- (f) How can countries reduce carbon dioxide emissions?

Tick **one** box.

only burn methane

use renewable energy supplies

use waste plastic bags as fuel

(1)

(g) Give **one** reason why it is difficult for countries to reduce emissions of carbon dioxide.

.....

(1)

(Total 10 marks)

Q2. Millions of years ago the Earth's atmosphere was probably like the atmosphere of Mars today.

(a) The table below shows percentages of the main gases in the atmospheres of Earth and Mars today.

| Gas | Percentage in atmosphere of Mars today | Percentage in atmosphere of Earth today |
|----------------|----------------------------------------|-----------------------------------------|
| Carbon dioxide | 95.00 | 0.04 |
| Nitrogen | 3.50 | 78.00 |
| Oxygen | 0.50 | 21.00 |

For each gas in the table, suggest a reason for the change in the percentage of the gas in Earth's atmosphere.

Carbon dioxide

.....

Nitrogen

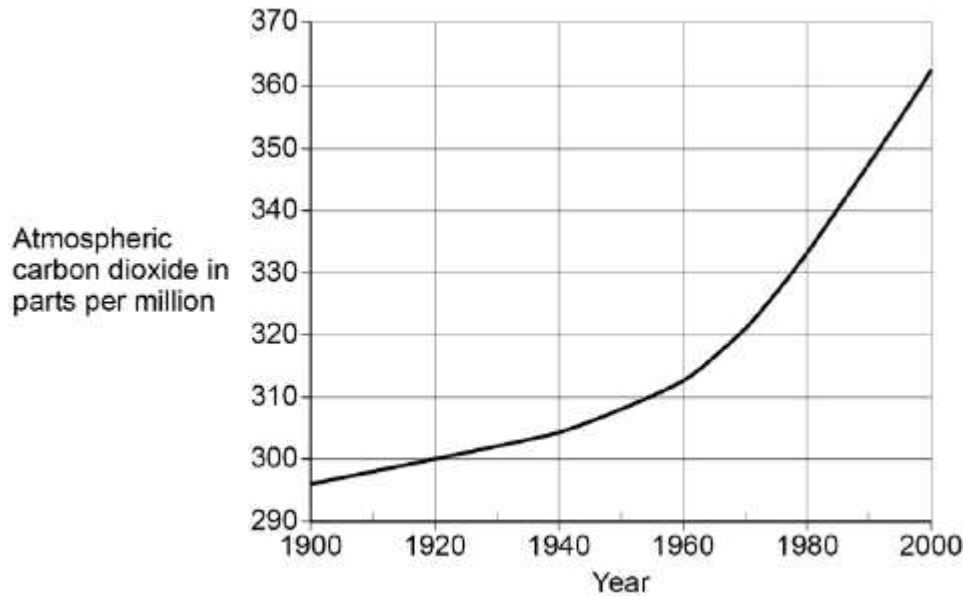
.....

Oxygen

.....

(3)

- (b) The figure below shows how the concentration of carbon dioxide in the Earth's atmosphere changed between 1900 and 2000.



One of the causes of the increase in carbon dioxide between 1900 and 2000 is increased use of fossil fuels.

Suggest when use of fossil fuels began to increase.

Use data from the figure above to explain your answer.

.....
.....
.....
.....

(2)

- (c) What is the percentage increase in carbon dioxide levels between 1970 and 2000?

.....
.....
.....

Increase = %

(3)

- (d) Explain how the changes shown in the figure above can have harmful effects on the environment.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(4)
(Total 12 marks)

Q3. Some theories suggest that the Earth’s early atmosphere was the same as Mars’ atmosphere today.

The table below shows the percentage of four gases in the atmosphere of Mars today and the atmosphere of Earth today.

| Gases | The atmosphere of | |
|----------------|-------------------|-------------|
| | Mars today | Earth today |
| Carbon dioxide | 95.00% | 0.04% |
| Nitrogen | 3.50% | 78.00% |
| Argon | 1.00% | 0.96% |
| Oxygen | 0.50% | 21.00% |

- (a) Which **one** of the gases in the table is a noble gas?

.....

(1)

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

(i) Noble gases are in Group

| |
|---|
| 0 |
| 1 |
| 7 |

(1)

(ii) Noble gases are

| |
|--------------------|
| slightly reactive. |
| unreactive. |
| very reactive. |

(1)

(c) The percentage of carbon dioxide in the Earth's early atmosphere was 95.00%. It is 0.04% in the Earth's atmosphere today.

(i) Calculate the decrease in the percentage of carbon dioxide in the Earth's atmosphere.

.....
.....

Decrease in percentage =%

(1)

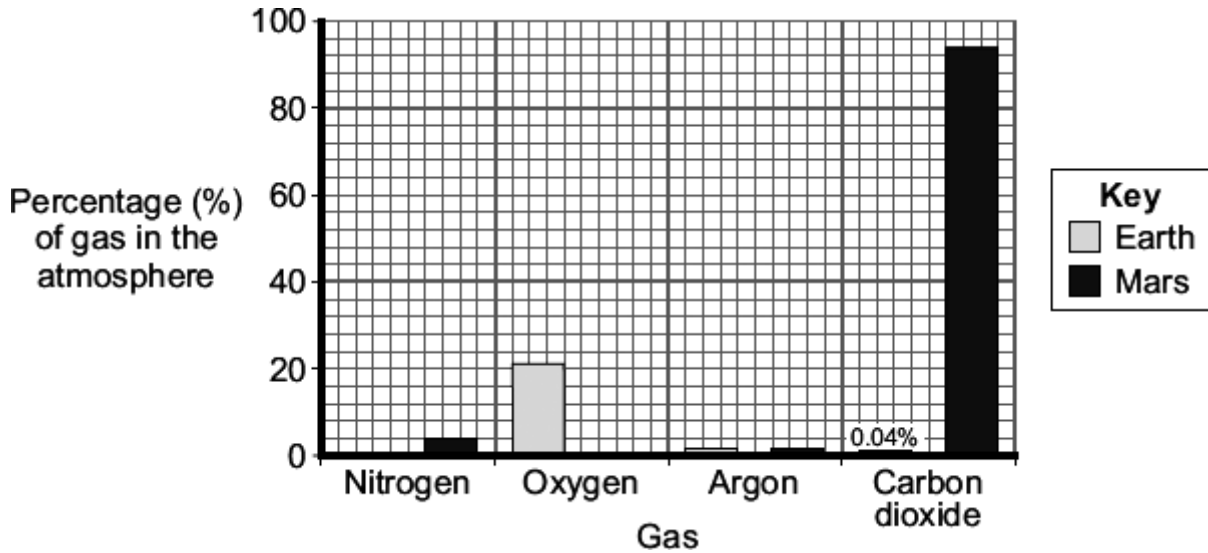
(ii) Give **two** reasons for this decrease.

.....
.....
.....
.....

(2)

(Total 6 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)

(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)

(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)

- (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)

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

Some theories suggest that the Earth’s early atmosphere was

made by

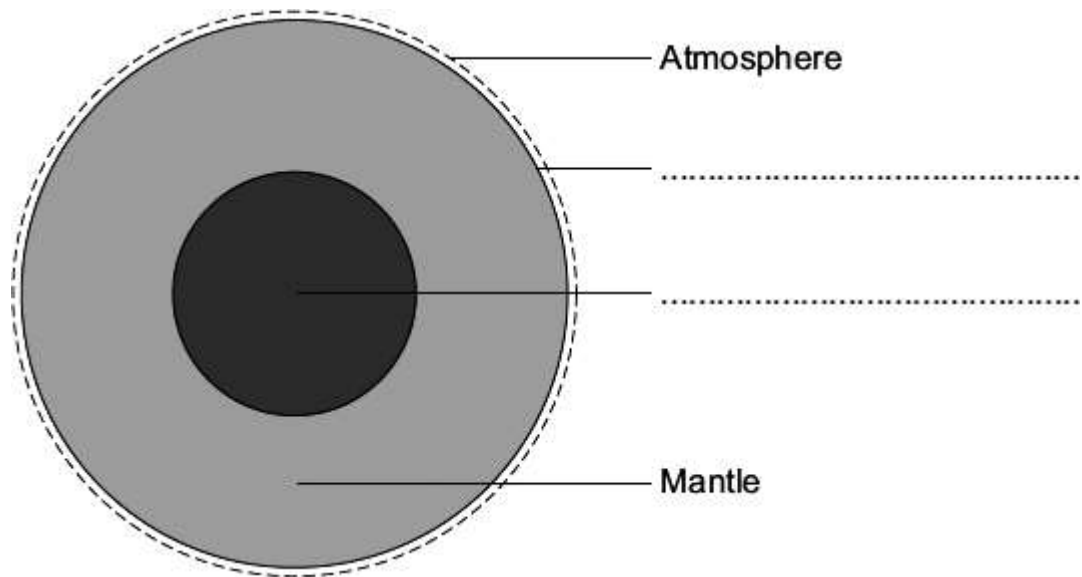
| |
|----------------------------|
| burning fossil fuels. |
| the formation of oceans. |
| the eruption of volcanoes. |

(1)
(Total 5 marks)

Q5. The Earth has a layered structure and is surrounded by an atmosphere.

- (a) The diagram shows the layers of the Earth.

Complete the labels on the diagram.

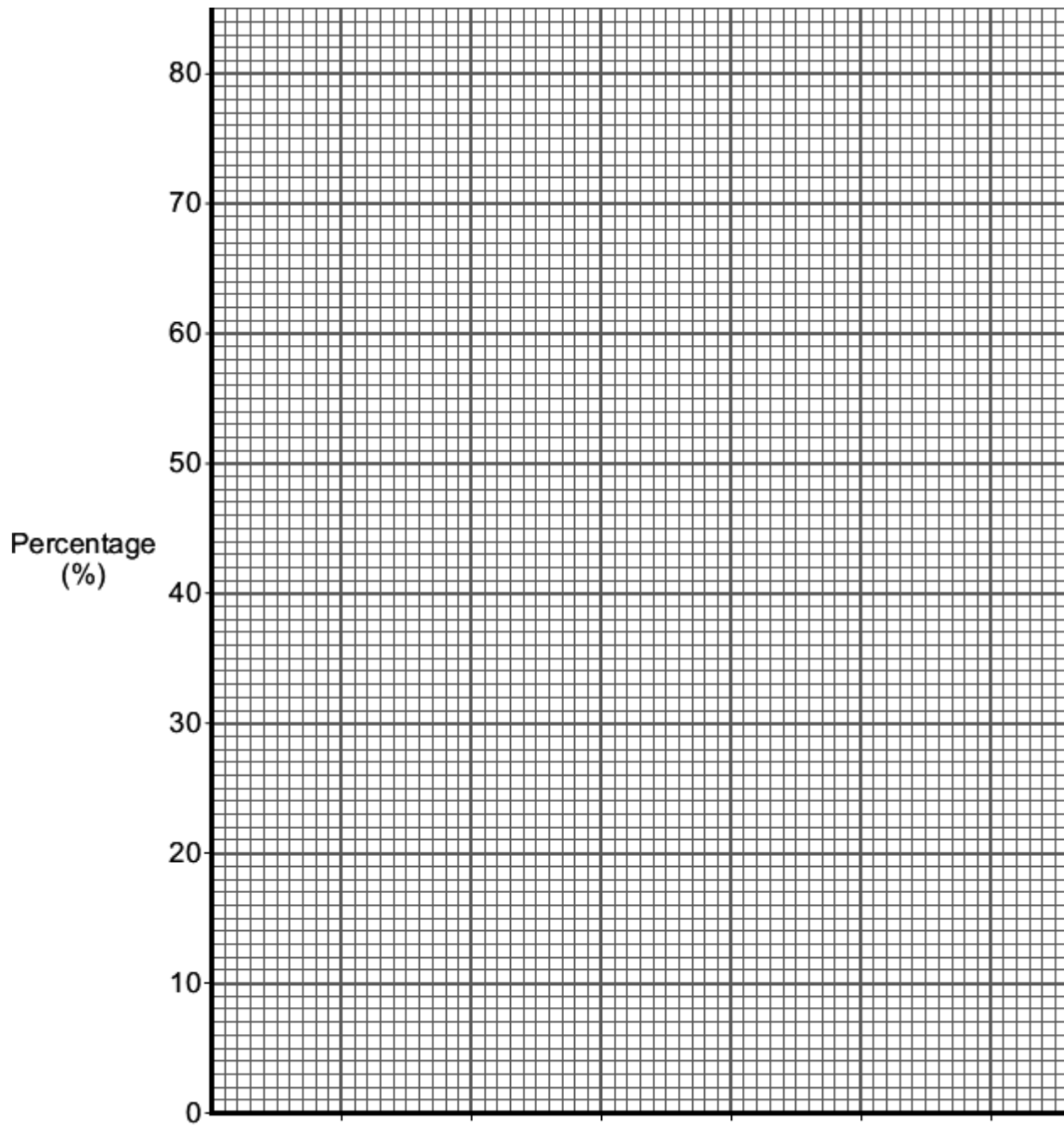


(2)

- (b) The data in the table shows the percentages of the gases in the Earth's atmosphere.

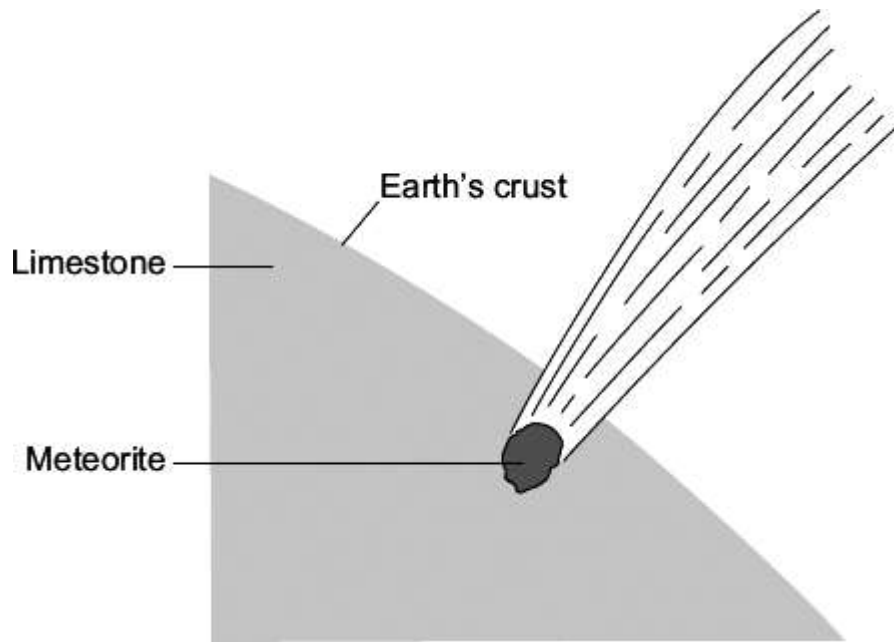
| Name of gas | Percentage (%) of gas |
|-------------|-----------------------|
| Nitrogen | 78 |
| Oxygen | 21 |
| Other gases | 1 |

Present the data in the table on the grid below.



Name of
(3)

- (c) Millions of years ago a large meteorite hit the Earth. The meteorite heated limestone in the Earth's crust to a very high temperature. The heat caused calcium carbonate in the limestone to release large amounts of carbon dioxide.



Draw a ring round the correct answer to complete each sentence.

(i) Carbon dioxide was released because the calcium carbonate was

- decomposed.
- evaporated.
- reduced.

(1)

(ii) More carbon dioxide in the Earth's atmosphere causes

- acid rain.
- global dimming.
- global warming.

(1)
(Total 7 marks)