

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

For Examiner's Use

General Certificate of Secondary Education
January 2007

SCIENCE B
Unit Chemistry C1

CHEMISTRY
Unit Chemistry C1

Foundation Tier

Friday 19 January 2007 1.30 pm to 2.15 pm



CHY1F
F

For this paper you must have:

- a ruler.

You may use a calculator.

Time allowed: 45 minutes

Instructions

- Use blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- Answer the questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The maximum mark for this paper is 45.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

Advice

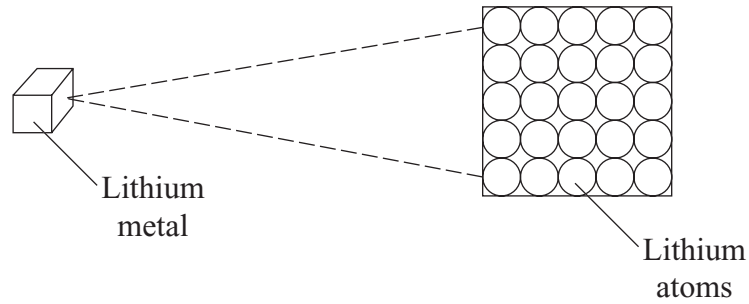
- In all calculations, show clearly how you work out your answer.

For Examiner's Use			
Question	Mark	Question	Mark
1		6	
2		7	
3			
4			
5			
Total (Column 1) →			
Total (Column 2) →			
TOTAL			
Examiner's Initials			

Answer **all** questions in the spaces provided.

1 Lithium metal is used in alkaline batteries.

(a) The diagram shows the atoms in lithium metal.



Why is lithium metal described as an element?

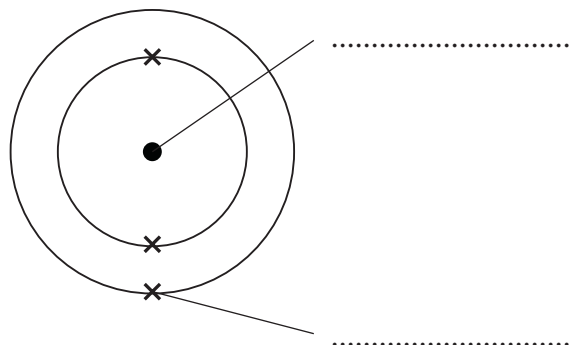
.....

(1 mark)

(b) The diagram below represents a lithium atom.

Choose words from the box to label parts of the atom.

bond	electron	molecule	nucleus
-------------	-----------------	-----------------	----------------

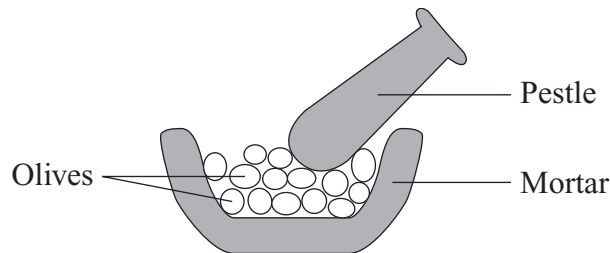


(2 marks)

3

2 A vegetable oil can be extracted from olives.

(a) The diagram shows the first step in this extraction.

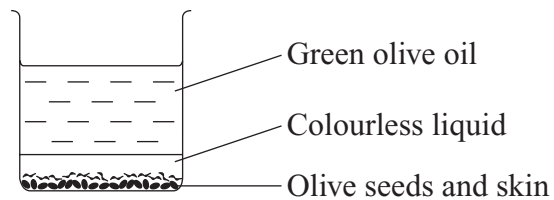


Use the correct word from the box to complete the sentence about this first step.

evaporating	filtering	pressing
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The olive oil is extracted by the olives.
(1 mark)

(b) The contents from the mortar are tipped into a beaker. The mixture is left to settle.



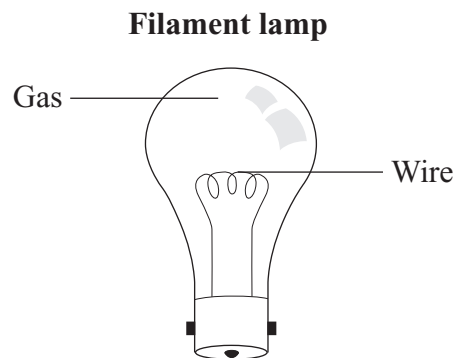
(i) What is the name of the colourless liquid?

.....
(1 mark)

(ii) How can the olive seeds and skins be removed from the liquids?

.....
.....
(1 mark)

- 3 When electricity passes through a thin wire, the wire gets hot. If the wire gets very hot, it may glow. This idea is used in filament lamps.



- (a) The table shows some metals and their melting points.

Metal	Melting point in °C
Aluminium	660
Copper	1084
Iron	1540
Tungsten	3410

Which metal in the table should be used to make the wire in a filament lamp?

Give a reason for your answer.

.....

.....

.....

.....

(2 marks)

(b) The table shows some gases.

Gas
Argon
Carbon dioxide
Oxygen
Sulfur dioxide

Which gas in the table should be used in a filament lamp?

Give a reason for your answer.

.....

.....

.....

.....

(2 marks)

4

Turn over for the next question

Turn over ►

4 Limestone contains calcium carbonate.

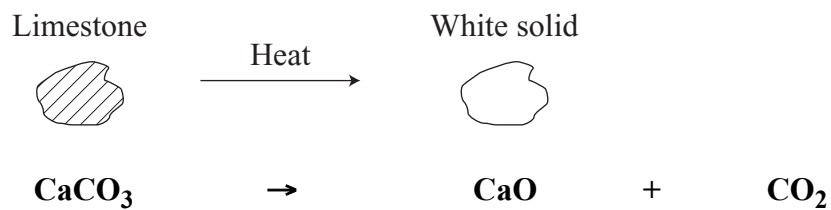
(a) Calcium carbonate has the formula CaCO_3 .

Complete the sentence by writing in the correct numbers.

The formula of calcium carbonate is made up of 1 calcium atom, carbon atom(s)
and oxygen atom(s).

(2 marks)

(b) When limestone is heated it forms two other compounds.



(i) State **one** safety precaution that you should take when heating limestone.

.....
(1 mark)

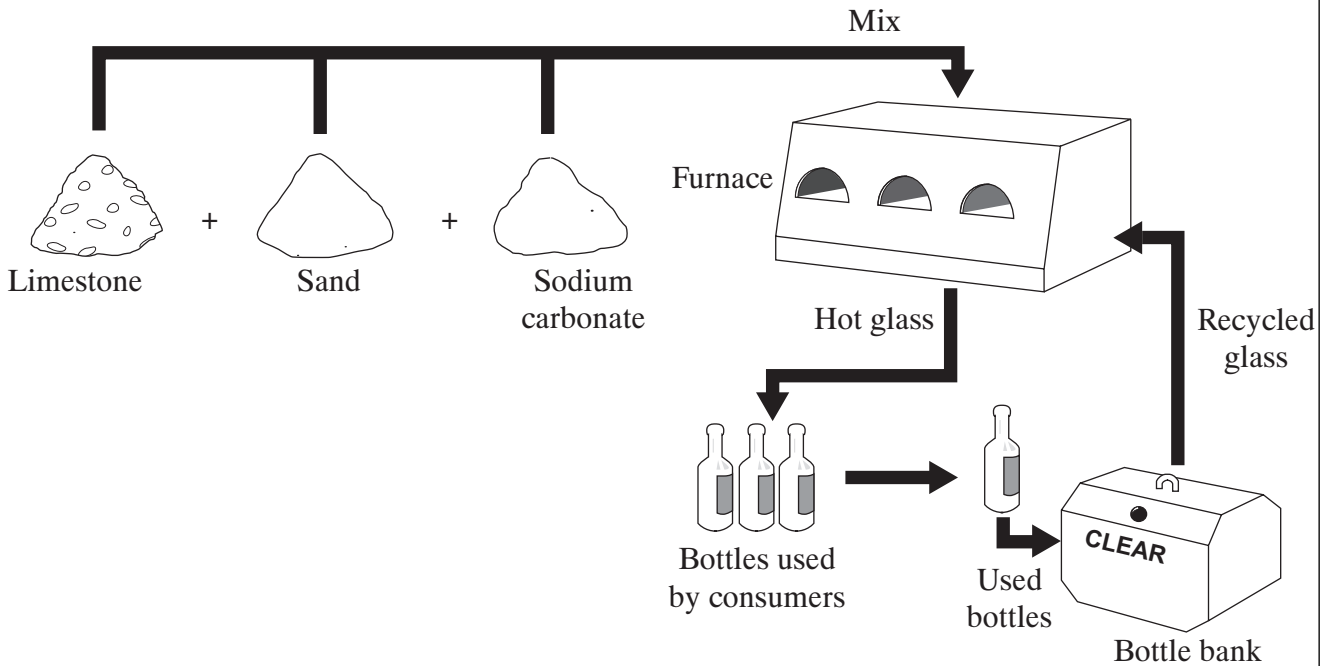
(ii) Name the white solid produced.

.....
(1 mark)

(iii) Why does a piece of limestone lose mass as it is heated?

.....
.....
(1 mark)

- (c) Limestone is used to manufacture glass. Glass is made by heating a mixture of limestone, sand and sodium carbonate in a furnace. The reaction requires a high temperature. If some recycled glass is added, the reaction takes place at a lower temperature.



Suggest **two** reasons why people are encouraged to recycle glass.

- 1
-
- 2
-

(2 marks)

Question 4 continues on the next page

Turn over ►

(d) A company wants to quarry limestone. There are some houses near the quarry.



Residents in the houses say that they do not want a quarry next to them.

(i) Suggest **two** reasons why they do not want the quarry next to them.

1

.....

2

.....

(2 marks)

(ii) Suggest **one** possible benefit to the residents of having a quarry near their houses.

.....

.....

(1 mark)

5 Polymers are used to make many materials that people need.

- (a) Plastic bags are used to carry, protect and store food. Plastic bags are made from polymers.



Plastic bag made from a polymer

- (i) Ethene is the small molecule (the monomer) used to make the polymer for this plastic bag.

Name the polymer that is made from ethene.

.....
(1 mark)

- (ii) Use the correct word from the box to complete the sentence about ethene.

condensing

corroding

cracking

Ethene is made by breaking down large hydrocarbon molecules into smaller hydrocarbon molecules by a process called
(1 mark)

- (iii) The hydrocarbon ethene has the formula C_2H_4

Complete the sentence about ethene.

Ethene is a hydrocarbon made up of carbon and atoms.
(1 mark)

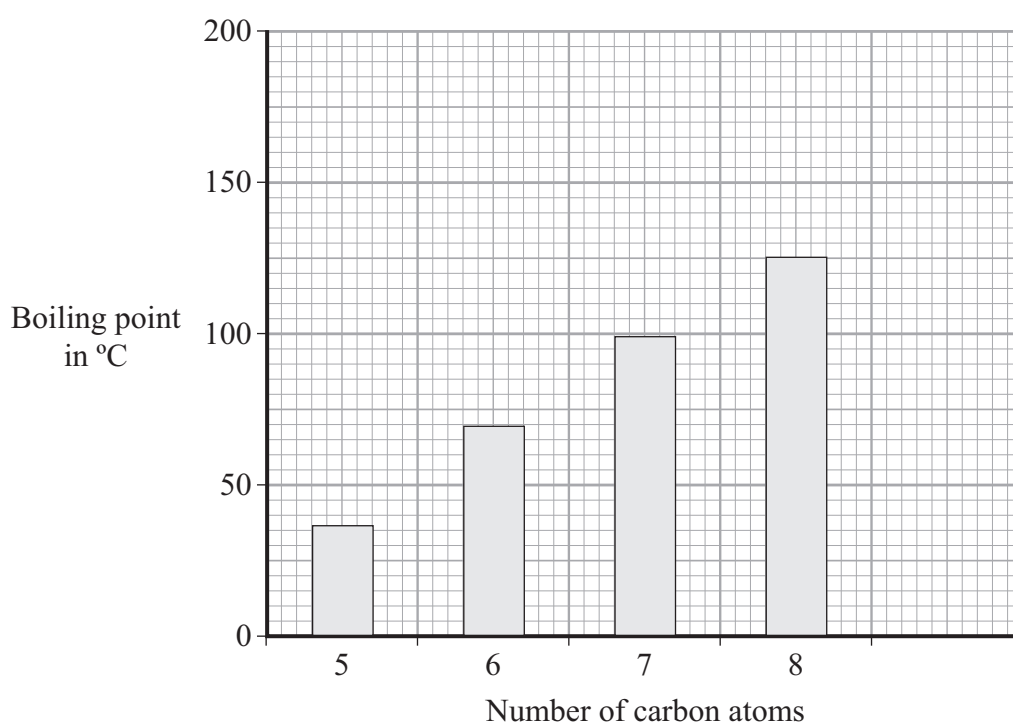
Question 5 continues on the next page

Turn over ►

- (b) The hydrocarbons used to make ethene come from crude oil. The properties of hydrocarbons are linked to the number of carbon atoms in their molecules.

Number of carbon atoms	5	6	7	8	9
Boiling point in °C	36	69	99	125	151

- (i) Use the data in the table to complete the bar chart.



(2 marks)

- (ii) What happens to the boiling point of a hydrocarbon as the number of carbon atoms increases?

.....
(1 mark)

(iii) All the hydrocarbons in the table are found in petrol. Petrol is one of the fractions separated from crude oil.

Describe how the fractions are separated from crude oil.

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

(2 marks)

(c) Most plastic bags that are made of hydrocarbons are not biodegradable.

Used plastic bags can be:

- dumped into large holes, which is called landfill
- burned to give out heat energy, which would produce large amounts of gases.

Would burning used plastic bags be better for the environment than dumping them in landfill?

Explain your answer.

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

(2 marks)

10

Turn over for the next question

Turn over ►

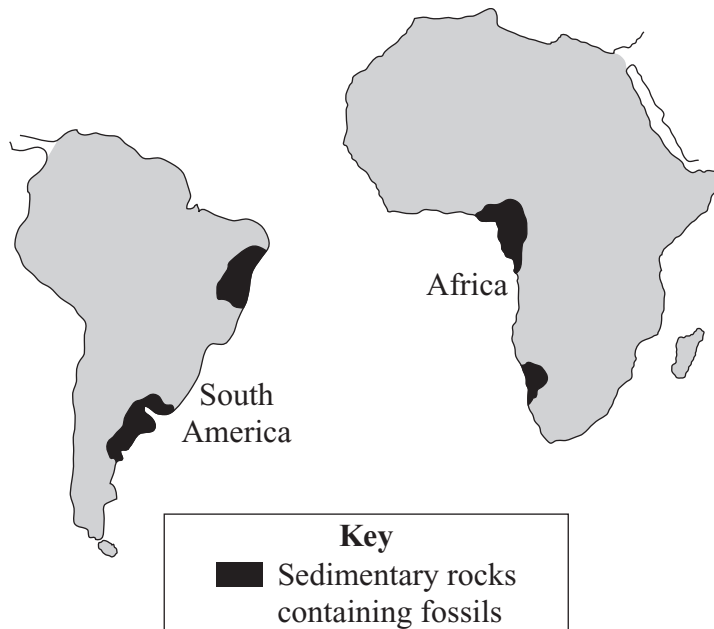
- 6 (a) Two hundred years ago, scientists thought that the Earth was about 400 million years old. This estimate came from the idea that the centre of the Earth was still molten. More recently, measurement of radioactivity in rocks has shown that the Earth is much older than 400 million years.

Suggest **one** reason why scientists now know that the Earth is much older than 400 million years.

.....
.....

(1 mark)

- (b) About one hundred years ago there was a scientist called Alfred Wegener. He found evidence that the continents, such as South America and Africa, had once been joined and then drifted apart.



Use the diagram to suggest **two** pieces of evidence that could be used to show that the continents had once been joined.

1

.....

2

.....

(2 marks)

- (c) About fifty years ago, new evidence convinced scientists that the Earth's crust is made up of tectonic plates that are moving very slowly.

Give **two** pieces of evidence that have helped to convince these scientists that the tectonic plates are moving.

1

.....

2

.....

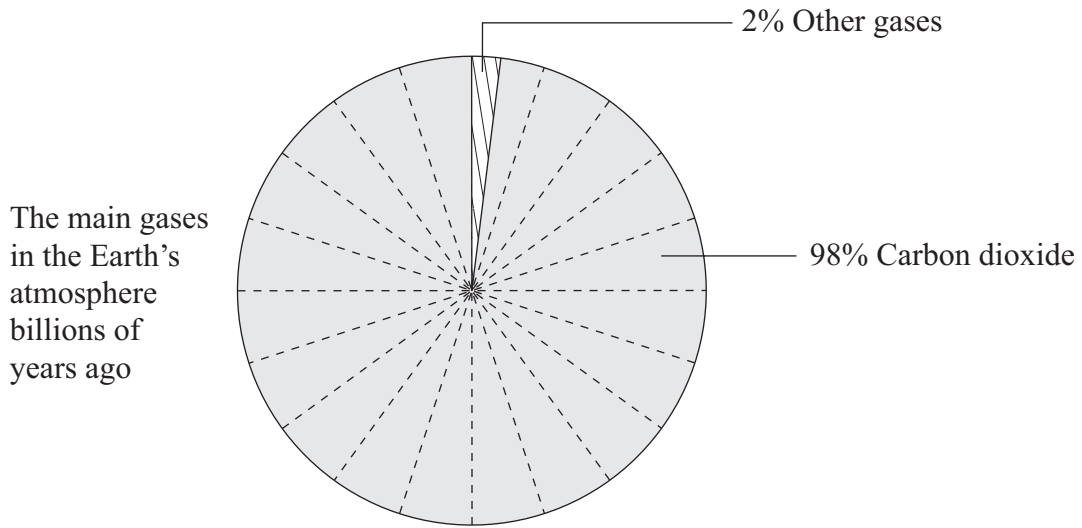
(2 marks)

5

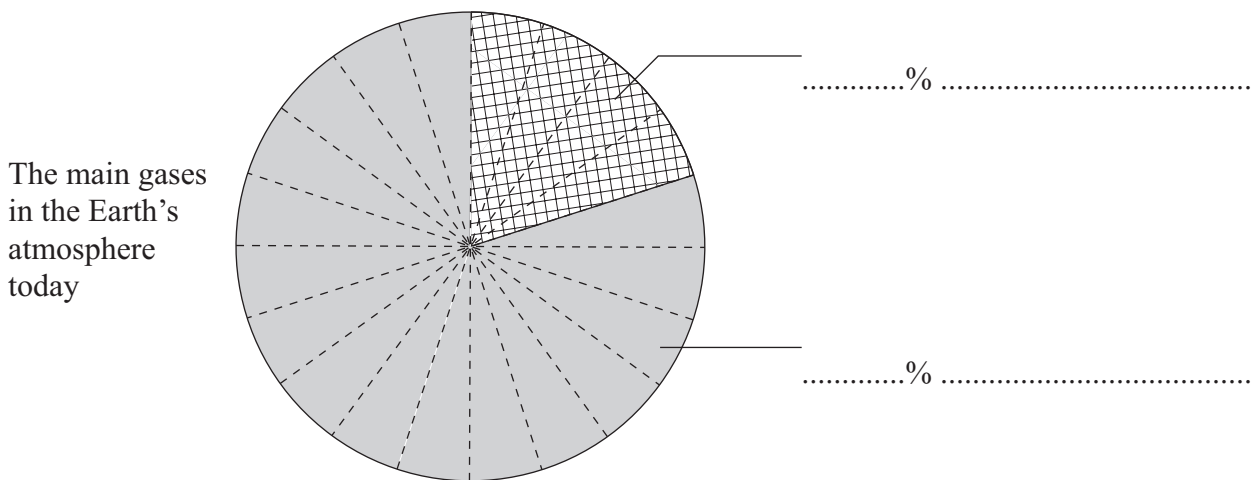
Turn over for the next question

Turn over ►

- 7 Life on Earth would not exist without the atmosphere. Billions of years ago the composition of the Earth's atmosphere was very different from the composition today.



- (a) Label the pie chart below to show the percentages and names of the two main gases in the Earth's atmosphere today.



(2 marks)

- (b) There is evidence that the composition of the Earth's atmosphere is still changing. One possible reason is that many power stations generate electricity by burning fossil fuels such as coal, oil or natural gas. Sulfur dioxide, SO_2 , is produced when coal burns in air.

- (i) What environmental problem does sulfur dioxide cause?

.....
.....
(1 mark)

- (ii) How could this environmental problem be reduced in coal-fired power stations?

.....
.....
(1 mark)

- (iii) Gas-fired power stations burn methane, CH_4 , in air.

Complete the word equation for this reaction.

methane + \rightarrow carbon dioxide +
(2 marks)

- (c) Excess carbon dioxide should be prevented from entering the atmosphere.

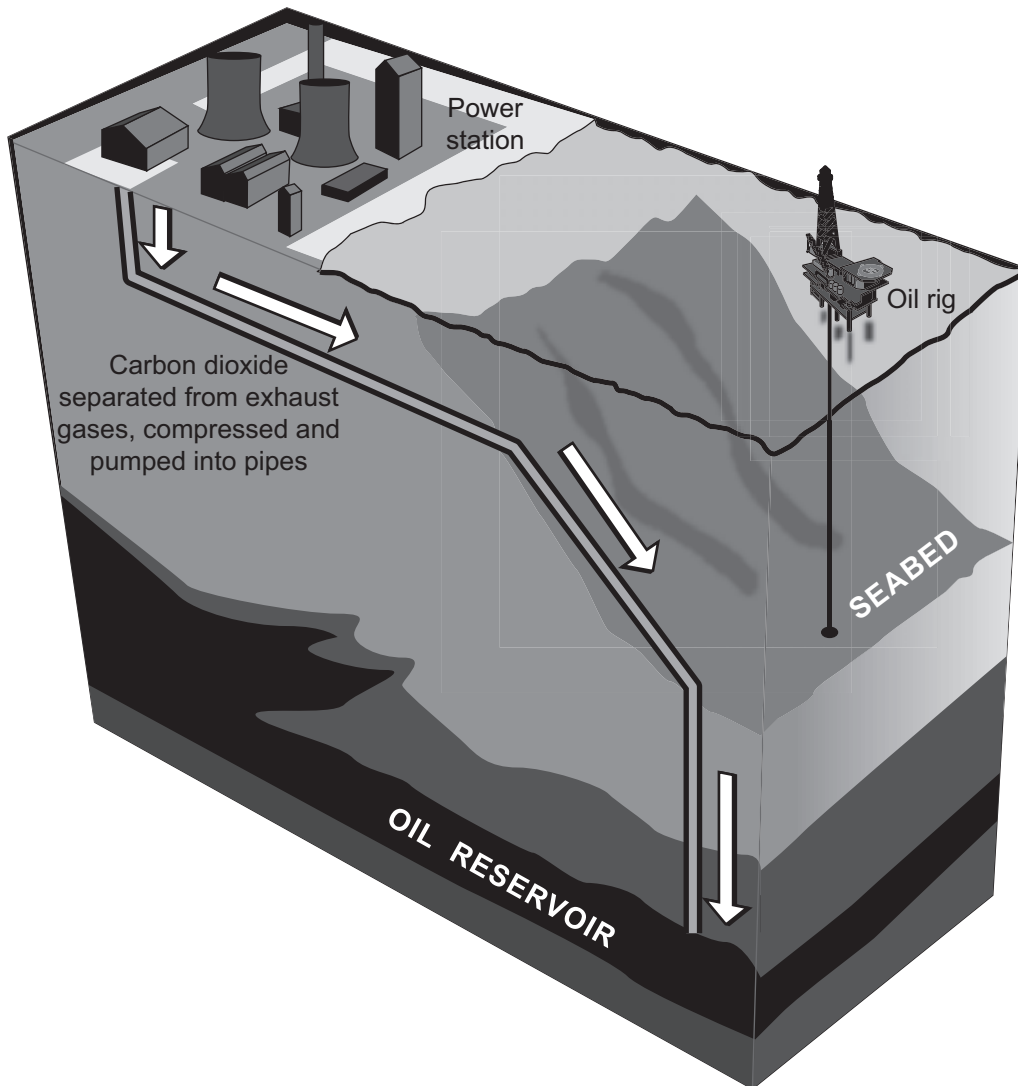
Explain why.

.....
.....
.....
.....
(2 marks)

Question 7 continues on the next page

Turn over ►

- (d) Carbon dioxide is produced when fossil fuels burn in power stations. The diagram represents one idea to prevent excess carbon dioxide from entering the atmosphere.



Use the diagram to explain how carbon dioxide can be prevented from entering the atmosphere.

.....

.....

.....

.....

(2 marks)

END OF QUESTIONS