

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										



General Certificate of Secondary Education
Foundation Tier
January 2011

Science B

Unit Chemistry C1

Chemistry

Unit Chemistry C1

Written Paper

Monday 17 January 2011 9.00 am to 9.45 am

For this paper you must have:

- a ruler.
- You may use a calculator.

Time allowed

- 45 minutes

Instructions

- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 45.
- 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	
Examiner's Initials	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
TOTAL	

CHY1F
F



J A N 1 1 C H Y 1 F O 1

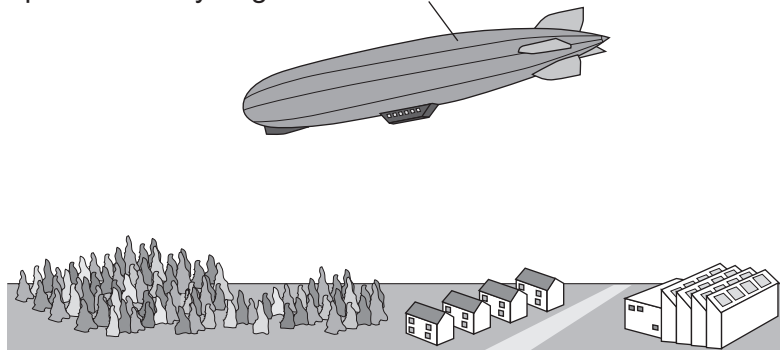
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CHY1F

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

- 1** Hydrogen and helium have both been used in airships.

Airship filled with hydrogen or helium



- 1 (a)** Tick (✓) the property which both hydrogen and helium have that makes an airship float in air.

Property	Tick (✓)
Colourless	
Less dense than air	
More dense than air	

(1 mark)

- 1 (b) (i)** Hydrogen is no longer used in airships because it burns in oxygen.

The chemical equation for this reaction is shown.



Complete the word equation for this reaction.

hydrogen + oxygen →

(1 mark)



- 1 (b) (ii) Helium is safer than hydrogen because it does **not** burn in oxygen.

Draw a ring around the correct answer to complete the sentence.

Helium is now used in airships because it is

a fuel.

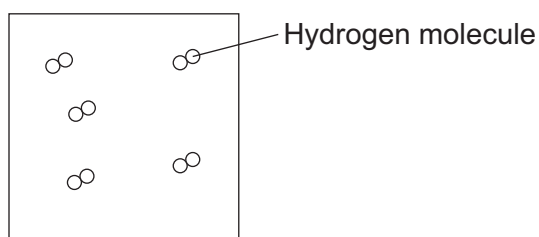
already in the air.

unreactive.

(1 mark)

- 1 (c) **Diagram 1** represents hydrogen molecules.

Diagram 1



Draw a ring around the correct answer to complete the sentence.

Each hydrogen molecule is made up of two hydrogen

atoms.

compounds.

elements.

(1 mark)

- 1 (d) **Diagram 2** shows the parts of a helium atom.

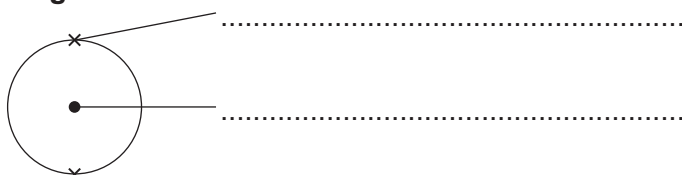
Use words from the box to label **diagram 2**.

bond

electron

nucleus

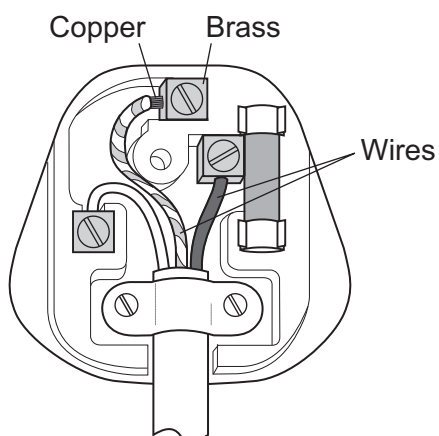
Diagram 2



(2 marks)



- 2 The diagram shows an electric plug.



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

Copper is used for the wires because it

conducts electricity.

conducts heat.

is shiny.

(1 mark)

- 2 (a) (ii) Brass is an *alloy* of copper and zinc.

What is an *alloy*?

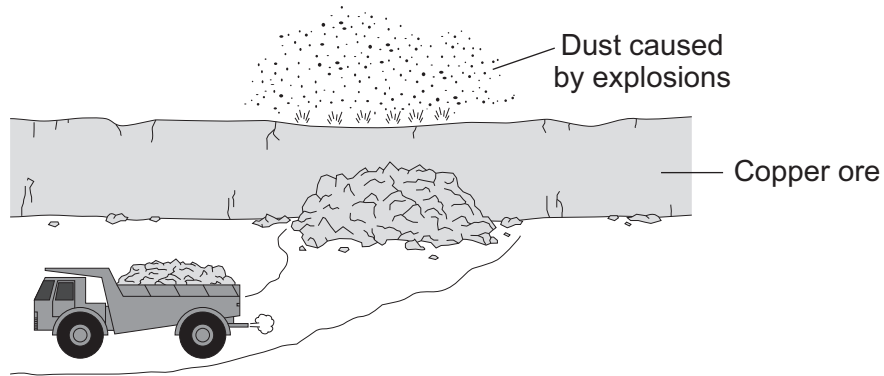
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(1 mark)



2 (b) Open-cast mines are used to obtain copper ore.



Suggest **two** reasons why people would **not** like to live near an open-cast mine.

- 1
-
- 2
-

(2 marks)

4

Turn over for the next question

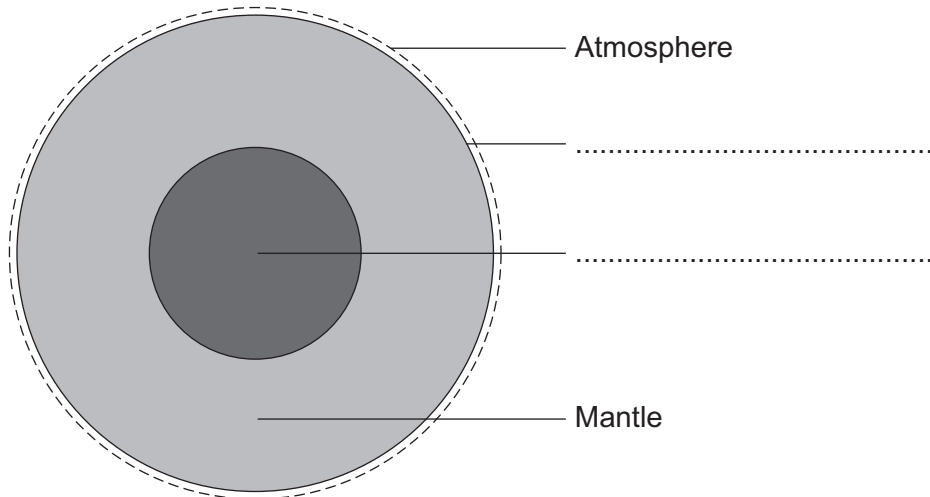
Turn over ►



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

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

Complete the labels on the diagram.



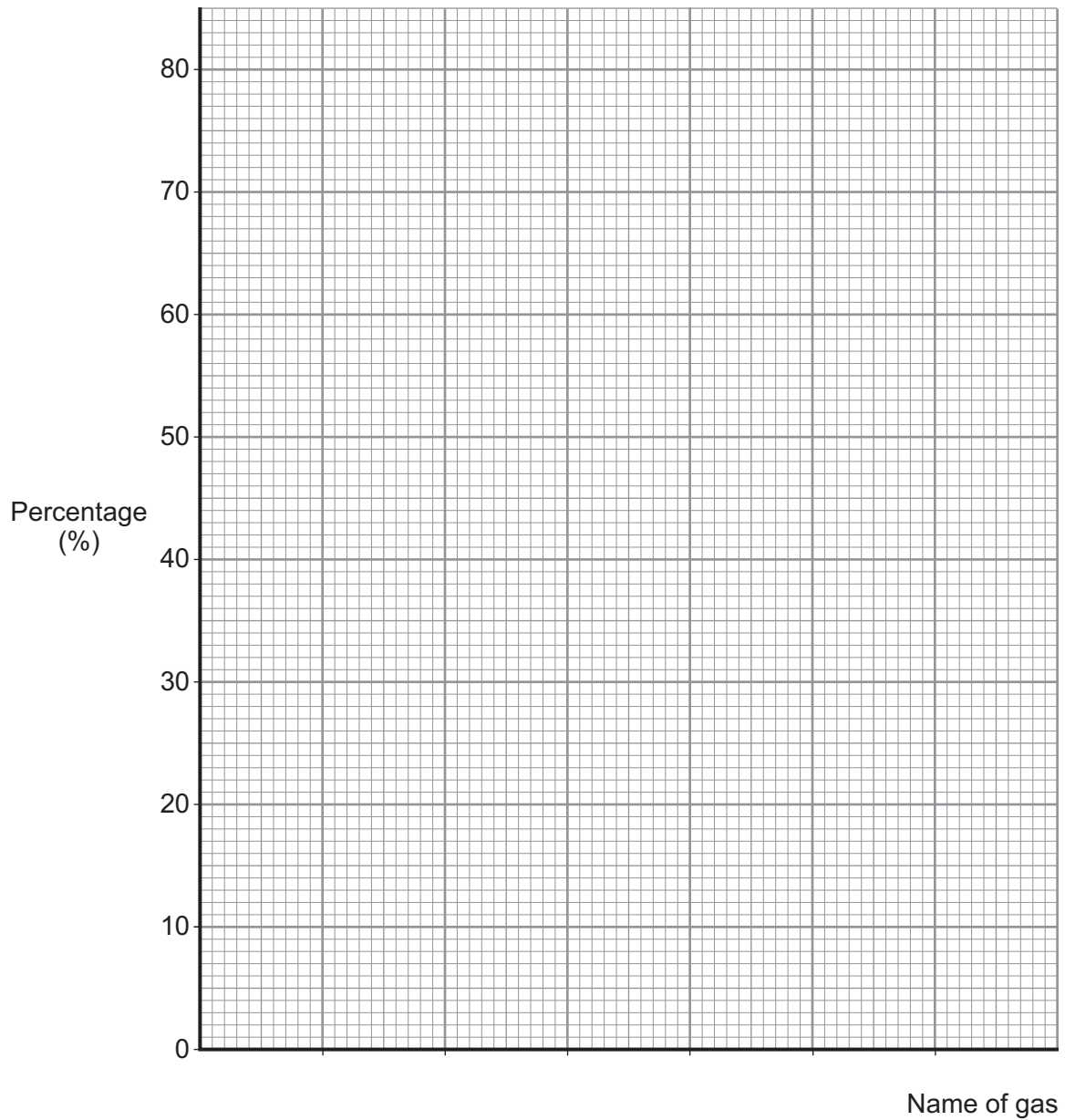
(2 marks)

3 (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.



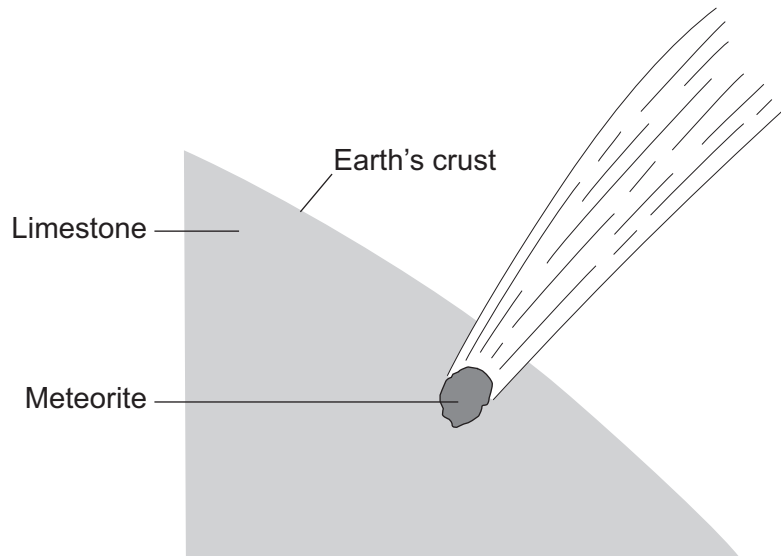
(3 marks)

Question 3 continues on the next page

Turn over ►



- 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.

- 3 (c) (i)** Carbon dioxide was released because the calcium carbonate was

decomposed.
evaporated.
reduced.

(1 mark)

- 3 (c) (ii)** More carbon dioxide in the Earth's atmosphere causes

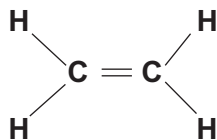
acid rain.
global dimming.
global warming.

(1 mark)



- 4** Supermarkets in the UK have been advised by the Government to stop giving plastic bags to customers.
Plastic bags are made from a polymer.
The polymer is made from ethene.

The structural formula of ethene is shown.



Ethene is made by cracking hydrocarbons.
These hydrocarbons come from crude oil.

- 4 (a)** Complete these sentences about ethene.

4 (a) (i) Ethene is a hydrocarbon because it contains only and
(2 marks)

4 (a) (ii) Ethene is unsaturated because it has a bond.
(1 mark)

- 4 (b)** Tick (✓) the name of the polymer formed when many ethene molecules join together.

Name of polymer	Tick (✓)
poly(chloroprene)	
poly(ethene)	
poly(propene)	

(1 mark)

- 4 (c)** Suggest **two** reasons why supermarkets should stop giving plastic bags to customers.

1

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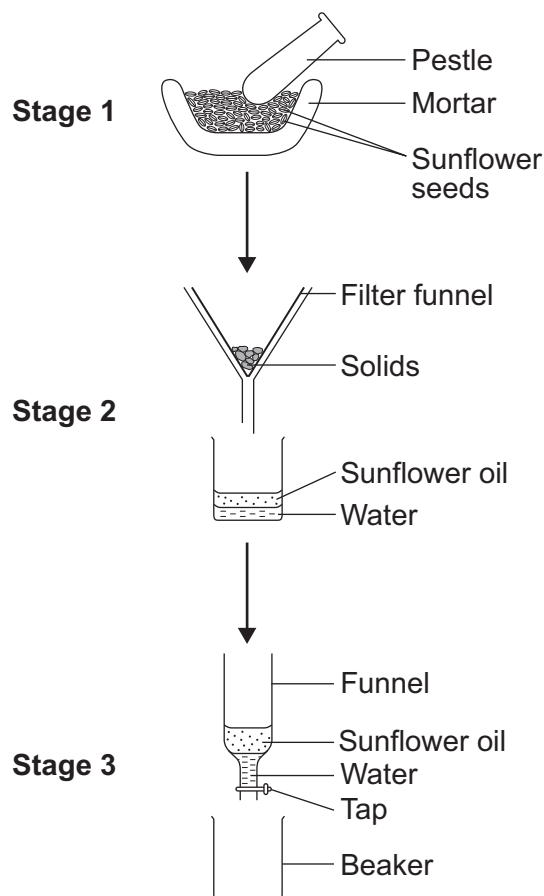
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(2 marks)



- 5 (a)** The diagram shows how sunflower oil can be extracted from sunflower seeds in three stages.



- 5 (a) (i)** Complete the sentences.

To release the oil and water in **stage 1** the sunflower seeds
are

To remove any solids in **stage 2** the mixture is
(2 marks)



5 (a) (ii) Describe how the funnel with a tap in **stage 3** is used to separate the oil from the water.

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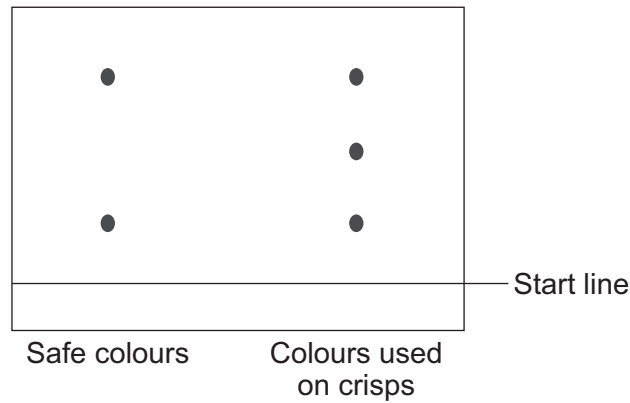
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(2 marks)

5 (b) Some crisps are made by frying thin slices of potato in sunflower oil. Colours can be added to improve the appearance of the crisps. Chromatography is used to check if these colours are safe to eat. One result is shown below.



Use the results to help you to answer these questions.

5 (b) (i) How many colours were added to the crisps?
(1 mark)

5 (b) (ii) Are the crisps safe to eat? Explain your answer.

.....

.....

.....

(1 mark)

5 (b) (iii) Why would a manufacturer want to improve the appearance of their crisps?

.....

.....

(1 mark)



- 6** The flow diagram shows the main stages used to extract a metal from its ore.

mining the ore → purifying the ore → extracting the metal

The table shows some information about three metals.

Metal	Metal ore	Purified ore	% of metal in the ore	% of metal in the Earth's crust
aluminium	bauxite	aluminium oxide, Al_2O_3	28.0	8.0
copper	chalcocite	copper sulfide, Cu_2S	0.5	0.001
iron	haematite	iron oxide, Fe_2O_3	29.0	5.0

- 6 (a)** Use the information in the table and your knowledge and understanding to help you to answer the questions.

- 6 (a) (i)** Suggest why purifying the copper ore produces large quantities of waste.

.....

.....

.....

(1 mark)

- 6 (a) (ii)** Suggest why the annual world production of iron is forty times greater than that of aluminium.

.....

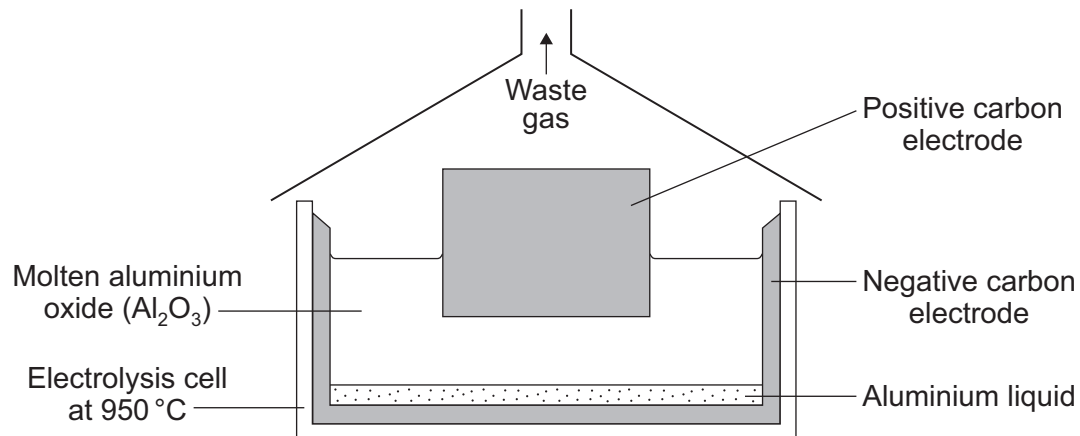
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(1 mark)



- 6 (b)** Aluminium is used for drinks cans.
Aluminium is extracted from its purified ore by electrolysis.



- 6 (b) (i)** Suggest why the aluminium produced in the electrolysis cell is a liquid.

.....

 (1 mark)

- 6 (b) (ii)** In this electrolysis, aluminium and oxygen gas are produced from the aluminium oxide.

Use the information in the diagram to suggest why most of the waste gas is carbon dioxide and not oxygen.

.....

 (2 marks)

- 6 (b) (iii)** Aluminium is the most abundant metal in the Earth's crust.

Suggest **two** reasons why we should recycle aluminium drinks cans.

1

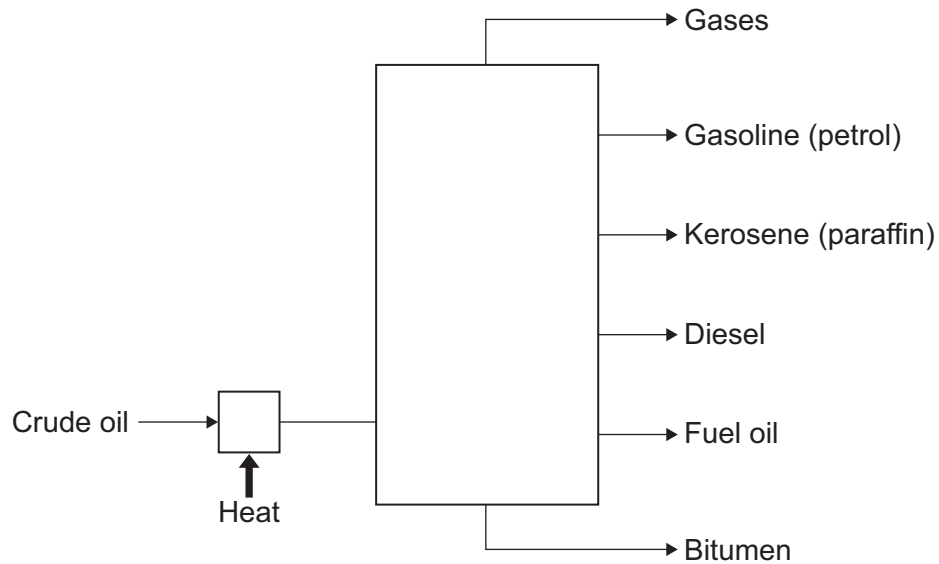
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 (2 marks)



7 Crude oil is used to produce many useful materials.

7 (a) The diagram shows some of the fractions produced from crude oil by fractional distillation.



Use the diagram to help you to explain how crude oil is separated into fractions.

You should use the words evaporated and condensed in your answer.

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(3 marks)



- 7 (b)** The table shows some information about four of the fractions from crude oil that are used as fuels.

Fraction	Boiling point in °C	Number of carbon atoms found in the molecules
Gasoline (petrol)	20–200	5–10
Kerosene (paraffin)	180–260	10–16
Diesel	260–340	14–20
Fuel oil	370–600	20–70

Use the information in the table to help you to answer these questions.

- 7 (b) (i)** How can you tell that each of the fractions is a mixture?

.....

 (1 mark)

- 7 (b) (ii)** How does the number of carbon atoms in a molecule affect its boiling point?

.....

 (1 mark)

- 7 (c)** Fuels are substances that release energy.

- 7 (c) (i)** Name the reaction that releases energy from a fuel such as gasoline (petrol).

.....
 (1 mark)

- 7 (c) (ii)** Describe how fuel oil is broken down into smaller, more useful molecules such as gasoline (petrol).

.....

 (2 marks)

END OF QUESTIONS



There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**

