Surname		Other Names	
Centre Number			Candidate Number				
Candidate Signature									

For Examiner's Use

General Certificate of Secondary Education
June 2008

SCIENCE B
Unit Chemistry C1

CHY1F
F

CHEMISTRY
Unit Chemistry C1

Foundation Tier

Wednesday 18 June 2008 1.30 pm to 2.15 pm

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. Answers written in margins or on blank pages will not be marked.
- 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		7	
2		8	
3			
4			
5			
6			
Total (Column 1) →			
Total (Column 2) →			
TOTAL			
Examiner's Initials			

There are no questions printed on this page

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

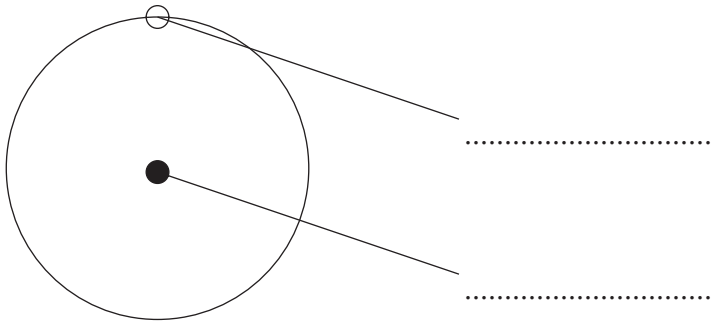
Answer **all** questions in the spaces provided.

1 Hydrogen is an element.

1 (a) The diagram shows the parts of a hydrogen atom.

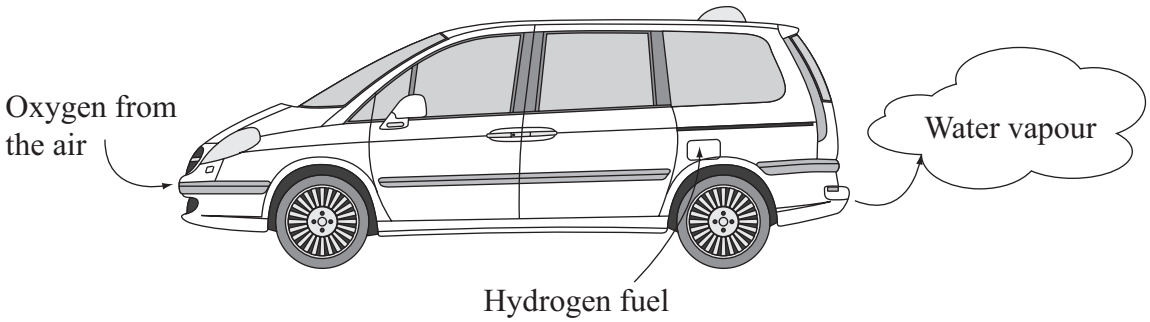
Use words from the box to label the diagram.

electron	**group**	**nucleus**	**symbol**



(2 marks)

1 (b) Hydrogen can be used as a *clean fuel* for cars.



1 (b) (i) When hydrogen burns in air, it reacts with another element.

Complete the word equation for this reaction.

hydrogen + ... → water

(1 mark)

1 (b) (ii) Suggest **one** reason why hydrogen is called a *clean fuel*.

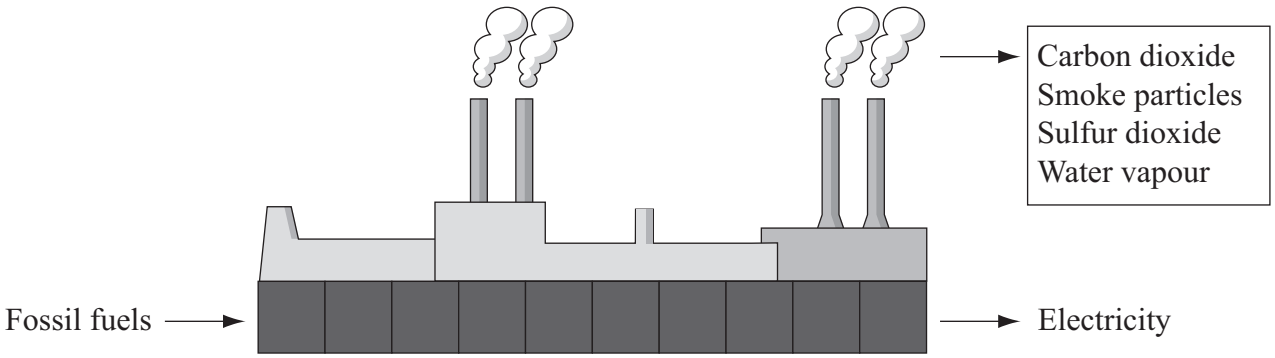
.....

.....

(1 mark)

4

2 Most electricity in the UK is generated in power stations that burn fossil fuels.
The diagram lists some of the substances released into the air when fossil fuels are burned.



Power station

2 (a) (i) Which **one** of the substances released into the air causes acid rain?

.....

(1 mark)

2 (a) (ii) In the sentence below, draw a ring around the correct answer.

The type of environmental pollution caused by

smoke particles is

global dimming
global warming
rising sea levels

.

(1 mark)

2 (a) (iii) Suggest how the burning of fossil fuels may cause climate change.

.....

.....

.....

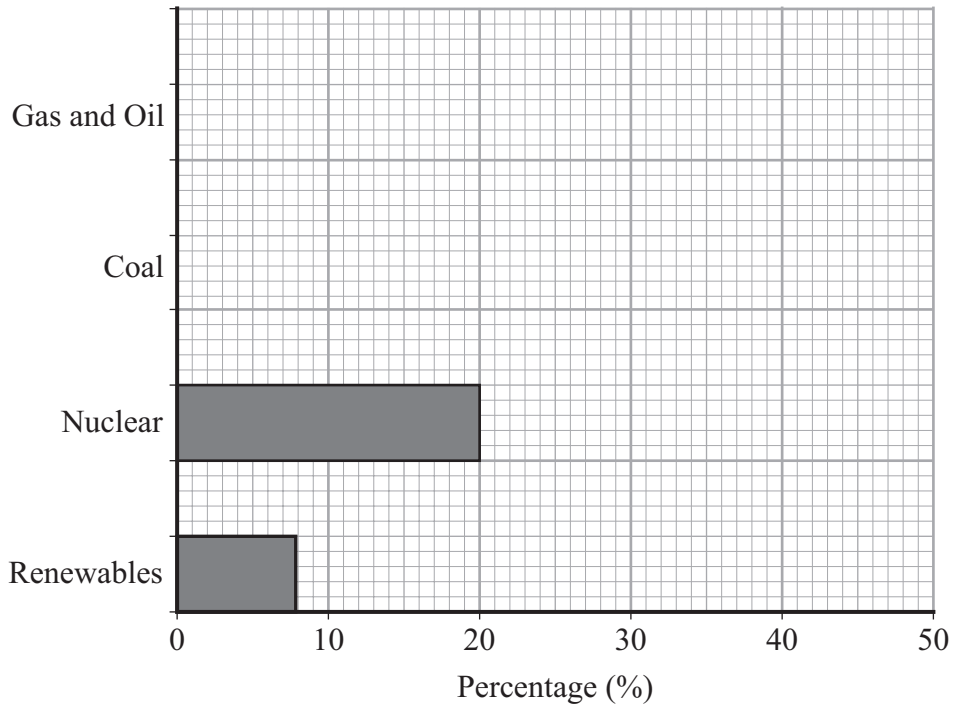
.....

(2 marks)

2 (b) The table shows the percentage of electricity generated by different energy sources.

Energy sources	Renewables	Nuclear	Coal	Gas and Oil
Percentage (%)	8	20	32	40

Complete the bar chart to show the percentage of electricity generated by coal and by gas and oil.



(2 marks)

6

Turn over for the next question

3 A headline from 27 December 2004 read:

‘MASSIVE EARTHQUAKE CAUSES TSUNAMI’

The earthquake happened at a plate boundary under the sea. This produced a huge wave, called a tsunami. The wave travelled quickly across the Indian Ocean. The tsunami destroyed homes on many islands and on the east coast of India.

3 (a) Use words from the box to complete the sentences about earthquakes.

convection	**radioactive**	**tectonic**	**volcanic**

The earthquake was caused by the movement of two of the Earth’s

..... plates.

The energy for this movement comes from the heat released by natural

..... processes. *(2 marks)*

3 (b) It was estimated that 300 000 people died as a result of the tsunami in 2004.

Some newspapers criticised scientists for not predicting the tsunami, because if people had been warned they could have moved to safety.

3 (b) (i) Suggest why we can only estimate that 300 000 people died as a result of the tsunami.

.....

.....

.....

.....

(2 marks)

3 (b) (ii) Explain why scientists could not have predicted the tsunami.

.....

.....

.....

.....

(2 marks)

6

Turn over for the next question

4 The label on a bottle of salad dressing shows that the dressing contains the following ingredients.

Ingredients	
Water Vegetable oil Egg yolk Sugar Flour Vinegar Salt	Extract of spices Preservative E202 Emulsifier E405

4 (a) One of the main ingredients in salad dressing is vegetable oil.

4 (a) (i) Use the correct word from the box to complete the sentence about the extraction of vegetable oil.

crushed	**evaporated**	**hardened**

To extract the vegetable oil, the fruits or seeds of plants are first

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

4 (a) (ii) The liquids can be separated from the solid parts of the fruits or seeds by filtering.

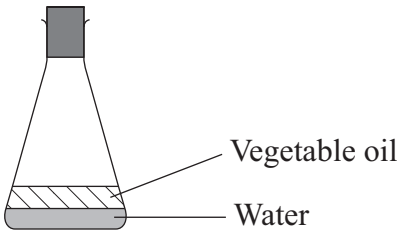
Suggest **one** reason why separation by filtering is better than separation by distilling.

.....

.....

(1 mark)

4 (b) (i) A mixture of vegetable oil and water is shaken and left to stand for several minutes. The diagram shows the result.

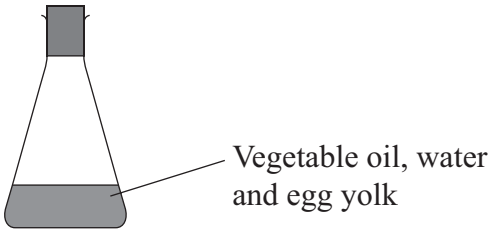


Complete the following sentence.

The vegetable oil and water ..... .

(1 mark)

4 (b) (ii) A mixture of vegetable oil, water and egg yolk is shaken and left to stand for several minutes.
The diagram shows the result.



Use words from the box to complete the sentence.

additive	**distil**	**emulsion**	**extract**	**mix**	**separate**

The egg yolk causes vegetable oil and water to .....

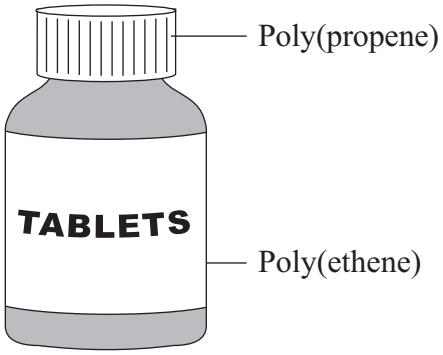
and form an ..... .

(2 marks)

5

Turn over for the next question

5 Tablet containers are often made from two different polymers.



5 (a) Ethene, C_2H_4, and propene, C_3H_6, can be made from crude oil.

5 (a) (i) Complete the following sentence.

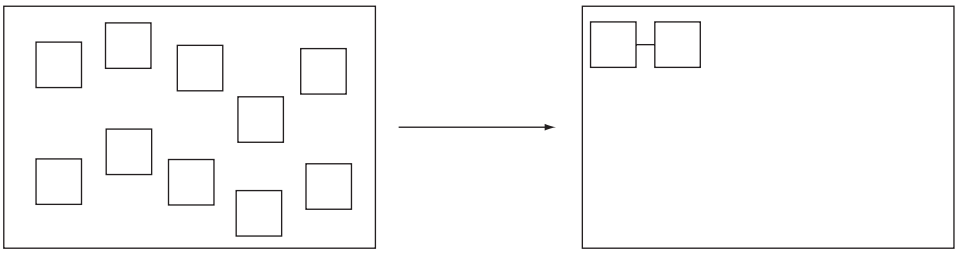
Ethene and propene are called hydrocarbons because they are made up of carbon and ..... atoms only.

(1 mark)

5 (a) (ii) Ethene molecules are used to form poly(ethene) molecules.

Complete the diagram to show the poly(ethene) molecule.

Ethene molecules **Poly(ethene) molecule**



(2 marks)

5 (b) The tablet containers could be disposed of in a landfill site or could be recycled.

5 (b) (i) Suggest **two** reasons why disposing of the tablet containers in a landfill site could cause problems.

1 .....

.....

2 .....

.....

(2 marks)

5 (b) (ii) Suggest **one** reason why recycling the tablet containers would be difficult.

.....

.....

(1 mark)

6

Turn over for the next question

6 Metals and their alloys have many uses.

6 (a) Dentists use a smart alloy to make braces that gently push teeth into the right position.

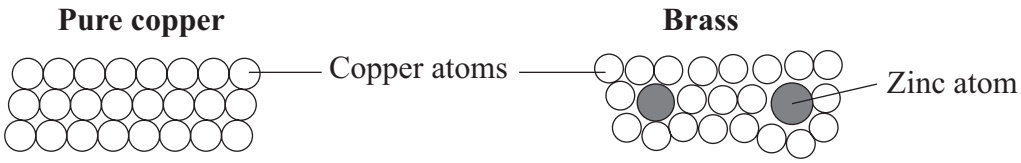
What is meant by a *smart alloy*?

.....

.....

(1 mark)

6 (b) Pure copper is made up of layers of copper atoms. Brass is an *alloy* of copper and zinc.



Why are the physical properties of brass different from the physical properties of pure copper?

.....

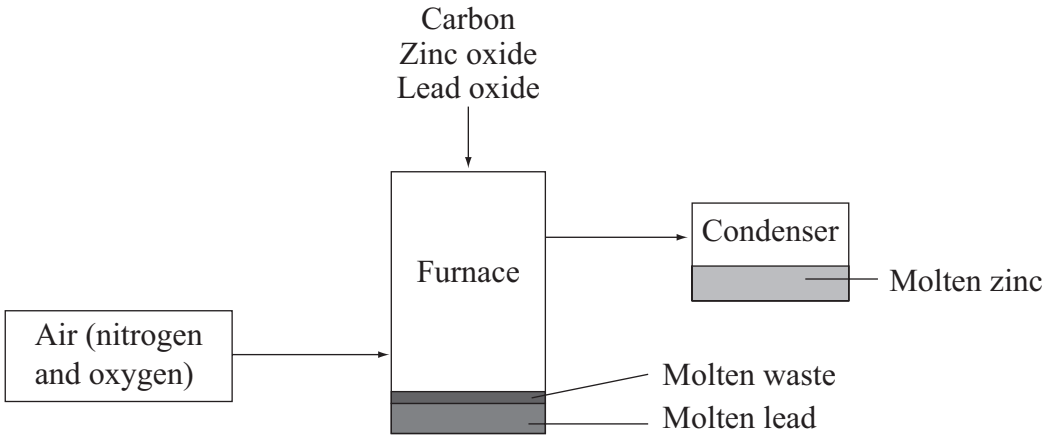
.....

.....

.....

(2 marks)

6 (c) Nearly all zinc is obtained from ores that also contain lead. The metals zinc and lead can be extracted by reducing their oxides using carbon.



6 (c) (i) Choose **one** element from the box below to complete the sentence about the reduction of zinc oxide.

lead	**nitrogen**	**oxygen**

Zinc oxide is reduced by carbon, which takes away..... to leave zinc metal.

(1 mark)

6 (c) (ii) The melting points and boiling points of lead and zinc are given in the table.

Metal	**Lead**	**Zinc**
Melting point in °C	328	420
Boiling point in °C	1740	907

The furnace operates at a temperature of 1200 °C.

Suggest how the lead metal and zinc metal are separated in the furnace.

.....

.....

.....

.....

(2 marks)

6

Turn over for the next question

7 Limestone is mainly calcium carbonate.

7 (a) Quicklime is produced by heating limestone.

7 (a) (i) Complete the word equation for this reaction by writing the chemical name of the solid and the gas produced.

calcium carbonate → ..... + ...

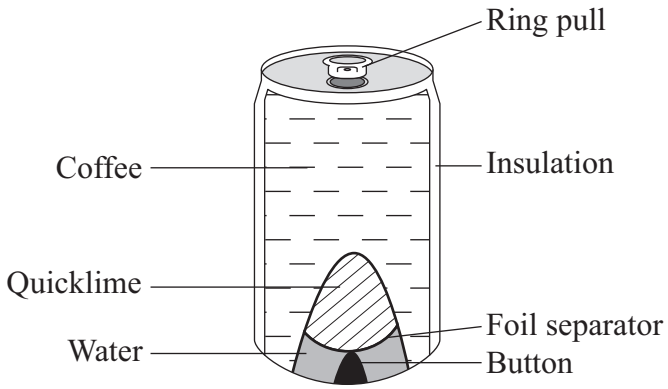
(2 marks)

7 (a) (ii) What is the name for this type of chemical reaction?

.....

(1 mark)

7 (b) Quicklime is used in self-heating cans.
The diagram shows a self-heating can designed to raise the temperature of coffee to 60 °C.



The button on the base of the can is pushed. The foil separator breaks, allowing water to mix with the quicklime. After about 3 minutes, the can is opened by the ring pull. Insulating materials are used inside the walls of the can to prevent either the lips or the fingers from being burned.

7 (b) (i) Explain why the coffee becomes hot.

.....

.....

.....

.....

(2 marks)

7 (b) (ii) Suggest **two** reasons why it is **not** possible to re-use this self-heating can.

1 .....

.....

2 .....

.....

(2 marks)

7

Turn over for the next question

8 The hydrocarbons in crude oil can be separated into useful fractions.

Fraction	Boiling point in °C	Carbon chain length	Relative % in crude oil	Relative % demand
Naphtha	20–180	5–9	10	20
Gasoline (petrol)	20–200	5–10	10	20
Kerosene (paraffin)	180–260	10–16	15	23
Diesel	260–340	14–20	20	25
Fuel oil	370–600	20–70	45	12

8 (a) Why does gasoline (petrol) have a lower boiling point than fuel oil?

.....

.....

(1 mark)

8 (b) Suggest why gasoline (petrol) costs more than fuel oil.

.....

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(2 marks)

8 (c) Describe how fuel oil can be changed into gasoline (petrol).

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(2 marks)

5

END OF QUESTIONS