

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

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General Certificate of Secondary Education
June 2003



SCIENCE: SINGLE AWARD (CO-ORDINATED) 3463/2F
FOUNDATION TIER
Paper 2

F

Monday 9 June 2003 9.00 am to 9.45 am

In addition to this paper you will require:
 a ruler;
 the Data Sheet (enclosed).
 You may use a calculator.

For Examiner's Use			
Number	Mark	Number	Mark
1		6	
2		7	
3		8	
4			
5			
Total (Column 1)	→		
Total (Column 2)	→		
TOTAL			
Examiner's Initials			

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** the questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want marked.

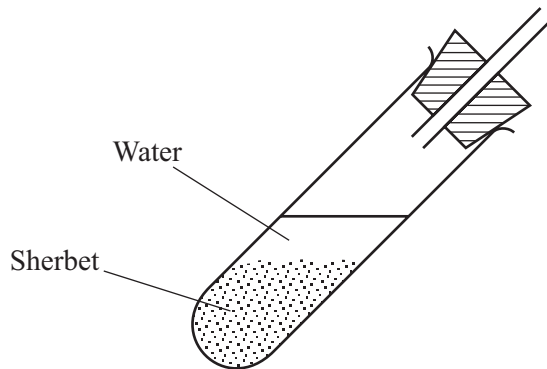
Information

- The maximum mark for this paper is 45.
- Mark allocations are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers.

- 2 A student added water to some sherbet and noticed that it bubbled.



- (a) Complete the diagram to show how the student could collect some of the gas produced.



(1 mark)

- (b) The student tested the gas to see if it was carbon dioxide.

- (i) Name the solution used to test for carbon dioxide.

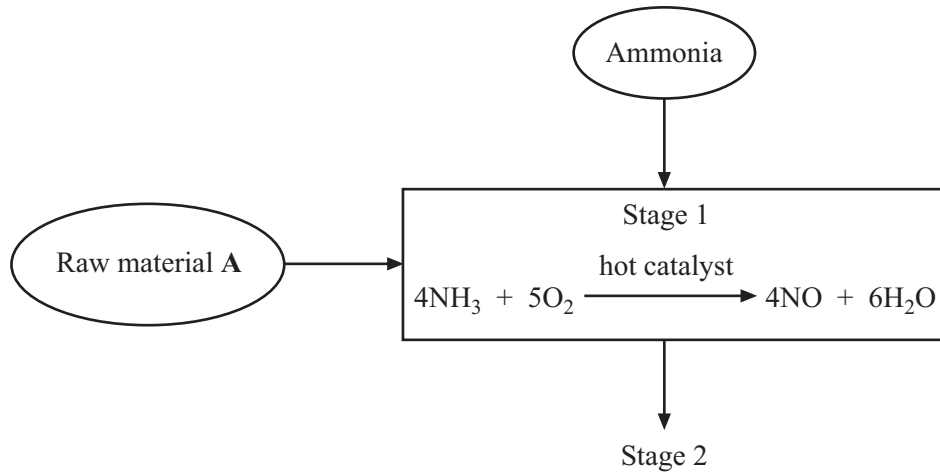
.....
(1 mark)

- (ii) What effect does carbon dioxide have on this solution?

.....
(1 mark)

3 Nitric acid is made from ammonia, NH_3 .

The first stage in this process can be shown in a flow diagram.
Look at the flow diagram below.



(a) Name raw material A.

..... (1 mark)

(b) Draw a ring around:

(i) the name of the catalyst used in stage 1;

gold **iron** **mercury** **platinum** (1 mark)

(ii) the word which best describes this reaction.

decomposition **displacement** **neutralisation** **oxidation** (1 mark)

(c) Nitric acid can be neutralised by alkalis to make salts.

(i) The salt called potassium nitrate can be made from nitric acid.

Complete the word equation for this neutralisation reaction.
Choose the correct substances from the box.

hydrogen	oxygen	potassium chloride
potassium hydroxide	water	

nitric acid + → potassium nitrate +

(2 marks)

(ii) Ammonium nitrate is another salt made from nitric acid.

Which **one** of the following is the main use of ammonium nitrate?
Draw a ring around your answer.

dye fertiliser plastic fuel

(1 mark)

(iii) Complete this sentence by choosing the correct ion from the box.

H^+	NH_4^+	NO_3^-	O^{2-}	OH^-
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The ion that makes solutions acidic is

(1 mark)

7

TURN OVER FOR THE NEXT QUESTION

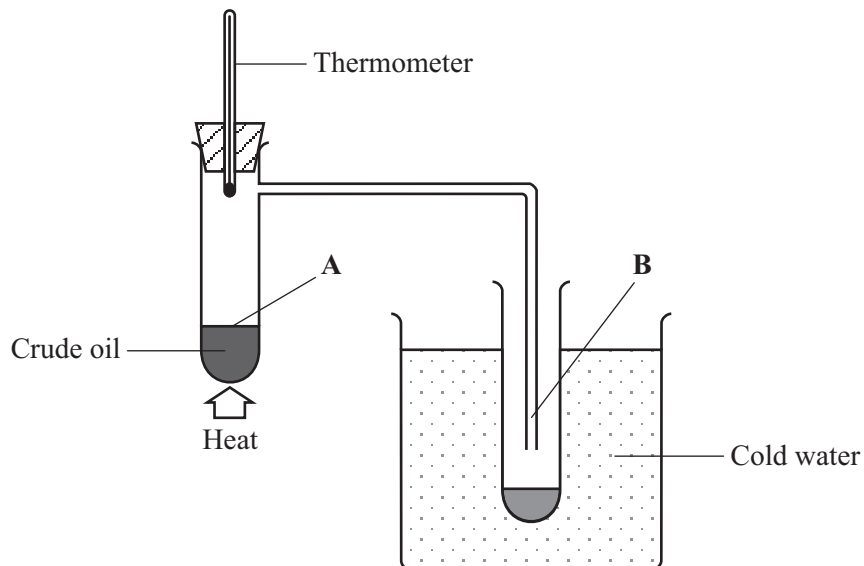
Turn over ►

- 4 (a) Complete this sentence about crude oil.

Crude oil is mainly a mixture of compounds called which contain carbon and hydrogen only.

(1 mark)

- (b) The diagram shows a laboratory experiment used to separate crude oil.



Complete each sentence by choosing the correct words from the box.

condensation

distillation

evaporation

melting

sublimation

The main process taking place at **A** is

The main process taking place at **B** is

This method of separating crude oil is called

(3 marks)

- (c) Complete this sentence by crossing out the word in each box that is wrong. The first one has been done for you.

This method of separating crude oil works because the smaller
~~larger~~ the molecules are,
the higher
lower their boiling point and the more
less volatile they are.

(1 mark)

- (d) Poly(ethene) is a plastic made from crude oil. It is a useful plastic but it can cause problems because it is **not** *biodegradable*.

- (i) Give **one** use of poly(ethene).

.....
(1 mark)

- (ii) Explain the meaning of *biodegradable*.

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

- (iii) Suggest reasons why the disposal of poly(ethene) may cause environmental problems.

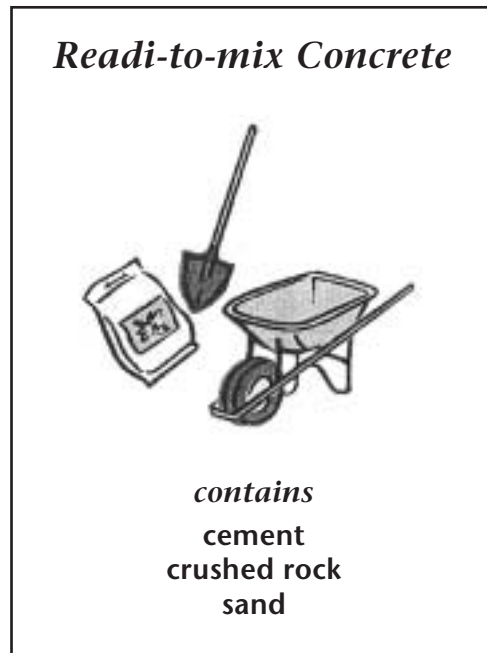
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(2 marks)

TURN OVER FOR THE NEXT QUESTION

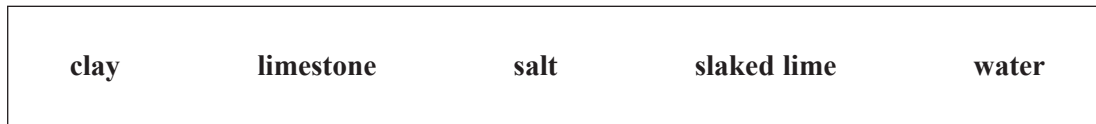
9

Turn over ▶

- 5 Bags of readi-to-mix concrete contain three ingredients.



Complete each sentence by choosing the correct words from the box.



Cement is made by heating and in a rotary kiln.

To make concrete, the contents of the bag of readi-to-mix concrete must be mixed with

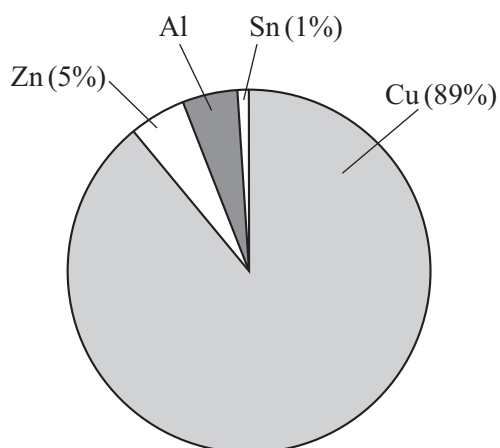
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(3 marks)

- 6 The 50 Eurocent coin is made from an alloy called 'Nordic Gold'.



The pie chart shows the percentage by mass of each metal in 'Nordic Gold'.



- (a) (i) Calculate the percentage of aluminium, Al, in the coin.

.....
(1 mark)

- (ii) The 50 Eurocent coin has a mass of 7 grams.
Calculate the mass of zinc, Zn, in this coin.

.....
.....

Mass of zinc = g
(2 marks)

- (b) Zinc is extracted by removing oxygen from zinc oxide.

- (i) What name is given to a reaction in which oxygen is removed from a substance?

.....
(1 mark)

- (ii) Explain how oxygen can be removed from zinc oxide to make zinc. Use the reactivity series on the Data Sheet to help you.

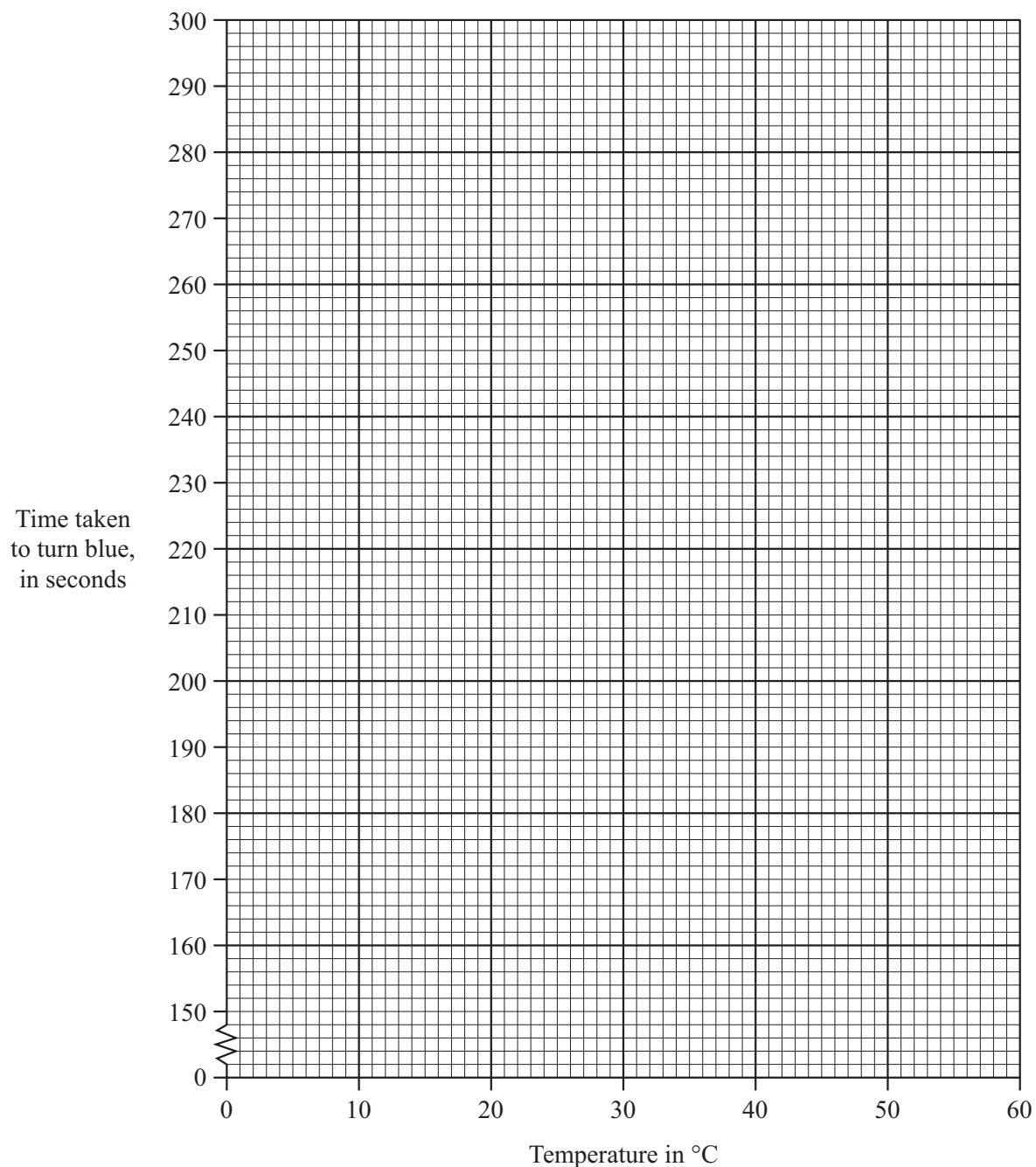
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(2 marks)

- 7 Solutions **A** and **B** are colourless. When they are mixed, they react and turn blue after a period of time. A student investigated how temperature affected the rate of reaction between solutions **A** and **B**. The rate was measured by timing how long the mixture took to turn blue.

The results are shown in the table.

Temperature in °C	22	25	34	45	51
Time taken to turn blue, in seconds	290	250	200	170	160

- (a) (i) Draw a graph for these results.



(3 marks)

(ii) Use your graph to find how long it takes the solution to turn blue at 40 °C.

Time = s
(1 mark)

(b) (i) How does the rate of reaction change as the temperature is increased?

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

(ii) Explain, in terms of particles, why temperature has this effect on the rate of reaction.

To gain full marks in this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.

.....
.....
.....
.....
.....
.....
(3 marks)

(c) State **one** variable that must be kept constant to make this experiment a fair test.

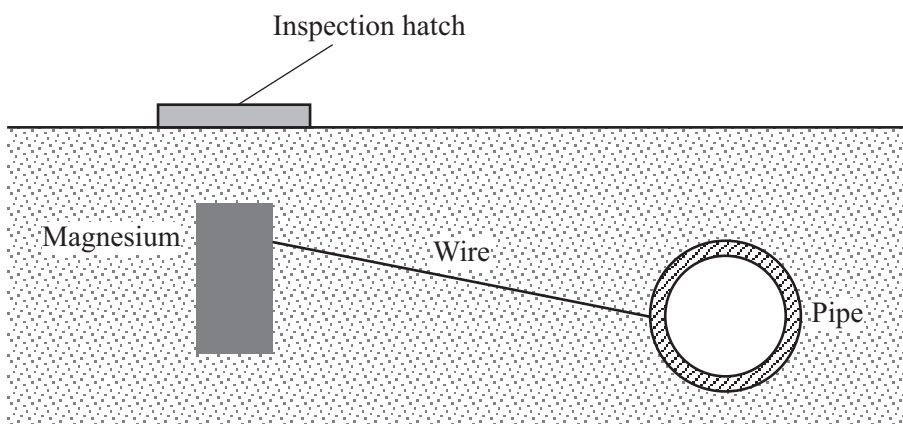
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(1 mark)

9

TURN OVER FOR THE NEXT QUESTION

Turn over ▶

- 8 Underground pipes are often made of iron. The diagram shows a method of preventing the pipes from corroding.
Pieces of magnesium are connected to the pipes at intervals.



- (a) Explain why magnesium can be used to protect pipes from corroding.
Information on the Data Sheet may help you to answer this question.

.....

.....

.....

.....

(2 marks)

- (b) Suggest why this method has to be used to protect underground pipes.

.....

.....

(1 mark)

END OF QUESTIONS

3