

Write your name here

| | | | | | | | | | |
|----------------------------------------------------------------------------------------------------------|--|--|--|--|----------------------------------------------------------------------------------------------------------|--|--|--|--|
| Surname | | | | | Other names | | | | |
| Centre Number | | | | | Candidate Number | | | | |
| <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> | | | | | <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> | | | | |

Edexcel GCSE

Chemistry/Science
Unit C1: Chemistry in Our World

Higher Tier

| | |
|-------------------------------------------------------|------------------------------------|
| Thursday 23 May 2013 – Morning Time: 1 hour | Paper Reference 5CH1H/01 |
|-------------------------------------------------------|------------------------------------|

| | |
|--------------------------------------------|-------------|
| You must have: Calculator, ruler | Total Marks |
|--------------------------------------------|-------------|

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
– *you should take particular care with your spelling, punctuation and grammar, as well as the clarity of expression, on these questions.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

P41937A

©2013 Pearson Education Ltd.

1/1/1/1/1/



PEARSON

The Periodic Table of the Elements

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 | | | | | | | | | | |
|--|--------------------------------------|------------------------------------|---------------------------------------|--------------------------------------------|--------------------------------------|-----------------------------------------|--------------------------------------|--------------------------------------|-----------------------------------------|-------------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|------------------------------------|-----------------------------------|----------------------------------|
| | 7 Li lithium 3 | 9 Be beryllium 4 | 11 Na sodium 11 | 12 Mg magnesium 12 | 13 Al aluminium 13 | 14 N nitrogen 7 | 15 P phosphorus 15 | 16 O oxygen 8 | 17 F fluorine 9 | 18 Ne neon 10 | | | | | | | | |
| | 19 K potassium 19 | 20 Ca calcium 20 | 21 Sc scandium | 22 Ti titanium 22 | 23 V vanadium 23 | 24 Cr chromium 24 | 25 Mn manganese 25 | 26 Fe iron 26 | 27 Co cobalt 27 | 28 Ni nickel 28 | 29 Cu copper 29 | 30 Zn zinc 30 | 31 Ga gallium 31 | 32 Ge germanium 32 | 33 As arsenic 33 | 34 Se selenium 34 | 35 Br bromine 35 | 36 Kr krypton 36 |
| | 37 Rb rubidium 37 | 38 Sr strontium 38 | 39 Y yttrium 39 | 40 Zr zirconium 40 | 41 Nb niobium 41 | 42 Mo molybdenum 42 | 43 Tc technetium 43 | 44 Ru ruthenium 44 | 45 Rh rhodium 45 | 46 Pd palladium 46 | 47 Ag silver 47 | 48 Cd cadmium 48 | 49 In indium 49 | 50 Sn tin 50 | 51 Sb antimony 51 | 52 Te tellurium 52 | 53 I iodine 53 | 54 Xe xenon 54 |
| | 55 Cs caesium 55 | 56 Ba barium 56 | 57 La* lanthanum 57 | 72 Hf hafnium 72 | 73 Ta tantalum 73 | 74 W tungsten 74 | 75 Re rhenium 75 | 76 Os osmium 76 | 77 Ir iridium 77 | 78 Pt platinum 78 | 79 Au gold 79 | 80 Hg mercury 80 | 81 Tl thallium 81 | 82 Pb lead 82 | 83 Bi bismuth 83 | 84 Po polonium 84 | 85 At astatine 85 | 86 Rn radon 86 |
| | [223] Fr francium 87 | [226] Ra radium 88 | [227] Ac* actinium 89 | [261] Rf rutherfordium 104 | [262] Db dubnium 105 | [266] Sg seaborgium 106 | [264] Bh bohrium 107 | [277] Hs hassium 108 | [268] Mt meitnerium 109 | [271] Ds darmstadtium 110 | [272] Rg roentgenium 111 | Elements with atomic numbers 112-116 have been reported but not fully authenticated | | | | | | |

1
H
hydrogen
1

Key
relative atomic mass
atomic symbol
name
atomic (proton) number

* The lanthanoids (atomic numbers 58-71) and the actinoids (atomic numbers 90-103) have been omitted.
The relative atomic masses of copper and chlorine have not been rounded to the nearest whole number.



BLANK PAGE

Questions begin on next page



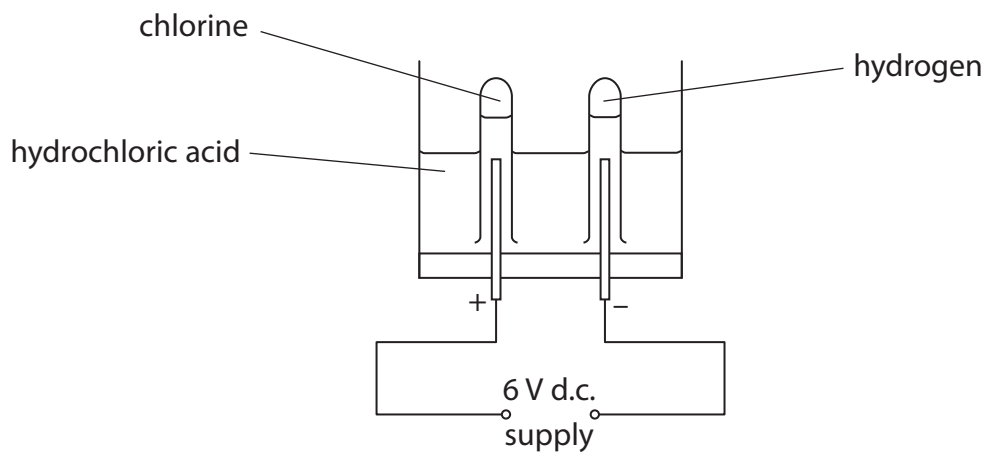
Answer ALL questions.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Hydrochloric acid

1 (a) Electrolysis of hydrochloric acid produces chlorine and hydrogen.

The apparatus used is shown.



(i) Explain what is meant by **electrolysis**.

(2)

.....

.....

(ii) Describe the test to show that a gas is chlorine.

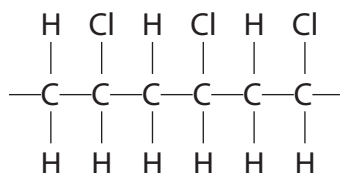
(2)

.....

.....

.....

(iii) Chlorine is used in the manufacture of a polymer.
Part of this polymer molecule is



State the name of the polymer.

(1)

.....



(b) Dilute hydrochloric acid reacts with silver nitrate solution to form silver chloride and nitric acid.

(i) Complete the sentence by putting a cross (☒) in the box next to your answer.

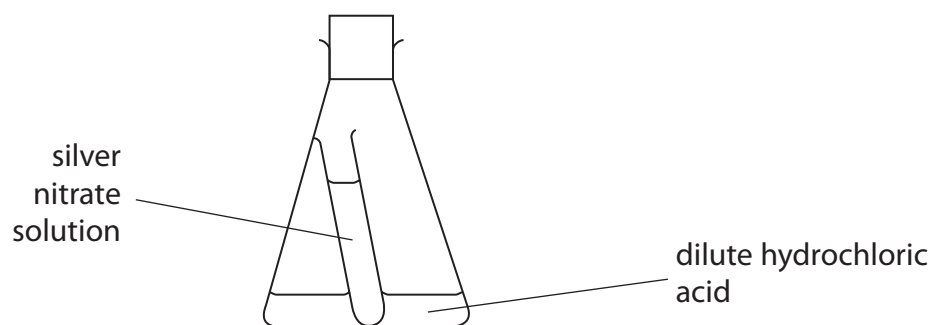
The reaction produces silver chloride as a precipitate.

In an equation this would be shown as

(1)

- A AgCl(aq)
- B AgCl(g)
- C AgCl(l)
- D AgCl(s)

(ii) This apparatus is used to investigate the mass of the reactants and the mass of products in this reaction.



The total mass of this apparatus was measured.

The flask was shaken to allow the silver nitrate solution and dilute hydrochloric acid to react.

After the reaction the total mass of the apparatus was measured again.

State how the total mass of the apparatus after the reaction will compare with the total mass of the apparatus before the reaction.

(1)

(iii) Write the balanced equation for the reaction of silver nitrate solution, AgNO_3 , with dilute hydrochloric acid to form silver chloride, AgCl , and nitric acid.

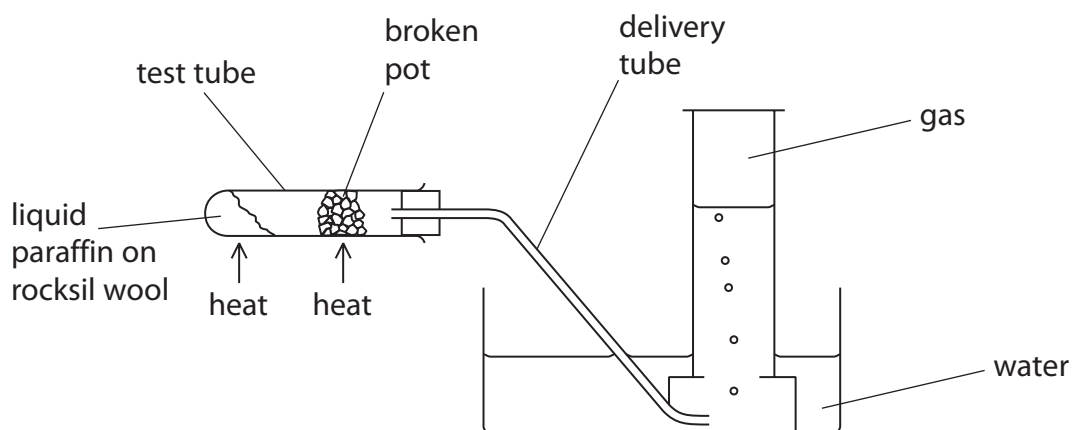
(2)

(Total for Question 1 = 9 marks)



Cracking

- 2 (a) In the laboratory this apparatus is used to crack long chain hydrocarbon molecules to form shorter chain hydrocarbon molecules.



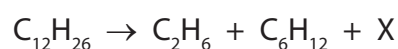
When the experiment is complete there is a danger that water will rise up the delivery tube into the hot test tube.

State what you would do to prevent this.

(1)

- (b) Complete the sentence by putting a cross (☒) in the box next to your answer.

The equation for a reaction that occurs during cracking is



In the balanced equation, X is

(1)

- A C_3H_8
- B C_4H_8
- C C_4H_{10}
- D C_6H_{14}

- (c) Alkenes are unsaturated hydrocarbons.

State what is meant by **unsaturated**.

(1)



(d) Propane and propene are bubbled through separate samples of bromine water.

Describe what you would **see** in these tests.

(3)

.....

.....

.....

.....

.....

(e) In industry, long chain hydrocarbon molecules are cracked to form shorter chain hydrocarbon molecules.

Explain why this process is important.

(2)

.....

.....

.....

.....

(Total for Question 2 = 8 marks)





BLANK PAGE



Gases in our atmosphere

3 (a) Complete the sentence by putting a cross (☒) in the box next to your answer.

(i) The percentage of carbon dioxide in the Earth's atmosphere today is

(1)

A greater than 5%

B 4%

C 3%

D less than 0.5%

(ii) The percentage of carbon dioxide in the Earth's atmosphere today is less than that in the Earth's earliest atmosphere.

Explain what has caused the percentage of carbon dioxide to decrease.

(2)

.....

.....

.....

(iii) Carbon dioxide and other gases in the atmosphere help to keep the Earth warm.

State how these gases keep the Earth warm.

(1)

.....

.....

.....

(b) Describe the test to show that a gas is oxygen.

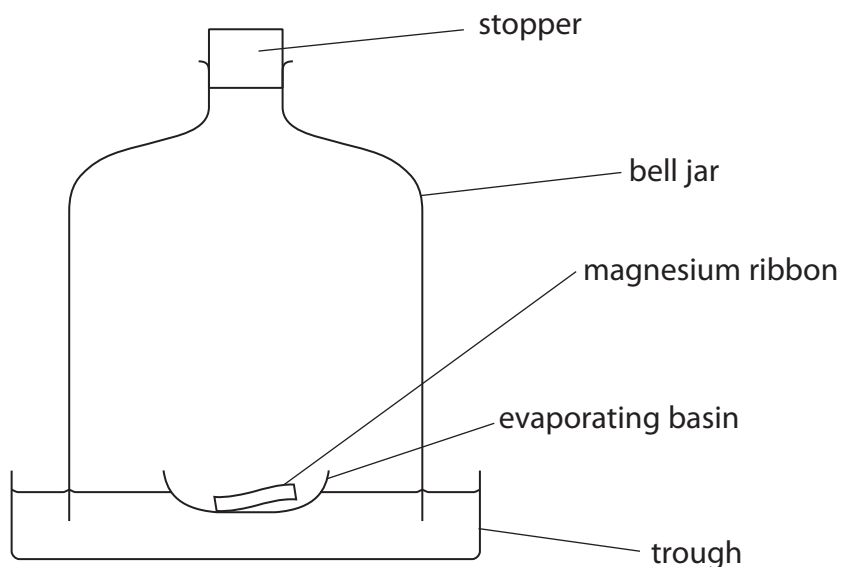
(2)

.....

.....



- (c) Magnesium reacts with oxygen to form magnesium oxide.
An excess of magnesium ribbon was placed in an evaporating basin that was floated on water in a trough.
The magnesium ribbon was lit.
A bell jar was placed over the evaporating basin and the stopper inserted to seal the experiment.



When the magnesium flame went out, there was some magnesium left in the basin.
When the apparatus had cooled, the water in the bell jar had risen.

- (i) Explain why the water level had risen.

(2)

.....

.....

.....

.....



Aluminium

- 4 (a) Drinks are often sold in cans.
These cans are made either of aluminium or of steel coated with tin.
The table gives information about these three metallic substances.

| metal | cost of 1 kg / £ | amount in Earth's crust / % |
|--------------|------------------|-----------------------------|
| aluminium | 1.31 | 8 |
| steel (iron) | 0.32 | 5 |
| tin | 12.6 | 0.0002 |

Use the table to give **two** reasons why it could be more important to recycle tin than to recycle aluminium or steel.

(2)

reason 1

.....

.....

reason 2

.....

.....

- (b) Complete the sentence by putting a cross (☒) in the box next to your answer.

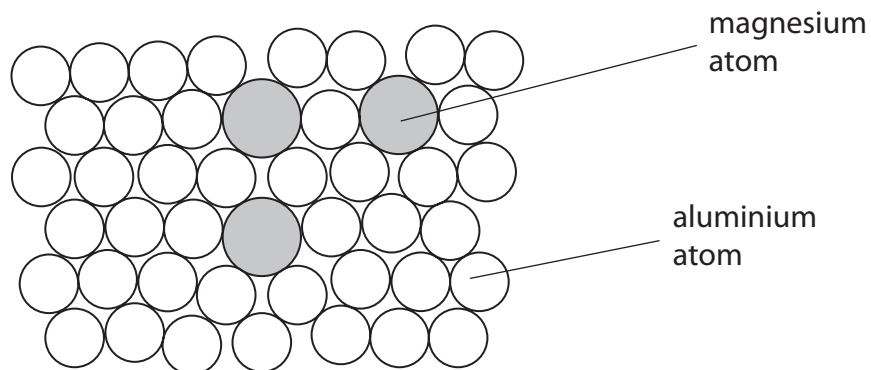
The reaction for the extraction of aluminium from its ore involves

(1)

- A** heating with carbon
- B** thermal decomposition
- C** reduction
- D** neutralisation



(c) Magnalium is an alloy of aluminium and magnesium.
The diagram shows the structure of this alloy.



(i) Explain what you understand by the term **alloy**.

(2)

.....

.....

.....

(ii) Explain, in terms of their structures, why magnalium is stronger than pure aluminium.

(3)

.....

.....

.....

.....

.....

.....

(Total for Question 4 = 8 marks)



Rocks

- 5 (a) Limestone is a natural form of calcium carbonate.

Explain why calcium carbonate can be used to treat waste gases produced in coal-fired power stations.

(3)

.....

.....

.....

.....

- (b) If calcium carbonate is heated strongly it decomposes to calcium oxide and carbon dioxide.

Write the balanced equation for this reaction.

(2)

.....

- (c) A few drops of cold water are added to a lump of calcium oxide.

Which of the following is **not** a correct statement about this reaction?

Put a cross (☒) in the box next to your answer.

(1)

- A** steam is formed
- B** a white powder is produced
- C** the lump of calcium oxide cools down
- D** calcium hydroxide is formed



Carbon compounds

6 (a) Which of these is the formula of a molecule of a hydrocarbon?

Put a cross (☒) in the box next to your answer.

(1)

- A $\text{CH}_3\text{COOCH}_3$
- B $\text{CH}_3\text{CH}_2\text{Cl}$
- C CH_3CH_3
- D CH_3COOH

(b) The formula of a molecule of propene is C_3H_6 .

Draw the structure of a molecule of propene, showing all covalent bonds.

(2)

(c) Methane burns in oxygen to form carbon dioxide and water.
Write the balanced equation for this reaction.

(3)





BLANK PAGE



BLANK PAGE





BLANK PAGE

