

Write your name here

Surname

Other names

Centre Number

Candidate Number

**Edexcel GCSE**

**Chemistry/Science**

**Unit C1: Chemistry in our World**

**Foundation Tier**

Wednesday 7 November 2012 – Morning

**Time: 1 hour**

Paper Reference

**5CH1F/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 ►

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**PEARSON**

# The Periodic Table of the Elements

	1	2	3	4	5	6	7	0										
	7 <b>Li</b> lithium 3	9 <b>Be</b> beryllium 4	11 <b>Na</b> sodium 23	12 <b>Mg</b> magnesium 24	13 <b>Al</b> aluminium 27	14 <b>Si</b> silicon 28	15 <b>P</b> phosphorus 31	16 <b>S</b> sulfur 32	17 <b>Cl</b> chlorine 35.5	18 <b>Ar</b> argon 40								
	19 <b>K</b> potassium 39	20 <b>Ca</b> calcium 40	21 <b>Sc</b> scandium 45	22 <b>Ti</b> titanium 48	23 <b>V</b> vanadium 51	24 <b>Cr</b> chromium 52	25 <b>Mn</b> manganese 55	26 <b>Fe</b> iron 56	27 <b>Co</b> cobalt 59	28 <b>Ni</b> nickel 59	30 <b>Zn</b> zinc 65	31 <b>Ga</b> gallium 70	32 <b>Ge</b> germanium 73	33 <b>As</b> arsenic 75	34 <b>Se</b> selenium 79	35 <b>Br</b> bromine 80	36 <b>Kr</b> krypton 84	
	37 <b>Rb</b> rubidium 85	38 <b>Sr</b> strontium 88	39 <b>Y</b> yttrium 89	40 <b>Zr</b> zirconium 91	41 <b>Nb</b> niobium 93	42 <b>Mo</b> molybdenum 96	43 <b>Tc</b> technetium [98]	44 <b>Ru</b> ruthenium 101	45 <b>Rh</b> rhodium 103	46 <b>Pd</b> palladium 106	47 <b>Ag</b> silver 108	48 <b>Cd</b> cadmium 112	49 <b>In</b> indium 115	50 <b>Sn</b> tin 119	51 <b>Sb</b> antimony 122	52 <b>Te</b> tellurium 128	53 <b>I</b> iodine 127	54 <b>Xe</b> xenon 131
	55 <b>Cs</b> caesium 133	56 <b>Ba</b> barium 137	57 <b>La*</b> lanthanum 139	72 <b>Hf</b> hafnium 178	73 <b>Ta</b> tantalum 181	74 <b>W</b> tungsten 184	75 <b>Re</b> rhenium 186	76 <b>Os</b> osmium 190	77 <b>Ir</b> iridium 192	78 <b>Pt</b> platinum 195	79 <b>Au</b> gold 197	80 <b>Hg</b> mercury 201	81 <b>Tl</b> thallium 204	82 <b>Pb</b> lead 207	83 <b>Bi</b> bismuth 209	84 <b>Po</b> polonium [209]	85 <b>At</b> astatine [210]	86 <b>Rn</b> radon [222]
	87 <b>Fr</b> francium [223]	88 <b>Ra</b> radium [226]	89 <b>Ac*</b> actinium [227]	104 <b>Rf</b> rutherfordium [261]	105 <b>Db</b> dubnium [262]	106 <b>Sg</b> seaborgium [266]	107 <b>Bh</b> bohrium [264]	108 <b>Hs</b> hassium [277]	109 <b>Mt</b> meitnerium [268]	110 <b>Ds</b> darmstadtium [271]	111 <b>Rg</b> roentgenium [272]	Elements with atomic numbers 112-116 have been reported but not fully authenticated						

1	<b>H</b>	1
	hydrogen	

relative atomic mass
atomic symbol
name
atomic (proton) number

Key

\* 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.



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**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 ☒.**

**Metals**

**1** (a) Unreactive metals are found as uncombined metals in the Earth's crust.

Which of the following metals is found uncombined in the Earth's crust?

(1)

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

- A** gold
- B** sodium
- C** tin
- D** zinc

(b) When iron oxide is heated with carbon, the iron oxide is reduced.

(i) Complete the word equation for the reaction.

(2)

iron oxide + carbon → ..... + .....

(ii) State what is meant by **reduced**.

(1)

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(iii) Part of the reactivity series is shown.

- sodium
- aluminium
- zinc
- iron
- copper

Aluminium is found in the ore bauxite.

Aluminium is obtained from bauxite by electrolysis.

Explain why electrolysis has to be used to obtain aluminium from bauxite.

(2)

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(c) A large amount of copper in use today has come from recycling copper.

Explain the advantages of recycling metals, such as copper, rather than obtaining them from their ores.

(2)

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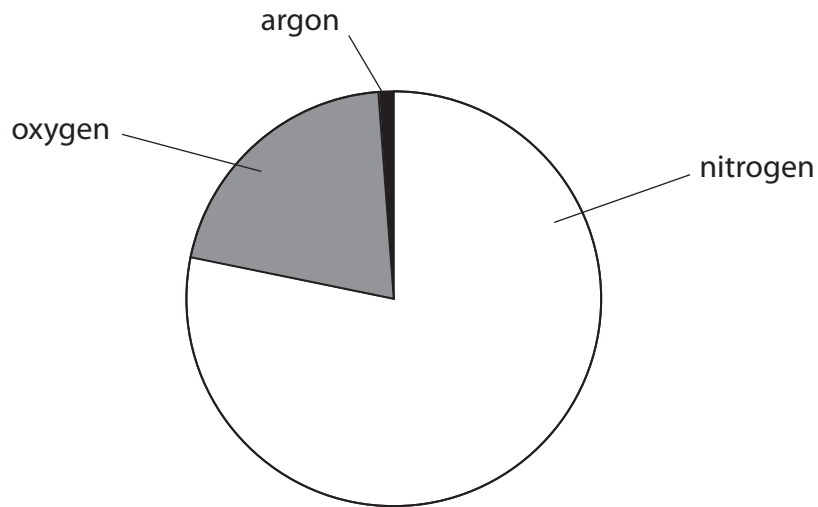
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**(Total for Question 1 = 8 marks)**



## Oxygen

- 2 (a) (i) The pie chart shows the percentages of the three most abundant gases in the Earth's atmosphere today.



What is the percentage of oxygen in the atmosphere?

(1)

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

- A** 1%
- B** 11%
- C** 21%
- D** 71%

- (ii) There was very little oxygen in the Earth's early atmosphere.

Which of the following caused the amount of oxygen to increase?

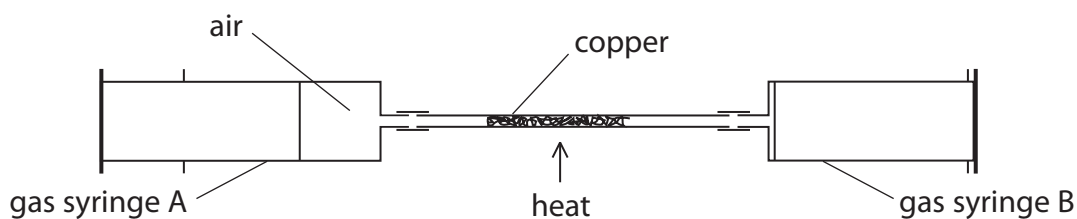
(1)

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

- A** respiration in animals
- B** photosynthesis in plants
- C** eruption of volcanoes
- D** condensation of water vapour



(b) The percentage of oxygen in a sample of air can be found by passing the sample of air over heated copper.



(i) State **two** safety precautions that need to be taken when carrying out this experiment.

(2)

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(ii) Explain how heated copper removes oxygen from the air.

(2)

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(c) Oxygen reacts with hydrogen in a fuel cell to produce energy.

(i) Give the name of the product formed when oxygen reacts with hydrogen.

(1)

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(ii) State **one** advantage of using a fuel cell instead of petrol to power a car.

(1)

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(Total for Question 2 = 8 marks)



## Acids

3 (a) The photograph shows bottles of some concentrated acids.



(i) There are hazard symbols on the bottles.

State why hazard symbols are used.

(1)

(ii) This hazard symbol is on all the bottles of concentrated acid.



State the meaning of this symbol.

(1)





(b) Which of these substances neutralises dilute hydrochloric acid?

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

(1)

- A** potassium chloride
- B** potassium hydroxide
- C** potassium nitrate
- D** potassium sulfate

(c) Which of these substances is produced when sodium carbonate reacts with dilute sulfuric acid?

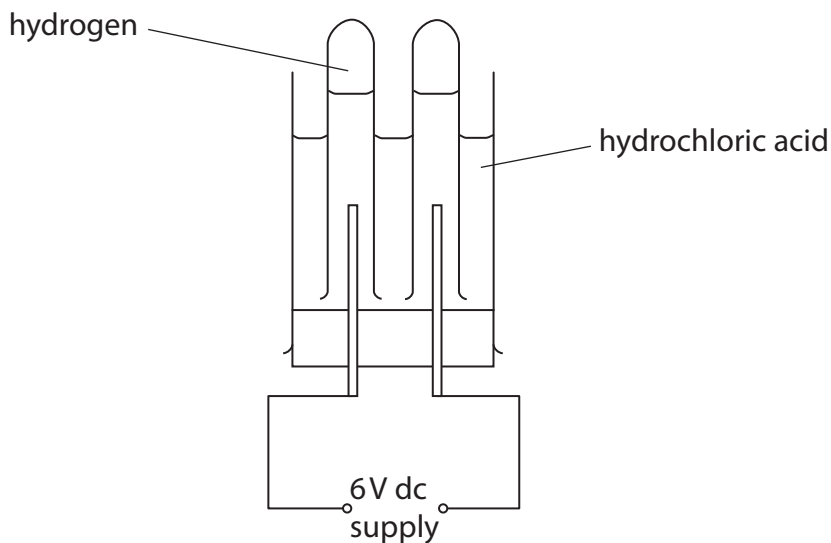
Put a cross (☒) in the box next to your answer.

(1)

- A** sodium chloride
- B** sodium hydroxide
- C** sodium nitrate
- D** sodium sulfate



(d) The electrolysis of hydrochloric acid can be carried out using this apparatus.



(i) Explain what is meant by the term **electrolysis**. (2)

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(ii) Hydrogen is formed at one electrode.  
Name the gas formed at the other electrode. (1)

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(iii) Describe the test to show a gas is hydrogen. (2)

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(e) When water is electrolysed, hydrogen is also formed at one electrode.  
Give the name of the gas formed at the other electrode. (1)

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(Total for Question 3 = 10 marks)



## Hydrocarbons

4 (a) Crude oil is separated into useful fractions by fractional distillation.

Diesel oil and kerosene are two of these fractions.

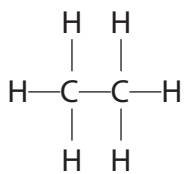
Draw **one** straight line from each of these fractions to a use of the fraction.

(2)

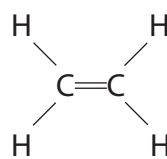
fraction	use
diesel oil ●	● fuel for aircraft
kerosene ●	● fuel for trains
	● making plastic bags
	● surfacing roads



(b) Molecules of two compounds **W** and **X** are shown.



molecule of compound **W**



molecule of compound **X**

(i) Compound **W** is an alkane.

Explain what is meant by the term **alkane**.

(2)

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(ii) Compound **X** is an alkene.

Give the name of compound **X**.

(1)

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(iii) Describe what you would **see** when bromine water is shaken with separate samples of compound **W** and compound **X**.

(2)

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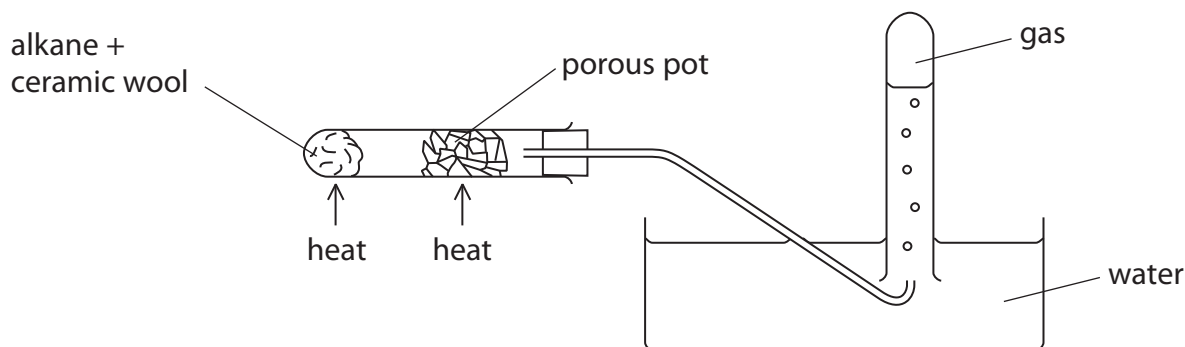
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(c) This apparatus is used to break down large alkane molecules into smaller alkane and alkene molecules.



What is the name of the process taking place in this apparatus?

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

(1)

- A burning
- B cracking
- C distillation
- D polymerisation

(d) Alkenes are used to make polymers such as poly(propene).

Uses of polymers depend on the properties of polymers.

Explain how a use of poly(propene) depends on one of its properties.

(2)

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**(Total for Question 4 = 10 marks)**



## Limestone

5 Limestone is a sedimentary rock.

(a) Explain how sedimentary rocks are formed.

(2)

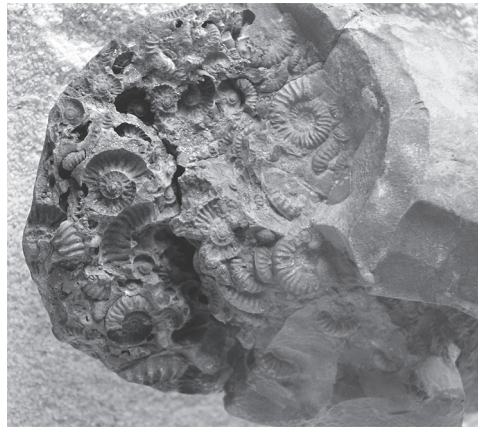
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(b) The photograph shows a piece of limestone.



State what can be seen in this photograph that shows limestone is likely to be a sedimentary rock.

(1)

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(c) Limestone contains calcium carbonate.

Farmers spread powdered limestone on their fields.

State why limestone is spread on fields.

(1)

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(d) Marble can be formed from limestone.

Marble is a metamorphic rock.

Describe the conditions needed for limestone to change into marble.

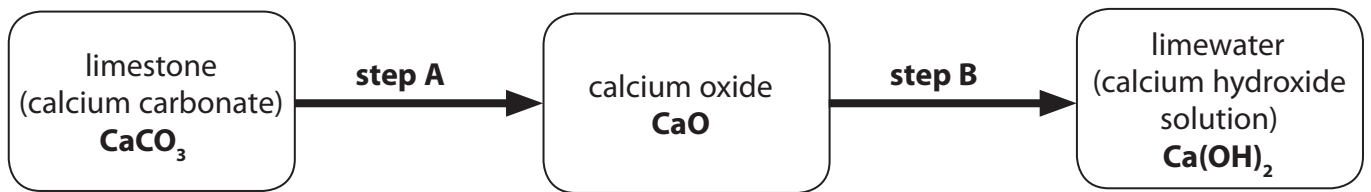
(2)

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\*(e) Limestone can be converted into limewater in two steps as shown in the diagram.



Describe how limestone is converted into limewater in the laboratory, using these reactions.

(6)

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**(Total for Question 5 = 12 marks)**



### The changing atmosphere

- 6 (a) (i) The composition of the atmosphere changes when fossil fuels are burned in air.

When methane undergoes complete combustion carbon dioxide and water are formed.

Write the word equation for the complete combustion of methane.

(2)

- (ii) Incomplete combustion of methane can produce carbon and carbon monoxide.

Describe some of the problems caused by these products.

(2)

- (b) Describe how impurities in fossil fuels result in the formation of acid rain.

(2)





\*(c) Some processes release carbon dioxide into the atmosphere and other processes remove it.

Describe some natural processes and human activities that release carbon dioxide and some that remove it.

(6)

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**(Total for Question 6 = 12 marks)**

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**TOTAL FOR PAPER = 60 MARKS**



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