

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	Key										3	4	5	6	7	0
		relative atomic mass atomic symbol atomic (proton) number															
7 Li lithium 3	9 Be beryllium 4											11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10
23 Na sodium 11	24 Mg magnesium 12											27 Al aluminium 13	28 Si silicon 14	31 P phosphorus 15	32 S sulfur 16	35.5 Cl chlorine 17	40 Ar argon 18
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	63.5 Cu copper 29	65 Zn zinc 30	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36	
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	[98] Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 I iodine 53	131 Xe xenon 54	
133 Cs caesium 55	137 Ba barium 56	139 La* lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	207 Pb lead 82	209 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] 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						

* 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)

.....

.....

.....



(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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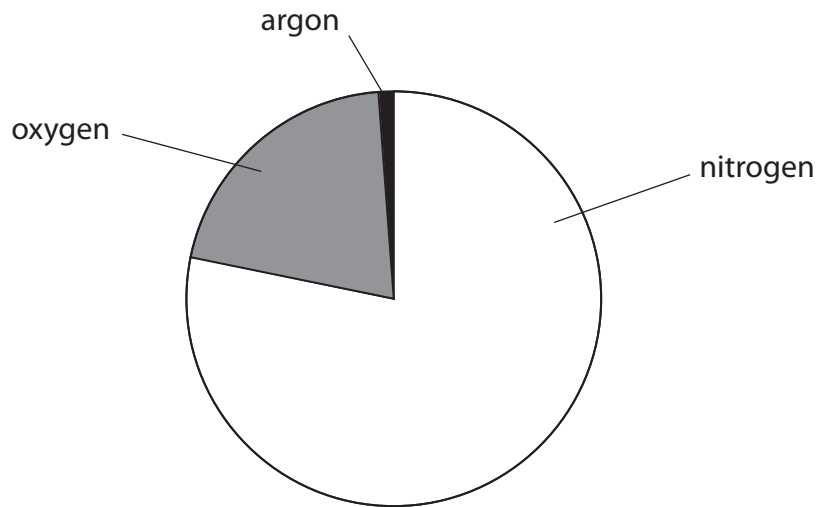
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(Total for Question 1 = 8 marks)



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 (X) 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?

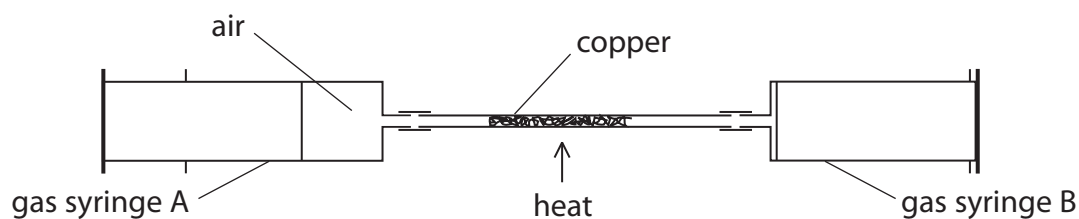
(1)

Put a cross (X) 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)

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

(2)

- (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)

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

(1)

(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 (X) 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?

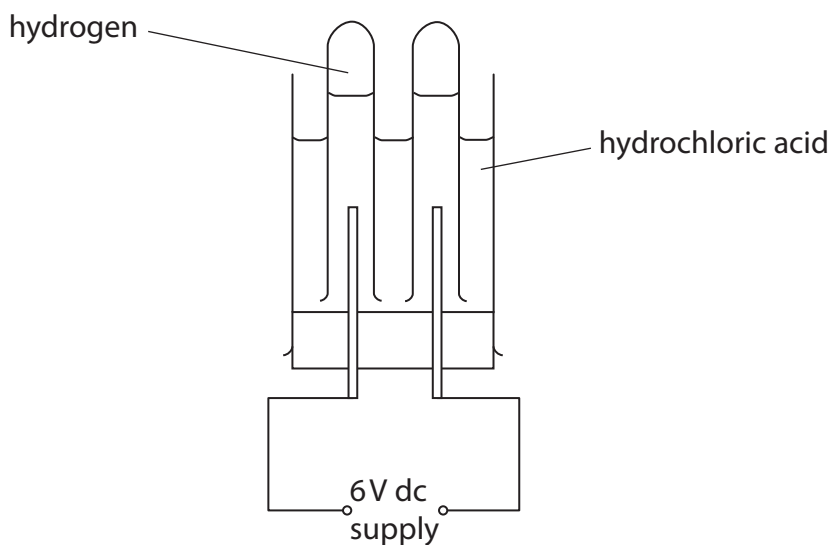
Put a cross (X) in the box next to your answer.

(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)

(ii) Hydrogen is formed at one electrode.

Name the gas formed at the other electrode.

(1)

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

(2)

(e) When water is electrolysed, hydrogen is also formed at one electrode.

Give the name of the gas formed at the other electrode.

(1)

(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

● fuel for trains

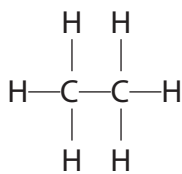
● making plastic bags

kerosene

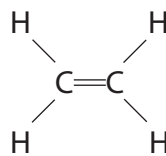
● surfacing roads



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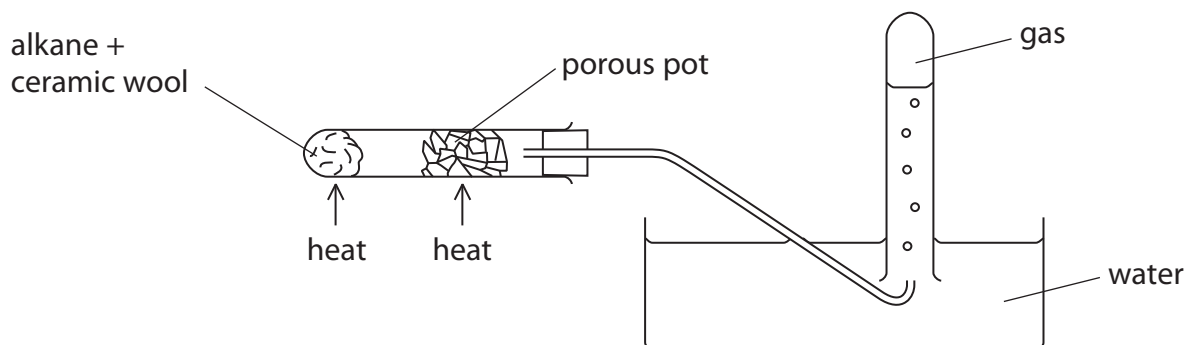
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- (c) This apparatus is used to break down large alkane molecules into smaller alkane and alkene molecules.



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

Put a cross (X) 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)



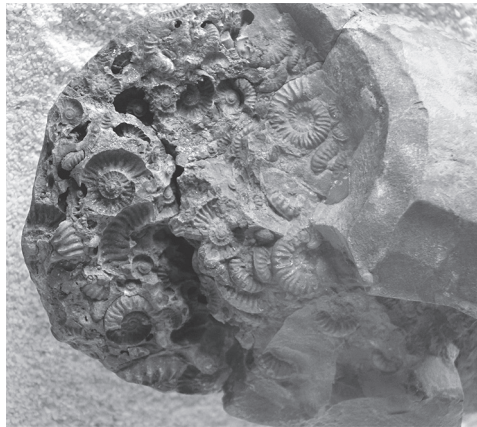
Limestone

5 Limestone is a sedimentary rock.

(a) Explain how sedimentary rocks are formed.

(2)

(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)

(c) Limestone contains calcium carbonate.

Farmers spread powdered limestone on their fields.

State why limestone is spread on fields.

(1)



(d) Marble can be formed from limestone.

Marble is a metamorphic rock.

Describe the conditions needed for limestone to change into marble.

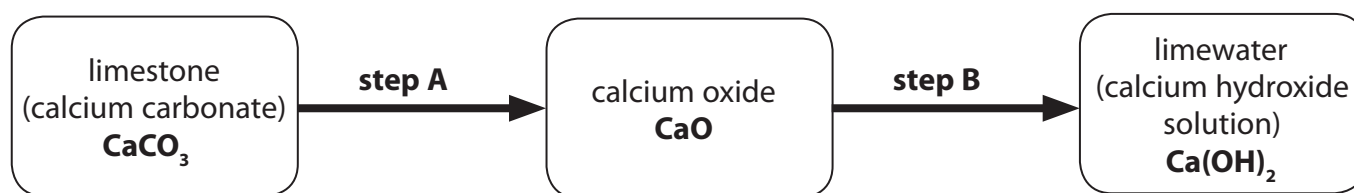
(2)

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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)



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

[illegible]

TOTAL FOR PAPER = 60 MARKS



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