Write your name here

Surname	Other names

Edexcel GCSE

Centre Number	Candidate Number

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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P 4 1 7 6 2 A 0 1 2 0

PEARSON

The Periodic Table of the Elements

1	2											3	4	5	6	7	0
							1 **H** hydrogen 1										4 **He** helium 2
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	70 **Ga** gallium 31	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	115 **In** indium 49	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	204 **Tl** thallium 81	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						

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.

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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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.....

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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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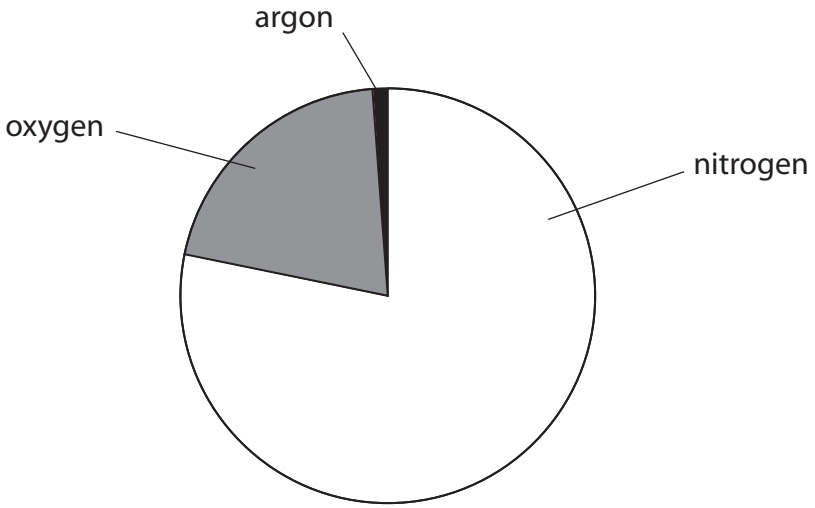
(Total for Question 1 = 8 marks)

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.

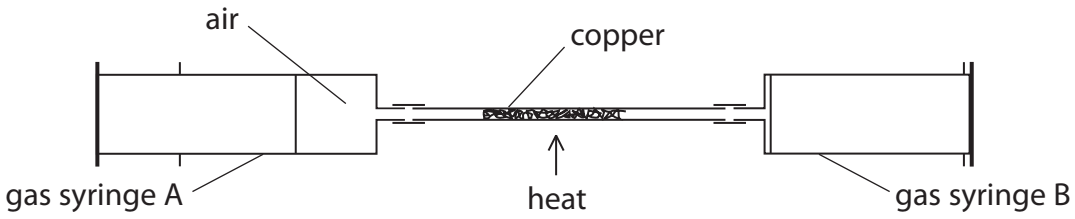
☒ **A** respiration in animals

☒ **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)

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

State the meaning of this symbol.

(1)

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(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

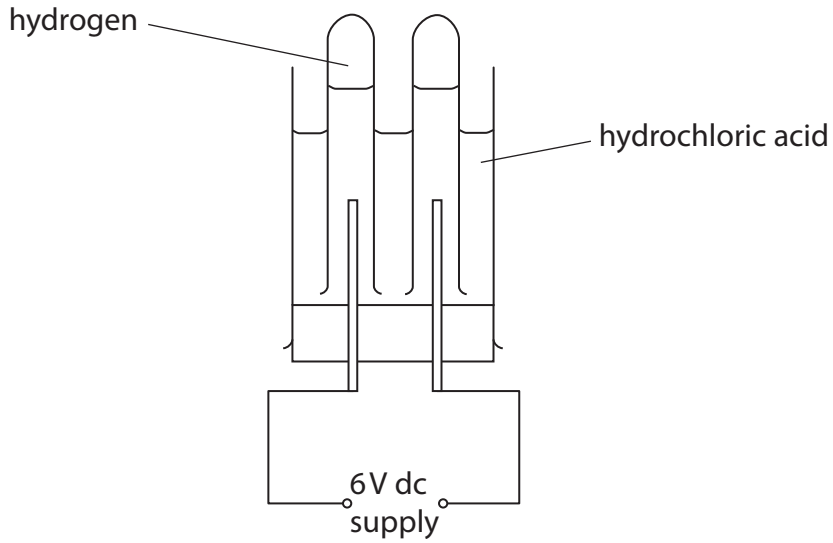
(c) Which of these substances is produced when sodium carbonate reacts with dilute sulfuric acid?

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)

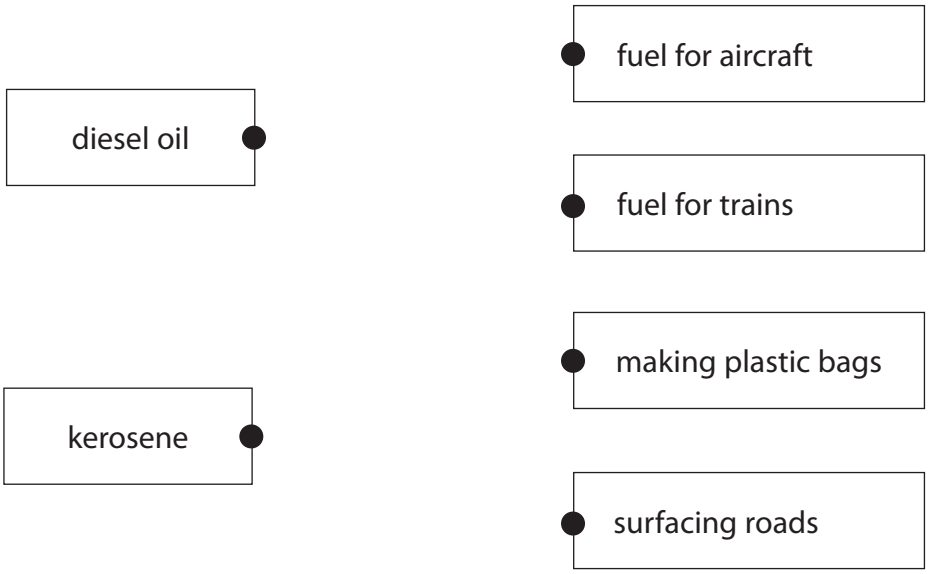
Hydrocarbons

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

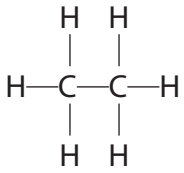
Diesel oil and kerosene are two of these fractions.

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

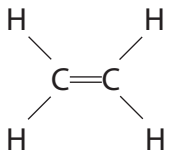
(2)



(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)

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

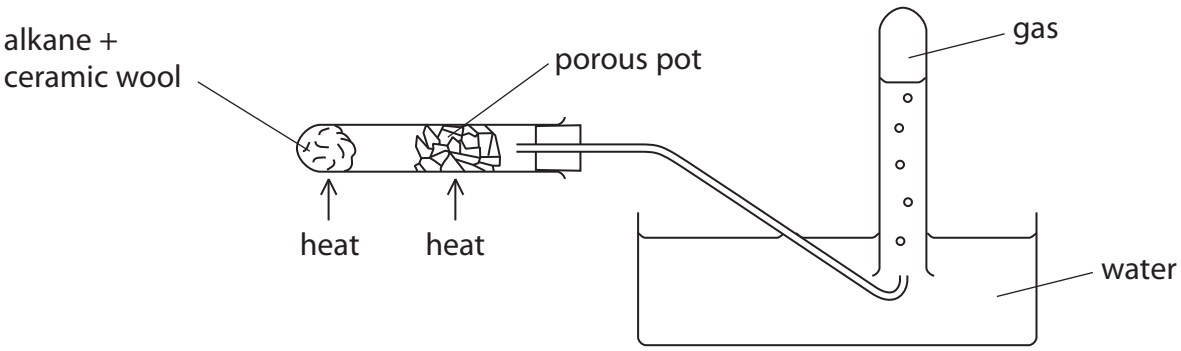
Give the name of compound **X**.

(1)

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

(2)

(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)

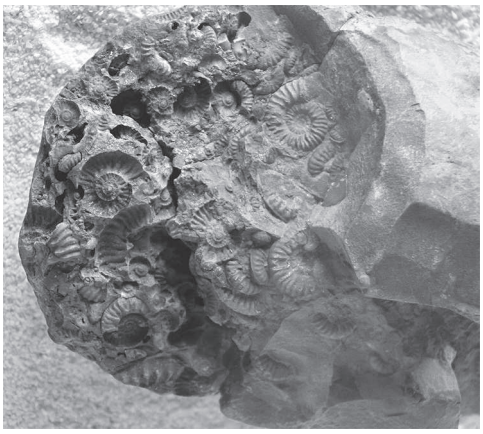
Limestone

5 Limestone is a sedimentary rock.

(a) Explain how sedimentary rocks are formed.

(2)

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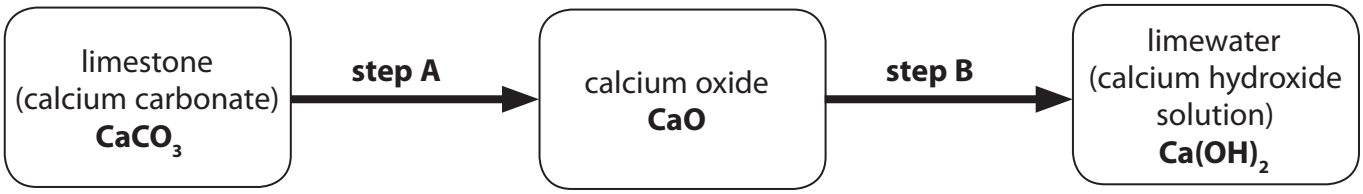
*(e) Limestone can be converted into limewater in two steps as shown in the diagram.



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)

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

Describe some of the problems caused by these products.

(2)

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

(2)

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*(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)

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS

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