

Write your name here

Surname

Other names

Centre Number

Candidate Number

Edexcel GCSE

Chemistry/Science

Unit C1: Chemistry in Our World

Foundation Tier

Tuesday 5 March 2013– 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 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 S sulfur 16	17 Cl chlorine 17	18 Ar argon 18								
19 K potassium 19	20 Ca calcium 20	21 Sc scandium 21	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.



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Questions begin on next page.

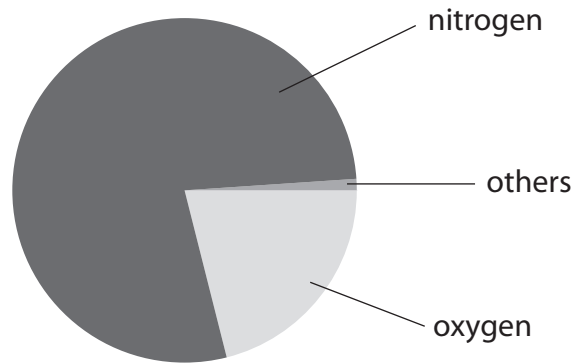


Answer ALL questions.

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 ☒.

Gases in the atmosphere

1 (a) The diagram shows the gases in dry air.



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

The percentage of nitrogen in dry air is

(1)

- A 21%
- B 50%
- C 78%
- D 90%

(ii) Give the name of the gas in air that is produced by photosynthesis.

(1)



(b) The early Earth was hot and its atmosphere contained a lot more water vapour than the atmosphere does now.

Explain how the amount of water vapour in the atmosphere decreased.

(2)

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(c) Some processes add carbon dioxide to the atmosphere, some remove it.

Three processes are shown in the table.

Complete the table to show the effect of each process on the amount of carbon dioxide in the atmosphere.

Put **one** tick (✓) in each row.

The first one has been done for you.

(2)

process	adds carbon dioxide	does not affect amount of carbon dioxide	removes carbon dioxide
burning fossil fuels	✓		
volcanic activity			
dissolving in the oceans			

(d) Explain why cutting down forests affects the amount of carbon dioxide in the atmosphere.

(2)

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(Total for Question 1 = 8 marks)



Limestone

- 2 (a) The photograph shows a limestone quarry.



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

Opening a limestone quarry causes environmental problems.

One of these problems is that opening the quarry

(1)

- A provides jobs for local people
- B increases noise
- C improves the habitat for wildlife
- D decreases the amount of traffic

- (b) Limestone is mainly calcium carbonate.

When calcium carbonate is heated, the reaction that occurs is



- (i) This reaction is a thermal decomposition.

Explain what is meant by **thermal decomposition**.

(2)

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(ii) When 100 kg of calcium carbonate was completely decomposed, 44 kg of carbon dioxide was given off.

Calculate the mass of calcium oxide produced in the reaction.

(1)

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mass of calcium oxide = kg

(c) Limestone is a sedimentary rock.
Limestone can be changed into a metamorphic rock.

(i) Give the name of a metamorphic rock formed from limestone.

(1)

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(ii) Explain how a sedimentary rock, such as limestone, is changed into a metamorphic rock.

(2)

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(iii) Sedimentary and metamorphic are two types of rock.

Give the name of the third type of rock.

(1)

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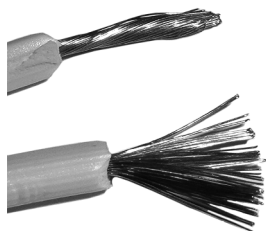
(Total for Question 2 = 8 marks)



Metals

3 Many everyday items are made of metal.

The picture shows four objects made of metals or alloys.



electrical wire



aeroplane



jewellery



knife

(a) The electrical wire is made of copper.

Give a property of copper that makes it suitable for this use.

(1)

(b) Parts of aeroplanes are made of aluminium alloys instead of pure aluminium.

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

The aluminium alloys are used instead of pure aluminium because they

(1)

- A** make the aeroplane heavier
- B** corrode more easily
- C** are more brittle
- D** are stronger

(c) Explain why gold is a suitable metal to make jewellery.

(2)



(d) The knife is made of stainless steel.

Stainless steel is an alloy.

Explain what is meant by an **alloy**.

(2)

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(e) An ore of iron contains iron oxide.

Iron is extracted from this ore.

In the extraction process, the iron oxide reacts with carbon monoxide and carbon dioxide is formed.

Write the word equation for this reaction.

(2)

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(f) Iron is often recycled.

Explain an advantage of recycling iron, rather than extracting iron from iron ore.

(2)

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(Total for Question 3 = 10 marks)

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Acids

4 (a) (i) Hydrochloric acid is produced in the stomach.

The acid kills bacteria.

State another reason why this acid is needed in the stomach.

(1)

(ii) Some people take indigestion remedies.

Why are indigestion remedies taken?

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

(1)

- A** to make bacteria grow
- B** to release energy
- C** to produce chlorine
- D** to neutralise excess acid

(b) Dilute sulfuric acid reacts with zinc oxide.

Write the word equation for this reaction.

(2)



- (c) (i) Water, with some dilute sulfuric acid added, can be decomposed by passing a direct electric current through it.

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

This process is

(1)

- A electrolysis
- B heating
- C neutralisation
- D precipitation

- (ii) The water decomposes to form hydrogen and oxygen.

Describe a test to show that a gas is hydrogen.

(2)

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- (d) Chlorine can be produced by the decomposition of hydrochloric acid.

- (i) The decomposition is carried out in a fume cupboard.

Explain why a fume cupboard is used.

(2)

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- (ii) Chlorine is used to make some polymers.

Give the name of a polymer containing chlorine.

(1)

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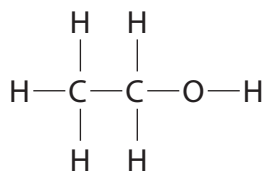
(Total for Question 4 = 10 marks)



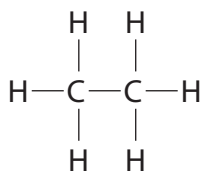
Crude oil

5 Crude oil is a mixture of hydrocarbons.

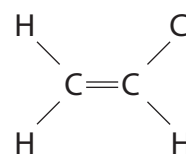
(a) The diagram shows a molecule of each of three substances, A, B and C.



A



B



C

Substance B is a hydrocarbon.

Substances A and C are not hydrocarbons.

Explain why substance B is a **hydrocarbon**.

(2)

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

Octane obtained from crude oil can be used as a fuel.

It is a useful fuel because it

(1)

- A** is colourless
- B** is not flammable
- C** produces a lot of ash
- D** burns to produce heat energy

(ii) The complete combustion of octane produces carbon dioxide and one other product.

Write the word equation for this reaction.

(2)

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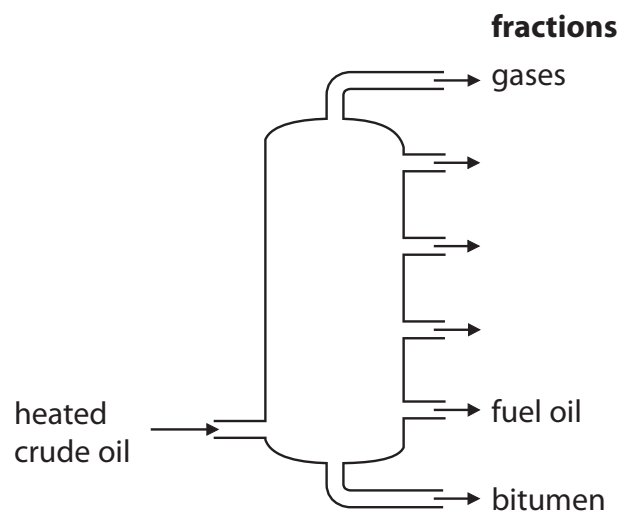
(iii) When a hydrocarbon is burned in a limited supply of air, a toxic gas is formed.

Give the name of this gas.

(1)

*(c) Crude oil is separated into fractions by fractional distillation.

The diagram shows a fractional distillation tower that has been partly labelled.



Complete the identification of the fractions that are obtained from crude oil and describe uses for the six fractions.

(6)

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(Total for Question 5 = 12 marks)



Alkanes and alkenes

6 (a) Ethane and propane are both alkanes.

Ethene and propene are both alkenes.

(i) Which of the following statements about ethene is correct?

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

(1)

- A** ethene can form a polymer
- B** ethene is a saturated hydrocarbon
- C** an ethene molecule has a double bond between two hydrogen atoms
- D** an ethene molecule contains four carbon atoms

(ii) Complete the table:

(3)

name	formula of molecule	structure of molecule
propene	C_3H_6	
		$\begin{array}{ccccccc} & H & & H & & H & \\ & & & & & & \\ H & - C & - & C & - & C & - H \\ & & & & & & \\ & H & & H & & H & \end{array}$



(iii) Describe a test to show that a compound is an alkene rather than an alkane.

(2)

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*(b) Many plastic bags are used by shoppers and then thrown away.

Most of these plastic bags are sent to landfill sites.

Two ways of reducing the amount of plastic in landfill sites are to recycle the plastic or to burn it.

Describe the possible environmental advantages and disadvantages of recycling and of burning plastics.

(6)

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(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS





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