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Surname					Other names			
Pearson		Centre Number			Candidate Number			
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Chemistry/Science								
Unit C1: Chemistry in Our World								
Foundation Tier								
Thursday 18 January 2018 – Morning						Paper Reference		
Time: 1 hour						5CH1F/01		
You must have: Calculator, ruler							Total Marks	
							<input type="text"/>	

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.
- 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 C carbon 6	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	23 Sc scandium 21	24 Ti titanium 22	25 V vanadium 23	26 Cr chromium 24	27 Mn manganese 25	28 Fe iron 26	29 Co cobalt 27	30 Ni nickel 28	31 Cu copper 29	32 Zn zinc 30	35.5 Cl chlorine 17	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 [98]	44 Ru ruthenium 44	45 Rh rhodium 45	46 Pd palladium 46	47 Ag silver 47	48 Cd cadmium 48	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	[210] At astatine 85	[222] Rn radon 86
[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	104 Rf rutherfordium 104	105 Db dubnium 105	106 Sg seaborgium 106	107 Bh bohrium 107	108 Hs hassium 108	109 Mt meitnerium 109	110 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.

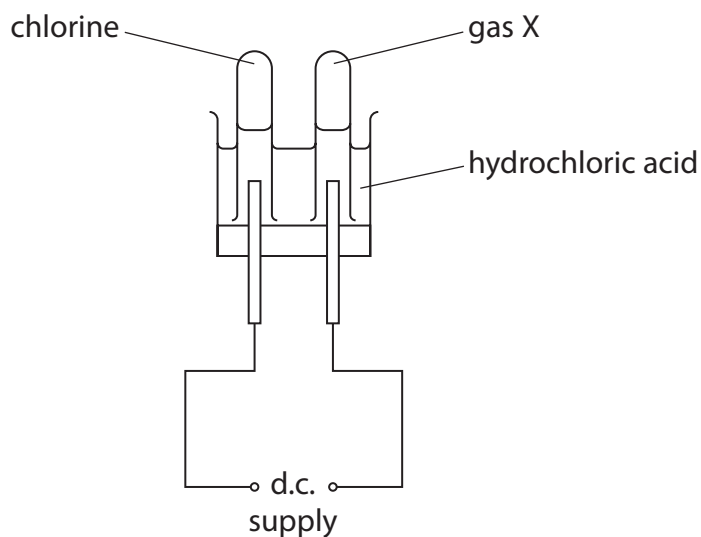


Answer ALL questions

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 ☒.

Hydrochloric acid

- 1 (a) Dilute hydrochloric acid can be decomposed by passing a direct electric current through it using the apparatus shown in the diagram.



- (i) Give the name of the process in which a substance is decomposed by a direct electric current. (1)

- (ii) The experiment is carried out in a fume cupboard because chlorine gas is formed. Explain why a fume cupboard is used. (2)

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(iii) Gas **X** is tested.

A burning splint is applied to a mixture of gas **X** and air in a test tube.
A squeaky pop is heard as the gas burns.

Give the name of gas **X**.

(1)

(b) Hydrochloric acid is produced in the stomach.

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

Hydrochloric acid in the stomach helps to break down food.
Hydrochloric acid in the stomach also

(1)

- A** improves the flavour of the food
- B** kills bacteria
- C** neutralises acid
- D** releases energy

(ii) Acid indigestion is caused by excess hydrochloric acid in the stomach.

Which of these could help to cure acid indigestion safely?

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

(1)

- A** sodium chloride
- B** sodium hydroxide
- C** calcium carbonate
- D** calcium chloride

(c) Hydrochloric acid reacts with metal oxides to form a salt and water.

Complete the word equation for the reaction of magnesium oxide with hydrochloric acid.

(2)

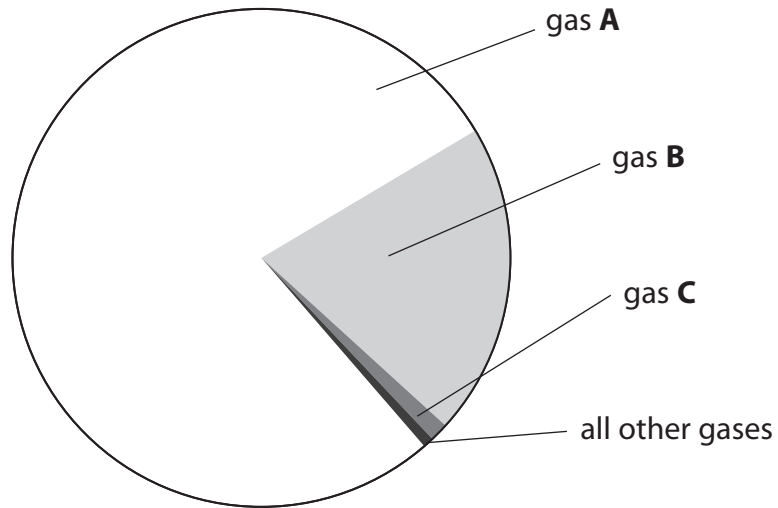
magnesium oxide + hydrochloric acid →

(Total for Question 1 = 8 marks)



The atmosphere

2 (a) The pie chart shows the percentages by volume of gases in dry air.



(i) State the name of gas **A**.

(1)

(ii) Gas **B** is released by photosynthesis.

State the name of gas **B** and state the percentage of gas **B** in dry air.

(2)

name.....

percentage =

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

Gas **C** is

(1)

- A** ammonia
- B** argon
- C** carbon dioxide
- D** water vapour

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(iv) Gas **A** makes up the largest percentage of dry air.
All the other gases make up 22% of dry air.

Calculate the percentage of gas **A** in dry air.

(1)

percentage of gas **A** =

(b) The Earth's early atmosphere contained a large amount of water vapour.

(i) State how this water vapour entered the early atmosphere.

(1)

(ii) Today's atmosphere contains a very different amount of water vapour.

Explain why the amount of water vapour in the atmosphere has changed.

(2)

(Total for Question 2 = 8 marks)



Metals

3 Iron and aluminium are metals.

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

Most metals are extracted from rocks found in the Earth's crust.

Rocks from which metals can be extracted are called

(1)

- A elements
- B igneous
- C ores
- D sand

(b) Iron is extracted by heating a mixture of iron oxide and carbon.

Complete the word equation for this reaction.

(2)

iron oxide + → iron +

(c) Aluminium, rather than iron, is used as the main metal in the production of aeroplanes.

Give **two** reasons why aluminium is used as the main metal in the production of aeroplanes.

(2)

reason 1

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reason 2

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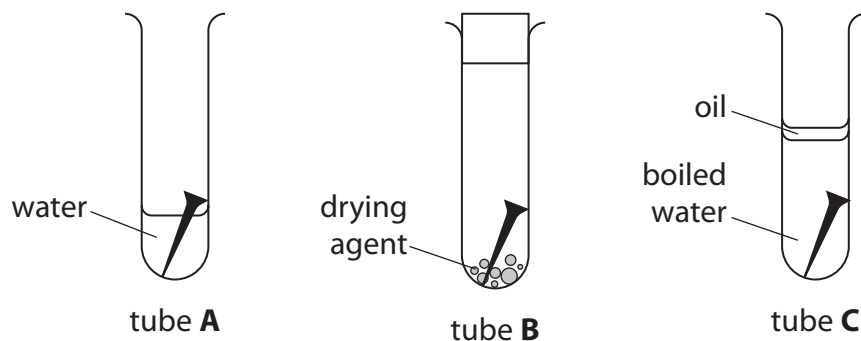
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(d) An experiment was carried out to investigate the conditions needed for iron to rust.

Three test tubes, **A**, **B** and **C**, had identical iron nails placed in them, under different conditions.



The tubes were left for two weeks.
The observations are recorded in the table.

test tube	conditions	observations
A	air and water	rusted
B	dry air	not rusted
C	boiled water containing no air	not rusted

Explain why the iron nail placed in test tube **A** rusted but the iron nails in test tubes **B** and **C** did not rust.

(2)

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(e) Stainless steel is an alloy containing iron and chromium.

(i) State what is meant by an **alloy**.

(2)

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(ii) Cutlery is made of stainless steel.

Give a reason why cutlery is not made of pure iron.

(1)

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(Total for Question 3 = 10 marks)

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Plastics

4 (a) Molecules of plastics are long chains of repeating units.

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

A substance that contains molecules that are long chains of repeating units is

(1)

- A an alkene
- B a biofuel
- C a polymer
- D a salt

(ii) Describe how ethene molecules can form molecules that are long chains of repeating units.

(2)

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(b) An experiment was carried out to see if different plastics, **A**, **B** and **C**, were biodegradable.

In the experiment, 100 g of each plastic was buried in identical samples of soil under identical conditions.

After 100 days and 200 days the mass of each plastic remaining was measured.

The results are shown in the table.

plastic	mass remaining / g	
	after 100 days	after 200 days
A	46	14
B	32	2
C	100	100

(i) Give the meaning of the term **biodegradable**.

(2)

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(ii) Explain, using evidence from the table, which plastic is non-biodegradable.

(2)

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(iii) Give one advantage of disposing of waste plastic by burning.

(1)

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(c) Poly(chloroethene) is used as a plastic.

A molecule of poly(chloroethene) can be shown as $(\text{CH}_2\text{CHCl})_n$.

Give the names of the **three** elements present in poly(chloroethene).

(1)

.....

(Total for Question 4 = 9 marks)



P 5 7 5 7 9 A 0 1 3 2 4



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Rocks

5 (a) Limestone is a sedimentary rock.
Limestone is a form of calcium carbonate.

(i) A sample of limestone has a layered structure and contains fossils.

Explain how this limestone has formed.

(2)

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(ii) When calcium carbonate is heated strongly, it is converted into calcium oxide.

This is a thermal decomposition reaction.

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

(2)

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(iii) When a given mass of solid calcium carbonate is completely decomposed, the solid calcium oxide formed has a lower mass.

Explain why the mass of calcium oxide at the end of the reaction is less than the original mass of calcium carbonate.

(2)

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(Total for Question 5 = 12 marks)



Fuels

6 Petrol is a fuel used in cars.

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

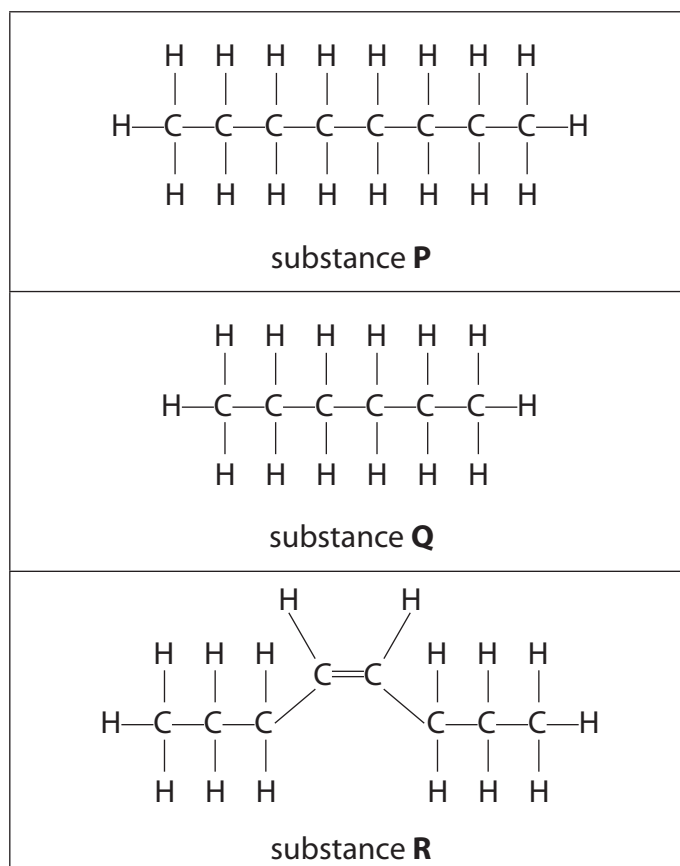
Petrol is obtained from crude oil.

The process used to separate petrol from crude oil is

(1)

- A dissolving
- B electrolysis
- C filtration
- D fractional distillation

(b) A molecule of each of three substances, **P**, **Q** and **R**, is shown below.



(i) One of the substances found in petrol is octane, C_8H_{18} .

Explain which of the substances, **P**, **Q** or **R**, is octane.

(2)

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- (ii) A small amount of bromine water is shaken with separate samples of **P**, **Q** and **R**.
One mixture changes colour from orange to colourless.
The other two mixtures remain orange.

Explain which two of the mixtures remain orange.

(2)

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- (iii) Substances **P**, **Q** and **R** are all hydrocarbons.

Explain how the formulae of substances **P**, **Q** and **R** show that they are all hydrocarbons.

(2)

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P 5 7 5 7 9 A 0 1 9 2 4

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(Total for Question 6 = 13 marks)

TOTAL FOR PAPER = 60 MARKS





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