

Write your name here

Surname					Other names				
Centre Number					Candidate Number				
<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>					<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>				

Edexcel GCSE

Chemistry/Additional Science
Unit C2: Discovering Chemistry

Foundation Tier

Tuesday 5 March 2013 – Morning Time: 1 hour	Paper Reference 5CH2F/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 ►

P41964A

©2013 Pearson Education Ltd.

1/1/1



PEARSON

The Periodic Table of the Elements

1	2	3	4	5	6	7	0																																		
7 Li lithium 3	9 Be beryllium 4	23 Na sodium 11	24 Mg magnesium 12	39 K potassium 19	40 Ca calcium 20	85 Rb rubidium 37	88 Sr strontium 38	133 Cs caesium 55	137 Ba barium 56	[223] Fr francium 87	[226] Ra radium 88	139 La* lanthanum 57	[227] Ac* actinium 89	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	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	127 I iodine 53	131 Xe xenon 54	204 Pb lead 82	207 Tl thallium 81	209 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86		
11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10	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	112 Cd cadmium 48	112 Cd cadmium 48	106 Pd palladium 46	103 Rh rhodium 45	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	112 Cd cadmium 48	197 Au gold 79	195 Pt platinum 78	192 Ir iridium 77	190 Os osmium 76	186 Re rhenium 75	184 W tungsten 74	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	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
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> 1 H hydrogen 1 </div>													<div style="border: 1px solid black; padding: 5px; display: inline-block;"> relative atomic mass atomic symbol name atomic (proton) number </div>																												
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.



BLANK PAGE

Questions begin on next page.



Answer ALL questions

Some questions must be answered with a cross . If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

Salts

- 1 (a) Lead iodide is an insoluble salt.

Use words from the box to complete the sentences.

Each word may be used once, more than once, or not at all.

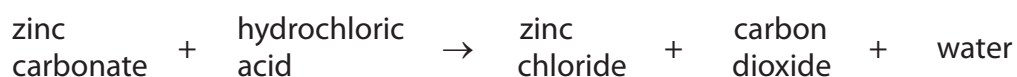
(4)

dried	filtered	gas	metal	precipitate	solution
-------	----------	-----	-------	-------------	----------

- (i) Lead iodide can be prepared by mixing potassium iodide solution and lead nitrate
- (ii) The lead iodide forms as a solid
- (iii) To separate the solid lead iodide, the mixture is
- (iv) To obtain a pure sample of solid lead iodide, the solid is washed and then

- (b) Solid zinc carbonate reacts with dilute hydrochloric acid.

The word equation for the reaction is



- (i) Describe what is **seen** during this reaction.

(2)

.....

.....

.....

.....



(ii) Describe a test to show that the gas produced is carbon dioxide.

(2)

.....

.....

.....

.....

(Total for Question 1 = 8 marks)



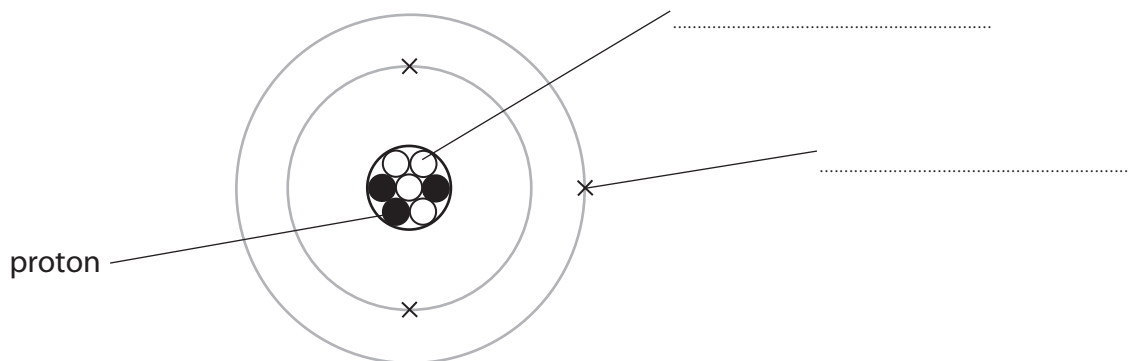
Atomic structure

2 (a) The diagram shows an atom of lithium.

(i) A proton has been labelled.

Complete the diagram by labelling the other two particles shown.

(2)



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

The atomic number of lithium is

(1)

- A** 3
- B** 6
- C** 7
- D** 10

(b) (i) Which row of the table shows the charge on a proton and the charge on an electron?

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

(1)

	proton	electron
<input type="checkbox"/> A	positive	positive
<input type="checkbox"/> B	negative	negative
<input type="checkbox"/> C	negative	positive
<input type="checkbox"/> D	positive	negative



(ii) Use a number from the box to complete the sentence.

(1)

0	$\frac{1}{1837}$	1
---	------------------	---

The relative mass of a proton is

(c) The electronic configuration of lithium is 2.1.
The electronic configuration of sodium is 2.8.1.

(i) Explain, in terms of their electronic configurations, why lithium and sodium are both in group 1 of the periodic table.

(2)

.....

.....

.....

.....

(ii) Explain, in terms of their electronic configurations, why lithium is placed in period 2 and sodium is placed in period 3 of the periodic table.

(2)

.....

.....

.....

.....

(Total for Question 2 = 9 marks)



Investigating a reaction

3 Zinc is a metal.

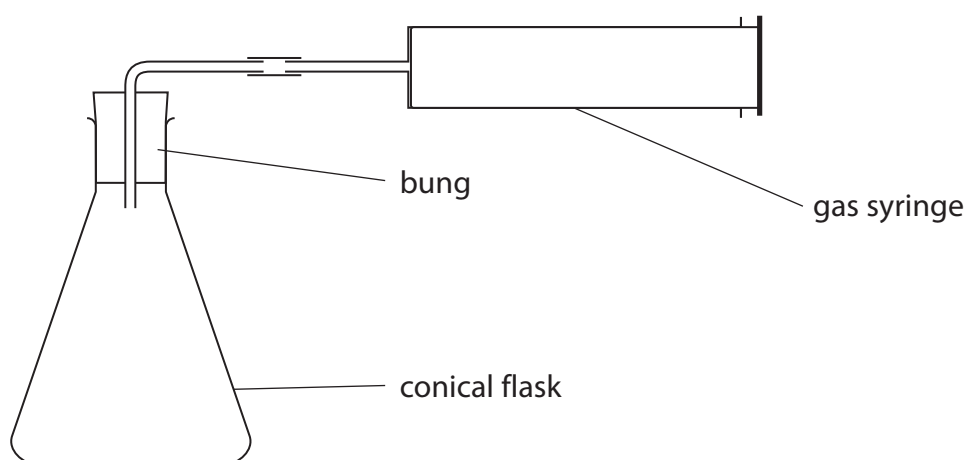
Zinc reacts with dilute hydrochloric acid to produce zinc chloride and hydrogen.

(a) Write the word equation for the reaction of zinc with dilute hydrochloric acid.

(1)

(b) A student wanted to investigate the speed of the reaction between zinc and dilute hydrochloric acid.

Describe how the student could use this apparatus to obtain the results in the table.



time after start of experiment / minutes	volume of hydrogen produced / cm ³
0	0
1	30
2	42
3	50

(3)



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

(i) For a reaction to take place the reacting particles must

(1)

- A dissolve
- B boil
- C collide
- D evaporate

(ii) The reaction can be slowed down by

(1)

- A using a bigger volume of the same acid
- B cooling the hydrochloric acid
- C increasing the concentration of the hydrochloric acid
- D adding a catalyst

(d) When zinc powder is used, instead of larger pieces of zinc, the reaction is faster.

Explain, using ideas about particles, why the reaction is faster when zinc powder is used.

(2)

.....

.....

.....

.....

(e) The reaction is exothermic.

Describe how you could prove that this reaction is exothermic.

(2)

.....

.....

.....

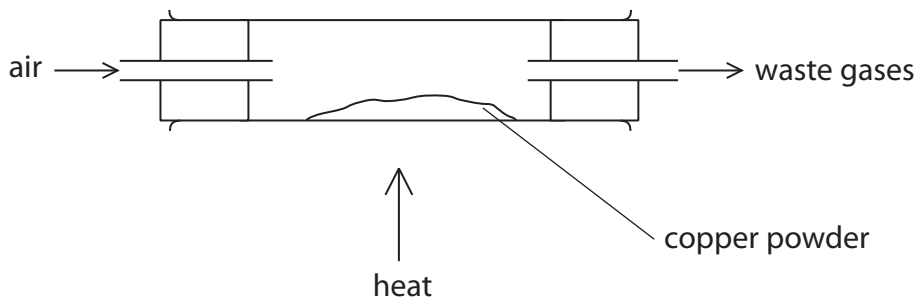
.....

(Total for Question 3 = 10 marks)



Reactions with oxygen

4 Rosie used this apparatus to prepare a sample of copper oxide.



Oxygen from the air reacted with the hot copper to form copper oxide.

These are Rosie's results

mass of copper used = 3.2 g

mass of copper oxide formed = 3.6 g

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

The yield of copper oxide in Rosie's experiment was

(1)

- A 0.4 g
- B 3.2 g
- C 3.6 g
- D 6.8 g

(b) What mass of oxygen combined with 3.2 g of copper in this experiment?

(1)

mass oxygen = g

(c) The theoretical yield for Rosie's experiment was 4.0 g of copper oxide.

She only obtained 3.6 g of copper oxide.

Calculate the percentage yield of Rosie's experiment.

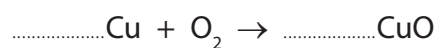
(2)

percentage yield



(d) Balance the equation for this reaction by putting numbers in the spaces provided.

(2)



(e) Calculate the percentage of oxygen in copper oxide, CuO.

(Relative atomic masses: Cu = 64, O = 16)

(2)

percentage of oxygen =

(f) Many oxides contain oxide ions, O^{2-} .

Explain how an oxygen atom becomes an oxide ion.

(2)

(Total for Question 4 = 10 marks)



Chromatography

- 5 (a) Some food colourings are a mixture of coloured substances.

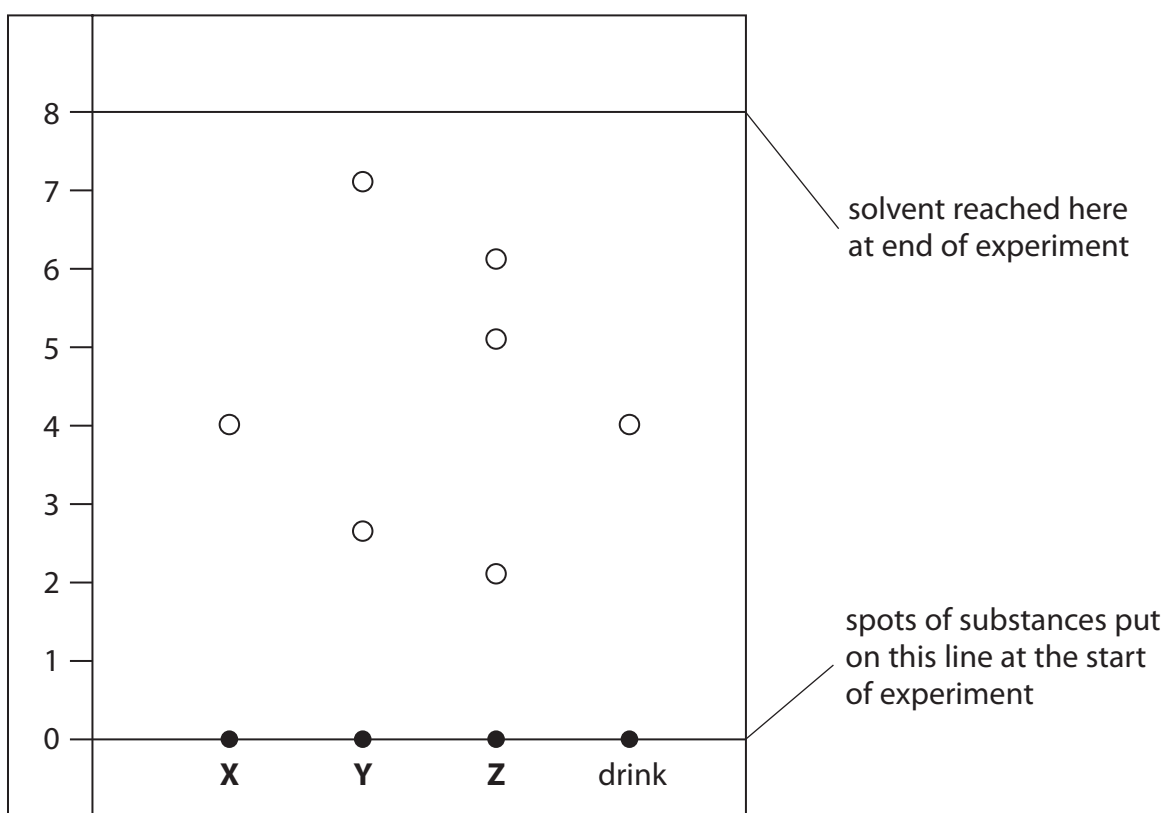
Paper chromatography can be used to separate the coloured substances in food colourings.

Charles carried out a chromatography experiment to test which food colouring was present in a coloured drink.

He used samples of three food colourings, **X**, **Y** and **Z**.

He also tested a sample of the colouring in the drink.

Charles obtained this chromatogram.



- (i) Charles looked at the chromatogram to find out which food colourings contained more than one coloured substance.

State all the food colourings that contain more than one coloured substance.

(1)



(ii) Food colouring **Y** is banned.

Explain how Charles can tell that the drink that he tested did **not** contain the banned food colouring.

(2)

(iii) Calculate the R_f value for the coloured substance in food colouring **X**.

(2)

$R_f =$

*(b) Describe in detail how the experiment should be carried out to produce the chromatogram shown in (a).

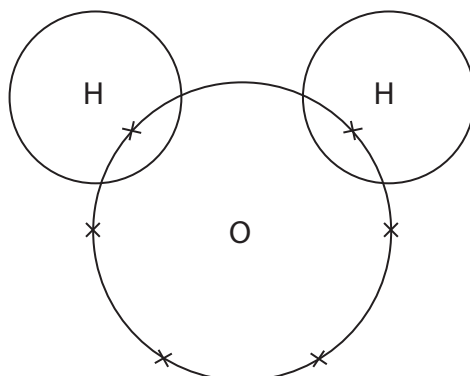
(6)



(c) The drink contained water.

Complete the dot and cross diagram for water by adding the electrons of the hydrogen atoms.

(1)



(Total for Question 5 = 12 marks)



BLANK PAGE



Patterns in the periodic table

- 6 (a) The table shows information about the first four elements in group 0 of the periodic table.

name	atomic number	density / g dm^{-3}
helium	2	0.15
neon	10	1.2
argon	18	
krypton	36	2.2

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

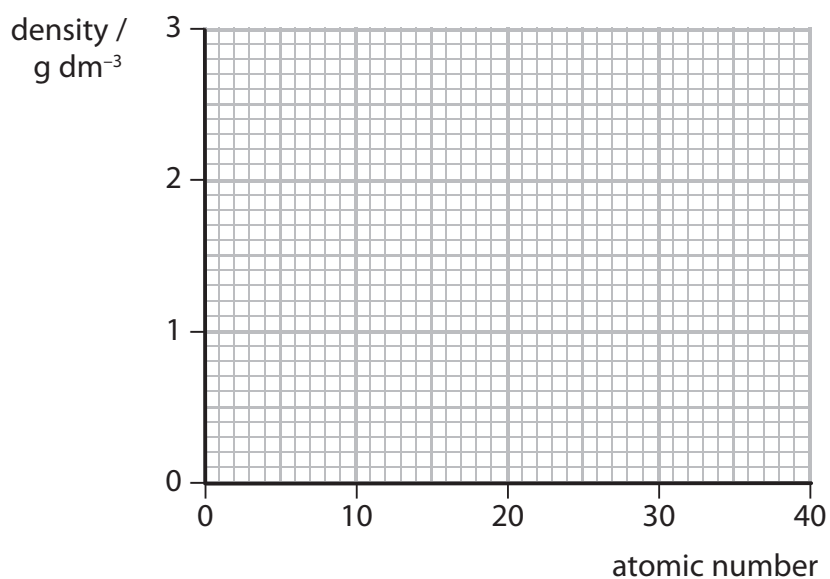
The elements in group 0 of the periodic table are

(1)

- A alkali metals
- B transition metals
- C halogens
- D noble gases

- (ii) On this grid draw a graph of density against atomic number for the elements helium, neon and krypton.

(3)



- (iii) Use your graph to estimate the density of argon.

(1)

density of argon = g dm^{-3}



*(b) Two elements in group 1 of the periodic table are lithium and sodium.

Very small pieces of lithium and sodium were reacted separately with water.

Describe the similarities and differences in what is seen and in the products of the reactions.

(6)

Ruled area for writing the answer, consisting of horizontal dotted lines.

(Total for Question 6 = 11 marks)

TOTAL FOR PAPER = 60 MARKS



P 4 1 9 6 4 A 0 1 7 2 0

BLANK PAGE



BLANK PAGE



BLANK PAGE

