GCSE

WJEC GCSE
The Sciences (Double Award)

Approved by Qualifications Wales

Sample Assessment Materials

Unit 2: Chemistry - Chemical Substances and How They Behave
Higher Tier

Teaching from 2026
For award from 2028

This Qualifications Wales regulated qualification is not available to centres in England.

Made for Wales.
Ready for the world.

WJEC would like to thank the students and teachers of Fitzalan High School, Cardiff and Llanwern High School, Newport for their participation in the creation of these covers.

Contents

Surname	Centre number	Candidate number
First name(s)		0

GCSE

3455UB

The Sciences (Double Award) – Unit 2 Chemistry: Chemical Substances and How They Behave

HIGHER TIER
1 hour 15 minutes
SAMPLE ASSESSMENT MATERIALS

Additional materials

A calculator and ruler are permitted.

Instructions to candidates

Use black ink or black ball-point pen. Do **not** use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces provided at the top of this page.

Answer **all** questions.

For examiner's use only		
Question	**Maximum mark**	**Mark awarded**
1.	**7**	
2.	**7**	
3.	**7**	
4.	**10**	
5.	**7**	
6.	**8**	
7.	**10**	
Total	**56**	

Write your answers in the spaces in this booklet. If you need more space, use the additional page(s) at the back of this booklet. Number the question(s) correctly.

Information for candidates

The number of marks is given in brackets at the end of each question or part-question.

The total number of marks available is **56.**

You should think carefully about how you use your time.

Your responses must be clear, accurate and well presented.

Answer **all** questions.

Examiner only

1. Every electric vehicle needs a battery, and those batteries are manufactured from a range of materials, including lithium. Lithium is extracted from finite supplies of lithium ore found in the Earth's crust.

(a) State what is meant when a raw material such as lithium ore is described as being finite. [1]

……

……

(b) Much of the lithium used to make batteries is produced from a solution of lithium salts pumped from underground into huge lakes in South America. The lakes are reduced to a wet slurry over several months as the solution becomes more concentrated. The slurry is then processed to form a dry powder.

(i) I Complete the following sentence. [1]

The solution of lithium salts becomes more concentrated because

water changes from the …… state to the

……state.

II Suggest what separation method is used to obtain a dry powder from a wet slurry. [1]

……

(ii) One mine produces 5000 tonnes of lithium per year. This is enough to make batteries for 80 000 electric vehicles.

Calculate the mass of lithium needed to make batteries for the 14 000 000 electric vehicles sold worldwide in 2023. [2]

Mass of lithium = …… tonnes

(c) Many people living in areas where lithium is mined do not want the works to be expanded despite the potential for new jobs.

Explain why this may be the case. [2]

……

……

……

……

Examiner only

7

Examiner only

2. Scientists agree that increased levels of greenhouse gases in the atmosphere as a result of human activity are responsible climate change.

(a) Explain how increased use of fossil fuels has contributed to increased mean global temperatures. [3]

……

……

……

……

……

……

(b) Transportation is a major source of greenhouse gas generation.

The table below shows the amount of a greenhouse gas generated, **in kilograms (kg)**, at different stages of the life cycle for an electric vehicle and a fossil fuel powered vehicle.

Stage of life cycle	Mass of greenhouse gases generated (kg)	
	Electric vehicle	Fossil fuel
Production of battery	60 000	0
Production of car	40 000	60 000
Electricity and fuel	40 000	160 000
Disposal of car	40 000	20 000

Examiner only

The ‘carbon footprint’ of a product is the total amount of greenhouse gases emitted over the full life cycle of a product.

The carbon footprint of the electric vehicle is 180 tonnes of greenhouse gases.

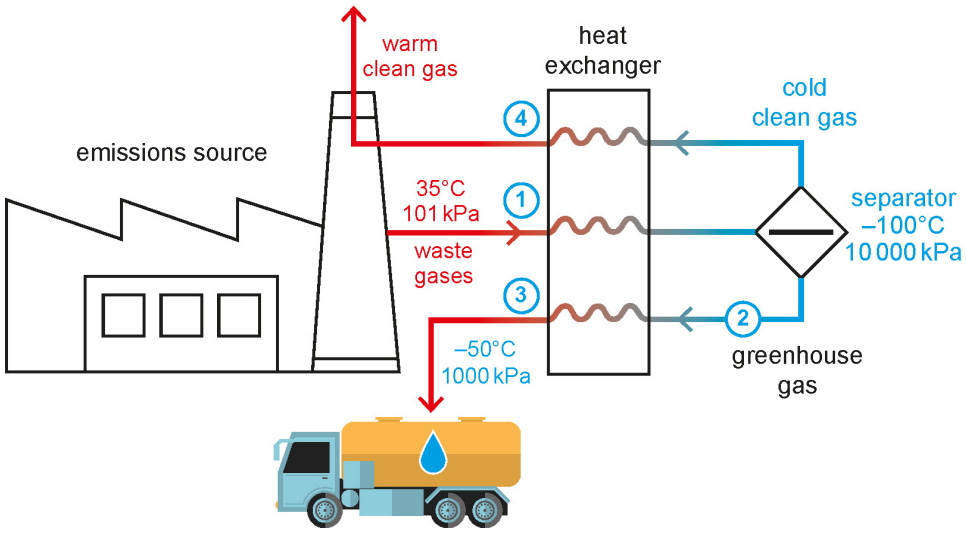
Use the table above to calculate the carbon footprint of the fossil fuel vehicle **in tonnes**. [2]

(1 tonne = 1000 kg)

Carbon footprint = ……tonnes

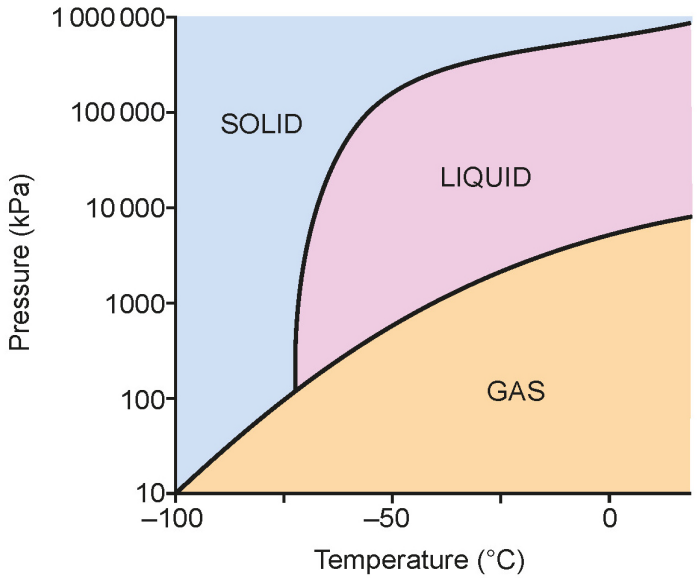
(c) Technologies are being developed to remove one greenhouse gas from waste gas emissions to reduce the volume released into the atmosphere.

Cryogenic capture is shown in the diagram below.



Examiner only

Figure 1 shows the state of the greenhouse gas at different temperatures and pressures.



Use the information in the diagram and **Figure 1** to answer these questions.

(i) Give the state of the greenhouse gas as it leaves the separator (stage 2). [1]

……..

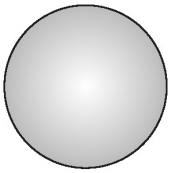
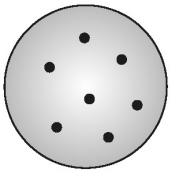
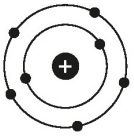
(ii) Name the physical process that describes the change of state that happens between stages 2 and 3. [1]

……...

7

Examiner only

3. (a) The table below shows the main stages in the development of the ideas of atomic structure.

John Dalton (1800s)	JJ Thomson (1897)	Ernest Rutherford (1911)	Niels Bohr (1913)
 solid atom which cannot be broken down to anything simpler	 electrons are spread through the atom		

Use the information in the table to answer questions (i) and (ii) below.

(i) Describe the main difference between Dalton's model of the atom and Thomson's model. [1]

.....

.....

(ii) Describe the main difference between Rutherford's model of the atom and Bohr's model. [1]

.....

.....

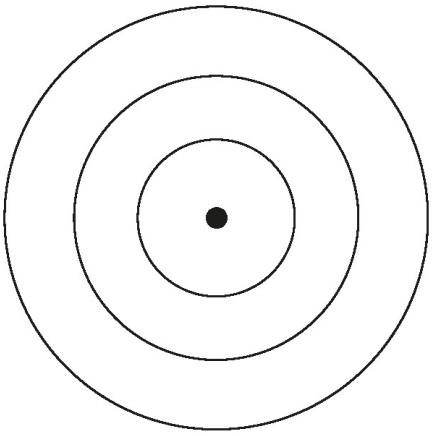
Examiner only

(b) The following table gives information about the atoms of some elements.

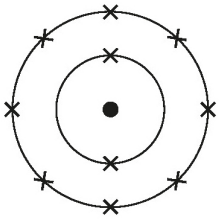
Element	Atomic number	Mass number	Number of protons	Number of neutrons	Number of electrons
lithium	3	7	3	4	3
aluminium	13	27	13	14	…….
argon	18	…….	18	22	18

(i) **Complete the table.** [2]

(ii) Complete the diagram below to show how the electrons are arranged in an atom of argon. [1]



(c) The following diagram shows the electronic structure of element **A**.



Explain how the electronic structure of element **A** can be used to determine its position in the periodic table. [2]

…….

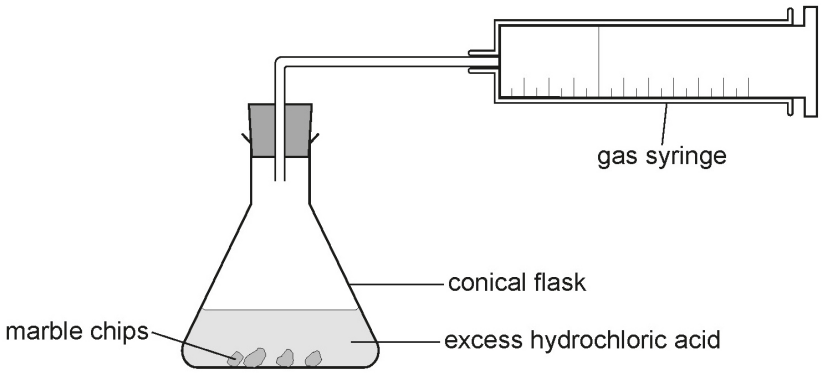
…….

7

Examiner only

4. (a) Marble chips (calcium carbonate) react with dilute hydrochloric acid to produce carbon dioxide gas.

A group of students used the following apparatus to investigate the rate of the reaction between 0.25 g of marble chips and **excess** dilute hydrochloric acid at 20°C. After 40 seconds no more carbon dioxide gas was produced.



(i) Write the chemical formula for calcium carbonate. [1]

……..

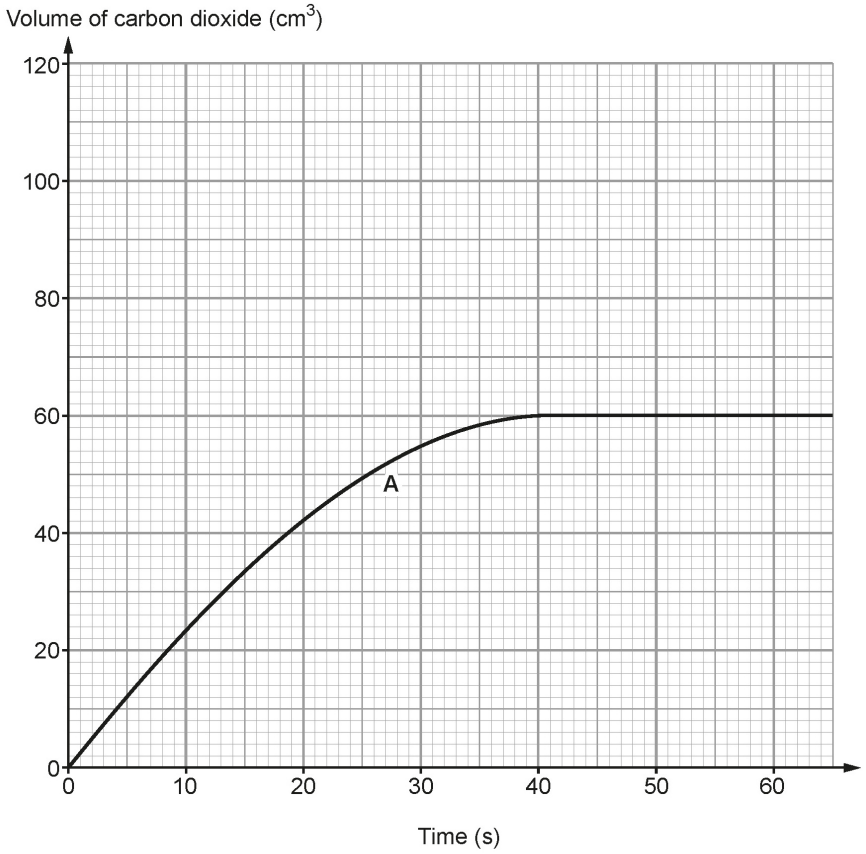
(ii) State why the reaction stopped after 40 seconds. [1]

……..

……..

Examiner only

(iii) Graph **A** shows the volume of carbon dioxide produced during the reaction at 20°C.



I. Sketch **on the grid**, the graph that would be expected if the experiment was repeated at 40°C. Label this graph **B**. [1]

II. Sketch **on the grid**, the graph that would be expected if the experiment was repeated at 20°C using 0.50 g of marble chips, with the hydrochloric acid still in excess**.** Label this graph **C**. [1]

(iv) The rate of reaction would increase if a higher concentration of acid was used compared to the original experiment.

Explain why using collision theory. [2]

……..

……..

……..

Examiner only

(b) Hydrogen peroxide is a colourless liquid with the chemical formula H_2O_2. It has many uses including as a bleach and an antiseptic.

The decomposition of hydrogen peroxide is represented by the following equation.

$$2H_2O_2 \rightarrow 2H_2O + O_2$$

The decomposition of hydrogen peroxide happens very slowly on its own. The reaction can be speeded up using catalysts.

Two catalysts were tested to find out which was the more effective in increasing the rate of decomposition of hydrogen peroxide.

An equal mass of each catalyst was added to equal volumes of hydrogen peroxide solution at four different temperatures.

The time taken to collect 50 cm^3 of oxygen gas was recorded.

Temperature (°C)	Time taken to collect 50 cm^3 of oxygen gas (s)	
	Catalyst **X**	Catalyst **Y**
20	88	98
30	44	49
40	22	31
50	11	11

(i) Compare the effectiveness of catalysts **X** and **Y** over the temperature range tested. [2]

.....

.....

.....

.....

(ii) Use the data in the table to describe the effect of changing temperature on the time taken to collect 50 cm^3 of oxygen when using catalyst **X**. [2]

.....

.....

.....

.....

10

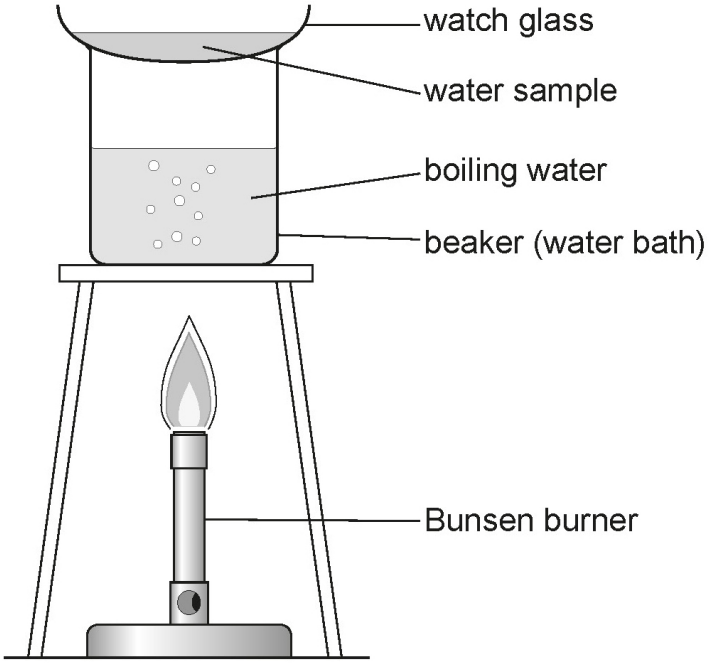
Examiner only

5. Water that is safe for humans to drink is called potable water. Potable water comes from a variety of sources, including rainwater, ground water and surface water. In the UK, climate change-fuelled droughts are reducing availability of potable water so we have to look for alternative sources of drinking water.

Despite the fact that the UK is an island surrounded by water, the ocean is not considered to be a source of potable water because it is too salty.

The equipment below was used to compare the mass of dissolved salts in three samples of water.

- One litre samples of water were taken from each water source
- 5 cm^3 of each water sample was heated to dryness



Examiner only

The results of the investigation are shown in the table below.

Mass (g)	Type of water		
	Sea water	**River water**	**Rain water**
Watch glass	9.52	9.49	9.54
Watch glass and dissolved solids	9.68	9.58	9.54
Dissolved solids in 5cm^3 of water	0.16	X	0.00

(a) (i) Calculate the mass of dissolved solids in the 5 cm^3 sample of river water. [1]

Mass = ... g

(ii) Use your answer from part (i) to calculate the mass of dissolved solids in 1 litre of river water. [1]

(1 litre = 1000 cm^3)

Mass = ... g

(b) A student commented that 5 cm^3 of water was too small a sample and that a larger volume of each water sample should have been used.

State **one** advantage and **one** disadvantage of using a larger volume of water. [2]

Advantage.....

.....

Disadvantage.....

.....

Examiner only

(c) The table below shows some of the ions identified when an analysis was carried out on the salts found in a sample of river water.

Ion	Concentration (mg per 1000 cm^3)
chloride	60.0
nitrate	22.6
sodium	34.5
magnesium	7.8

(i) Explain why this sample of river water cannot be described as pure water. [1]

……..

……..

(ii) Calculate the number of moles of sodium in 1000 cm^3 of the river water. [2]

(1 g = 1000 mg)

A_r(Na) = 23

$$\text{number of moles} = \frac{\text{mass (g)}}{A_r}$$

7

Number of moles =…….. mol

Examiner only

6. Soluble ionic pollutants released into the environment can cause major problems if left undetected. They can dissolve in lakes, rivers and other water sources that may then be used to irrigate crops, therefore contaminating food sources. For this reason, it is important that our water ways are regularly tested for soluble ionic pollutants.

The following table shows the observations made when ion tests were carried out on solutions of two ionic compounds.

Solution	Flame test	Addition of silver nitrate
A	lilac	white precipitate
barium chloride	apple green	white precipitate

(a) Name solution **A**. [1]

……

(b) (i) Insoluble barium carbonate is toxic to humans because it reacts with hydrochloric acid in our stomachs to produce soluble barium chloride, $BaCl_2$, as shown in the equation below.

Balance the equation. [1]

$$BaCO_3 + \square\ HCl \longrightarrow BaCl_2 + H_2O + CO_2$$

(ii) Calculate the percentage by mass of barium in barium carbonate, $BaCO_3$. [2]

A_r(Ba) = 137 A_r(C) = 12 A_r(O) = 16

Percentage by mass = ... %

Examiner only

(c) A sample of barium carbonate was found to contain two stable isotopes of carbon.

Carbon isotope	Percentage present in sample (%)
C-12	98.89
C-13	1.11

(i) State **one** similarity and **one** difference between the atomic structures of C-12 and C-13. [2]

Similarity…..……

…….....

Difference…….……..

…….....

(ii) Use the information in the table to calculate the relative atomic mass (A_r) of carbon.

Give your answer to **4 significant figures**. [2]

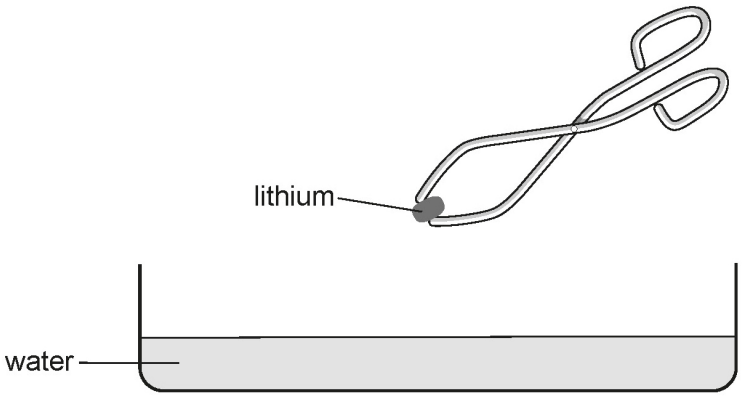
$$A_r = \frac{\text{(isotope 1 mass} \times \text{abundance)} + \text{(isotope 2 mass} \times \text{abundance)}}{100}$$

A_r = ...

8

Examiner only

7. A teacher investigated the reactivity of the group 1 metals using the equipment below.



(a) The teacher wore safety goggles and used tongs to add the group 1 metals to the water.

Give **one** other safety precaution the teacher should take. [1]

……

(b) The table below shows the diameter of the atoms of group 1 metals.

Element	Diameter of atom (nm)
lithium	0.304
sodium	0.372
potassium	0.454
rubidium	0.496

Describe the relationship between the diameter of the atoms and the reactivity of the group 1 metals. Explain this relationship. [3]

……

……

……

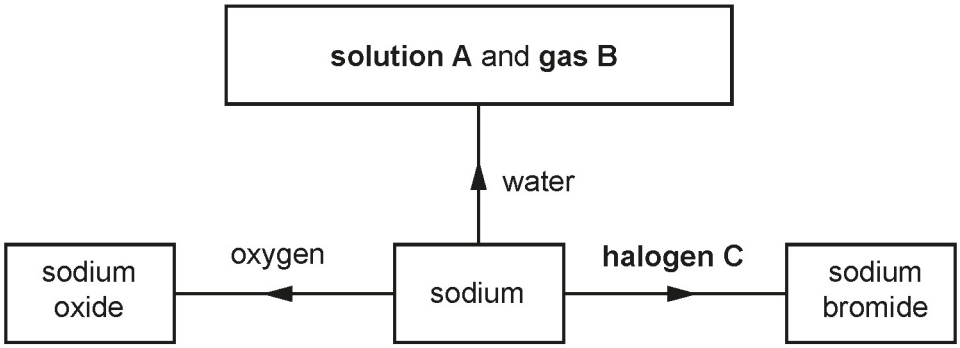
……

……

……

Examiner only

(c) The diagram shows some of the reactions of the group 1 metal sodium.



(i) Use the flow diagram to name the following chemicals. [2]

Solution **A** .....

Halogen **C** .....

(ii) Name gas **B** and describe a test that could be carried out to identify it. [2]

Gas **B** .....

Test …….....

.....

(d) Complete and balance the symbol equation that represents the reaction of potassium with chlorine. [2]

$2K + Cl_2 \longrightarrow$ ☐ .....

10

END OF PAPER

Question number	Additional page, if required. Write the question number(s) in the left-hand margin.
	…… ……

Examiner only

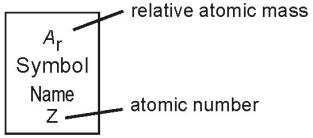
FORMULAE FOR SOME COMMON IONS

POSITIVE IONS		NEGATIVE IONS	
Name	**Formula**	**Name**	**Formula**
aluminium	Al^{3+}	bromide	Br^{-}
ammonium	NH_4^{+}	carbonate	CO_3^{2-}
barium	Ba^{2+}	chloride	Cl^{-}
calcium	Ca^{2+}	fluoride	F^{-}
copper(II)	Cu^{2+}	hydroxide	OH^{-}
hydrogen	H^{+}	iodide	I^{-}
iron(II)	Fe^{2+}	nitrate	NO_3^{-}
iron(III)	Fe^{3+}	oxide	O^{2-}
lithium	Li^{+}	sulfate	SO_4^{2-}
magnesium	Mg^{2+}		
nickel	Ni^{2+}		
potassium	K^{+}		
silver	Ag^{+}		
sodium	Na^{+}		
zinc	Zn^{2+}		

THE PERIODIC TABLE

Group 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
86 Rb Rubidium 37	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	99 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	179 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	210 Po Polonium 84	210 At Astatine 85	222 Rn Radon 86
223 Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89															

Key



THE SCIENCES (DOUBLE AWARD)
UNIT 2

Chemistry: Chemical Substances and How They Behave

HIGHER TIER

MARK SCHEME

Guidance for examiners

Generic marking principles

- Marks awarded are always whole marks (not half marks, or other fractions).
- Answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.
- Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
- Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Positive marking

It should be remembered that candidates are writing under examination conditions and credit should be given for what the candidate writes, rather than adopting the approach of penalising candidates for any omissions. It should be possible for a very good response to achieve full marks and a very poor one to achieve zero marks. Marks should not be deducted for a less than perfect answer if it satisfies the criteria of the mark scheme.

For questions that are objective or points-based, the mark scheme should be applied precisely. Marks should be awarded as indicated and no further subdivision made.

Mark schemes often list points which may be included in candidates' answers. The list is not exhaustive. The inclusion of *'Credit any other valid response.*' (or similar instruction) within mark schemes allows for the possible variation in candidates' responses. Credit will be given for correct and relevant alternative responses which are not recorded in the mark scheme. Credit should be given according to the accuracy and relevance of candidates' answers.

Appropriate terminology is reflected in exemplar responses in mark schemes. However, unless there is a specific requirement within a question, candidates may be awarded marks where the answer is accurate but expressed in their own words.

Marking abbreviations

The following may be used in marking schemes or in the marking of scripts to indicate reasons for the marks awarded.

ecf = error carried forward
bod = benefit of doubt

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Enquiry Skills
1.	(a)	award (1) for either of following it will run out there is a limited supply			1			1		
	(b)	(i)	I	both words needed for (1) mark … liquid …… gas / gaseous …		1		1		
			II	award (1) for either of following filtration evaporation		1		1		1
		(ii)		875 000 (2) if incorrect award (1) mark for either of following 175 $\left(\text{from } \frac{14\,000\,000}{80\,000}\right)$ 0.0625 $\left(\text{from } \frac{5000}{80\,000}\right)$ ecf possible		2		2	2	

Question		Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Enquiry Skills
	(c)	award (1) for any simple point and additional (1) for development of that point e.g. more land is covered by lakes ⇨ less land available for growing crops more land is dug up ⇨ reduces biodiversity more waste is created ⇨ contamination of water supply more dust in the air ⇨ causes respiratory problems credit any sensible suggestions			2	2		
		Question 1 total	**1**	**4**	**2**	**7**	**2**	**1**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Enquiry Skills
2.	(a)			burning fossil fuels increases CO_2 levels in atmosphere (1) more CO_2 in the atmosphere means more infrared radiation absorbed / less infrared radiation escapes (into space) accept 'heat' for infrared radiation (1) this warms the Earth's (lower) atmosphere (1)	2	1		3		
	(b)			240 tonnes (2) if incorrect award (1) for either of following 240 000 24		2		2	2	
	(c)	(i)		solid			1	1		1
		(ii)		melting			1	1		
				Question 2 total	**2**	**3**	**2**	**7**	**2**	**1**

<table>
<tr><th colspan="3" rowspan="2">Question</th><th rowspan="2">Marking details</th><th colspan="6">Marks available</th></tr>
<tr><th>AO1</th><th>AO2</th><th>AO3</th><th>Total</th><th>Maths</th><th>Enquiry Skills</th></tr>
<tr><td>3.</td><td>(a)</td><td>(i)</td><td>award (1) for any sensible answer e.g.

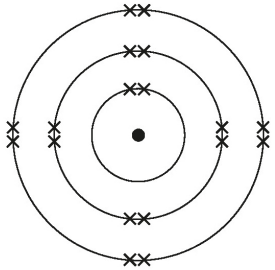
Thomson’s model includes electrons (but Dalton’s does not)
Thomson’s model refers to atoms being made up of different particles (when Dalton thought they could not be broken down to anything simpler)

difference can be by implication</td><td></td><td></td><td>1</td><td>1</td><td></td><td>1</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>award (1) for any sensible answer e.g.

Bohr’s model suggested that electrons exist in shells around the nucleus
Rutherford’s model did not suggest that electrons were arranged in any particular way

difference can be by implication</td><td></td><td></td><td>1</td><td>1</td><td></td><td>1</td></tr>
<tr><td></td><td>(b)</td><td>(i)</td><td>award (1) for each correct answer

<table>
<tr><th>Element</th><th>Atomic number</th><th>Mass number</th><th>Number of protons</th><th>Number of neutrons</th><th>Number of electrons</th></tr>
<tr><td>lithium</td><td>3</td><td>7</td><td>3</td><td>4</td><td>3</td></tr>
<tr><td>aluminium</td><td>13</td><td>27</td><td>13</td><td>14</td><td>13</td></tr>
<tr><td>argon</td><td>18</td><td>40</td><td>18</td><td>22</td><td>18</td></tr>
</table>
</td><td></td><td>2</td><td></td><td>2</td><td></td><td></td></tr>
</table>

		(ii)		1			1		
	(c)	element **A** has a full outer shell so it is in group 0 (1) element **A** has electrons in two shells so it is in period 2 (1) if no reference to element **A** specifically award (1) for the number of electrons in the outer shell gives the group number AND the number of shells containing electrons gives the period number			2		2		
			Question 3 total	**1**	**4**	**2**	**7**	**0**	**2**

Question			Marking details		Marks available					
					AO1	AO2	AO3	Total	Maths	Enquiry Skills
4.	(a)	(i)	$CaCO_3$			1		1		
		(ii)	the marble chips have all been used up / run out neutral answer – acid is in excess		1			1		
		(iii)	I	**B** – curve with steeper gradient than **A** levelling off at 60 cm^3 before 40 seconds			1	1		1
			II	**C** – curve with steeper gradient graph than **A** but rising to and levelling off at 120 cm^3			1	1		1
		(iv)	more (reacting) particles in the same volume / solution (1) do not award first mark if any reference to energy of particles award (1) for any of the following: • more collisions per second / per minute • more chance of collisions • higher frequency of collisions.		2			2		
	(b)	(i)	over temperature range 20-40°C catalyst **X** is more effective than catalyst **Y** (1) at 50°C both catalysts are equally effective (1) if neither mark credited, award (1) for catalyst **X** is more effective than catalyst **Y** (with no temperature reference)				2	2		2

		(ii)	award (2) for every 10°C increase in temperature halves the time taken to collect 50 cm^3 of oxygen award (1) for when temperature increases the time taken to collect 50 cm^3 of oxygen decreases		2		2		2
Question 4 total				**3**	**3**	**4**	**10**	**0**	**6**

Question			Marking details	Marks available					
				AO1	AO2	AO3	Total	Maths	Enquiry Skills
5.	(a)	(i)	0.09	1			1		
		(ii)	18		1		1	1	
	(b)	award (1) for any advantage more accurate results reduces uncertainty / percentage error neutral answer – more reliable results award (1) for any disadvantage takes longer to evaporate the water more energy needed to evaporate the water				2	2		1
	(c)	(i)	it contains dissolved ions but pure water contains water molecules only accept any sensible answer	1			1		
		(ii)	0.0015 mol (2) if incorrect award (1) for $\frac{34.5}{1000}$ / 0.0345		2		2	2	
Question 5 total				**2**	**3**	**2**	**7**	**3**	**1**

Question			Marking details	Marks available					
				AO1	AO2	AO3	Total	Maths	Enquiry Skills
6.	(a)		potassium chloride			1	1		1
	(b)	(i)	$BaCO_3 + \boxed{2} HCl \longrightarrow BaCl_2 + H_2O + CO_2$		1		1		
		(ii)	70 / 69.5 / 69.54 % (2) if incorrect award (1) for M_r 197 ecf possible from incorrect M_r value		2		2	2	
	(c)	(i)	award (1) for similarity both contain 6 protons / the same number of protons award (1) for difference C-12 contains 6 neutrons <u>and</u> C-13 contains 7 neutrons neutral answer – they contain different number of neutrons	1	1		2		
		(ii)	award (2) for correct answer to 4 sig figs 12.01 award (1) for 12 / 12.0 / 12.011 / 12.0111		2		2	2	
			Question 6 total	**1**	**6**	**1**	**8**	**4**	**1**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Enquiry Skills
7.	(a)			award (1) for any of following use a small piece of the metal use a safety screen use a large volume of water	1			1		
	(b)			reactivity increases as the diameter of the atom increases (1) as the diameter increases the outer electron becomes further from the nucleus / is attracted less strongly to the nucleus (1) so the outer electron is more easily lost (1)	2		1	3		1
	(c)	(i)		**A** ⇨ sodium hydroxide (1) accept NaOH **C** ⇨ bromine (1) accept Br_2 do not accept bromide		2		2		
		(ii)		gas **B** is hydrogen (1) accept H_2 do not accept H gives a squeaky pop with a lit splint (1)	1	1		2		
	(d)			**2 KCl** award (1) for correct formula award (1) for balancing only if correct formula given		2		2		
				Question 7 total	**4**	**5**	**1**	**10**	**0**	**1**

SUMMARY OF MARKS ALLOCATED TO ASSESSMENT OBJECTIVES

Question	AO1	AO2	AO3	TOTAL MARK	MATHS	Enquiry Skills
1	1	4	2	7	2	1
2	2	3	2	7	2	1
3	1	4	2	7	0	2
4	3	3	4	10	0	6
5	2	3	2	7	3	1
6	1	6	1	8	4	1
7	4	5	1	10	0	1
TOTAL	**14**	**28**	**14**	**56**	**11**	**13**