

Higher

GCSE

Chemistry B Twenty First Century Science

J258/03: Breadth in Chemistry (Higher Tier)

General Certificate of Secondary Education

Mark Scheme for June 2025

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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MARKING INSTRUCTIONS

PREPARATION FOR MARKING

RM ASSESSOR

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM Assessor Online Training: OCR Essential Guide to Marking*.
2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are available in RM Assessor
3. Log-in to RM Assessor and mark the **required number** of practice responses (“scripts”) and the **required number** of standardisation responses.

MARKING

1. Mark strictly to the mark scheme.
2. Marks awarded must relate directly to the marking criteria.
3. The schedule of dates is very important. It is essential that you meet the RM Assessor 50% and 100% (traditional 40% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.
4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone, email or via the RM Assessor messaging system.

5. **Crossed-Out Responses**

Where a candidate has crossed out a response and provided a clear alternative then the crossed-out response is not marked. Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed-out response where legible.

Rubric Error Responses – Optional Questions

Where candidates have a choice of question across a whole paper or a whole section and have provided more answers than required, then all responses are marked and the highest mark allowable within the rubric is given. Enter a mark for each question answered into RM Assessor, which will select the highest mark from those awarded. *(The underlying assumption is that the candidate has penalised themselves by attempting more questions than necessary in the time allowed.)*

Multiple-Choice Question Responses

When a multiple-choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate).

When a question requires candidates to select more than one option/multiple options, then local marking arrangements need to ensure consistency of approach.

Contradictory Responses

When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

Short Answer Questions (requiring only a list by way of a response, usually worth only one mark per response)

Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. *(The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.)*

Short Answer Questions (requiring a more developed response, worth two or more marks)

If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on a similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space).

Longer Answer Questions (requiring a developed response)

Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional judgement as to whether the second (or a subsequent) response is a 'new start' or simply a poorly expressed continuation of the first response.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there, then add the annotation 'SEEN' to confirm that the work has been seen and mark any responses using the annotations in section 11.
7. There is a NR (**No Response**) option. Award NR (No Response):
 - if there is nothing written at all in the answer space
 - OR if there is a comment which does not in any way relate to the question (e.g., 'can't do', 'don't know')
 - OR if there is a mark (e.g., a dash, a question mark) which is not an attempt at the question.

Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).

8. The RM Assessor **comments box** is used by your Team Leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**
9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. For answers marked by levels of response:

Read through the whole answer from start to finish, using the Level descriptors to help you decide whether it is a strong or weak answer. The indicative scientific content in the Guidance column indicates the expected parameters for candidates' answers, but be prepared to recognise and credit unexpected approaches where they show relevance. Using a 'best-fit' approach based on the skills and science content evidenced within the answer, first decide which set of level descriptors, Level 1, Level 2 or Level 3, best describes the overall quality of the answer.

Once the level is located, award the higher or lower mark:

The higher mark should be awarded where the level descriptor has been evidenced and all aspects of the communication statement (in *italics*) have been met.

The lower mark should be awarded where the level descriptor has been evidenced but aspects of the communication statement (in *italics*) are missing.

In summary:

The skills and science content determines the level.

The communication statement determines the mark within a level.

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11. Annotations available in RM Assessor

Annotation	Meaning
	Correct response
	Incorrect response
	Omission mark
	Benefit of doubt given
	Contradiction
	Rounding error
	Error in number of significant figures
	Error carried forward
	Level 1
	Level 2
	Level 3
	Benefit of doubt not given
	Noted but no credit given
	Ignore

12. Abbreviations, annotations and conventions used in the detailed Mark Scheme (to include abbreviations and subject-specific conventions).

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
✓	Separates marking points
DO NOT ALLOW	Answers which are not worthy of credit
IGNORE	Statements which are irrelevant
ALLOW	Answers that can be accepted
()	Words which are not essential to gain credit
—	Underlined words must be present in answer to score a mark
ECF	Error carried forward
AW	Alternative wording
ORA	Or reverse argument

13. Subject-specific Marking Instructions

INTRODUCTION

Your first task as an Examiner is to become thoroughly familiar with the material on which the examination depends. This material includes:

- the specification, especially the assessment objectives
- the question paper
- the mark scheme.

You should ensure that you have copies of these materials.

You should ensure also that you are familiar with the administrative procedures related to the marking process. These are set out in the OCR booklet **Instructions for Examiners**. If you are examining for the first time, please read carefully **Appendix 5 Introduction to Script Marking: Notes for New Examiners**.

Please ask for help or guidance whenever you need it. Your first point of contact is your Team Leader.

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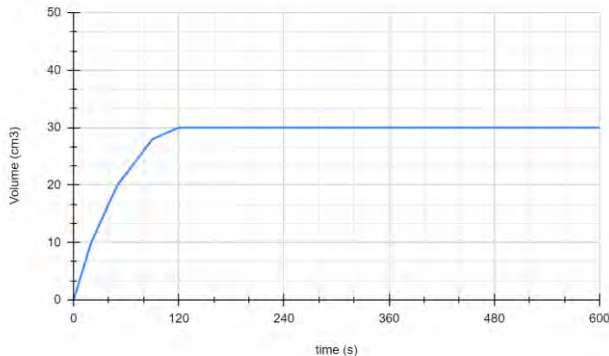
The breakdown of Assessment Objectives for GCSE (9-1) in Chemistry:

	Assessment Objective
AO1	Demonstrate knowledge and understanding of scientific ideas and scientific techniques and procedures.
AO1.1	Demonstrate knowledge and understanding of scientific ideas.
AO1.2	Demonstrate knowledge and understanding of scientific techniques and procedures.
AO2	Apply knowledge and understanding of scientific ideas and scientific enquiry, techniques and procedures.
AO2.1	Apply knowledge and understanding of scientific ideas.
AO2.2	Apply knowledge and understanding of scientific enquiry, techniques and procedures.
AO3	Analyse information and ideas to interpret and evaluate, make judgements and draw conclusions and develop and improve experimental procedures.
AO3.1	Analyse information and ideas to interpret and evaluate.
AO3.1a	Analyse information and ideas to interpret.
AO3.1b	Analyse information and ideas to evaluate.
AO3.2	Analyse information and ideas to make judgements and draw conclusions.
AO3.2a	Analyse information and ideas to make judgements.
AO3.2b	Analyse information and ideas to draw conclusions.
AO3.3	Analyse information and ideas to develop and improve experimental procedures.
AO3.3a	Analyse information and ideas to develop experimental procedures.
AO3.3b	Analyse information and ideas to improve experimental procedures.

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Question			Answer	Marks	AO element	Guidance
1	(a)		First check the answer on the answer line. If answer = 0.17 (cm³/s), award three marks. Volume after 120 s = 20 (cm³) ✓ Rate of reaction = vol/time, 20/120 (= 0.1666667) (cm³/s) ✓ Rate of reaction= 0.17 (cm³/s) ✓	3	2 x 2.2 1.2	IGNORE markings on the graph ALLOW 0.16 etc for MP2 ALLOW ECF for MP2: rate = change in volume / 120 DO NOT ALLOW final mark if not given to 2 d.p. ALLOW MP3 for clear evidence of incorrect answer correctly rounded to 2 decimal places.
	(b)	(i)	 Initial gradient steeper ✓ Curve goes flat before 300s at 30cm³ ✓	2	3.2a	MP1 ALLOW straight line MP2 Must be a curve MP2 allow flat line +/- 0.5 of a square

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Question			Answer	Marks	AO element	Guidance												
		(ii)	Higher/more surface area (to volume ratio) ✓ More frequent collisions / more collisions per unit time/ more collisions per second / higher rate of collisions / more particles or collisions have minimum activation energy ✓	2	2.1	ALLOW large surface area MP2 Must be comparative IGNORE atoms/molecules/ions IGNORE more chance of collisions / more successful/effective collisions / more collisions / faster collisions												
	(c)	(i)	Metal D✓ (because) fast(er) rate of reaction / less time AND can be recovered unchanged/ mass remains the same / has not been used up ✓	2	3.1b	Mark independently ALLOW faster reaction / speeds up the reaction / it is faster / faster time IGNORE comment A has same reaction time DO NOT ALLOW catalyst does not take part in the reaction/does not react/ 'is not used' alone												
		(ii)	<table><tr><td></td><td>True</td><td>False</td></tr><tr><td>A catalyst changes the overall energy change for a reaction.</td><td></td><td>✓</td></tr><tr><td>A catalyst lowers the activation energy of a reaction.</td><td>✓</td><td></td></tr><tr><td>A catalyst provides an alternative route for a reaction.</td><td>✓</td><td></td></tr></table> ✓✓		True	False	A catalyst changes the overall energy change for a reaction.		✓	A catalyst lowers the activation energy of a reaction.	✓		A catalyst provides an alternative route for a reaction.	✓		2	1.1	ALLOW 1 mark for 2 correct
	True	False																
A catalyst changes the overall energy change for a reaction.		✓																
A catalyst lowers the activation energy of a reaction.	✓																	
A catalyst provides an alternative route for a reaction.	✓																	

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Question			Answer	Marks	AO element	Guidance												
2	(a)		<table><tr><th>Particle</th><th>Relative Mass</th><th>Relative Charge</th></tr><tr><td>Proton</td><td>1</td><td>+1</td></tr><tr><td>Neutron</td><td>1</td><td>0</td></tr><tr><td>Electron</td><td>0.0005</td><td>- 1</td></tr></table> ✓✓	Particle	Relative Mass	Relative Charge	Proton	1	+1	Neutron	1	0	Electron	0.0005	- 1	2	1.1	ALLOW charge 'positive' / + / 1+ IGNORE '+' for mass of neutron All four correct = 2 marks Any 2 correct = 1 mark
Particle	Relative Mass	Relative Charge																
Proton	1	+1																
Neutron	1	0																
Electron	0.0005	- 1																
	(b)		Number of protons = 9 ✓ Number of neutrons = 10 ✓ Number of electrons = 9 ✓	3	2.1													
	(b)		First check the answer on the answer line. If answer = 1 x 10⁴ (m), award two marks. 2 x 10 ⁻¹ x 5 x 10 ⁴ / 10 x 10 ³ ✓ = 1 x 10 ⁴ ✓	2	2.1	ALLOW 10 ⁴ / 10 000 for MP1 ALLOW 1.0 x 10 ⁴ = 2 marks												

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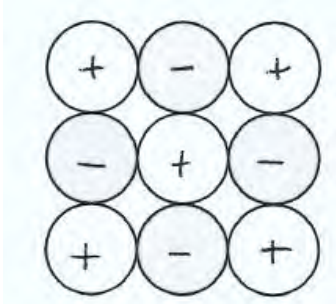
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Question			Answer	Marks	AO element	Guidance
3	(a)	(i)	O ₂ ✓ 2 ✓	2	2.1	ALLOW reasonable formula e.g. O ₂ DO NOT ALLOW O ²
		(ii)	Corrosion / oxidation ✓	1	1.1	IGNORE oxidation IGNORE corroding / oxidising
	(b)	(i)	zinc oxidises more readily/faster/instead/in preference to iron ✓ (because) zinc is more reactive/higher in the reactivity series than iron ✓	2	2.1	ALLOW AW for oxidises e.g. reacts/corrodes/loses electrons/forms a positive ion DO NOT ALLOW zinc rusts ALLOW reacts before/first.... IGNORE acts as a barrier IGNORE displacement
		(ii)	$\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$ ✓	1	1.1	
		(iii)	Reduction is gain of electrons OR reduction is loss of oxygen ✓	1	1.1	If both stated, both must be correct

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Question			Answer	Marks	AO element	Guidance
4	(a)	(i)	 positive and negative ions shown on circles ✓ alternating ✓	2	2.1	DO NOT ALLOW metal structure = 0 marks ALLOW 1 mark for both positive and negative charges present ALLOW K^+ and Br^- ions shown ALLOW 1+ and 1- DO NOT ALLOW MP1 if charges are shown as 2+, 3+ etc IGNORE arrangement of ions for MP1
		(ii)	It doesn't show the (position/arrangement of ions) in other layers / it is not to scale / does not show difference in sizes of the ions / not all ions are spheres / does not show which ion/element is which ✓	1	1.1	IGNORE It is not 3D IGNORE doesn't show the bonds DO NOT ALLOW atoms for ions IGNORE doesn't show electrons/protons/neutrons/nuclei

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		(iii)	<table><tr><td>A bromine atom gains an electron to form a positive ion.</td><td></td><td>✓</td></tr><tr><td>A potassium atom loses an electron to form a positive ion.</td><td>✓</td><td></td></tr><tr><td>Potassium bromide is held together by a sea of delocalized electrons.</td><td></td><td>✓</td></tr><tr><td>Strong electrostatic forces of attraction hold ions together.</td><td>✓</td><td></td></tr></table> ✓✓✓	A bromine atom gains an electron to form a positive ion.		✓	A potassium atom loses an electron to form a positive ion.	✓		Potassium bromide is held together by a sea of delocalized electrons.		✓	Strong electrostatic forces of attraction hold ions together.	✓		3	1.1	All 4 correct = 3 marks 3 correct = 2 marks 2 correct = 1 mark
A bromine atom gains an electron to form a positive ion.		✓																
A potassium atom loses an electron to form a positive ion.	✓																	
Potassium bromide is held together by a sea of delocalized electrons.		✓																
Strong electrostatic forces of attraction hold ions together.	✓																	
(b)		<table><tr><th>Property</th><th>Explanation</th></tr><tr><td>High melting point</td><td>Ions are arranged in a regular lattice.</td></tr><tr><td>Forms crystals</td><td>Ions are free to move.</td></tr><tr><td>Conducts electricity when molten</td><td>Oppositely charged ions are strongly attracted to each other.</td></tr></table> ✓✓	Property	Explanation	High melting point	Ions are arranged in a regular lattice.	Forms crystals	Ions are free to move.	Conducts electricity when molten	Oppositely charged ions are strongly attracted to each other.	2	1.1	All 3 correct = 2 marks 1 or 2 correct = 1 mark					
Property	Explanation																	
High melting point	Ions are arranged in a regular lattice.																	
Forms crystals	Ions are free to move.																	
Conducts electricity when molten	Oppositely charged ions are strongly attracted to each other.																	

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Question			Answer	Marks	AO element	Guidance
5	(a)	(i)	Reactivity increases down the group ✓	1	1.1	
		(ii)	Reaction Heated with chlorine Left in moist air Put in cold water Observation Burns with a bright yellow flame Fizzes Forms a white coating ✓✓	2	1.1	3 correct = 2 marks 1 or 2 correct = 1 mark
		(iii)	Caesium hydroxide ✓	1	2.1	ALLOW CsOH IGNORE + hydrogen DO NOT ALLOW any other additional products e.g. water
	(b)		Boiling point increases down the group ✓ forces between molecules/intermolecular forces become stronger (down the group) / fluorine has the weakest and iodine has the strongest intermolecular forces ✓ More energy is required to break/overcome these forces / more difficult to break / fluorine requires least energy and iodine requires the most energy to break the forces ✓	3	1 x 3.1a 2 x 2.1	Must be comparative IGNORE MORE imfs ALLOW MP2 bonds for forces DO NOT ALLOW MP2 for forces between atoms/elements/bonds DO NOT ALLOW MP2 for reference to covalent bonds breaking MP3 is independent of MP2 MP3 need idea of breaking forces

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	(c)	(i)	aqueous or gaseous chlorine/chlorine water AND aqueous potassium bromide ✓ Colour change (from yellow/green/colourless) to brown ✓	2	3.3a	ALLOW any named metal bromide other than silver, lead or mercury IGNORE liquid ALLOW red-brown / orange-brown / red-orange / orange / yellow IGNORE fumes/gas/liquid for MP2
		(ii)	(Wear) gloves / goggles/safety glasses / use a fume cupboard ✓	1	3.3a	IGNORE safety equipment/PPE IGNORE don't touch it / keep it away from skin etc.

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Question			Answer	Marks	AO element	Guidance
6	(a)	(i)	Solid particles (only) vibrate / particles have less <u>kinetic</u> energy ✓ Liquid particles move over each other / move but remain touching/close together ✓ in a solid arrangement is no longer random/irregular / is regular ✓	3	1.1	DO NOT ALLOW particles separate/spread out IGNORE move more / move around / vibrate more IGNORE liquid arrangement irregular alone ALLOW lattice / 'particles in rigid rows' for regular IGNORE all references to bonds and imfs IGNORE fixed arrangement
		(ii)	It assumes the particles are spheres / particles are the same size / does not show real size of particles / does not show bonds/forces between particles / does not show identity of particles e.g. molecules/atoms/ions / does not show structure of particles ✓	1	1.1	IGNORE movement/arrangement ALLOW does not show protons/neutrons/electrons for 'structure'

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Mark scheme

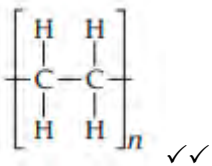
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	(b)	(i)	<table><thead><tr><th></th><th>True</th><th>False</th></tr></thead><tbody><tr><td>They absorb infrared radiation from the Earth.</td><td>✓</td><td></td></tr><tr><td>They come only from anthropogenic sources.</td><td></td><td>✓</td></tr><tr><td>They emit radiation in all directions.</td><td>✓</td><td></td></tr><tr><td>They prevent all radiation from the Sun passing through the atmosphere.</td><td></td><td>✓</td></tr></tbody></table> ✓✓✓		True	False	They absorb infrared radiation from the Earth.	✓		They come only from anthropogenic sources.		✓	They emit radiation in all directions.	✓		They prevent all radiation from the Sun passing through the atmosphere.		✓	3	1.1	All four correct = 3 marks. 3 correct = 2 marks 2 correct = 1 mark 1 correct = 0 marks
	True	False																			
They absorb infrared radiation from the Earth.	✓																				
They come only from anthropogenic sources.		✓																			
They emit radiation in all directions.	✓																				
They prevent all radiation from the Sun passing through the atmosphere.		✓																			
		(ii)	Any two from: extreme weather events / (more) hurricanes/tornadoes//monsoons / (more) flooding (due to rain) / droughts ✓ melting ice caps / rise in sea level ✓ more forest fires / wild fires ✓ crop failure / famine / loss of habitats / extinction / reduction in biodiversity ✓ coral bleaching / change to ocean currents (e.g. Gulf Stream slows) ✓	2	1.1	ALLOW more (severe) storms IGNORE natural disasters / alone but MAX 1 if tsunamis/earthquakes stated															

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Question			Answer	Marks	AO element	Guidance
7	(a)	(i)	 single bond between two carbons and continuation bonds ✓ rest of the diagram being correct ✓	2	2.1	IGNORE brackets and n
		(ii)	Polyethene ✓	1	2.1	ALLOW Polyethylene, polythene
	(b)		the double bonds break ✓ <u>many</u> monomers/small molecules join together (to form a chain) OR a <u>long</u> chain is formed ✓	2	1.1	ALLOW open for break IGNORE becomes a single bond ALLOW ethene/alkene for monomer

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(c)				3	1.1	All four correct = 3 marks 3 correct = 2 marks 2 correct = 1 mark 1 correct = 0 marks										
			<table><tr><th>True</th><th>False</th></tr><tr><td>✓</td><td></td></tr><tr><td>✓</td><td></td></tr><tr><td></td><td>✓</td></tr><tr><td></td><td>✓</td></tr></table>				True	False	✓		✓			✓		✓
		True	False													
		✓														
		✓														
			✓													
	✓															
Condensation polymers do not contain repeating units.	✓															
Condensation polymers form from monomers that contain two functional groups.	✓															
Some condensation polymers are hydrocarbons.		✓														
The polymer is the only product in a condensation polymerisation reaction.		✓														
			✓✓✓													

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Question			Answer	Marks	AO element	Guidance
8	(a)	(i)	First check the answer on the answer line. If answer = 0.119/0.12 award four marks. Mass of sodium bicarbonate = $200 - (150 + 40) = 10 \text{ g}$ ✓ RFM $\text{NaHCO}_3 = 84$ ✓ No. of moles = mass/ RFM OR correct substitution: $10/84$ ✓ No. of moles = 0.119 ✓	4	1 x 2.2 1 x 1.2 2 x 2.2	ALLOW ECF throughout e.g. on incorrect mass and/or incorrect RFM ALLOW 2 or more sig figs 0.12 / answers that round to 0.119
		(ii)	Any three from: The end mass is less than/smaller/different to start mass ✓ law of conservation of mass states that no mass is lost or gained during a chemical reaction / (total) mass of products = (total) mass of reactants ✓ The reaction takes place in an open vessel / not a closed system / flask is not sealed (e.g. bung) ✓ gas/carbon dioxide is lost/given off/escapes/leaves ✓	3	2.1	ALLOW mass cannot be created or destroyed IGNORE nothing is lost or gained IGNORE mass at the start should equal mass at the end for MP2 ALLOW lid/cover IGNORE gas is formed alone
	(b)	(i)	250g ✓ No gas is made / no gas is taken in / <u>all</u> products remain in the flask / products are an aqueous solution (and a liquid) ✓	2	3.2b	IGNORE no change in state IGNORE is a closed system
		(ii)	limiting ✓ excess ✓	2	1.2	

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Question			Answer	Marks	AO element	Guidance
9	(a)	(i)	Any three from: EITHER 1. dip wire in (concentrated hydrochloric) acid ✓ 2. dip wire into (solid) sample ✓ OR 3. dissolve sample (in water or ethanol) to make a solution / use a solution ✓ 4. soak/put splint in solution (of sample) ✓ THEN... put wire/splint into <u>blue</u> flame ✓ observe the flame <u>colour</u> and compare to known colours / each element has a <u>specific/unique</u> colour ✓	3	1.2	ALLOW sample = compound/solid/ions DO NOT ALLOW tongs/spatula etc (No MP1 or MP2) b ALLOW MP3 and MP4 Put a splint in a <u>solution</u> of the sample ALLOW MP4 Dip a splint in the (solid) sample = 1 mark IGNORE spray bottles/igniting ethanol directly (no MP4 but allow MP3) ALLOW roaring flame IGNORE identify the element from the colours
		(ii)	No yellow flame seen / sodium gives yellow flame ✓	1	2.2	ALLOW red-yellow / orange-yellow IGNORE sodium does not give a blue-green flame
		(iii)	Copper (ions) ✓	1	1.2	IGNORE named compounds ALLOW Cu / Cu ²⁺
	(b)		identifies variation / represents bulk (of sample) / all of sample / unbiased / represents range / can be generalised / results can be applied across a larger range ✓	1	1.1	IGNORE accurate/precise

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	(c)	(i)	The sample contains lithium because lines/spectrum match idea ✓ And some other/unknown elements/ions / it is a mixture ✓ some <u>lines</u> do not match / there are extra/additional lines ✓	3	3.1b	IGNORE it is a compound / it is impure ALLOW may contain other named ion e.g. may contain copper etc
		(ii)	Any two from: Sensitivity / (very) small amounts/low concentrations can be identified ✓ More than one ion can be identified (at the same time) ✓ Do not depend on (human) judgment/interpretation/not subjective idea /some elements give similar colours ✓ Speed / Faster ✓	2	1.2	ALLOW can be used to identify negative ions ALLOW some people are colour blind IGNORE safety IGNORE quantitative instead of qualitative

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Question			Answer	Marks	AO element	Guidance
10	(a)	(i)	NaCl ✓ H ₂ O ✓	2	2.2	DO NOT ALLOW NaCl / H ₂ O
		(ii)	Do a rough titration first / add acid slowly (near the end point) / measure dilute sodium hydroxide using a volumetric pipette / repeat until values agree/are concordant / swirl mixture / use a white tile ✓	1	3.3b	IGNORE repeat the experiment/ collect more data IGNORE add acid in a pipette ALLOW pH probe/pH meter
		(iii)	Repeat experiment without indicator / evaporate (the solution) ✓	1	2.2	IGNORE heat alone DO NOT ALLOW heat to dryness/all liquid removed IGNORE crystallisation/filtration DO NOT ALLOW distillation
	(b)	(i)	Strong acids have a pH <7 ✓ Strong acids ionise completely ✓	1	1.1	
		(ii)	pH 4 ✓	1	2.2	
	(c)		Any number > 25 s ✓ (Weak acids) do not fully ionise/dissociate / fewer hydrogen ions <u>are in solution</u> / have a lower concentration <u>of hydrogen ions</u> ✓	2	1 x 3.2b 1 x 1.2	ALLOW more ionised / ionises more but IGNORE more ionising

Need to get in touch?

If you ever have any questions about OCR qualifications or services (including administration, logistics and teaching) please feel free to get in touch with our customer support centre.

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