CAMBRIDGE
International Education

Cambridge IGCSE™ (9–1)

CHEMISTRY **0971 / 62**

Paper 6 Alternative to Practical **May/June 2026**

MARK SCHEME

Maximum Mark: 40

Published

This mark scheme contains the instructions and marking guidance that our examiners used to mark candidate responses for this component.

Before they start marking, examiners complete a standardisation process. They review a range of candidate responses and discuss the mark scheme in detail to agree which answers can and cannot be accepted. Examiners award marks where it is clear that candidate responses have met the requirements of the mark scheme. These requirements may vary between different components or different versions of the same component, depending on the exact requirements of the question and the candidate responses seen during the standardisation process.

Sometimes, our mark schemes may allow marks to be awarded to responses which contain elements that are factually incorrect or for content not covered by the syllabus. We do this in response to the demands of a specific question to support candidates and make sure that our assessments are fair. However, these allowances should not be used as a guide for teaching and learning.

We cannot discuss the mark scheme with schools, and we recommend that schools read the mark scheme together with the assessment material and the Principal Examiner Report for Teachers.

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General marking principles

All examiners must apply these marking principles when marking candidate responses.

1	Examiners must award marks for each response in line with: • the specific **content** defined in the mark scheme • the specific **skills** defined in the mark scheme or in the level descriptions • the **standard of response** required as exemplified by the standardisation scripts.
2	Examiners must award **whole marks** (not half marks, or other fractions).
3	Examiners must award marks **positively**. This means that: • marks are not deducted for errors or omissions • marks are awarded for correct / valid answers as defined in the mark scheme and also for **other valid answers** which go beyond the scope of the syllabus and mark scheme referring to your team leader as appropriate • the quality of spelling, punctuation and grammar are judged **only** when the mark scheme indicates that these features are **specifically assessed** in the question. However, the meaning of all responses must be unambiguous.
4	Examiners must **consistently** apply the requirements of the mark scheme and any rules for what to do when candidates have not followed instructions correctly.
5	Examiners must use the **full range of marks** defined in the mark scheme, unless limited by the quality of the candidate responses seen.
6	Examiners must award marks according to the mark scheme and **must not** award marks with grade thresholds or grade descriptions in mind.

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Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	<u>'List rule' guidance</u> For questions that require ***n*** responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards ***n***. • Incorrect responses should not be awarded credit but will still count towards ***n***. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non-contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

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6	<u>Calculation specific guidance</u> Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'. For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values. For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme. Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.
7	<u>Guidance for chemical equations</u> Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme. State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

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Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
^	information missing or insufficient for credit
BOD	benefit of doubt given
CON	contradiction in response, mark not awarded
✗	incorrect point or mark not awarded
●	key point attempted / working towards marking point / incomplete answer / response seen but not credited / blank page seen
ECF	error carried forward applied
I	incorrect or insufficient response, mark not awarded
NAQ	response has not answered question
NBOD	benefit of doubt was considered, but the response was decided to not be sufficiently close for benefit of doubt to be applied
R	incorrect point or mark not awarded
SEEN	blank page seen

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Annotation	Meaning
✔	correct point of mark awarded

Mark Scheme Abbreviations	
;	separates marking points
/	alternative responses for the same marking point
R	reject the response
A	allow/accept the response
I	ignore the response
CON	contradiction in response, no mark
ecf	error carried forward
ora	or reverse argument
AW	alternative wording
underline or **bold**	actual word given must be used by candidate (grammatical variants excepted)
( )	the word / phrase in brackets is not required but sets the context
max	indicates the maximum number of marks that can be given
MP / M	marking point

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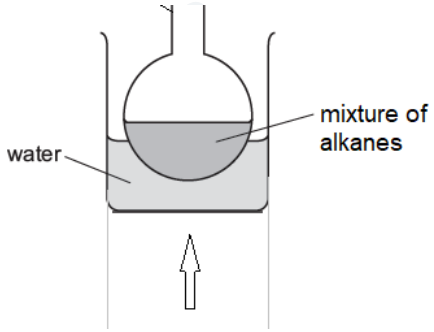
Question	Answer	Marks	Guidance
1(a)	**A** condenser	1	**Allow** condensing tube / jacket / condensator / condense tube **Ignore** Liebig / cooling tube / cooling jacket / delivery tube / distillation (tube) / water jacket / receiver If both correct but reversed, allow one mark
	B beaker	1	**Ignore** measuring / receiver **Reject** flask / trough / tub If both correct but reversed, allow one mark
1(b)(i)	arrow anywhere under the left-hand beaker  	1	**Allow** arrow that passes through the beaker to the flask / diagrams of any heating device in place of an arrow **Reject** arrows elsewhere on diagram unless clearly for the water flow so **Ignore** any arrow that is associated with a water inlet / outlet on the condenser
1(b)(ii)	alkanes / fractions / mixture is / are flammable	1	**Allow** flammable / inflammable alone **Allow** any specified alkane in mixture being flammable **Allow** a description of flammable / inflammable **Allow** (alkanes / hydrocarbons) may ignite / burn but **Ignore** apparatus burns **Ignore** too hot / explosions / maintaining a steady temperature **Ignore** volatile / to prevent evaporation **Ignore** apparatus breaking / cracking

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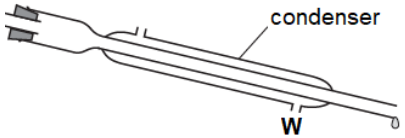
Question	Answer	Marks	Guidance
1(c)	**W** written by bottom inlet to condenser.  	**1**	**Reject** W written anywhere else on diagram, including inside the condenser.
1(d)	alkane: pentane **and** reason: lowest boiling point	**1**	**Allow** low / lower in place of lowest **Allow** lowest temperature
1(e)	**M1** undecane	**1**	**Allow** slips in spelling
	M2 boiling point over 100 °C / boils above boiling point of water / water boils at a lower temperature / temperature not high enough so will not reach its boiling point / water boils at 100 °C	**1**	M2 not awarded unless M1 correct **Ignore** high / highest boiling point / boiling point too high **Ignore** it is all that is left / everything else has evaporated

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Question	Answer	Marks	Guidance
2(a)	**M1** all ten liquid volumes correct (dilute ethanoic acid recorded as 10.0 or 10) and all five volumes of distilled water are correct (100, 90, 80, 70, 60)	1	ignore trailing zeros
	M2 all 5 measuring cylinder readings correct (10, 16, 27, 46, 82)	1	ignore trailing zeroes
	M3 volume of ethanoic acid all to 1dp, and volumes of water and gas collected all with no decimal places	1	
2(b)	**M1** y-axis scale in linear and points extend over half way up the *y*-axis scale	1	There must be a total of four ticks and crosses shown.
	M2 and M3 All points plotted correctly	2	All five corrects scores 2, any four correct scores 1. If scale non-linear then **Reject** points plotted in non-linear section.
	M4 best fit line	1	for correct points this should be a curve, for correct points line should pass with a small square of all points. **Reject** curves drawn as straight sections, individual curves between consecutive points, multiple lines (white visible in line).
2(c)(i)	**M1** (27 ÷ 75 =) 0.36 correct evaluation of volume of gas in experiment 3 ÷ 75	1	**Allow** 0.360 **Allow** ecf = gas volume in experiment 3 ÷ 75. if ecf answer is rounded then rounding must be correct, allow 2 sig figs or more, ignore missing trailing zeros.
	M2 cm^3 / s	1	standalone mark **Allow** $cm^3\ s^{-1}$ **Allow** alternatives for cm^3 such as 'ml' or 'cc' **Allow** secs / sec / seconds for s **Allow** units written as a fraction
2(c)(ii)	5	1	**Allow** the last one / 60 of water ecf on results if answer given is not 5

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Question	Answer	Marks	Guidance
2(d)	**M1** working shown on graph – construction from 77 on *x*-axis to line and from line to *y*-axis	1	minimum is a mark on the line or marks on BOTH axes
	M2 correct value	1	half small square tolerance. Allow ecf from incorrect volume on graph line but no ecf if working to random point on grid and not on the line.
	M3 units given as cm^3	1	standalone mark. Allow ml or cc
2(e)(i)	(10 cm^3 measuring cylinder is more) accurate	1	**Allow** precise / accuracy / (more) exact **Ignore** faster etc.
2(e)(ii)	**M1** advantage: (more) accurate	1	If comparison is made, then it must **not** be to 50 cm^3 measuring cylinder **Allow** accurate / (more) precise / (more) exact **Ignore** comments of speed / ease of use / adding dropwise **Ignore** comments on fixed volumes
2(f)(i)	(volume of gas is) smaller	1	**Allow** less / small / decreases **Allow** more if answer makes it clear that they are referring to when gas does not escape **Reject** comments on rate of reaction changing **Ignore** comments on time taken and accuracy
2(f)(ii)	**M1** experiment 5	1	**Allow** ecf from Table 2.1
	M2 fast(er) / makes gas (more) quickly	1	M2 is only awarded if M1 is correct **Allow** more gas made / produced / formed before stopper is put back M2 must relate to rate / speed of gas production **Ignore** makes most gas without reference to first few / 75 seconds / set time **Ignore** references to highest concentration

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Question	Answer	Marks	Guidance
2(g)	sketched line is at a higher volume (above) than the plotted line and does not meet plotted line at any point.	1	Does not need to be the same shape as the plotted line. No minimum range required

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Question	Answer	Marks	Guidance
3(a)	(solid **C** is) hydrated / (solid **C**) contains water (of crystallisation)	1	**Allow** water is given off / hydrous / hydrate / water evaporates **Ignore** 'water' alone / wet / moist / damp / water forms **Reject** comments on boiling point / solubility
3(b)	**M1** chromium(III) / Cr^{3+}	1	the name takes precedence over an incorrect formula **Allow** missing oxidation state **Reject** incorrect oxidation state
	M2 potassium / K^+	1	
	M3 sulfate / SO_4^{2-}	1	**[2]** incorrect formula but containing at least two correct ions $CrKSO_4$ **[1]** incorrect formula containing one correct ion $FeNaSO_4$ **[0]** Cr (not part of a formula) SO_4 (not part of a formula) K (not part of a formula) **Reject** any incorrect additional ions
3(c)	no change / no reaction / no precipitate	1	**Allow** no observations / nothing happens / colourless (solution) **Ignore** ammonia made / ammonia given off / bubbling **Reject** any answer that implies a change, such as 'becomes colourless'
3(d)	(damp) red litmus turns blue	1	**Ignore** any additional negative gas tests **Ignore** fizzing / bubbling / effervescence **Ignore** pungent gas **Reject** any additional positive gas tests

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Question	Answer	Marks	Guidance
3(e)	cream precipitate	1	**Allow** ppt / ppte **Ignore** solid / any changes on standing **Reject** any incorrect additional observations

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Question	Answer	Marks	Guidance
4	**reduction of solid method** Any 6 from: MP1 crush / grind ore / break into smaller pieces / powder MP2 using a suitable method e.g. pestle and / or mortar, hammer MP3 add more reactive element / reducing agent MP4 carbon / coke / iron / zinc / aluminium / magnesium / CO / hydrogen specified MP5 heat MP6 In a suitable container (e.g. crucible, evaporating basin) MP7 tin displaced / reduced / displacement reaction to make tin	6	**Ticks must show where marks are awarded, but not covering the answer so it cannot be read.** **Ignore** irrelevant washings, dryings, weighing, crystallisation, evaporation, effervescence etc **Allow** methods starting with tin oxide, **Reject** methods starting with tin, **Ignore** other tin compounds MP4 does not subsume MP3 **Allow** correct equation **Ignore** replaced for displaced

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Question	Answer	Marks	Guidance
4	**displacement from solution method** Any 6 from: MP1 crush / grind ore / break into smaller pieces / powder MP2 using a suitable method e.g. pestle and / or mortar, hammer MP3 add a (dilute) acid MP4 suitable strong acid named (e.g. HCl, H_2SO_4, HNO_3) MP5 add metal more reactive than tin MP6 name of metal added specified (e.g. iron, zinc, magnesium) MP7 tin displaced / tin reduced / displacement reaction to make tin **electrolysis of solution method** Any 6 from: MP1 crush / grind ore / break into smaller pieces / powder MP2 using a suitable method e.g. pestle and / or mortar, hammer MP3 add a (dilute) acid MP4 suitable strong acid named (e.g. HCl, H_2SO_4, HNO_3) MP5 electrolysis (of solution) MP6 specified inert material for electrodes (e.g. carbon, platinum) MP7 tin obtained at the negative electrode / cathode		**Allow** MPs 3 & 4 for 'dil HCℓ' etc but **Reject** concentrated acids **Ignore** weak acids, e.g. ethanoic (MP 3 awarded but not 4) A named more reactive metal does **not** subsume MP5 **Reject** Ca and above. **Allow** correct equation **Ignore** replaced for displaced **Allow** MPs 3 and 4 for 'dil HCℓ' etc. **Ignore** weak acids, e.g. ethanoic acid (MP 3 awarded but not 4) **Allow** description of electrolysis **Allow** correct cathode half equation

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Question	Answer	Marks	Guidance
4	**electrolysis of molten ore / oxide** Any 6 from: MP1 crush / grind ore / break into smaller pieces / powder MP2 using a suitable method e.g. pestle and / or mortar, hammer MP3 heat ore / oxide MP4 until molten MP5 electrolysis MP6 specified inert material for electrodes (e.g. carbon, platinum) MP7 tin obtained at the negative electrode / cathode		 **Allow** description of electrolysis **Allow** correct cathode half equation

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	reduction of solid	displacement from solution	electrolysis of solution	electrolysis of molten
MP1	crush / grind ore / break into smaller pieces / powder			
MP2	using a suitable method e.g. pestle and / or mortar, hammer			
MP3	add more reactive element / reducing agent	add (dilute) acid		heat ore / oxide
MP4	identified as carbon / coke / iron / zinc / aluminium / magnesium / hydrogen / carbon monoxide	suitable strong acid named		until molten
MP5	heat	add more reactive metal	electrolysis	
MP6	in crucible / evaporating basin	suitable more reactive metal identified (up to Mg in reactivity) does **not** subsume MP5	specified inert material for electrodes (e.g. carbon, platinum)	
MP7	tin displaced / reduced / displacement reaction to make tin / correct equation		tin forms at cathode / cathode half equation	

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