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CAMBRIDGE
International Education

Cambridge IGCSE™

CHEMISTRY **0620/61**

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.

This document consists of **16** printed pages.

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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 Calculation specific guidance

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 Guidance for chemical equations

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
	benefit of doubt given
	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
	error carried forward applied
	incorrect or insufficient response, mark not awarded
	response has not answered question
	benefit of doubt was considered, but the response was decided to not be sufficiently close for benefit of doubt to be applied
	incorrect point or mark not awarded
	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)(i)	**blue** solution forms / solid disappears	**1**	**Allow** liquid / solution becomes blue **Allow** dissolves for disappears / allow copper(II) carbonate / it for solid **Ignore** solid gets smaller (question states before copper(II) carbonate is in excess, so it will ALL react) **Ignore** blue without reference to solution / liquid **Ignore** fizzing / bubbles / effervescence / solid stops dissolving **Ignore** incorrect colour of solid / starting colour of solution / test for carbon dioxide / temperature changes **Reject** incorrect observations (such as wrong coloured solution / solid melting)
1(a)(ii)	so **all** of the acid reacts / to remove **all** of the acid from the solution / so no acid left / so all acid is neutralised	**1**	Note: 'it' = copper(II) carbonate **Allow** H^+ (ions) for acid **Ignore** so acid is limiting / to get a saturated solution / slips in name of acid **Ignore** comments about yield **Reject** so all substances react / all copper carbonate reacts
1(b)(i)	filtration	**1**	**Allow** filtering / filter / filtrate **Reject** sieving / decanting and any other incorrect names
1(b)(ii)	copper(II) carbonate / $CuCO_3$	**1**	Name takes precedence over any formula **Allow** $Cu(II)CO_3$ **Allow** cupper for copper **Ignore** case (upper or lower) of all letters as all same shape **Ignore** missing oxidation state **Reject** incorrect oxidation state / sulfuric acid
1(b)(iii)	funnel	**1**	**Ignore** filter / filtration / filter paper / filtrating tube **Reject** incorrect types of funnel (such as Buchner or separating)
1(c)(i)	<u>anhydrous</u> copper(II) sulfate	**1**	Name required, **Ignore** any formulae **Allow** 'unhydrous' or 'unhydrated' or 'dehydrated' for 'anhydrous' **Ignore** missing oxidation state **Reject** incorrect oxidation state

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Question	Answer	Marks	Guidance
1(c)(ii)	**M1** heat until half evaporated / heat until saturated / heat to point of crystallisation	1	**Allow** heat until half / most / some water gone / evaporated **Allow** 'warm' or 'boil' in place of 'heat' **Ignore** the container used **Ignore** heat to remove water / heat to evaporate water M2 not awarded unless some indication of heating the solution. If solution heated to dryness then score zero **Ignore** cool the crystals **Ignore** any washing / filtering / drying after M2 **Reject** drying before M2
	M2 (leave heated solution to) cool or leave heated solution to crystalise	1	An alternative to heating can still score both marks: **M1** Leave (in a warm place / on windowsill) **M2** so that (some) water evaporates (and crystals form) **M2** not awarded unless an indication of leaving the solution without direct heating evaporate is not the same as heating or leaving. Heating or leaving are something that that the candidate has to do. The idea of 'evaporate' is in the stem to **(c)** and so does not gain M1 or M2 alone **Ignore** any washing and drying

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Question	Answer	Marks	Guidance
2(a)	**M1** all five volumes of distilled water correct (1.0, 2.0, 4.0, 6.0, 8.0)	**1**	There must be a total of 5 ticks and crosses. **Ignore** missing trailing/additional zeros
	M2 and **M3** all lowest temperature readings are correct (-5.0, 0.5, 3.0, 5.0, 7.0)	**2**	5 correct scores 2, 4 correct scores 1 **Ignore** missing/additional trailing zeros (so accept 7 or 7.00 for 7.0, etc.) **Reject** 0 or 1 for 0.5
	M4 all five temperature decreases are correct (26.0, 20.5, 18.5, 16.5, 15.0)	**1**	ecf on lowest temperatures recorded **Ignore** missing/additional trailing zeros – so allow 26 for 26.0 **Ignore** sign in front of number
	M5 all water volumes, temperatures and temperature decreases recorded to 1 dp	**1**	**Reject** numbers such as 26 in place of 26.0

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Question	Answer	Marks	Guidance
2(b)	**M1** y-axis scale in linear and points take up over half available space on *y*-axis	**1**	**Allow** ecf on the data plotted Note that a scale of each large square = 5 or 4 will not score M1
	M2 and M3 All points plotted correctly	**2**	Allow ECF from Table All five correct scores 2, any four correct scores 1. If scale non-linear then no marks awarded for plotting of points in non-linear section. Half small square tolerance.
	M4 best fit line	**1**	Allow a best fit curve for the 5 points OR a best fit curve that treats the point at 2 as anomalous and ignores it OR a best fit straight line or slight curve that treats the point at 1 as anomalous and ignores it. Line must cover at least 1 cm^3 to 8 cm^3. **Ignore** any line to left of 1 **Reject** multiple lines (line with ANY white visible in middle of it), dot to dot curves, excessively wobbly/thick lines and sigmoidal sections.
2(c)	endothermic **and** **(because)** temperature decreases / gets cooler	**1**	**Allow** ecf from table **Allow** temperature decreases are positive **Allow** temperature of surroundings **Reject** temperature **changes** are positive **Ignore** comments about heat lost / gained (from surroundings) – the answer must use the data in Table 2.1 which shows a temperature decrease **Ignore** comments on trends in temperature decrease. So 'endothermic because the temperature decrease decreases as the volume gets larger' scores the mark as it is endothermic and there is a temperature decrease

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Question	Answer	Marks	Guidance
2(d)	**M1** working shown on graph – construction line up from 5.5 to line and horizontal to *y*-axis	**1**	minimum is a mark on the line or marks on BOTH axes. The construction line from 5.5 need to be in the correct place (± half small square) where it meets the graph line.
	M2 correct value from their graph	**1**	half small square tolerance from correct value from graph. Allow ecf from incorrect volume on graph line but no ecf if working to random point on grid and not on the line. Do not award M2 for reading in non-linear section of a non-linear scale.
2(e)	As volume of distilled water increases the temperature **decrease** becomes less	**1**	**Allow** ecf from Table 2.1 **Allow** 'change' for 'decrease' **Allow** inversely proportional / inverse relationship The relationship can be stated either way round (so **Allow** as temperature decrease decreases the volume increases) **Ignore** 'as the volume increases the temperature decreases' **Ignore** negative relationship / correlation **Ignore** relationships with the rate of temperature change – the time was not measured **Ignore** any attempted explanations **Reject** as volume of water increases temperature increases / (directly) proportional
2(f)(i)	**M1** (cotton wool is an) insulator	**1**	**Allow** poor (heat) conductor
	M2 prevents / reduces heat gain (from surroundings)	**1**	**Allow** reduces heat loss / less heat given off / no heat loss / traps heat **Allow** (thermal) energy in place of heat **Ignore** temperature loss / gain **Ignore** prevents temperature changing / keeps temperature constant **Ignore** comments about gas loss or splashing

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Question	Answer	Marks	Guidance
2(f)(ii)	keeps the mixture at room temperature / (there would be) no temperature change / prevents / reduces temperature decrease	1	**Allow** prevents / reduces temperature change **Allow** idea of not wanting a fixed / constant temperature **Allow** mixture **gains** energy from water bath / surroundings **Ignore** changes temperature / difficult to measure temperature **Reject** increases the temperature
2(g)	(the 10 cm^3 measuring cylinder is) more accurate	1	**Allow** opposite argument **Allow** accuracy alone **Allow** (more) accurate results **Allow** precision / precise / exact for accuracy **Ignore** comments on speed / time / reliability **Ignore** maximum volume is less than 10
2(h)	sketch line is below plotted line and lines do not meet	1	**Allow** any shape line No minimum range required

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Question	Answer	Marks	Guidance
3(a)	oxygen / O_2	1	name takes precedence over any formula **Ignore** writing in Table 3.1 **Reject** O as the formula
3(b)	**M1** iron(II) / Fe^{2+}	1	the name takes precedence over any formula but 'iron sulfate' with '$FeSO_4$' together will score both marks oxidation state required, **Ignore** 'iron' with no oxidation state
	M2 sulfate / SO_4^{2-}	1	**Allow** Fe(II)SO_4 or $FeSO_4$ as correct formula **[1]** incorrect formula but containing at least one correct ion e.g. Fe*Cl* = [1] e.g. $LiSO_4$ = [1] e.g. Fe_2SO_4 = [1] **[0]** Fe (not part of a formula) SO_4 (not part of a formula) **Reject** any additional incorrect ions **Ignore** aqueous
3(c)	**M1** white precipitate	1	**Allow** ppt / ppte **Ignore** solid **Reject** any other colour
	M2 (precipitate) remains / does not dissolve / insoluble / white precipitate in excess	1	'insoluble white ppt' scores M1 and M2 as long as not contradicted elsewhere **Allow** no change as long as suggestion of precipitate/solid in the first place **Allow** Soluble white precipitate for M1 only **Reject** any incorrect observation such as fizzing

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Question	Answer	Marks	Guidance
3(d)(i)	**M1** white precipitate	1	**Allow** ppt / ppte **Ignore** solid **Ignore** 'soluble' before precipitate for M1
	M2 dissolves / disappears / colourless solution	1	**Allow** ecf from incorrect precipitate colour to score **M2** there must be some indication of a solid having formed (such as ppt, cloudy, etc.) **Allow** 'soluble white ppt' for M1 and M2 **Allow** 'becomes clear' for M2 as long as there has been an indication of a ppt / solid / cloudy **Reject** any additional incorrect observations
3(d)(ii)	(damp) <u>red</u> litmus turns blue	1	**Ignore** positive hydrogen test / things that are not gas tests **Reject** incorrect observations (such as coloured) **Reject** any other positive gas test

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Question	Answer	Marks	Guidance
4	**any 6 from**	**max 6**	**Ignore** control with no oil / paint **Ignore** additional steps such as cleaning the nails or additional experiments such as those used to find conditions required for rusting.
	MP1 known / stated / measured / same mass of nails		**Allow** known / stated / same number / same amount of nails / 'a nail' as that suggests using 1 nail. **Ignore** volume of nails **Reject** nails that are already rusty
	MP2 (oiled / painted) nails placed in water in a suitable container		**Allow** flask / test-tube / boiling tube / beaker / evaporating basin **Allow** 'expose the nails to water and oxygen' in a suitable container **Ignore** how much water is used / 'leave nails outside' **Ignore** addition of things such as salt or acid or alkali to the water **Reject** addition of oil or paint to the water or adding water to a beaker containing oil or paint / placing a bung in the tube / sealing the tube
	MP3 leave for a stated suitable length of time		any time $\geqslant$ 1 hour **Allow** statements such as 'a few days' **Ignore** heating
	MP4 filter (out the rust / hydrated iron(III) oxide)		**Allow** filter out nails
	MP5 dry the rust / hydrated iron(III) oxide / residue		If method based on change in mass of nail then: **Allow** dry the nails for **MP5**
	MP6 find / measure mass of rust		**Allow** find / measure mass of nails for **MP6**

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Question	Answer	Marks	Guidance
4	**MP7** biggest mass of rust shows coating slows down rusting least / biggest mass shows most rust(ing) / least mass of rust shows slows rusting the most / least mass of rust shows least rusting / least mass of rust shows best coating		Use of mass in MP7 (even if incorrectly used to find a mass increase) subsumes MP6 and so MP6 is awarded) **Allow** Least rust means rusted slowest (no mass so no MP6) **Allow** biggest mass of nails has rusted least / smallest mass of nail has rusted most / biggest change in mass of nails means rusted most If candidates think mass of **nails** increases (question states rust drops off) then MP7 cannot be awarded Some responses suggest timing to see when rust starts rather than use a fixed time. This is impractical as it could take days. Max 5 MP1 as above method MP2 as above method MP3 observe until rust forms / rust falls from nail / orange or brown colour seen MP4 record / measure time (requires an appropriate observation in MP3) So time until rust forms scores MP3 and MP4) MP5 shorter time rusts fastest / shorter time is worse coating Max 5

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