CAMBRIDGE
International Education

Cambridge O Level

CHEMISTRY **5070/32**

Paper 3 Practical Test **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
✓	correct point or mark awarded
✗	incorrect point or mark not awarded
^	information missing or insufficient for credit
I	incorrect or insufficient point ignored while marking the rest of the response
CON	contradiction in response, mark not awarded
BOD	benefit of the doubt given
ECF	error carried forward applied
R	incorrect point or mark not awarded
RE	rounding error

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Annotation	Meaning
SEEN	point has been noted, but no credit has been given or blank page seen
SF	error in number of significant figures
✓ 1	correct awarding one mark from marking point or marking group 1. similar numbered ticks are used for marking point or marking groups 2, 3, 4 etc.
⬭	used to highlight part of the response
?	unclear response

Abbreviations used within Mark Scheme

Abbreviation	Meaning
ECF	error carried forward
ORA	Or reverse argument
CON	contradiction in response, mark not awarded

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Question	Answer	Marks	Guidance
1(a)(i)	**M1** Five times are recorded. **M2** The times increase down the column. **M3** All times to the nearest second	3	**M1** does not score if time is clearly in minutes rather than seconds e.g. 2:25:02 or 5 minutes or 5 mins but **ALLOW** 2:25
1(a)(ii)	Effervescence / bubbles / fizzing stops / **all** solid reacted / **all** solid disappears / no solid remains	1	**ALLOW** The black paper is visible / clearly seen (through the solution) **ALLOW** calcium carbonate for solid **IGNORE** solution turns colourless / gas production stops **REJECT** Black paper no longer visible / precipitate is formed
1(a)(iii)	**M1** both axes labelled with units **M2** A linear scale for time using at least half of the grid. **M3** Points plotted correctly within ± half a small square.	3	**M1 ALLOW** label for x-axis as volume / cm^3 or vol / cm^3 **ALLOW** minutes if shown in the table If axes labels are reversed but scales are correct then **M2** and **M3** can score. If axes labels and scales are reversed only **M3 can score** **M3 REJECT** if scale not linear **M3 ALLOW** if the line through the points even if the point is not visible
1(a)(iv)	Appropriate curve of best fit	1	**ALLOW** if reasonable point is assumed to be an anomaly and not on the line otherwise the line should have an even spread of points on either side **ALLOW** an S shaped curve if appropriate **REJECT** if curve goes below the lowest plotted point within ± half a small square **REJECT** multiple lines at any point on the curve **REJECT** point to point straight lines or curves

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Question	Answer	Marks	Guidance
1(a)(v)	Value recorded correctly to ± half a small square.	1	**ALLOW** correct value from any line of best fit they have drawn **REJECT** if nonlinear scale and value cannot be determined
1(b)	**Any two sources and linked improvement from:**	4	**IGNORE** making a mistake / doing it wrong / human error / repeat the experiment / stopwatch reaction time / mass of calcium carbonate / solid **IGNORE** where looking / not looking from the top / use of white paper (instead of black)
	Source: measuring volumes (of water and acid) Improvement: use pipette or burette instead (of measuring cylinder)		**ALLOW** measurement of a given volume e.g. 50 cm^3 / (using a) measuring cylinder / volume not precise for source mark **IGNORE the** volume of a substance on its own e.g. the volume of acid there must be some indication of measurement
	Source: judging when all solid has reacted / reaction has ended Improvement: collect and measure volume of gas produced instead of solid disappearing/place experiment on a balance / scale(s) (to tell when no further change in mass)		
	Source: clumping of solid in flask Improvement: stir / swirl / shake		**IGNORE** it isn't stirred for source but **ALLOW** stir / swirl / shake for improvement
	Source: Temperature variation Improvement: water bath / other method of ensuring constant temperatures		**ALLOW** insulate the flask for improvement
1(c)(i)	1.4 mol / dm^3	1	

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Question	Answer	Marks	Guidance
1(c)(ii)	**M1** the greater the concentration the greater the rate (ORA) **M2**.the less volume of acid used / the more water used the lower the concentration (ORA) **M3** the shorter the time the greater the rate (ORA)	3	**M1 ALLOW** (directly) proportional **M2 AND M3 IGNORE** comments about collision theory / number of collisions etc. **M2 AND M3 IGNORE** time taken decreases as volume of **A** increases as this is just a statement from the table **M2 ALLOW** rate decreases as volume of hydrochloric acid decreases **M3 ALLOW** time decreases as concentration increases **ALLOW** any valid conclusion which can be derived from their table of data

Question	Answer	Marks	Guidance
2(a)(i)	**M1** solid spitting out of tube **M2** keep flame moving / pointing tube away from people / wear safety goggles	2	**M1 IGNORE** tube breaking **M2 ALLOW** glass wool / cotton wool at the end of the tube **M2 IGNORE** gloves / burning hands / mask / other protective clothing / glasses on their own / eye protection **ALLOW M1** gas produced may be harmful / irritant / toxic **M2** well-ventilated room / use fume cupboard Goggles does not score if the hazard is toxic / harmful
2(a)(ii)	Bunsen (burner)	1	**ALLOW** spirit burner / spirit lamp / electric heater / heat mantle **IGNORE** water bath / burner on its own

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Question	Answer	Marks	Guidance
2(a)(iii)	**M1** (Solid / **B**) turns to liquid / dissolves. **M2** (Solid / **B**) changes (from pink / purple) to yellow. **M3** Steamy white fumes formed / colourless liquid formed (at mouth of tube)	**3**	**M1 ALLOW** melts / becomes aqueous **M2 ALLOW** turns yellow / brown / shades of brown **IGNORE** Orange **REJECT** Red **M3 ALLOW** condensation / water / steam forms (at neck of tube)
2(a)(iv)	**M1** (red litmus) turns blue **and (**blue litmus) does not change **M2** ammonia / NH_3 gas produced **M3** Solid contains ammonium ions / NH_4^+.	**3**	If **2(a)(iv)** does not have a description for litmus allow mark from **2(a)(iii)** **M1 ALLOW** (red litmus) turns blue **M1 DO NOT ALLOW** blue litmus changes **M1 REJECT** bleaches litmus **ALLOW M2** and **M3** even if **M1** wrong or no colour change with litmus **M2 ALLOW** Steam if no change to both litmus **M2 ALLOW** chlorine if **both** limus bleached **M3** cannot score from chlorine in **M2** **M3 ALLOW** contains water of crystallisation / hydrated if steam in **M2** **M3 REJECT** ammonium if steam for **M2**
2(b)(i)	Use universal indicator	**1**	**ALLOW** pH indicator / pH paper / pH test strip **IGNORE** pH chart / pH meter / pH stick / detector **REJECT** Methyl orange / litmus or any other named indicator

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Question	Answer	Marks	Guidance
2b(ii)	**M1** orange / yellow **M2** if orange in **M1** pH = 3 to 4 / if yellow in **M1** pH = 5 to 6	2	**M1 IGNORE** initial colour **ECF from 2(b)(i) ALLOW M1** (blue litmus) turns red **M1 REJECT** red / pink for universal indicator **M2 ALLOW** anywhere between 3–6 if colour is orange-yellow **M2 ECF** on other colours **M2 ALLOW** pH 3–6 if no colour given **M2** does not score unless Universal indicator used in **2(b)(i)** or **2(b)(i)** left blank
2(b)(iii)	**M1** red / brown / orange precipitate **M2** insoluble in excess **M3** iron(III) (ions) / Fe^{3+}	3	**M1** Red-brown does not score unless linked to precipitate / solid **REJECT** red or brown on their own **M2 ALLOW** (Precipitate) is unchanged/does not dissolve in excess **M2 ALLOW** independent of **M1** i.e. if wrong colour precipitate for **M1** then insoluble can score **M2,** if no precipitate mentioned then **M1** does not score but remains insoluble scores **M2** **IGNORE** iron on its own **M3 ECF** on **M1** and **M2**
2(b)(iv)	**M1** white precipitate formed with barium nitrate. **M2** sulfate ions / SO_4^{2-}	2	**M1 IGNORE** effervescence **M1 REJECT** Yellow precipitate. **M2 ALLOW** ECF for carbonate/CO_3^{2-} if there is effervescence and no precipitate in **M1** **M2 REJECT** sulfate if no white ppt in **M1**

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Question	Answer	Marks	Guidance
3	Apparatus • Uses a burette **and** pipette. Method **Any four from:** • Adds dilute hydrochloric acid to aqueous ammonia (ORA). • Suggests a named suitable indicator • The acid is added to the aqueous ammonia until indicator / it changes colour (ORA). • Takes an initial and final burette reading. • Repeats **and** takes an average (of concordant results) with **same sample** of ammonia **OR** adds acid dropwise **and** swirling / mixing / stirring. • Repeats with the other two samples of aqueous ammonia. Conclusion If acid is in the burette The cleaner which needs the highest volume of acid is the most effective/has the highest concentration (ORA). **OR** if ammonia is in the burette The cleaner which needs the lowest volume of ammonia is the most effective/has the highest concentration (ORA).	**6**	**ALLOW** Do an acid-base / acid-alkali titration / titrate acid against alkali / titrate acid against base / titrate hydrochloric acid against ammonia / titrate ammonia against hydrochloric acid. **ALLOW** Litmus **REJECT** Universal indicator If the colour changes are given, they must be correct for the chosen indicator **IGNORE** end point **ALLOW** records / calculates the volume of acid/ammonia used **IGNORE** adding acid/alkali slowly **DO NOT ALLOW** the repeat mark if it is only repeated without the indicator. Conclusion must be linked to volume / amount not just concentration

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