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Cambridge Assessment International Education

Cambridge International AS & A Level

CHEMISTRY **9701/37**

Paper 3 Advanced Practical Skills 1 **October/November 2025**

CONFIDENTIAL INSTRUCTIONS

This document gives details of how to prepare for and administer the practical exam.

The information in this document and the identity of any materials supplied by Cambridge International are confidential and must NOT reach candidates either directly or indirectly.

The supervisor must complete the report at the end of this document and return it with the scripts.

INSTRUCTIONS

- If you have any queries regarding these confidential instructions, contact Cambridge International stating the centre number, the syllabus and component number and the nature of the query.
  email info@cambridgeinternational.org
  phone +44 1223 553554

This document has **8** pages. Any blank pages are indicated.

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General information about practical exams

Centres must follow the guidance on science practical exams given in the *Cambridge Handbook*.

Safety

Supervisors must follow national and local regulations relating to safety and first aid.

Only those procedures described in the question paper should be attempted.

Supervisors must inform candidates that materials and apparatus used in the exam should be treated with caution. Suitable eye protection should be used where necessary.

The following hazard codes are used in these confidential instructions, where relevant:

C	corrosive	**MH**	moderate hazard
HH	health hazard	**T**	acutely toxic
F	flammable	**O**	oxidising
N	hazardous to the aquatic environment		

Hazard data sheets relating to substances used in this exam should be available from your chemical supplier.

Before the exam

- The packets containing the question papers must **not** be opened before the exam.
- It is assumed that standard school laboratory facilities, as indicated in the *Guide to Planning Practical Science*, will be available.
- Spare materials and apparatus for the tasks set must be available for candidates, if required.

During the exam

- It must be made clear to candidates at the start of the exam that they may request spare materials and apparatus for the tasks set.
- Where specified, the supervisor **must** perform the experiments and record the results as instructed. This must be done **out of sight** of the candidates, using the same materials and apparatus as the candidates.
- Any assistance provided to candidates must be recorded in the supervisor's report.
- If any materials or apparatus need to be replaced, for example, in the event of breakage or loss, this must be recorded in the supervisor's report.

After the exam

- The supervisor must complete a report for each practical session held and each laboratory used.
- Each packet of scripts returned to Cambridge International must contain the following items:
  - the scripts of the candidates specified on the bar code label provided
  - the supervisor's results relevant to these candidates
  - the supervisor's reports relevant to these candidates
  - seating plans for each practical session, referring to each candidate by candidate number
  - the attendance register.

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Specific information for this practical exam

During the exam, the supervisor (**not** the invigilator) must do all the experiments and record the results on a spare copy of the question paper, clearly labelled 'supervisor's results'.

If chemicals are prepared in more than one batch, clearly labelled supervisor's results must be provided for each batch. The candidates using each batch must be listed on the supervisor's report.

Apparatus

The apparatus listed must be provided to each candidate.

1 × 25 cm^3 pipette
1 × pipette filler
1 × 50 cm^3 burette
2 × 150 cm^3 or 250 cm^3 conical flask
1 × 25 cm^3 measuring cylinder
1 × burette stand and clamp
1 × 100 cm^3 beaker
1 × funnel (for filling burette)
1 × white tile
1 × thermometer (–10 °C to +110 °C at 1 °C)
1 × glass rod
1 × stop-clock to measure to an accuracy of 1 second
3 × teat/dropping pipette
1 × spatula
1 × crucible with lid (approximate capacity 15 cm^3)
1 × crucible tongs
1 × pipeclay triangle
1 × tripod
1 × gauze
1 × Bunsen burner
1 × heat-proof mat
1 × test-tube holder
8 × test-tube*
2 × hard-glass test-tubes
1 × test-tube rack
balance, single-pan, direct reading, minimum accuracy 0.01 g (1 per 8–12 candidates) weighing to 200 g
1 × wash bottle containing distilled water
1 × pen for labelling glassware
1 × funnel (for filtering)
1 × filter paper
paper towels
red and blue litmus papers
aluminium foil
wooden splints
the apparatus normally used in the centre for use with limewater in testing for carbon dioxide

* Candidates are expected to rinse and reuse test-tubes and boiling tubes where possible.
Additional test-tubes should be available.

Where balance provision is limited, some candidates should be instructed to start the exam with different questions.

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Materials

The materials listed in the table must be provided to each candidate. **Materials must be labelled only as specified in the 'label' column. The identities of chemicals labelled with letter codes, e.g. FA 1, may be different from their descriptions in the question paper. Candidates must use the descriptions given in the question paper. For example, candidates may be supplied with sulfuric acid, labelled as FA 1, but be told in the question paper that FA 1 is phosphoric acid.**

label	per candidate	identity	notes
FA 1	150 cm^3	0.0492 mol dm^{-3} ethanedioic acid OR sodium ethanedioate	Dissolve 6.20 g of $(COOH)_2 \cdot 2H_2O$ **[MH]** OR 6.59 g of $Na_2C_2O_4$ **[MH]** in each dm^3 of solution. Ethanedioic acid may be known as oxalic acid.
FA 2 [MH]	150 cm^3	0.0200 mol dm^{-3} acidified potassium manganate(VII)	Dissolve 3.16 g of $KMnO_4$ **[O][MH][HH][N]** in each dm^3 of 0.5 mol dm^{-3} H_2SO_4 **[MH]**. See also **FA 7**.
FA 3 [MH]	100 cm^3	1.00 mol dm^{-3} sulfuric acid	See preparation instructions in the current syllabus.
FA 4 [C][MH][N]	3.20 ± 0.20 g	hydrated zinc sulfate	Provide 3.20 ± 0.20 g $ZnSO_4 \cdot 7H_2O$ **[C][MH][N]** in a stoppered container.
FA 5	2.0 ± 0.1 g	hydrated magnesium sulfate	Provide 2.0 ± 0.1 g $MgSO_4 \cdot 7H_2O$ in a stoppered container.
FA 6 [O][MH][HH][N]	0.4 ± 0.1 g	potassium manganate(VII)	Provide 0.4 ± 0.1 g $KMnO_4$ **[O][MH][HH][N]** in a stoppered container.
FA 7 [MH]	10 cm^3	0.0200 mol dm^{-3} acidified potassium manganate(VII)	This is the same as **FA 2**.
FA 8	10 cm^3	0.10 mol dm^{-3} hydrated manganese(II) sulfate OR hydrated manganese(II) chloride	Dissolve 16.9 g of $MnSO_4 \cdot H_2O$ **[HH][N]** OR 19.8 g of $MnCl_2 \cdot 4H_2O$ **[MH]** in each dm^3 of solution. **Note:** $MnSO_4 \cdot H_2O$ needs agitation with water in order to dissolve.
FA 9 [MH]	2.0 ± 0.2 g	manganese(IV) oxide	Provide 2.0 ± 0.2 g MnO_2 **[MH]** in a stoppered container.
hydrogen peroxide	10 cm^3	10-vol hydrogen peroxide	Dilute 100 cm^3 100-vol H_2O_2 **[C]** or 500 cm^3 20-vol H_2O_2 **[MH]** to 1 dm^3.
aqueous iron(II) sulfate [MH]	10 cm^3	0.20 mol dm^{-3} iron(II) sulfate	Dissolve 55.6 g $FeSO_4 \cdot 7H_2O$ **[MH]** in each dm^3 of 1.0 mol dm^{-3} H_2SO_4 **[MH]**.

Compounds with water of crystallisation: any number of water molecules is acceptable, provided it is noted in the supervisor's report.

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label	per candidate	identity	notes
dilute hydrochloric acid	10 cm^3	2.0 mol dm^{-3} HCl	See preparation instructions in the current syllabus. If necessary, each of these reagents can be provided as a communal supply for groups of up to 6 candidates. Invigilators must be alert to the risk of contamination and the opportunity for malpractice when using a communal supply.
dilute nitric acid **[C]**	10 cm^3	2.0 mol dm^{-3} HNO_3	
dilute sulfuric acid **[MH]**	10 cm^3	1.0 mol dm^{-3} H_2SO_4	
aqueous ammonia **[C][MH][N]**	10 cm^3	2.0 mol dm^{-3} NH_3	
aqueous sodium hydroxide **[C]**	10 cm^3	2.0 mol dm^{-3} NaOH	
aqueous barium chloride or aqueous barium nitrate	10 cm^3	0.1 mol dm^{-3} BaCl_2 or 0.1 mol dm^{-3} $Ba(NO_3)_2$	
limewater **[MH]**	10 cm^3	saturated aqueous calcium hydroxide, $Ca(OH)_2$	
aqueous silver nitrate	10 cm^3	0.05 mol dm^{-3} $AgNO_3$	
acidified aqueous potassium manganate(VII) **[MH]**	10 cm^3	0.01 mol dm^{-3} $KMnO_4$ in 0.5 mol dm^{-3} H_2SO_4	

- An excess of at least 10% of each material must be prepared to cover accidental loss.
- All solutions must be thoroughly mixed.
- If you are unable to source any of these chemicals, you must contact Cambridge International as far as possible in advance of the exam for advice.

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Supervisor's report

Syllabus and component number | | | | | / | | |

Centre number | | | | | |

Centre name .....

Time of the practical session .....

Laboratory name/number .....

Give details of any difficulties experienced by the centre or by candidates (include the relevant candidate names and candidate numbers).

You must include:
- any difficulties experienced by the centre in the preparation of materials
- any difficulties experienced by candidates, e.g. due to faulty materials or apparatus
- any specific assistance given to candidates.

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[Turn over

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If chemicals have been prepared in more than one batch, list the candidates using each batch.

Declaration

1 Each packet that I am returning to Cambridge International contains all of the following items:
- the scripts of the candidates specified on the bar code label provided
- the supervisor's results relevant to these candidates
- the supervisor's reports relevant to these candidates
- seating plans for each practical session, referring to each candidate by candidate number
- the attendance register.

2 Where the practical exam has taken place in more than one practical session, I have clearly labelled the supervisor's results, supervisor's reports and seating plans with the time and laboratory name/number for each practical session.

3 I have included details of difficulties relating to each practical session experienced by the centre or by candidates.

4 I have reported any other adverse circumstances affecting candidates, e.g. illness, bereavement or temporary injury, directly to Cambridge International on a *special consideration form*.

Signed ..... (supervisor)

Name (in block capitals) .....

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