

www.papacambridge.com UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS General Certificate of Education Advanced Subsidiary Level and Advanced Level

CHEMISTRY

Advanced Practical Skills 1

CONFIDENTIAL INSTRUCTIONS

Great care should be taken to ensure that any confidential information given does not reach the candidates either directly or indirectly.

The Supervisor's attention is drawn to the form on page 7 which must be completed and returned with the scripts.

If you have any problems or queries regarding these Instructions, please contact CIE by e-mail: info@cie.org.uk, by phone: +44 1223 553554, by fax +44 1223 553558, stating the Centre number, the nature of the query and the syllabus number quoted above.

This document consists of 8 printed pages.



[Turn over

9701/35

May/June 2013

Safety

2

Supervisors are advised to remind candidates that all substances in the examination should be with caution.

www.papaCambridge.com Only those tests described in the question paper should be attempted. Please also see under 'Apparate on the use of pipette fillers, safety goggles and plastic gloves.

In accordance with COSHH (Control of Substances Hazardous to Health) Regulations, operative in the UK, a hazard appraisal of the examination has been carried out.

Attention is drawn in particular, to certain materials used in the examination. The following codes are used where relevant.

С corrosive substance

- highly flammable substance F.
- н harmful or irritating substance Т
 - 0 toxic substance Ν
- oxidising substance dangerous for the environment

The attention of Supervisors is drawn to any local regulations relating to safety and first-aid.

'Hazard Data Sheets', relating to materials used in this examination, should be available from your chemical supplier.

Before the Examination

1 Access to the question paper is NOT permitted in advance of the examination.

2 **Preparation of materials**

Where quantities are specified for each candidate, they are sufficient for the experiments described in the question paper to be completed.

In preparing materials, the bulk quantity for each substance should be increased by 25% as spare material should be available to cover accidental loss. More material may be supplied if requested by candidates, without penalty.

All solutions should be bulked and mixed thoroughly before use to ensure uniformity.

Every effort should be made to keep the concentrations accurate to within one part in two hundred of those specified.

Supervisors are asked to carry out any confirmatory tests given on page 4 to ensure the materials supplied are appropriate.

If the concentrations differ slightly from those specified, the Examiners will make the necessary allowance. They should be informed of the exact concentrations.

Labelling of materials 3

Materials must be labelled as specified in these Instructions. Materials with an FA code number should be so labelled without the identities being included on the label. Where appropriate the identity of an FA coded chemical is given in the guestion paper itself.

Identity of materials 4

It should be noted that descriptions of solutions given in the question paper may not correspond exactly with the specifications in these Instructions. The candidates must assume the descriptions given in the question paper.

Size of group 5

In view of the difficulty of the preparation of large quantities of solution of uniform concentration, it is recommended that the maximum number of candidates per group be 30 and that separate supplies of solutions be prepared for each group.

Apparatus

3

- 1 In addition to the fittings ordinarily contained in a chemical laboratory, the apparatus and n specified below will be necessary.
- www.papaCambridge.com 2 Pipette fillers (or equivalent safety devices), safety goggles and disposable gloves should be used where necessary.
- For each candidate 3
 - $1 \times 250 \, \text{cm}^3$ beaker
 - 1 × foamed plastic (polystyrene) cup
 - $1 \times 25 \, \text{cm}^3$ measuring cylinder
 - $1 \times$ thermometer $-10 \degree$ C to $+110 \degree$ C at $1 \degree$ C
 - $1 \times \text{stop clock}$ (stop watch) or sight of a clock with a seconds display
 - $1 \times glass rod$
 - $1 \times \text{test-tube holder}$
 - $9 \times test-tube^*$
 - $3 \times \text{boiling tube}^*$
 - $1 \times \text{test-tube rack}$
 - 2 × teat/dropping pipette
 - $1 \times Bunsen burner$
 - $1 \times heat proof mat$

access to a balance weighing to 1 decimal place or better wash bottle containing distilled water

paper towels

pen for labelling glassware

*Candidates are expected to rinse and re-use 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 examination with Question 2.

Chemicals Required

- It is especially important that great care is taken that the confidential information given below does not reach the candidates either directly or indirectly.
- 2 Particular requirements

hazard	label	per candidate	identity	notes (hazards given in this column are for the raw materials)
	FA 1	$2.5\pm0.1g$	anhydrous magnesium sulfate	2.5 \pm 0.1 g anhydrous magnesium sulfate 2.5 \pm 0.1 g freshly purchased MgSO ₄ supplied in a stoppered tube.
Check of used in a	on suitability of reaction of the section of the se	gent If the anl several hours	Check on suitability of reagent If the anhydrous magnesium sulfate is not freshly purchas used in an oven at 60 °C for several hours then cool in a desiccator or in stoppered bottles.	Check on suitability of reagent If the anhydrous magnesium sulfate is not freshly purchased, heat all the anhydrous magnesium sulfate to be used in an oven at 60 °C for several hours then cool in a desiccator or in stoppered bottles.
	FA 2	3.2 ±0.1 g	magnesium sulfate-7-water	3.2 ± 0.1 g MgSO ₄ .7H ₂ O supplied in a stoppered tube.
	FA 3	20 cm ³	0.10 mol dm ⁻³ chromium(III) chloride	Dissolve 26.7 g CrC l_3 .6 H_2 O [H] in each dm ³ of solution.
	FA 4	20 cm ³	0.20 mol dm ⁻³ diammonium iron(II) sulfate	Dissolve 78.4 g (NH ₄) ₂ Fe(SO ₄) ₂ .6H ₂ O [H] in 250 cm ³ 1.0 mol dm ⁻³ sulfuric acid [H] and make up to 1 dm ³ with distilled water.
[N] [T]	FA 5	20 cm ³	0.10 mol dm ⁻³ lead(II) nitrate	Dissolve 33.1 g Pb(NO $_3)_2$ [T] [N] in each dm 3 of solution.
	distilled water	100 cm ³	distilled water	





4

The reagents below should also be provided. Unless otherwise stated, each candidate should require no more than 10 cm³ of any of these reagents. If necessary, they may be made available from a communal supply: however, the attention of the Invigilators should be drawn to the fact that such an arrangement may lead to contamination of reagents and enhance the opportunity for malpractice between candidates. ო

[H] dilute hydrochloric acid [C] dilute nitric acid [H] aqueous ammonia [H] aqueous ammonia [H] aqueous ammonia [C] aqueous ammonia [H] aqueous ammonia [C] aqueous ammonia [H] 0.1 moldm ⁻¹ barium nitrate [H] acidified aqueous potassium [H]	[H] dilute hydrochloric acid [C] dilute nitric acid [H] dilute nitric acid [H] dilute nitric acid [H] aqueous ammonia [H] aqueous ammonia [O] aqueous ammonia [C] aqueous ammonia [O] aqueous anumonia [P] [D] [P] [D] [I] N] 0.1 moldm ⁻¹ barium nitrate [H] 0.1 moldm ⁻³ barium nit	Initial production and the hydrochloric acid Initial hydrochloric acid Initial production 30 cm ³ Initine 30 cm ³	hazard	label	quantity	notes
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H] [N] 0.05 mol dm ⁻³ silver nitrate T] [N] 0.1 mol dm ⁻³ lead(II) nitrate [H] 0.1 mol dm ⁻³ lead(II) nitrate [H] 0.1 mol dm ⁻³ lead(II) nitrate [T] [N] 0.1 mol dm ⁻³ lead(II) nitrate T] [N] 0.1 mol dm ⁻³ lead(II) nitrate T] [N] acidified aqueous potassium T] [N] acidified aqueous potassium Th following materials and apparatus should be available. Ed and blue litmus papers, plain filter paper strips for use with dichromate(VI), aluminium foil for testing nitrate/nitrite, wooden	HJ [N] 0.05 moldm ⁻³ silver nitrate TJ [N] 0.1 moldm ⁻³ lead(II) nitrate [H] 0.1 moldm ⁻³ lead(II) nitrate [H] nimewater [T] [N] acidified aqueous potassium TJ [N] acidified aqueous potassium TJ [N] acidified aqueous potassium Th following materials and apparatus should be available. Ed and blue litmus papers, plain filter paper strips for use with dichromate(VI), aluminium foil for testing nitrate/nitrite, wooden ipparatus normally used in the Centre for use with limewater in testing for carbon dioxide.	H) [N] 0.05 mol dm ⁻³ silver nitrate T) [N] 0.1 mol dm ⁻³ lead(II) nitrate [H] 0.1 mol dm ⁻³ lead(II) nitrate [H] 0.1 mol dm ⁻³ lead(II) nitrate [T] [N] 0.1 mol dm ⁻³ lead(II) nitrate T] [N] 0.1 mol dm ⁻³ lead(II) nitrate T] [N] acidified aqueous potassium dictorate(VI) T] [N] acidified aqueous potassium dictorate(VI) The following materials and apparatus should be available. The following materials and apparatus should be available. ed and blue littuus papers, plain filter paper strips for use with dichromate(VI), aluminium foil for testing nitrate/nitrite, wooden ipparatus normally used in the Centre for use with limewater in testing for carbon dioxide.	Ξ	0.1 mol dm ⁻³ barium chloride or 0.1 mol dm ⁻³ barium nitrate	See iden	tity details and preparation instructions on pages 68 and 69 of the 2013 syllabus.
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		oridge.co	red and apparati	blue litmus papers, plain filter pape us normally used in the Centre for u	r strips for u ise with lime	se with dichromate(VI), aluminium foil for testing nitrate/nitrite, wooden splints and the water in testing for carbon dioxide.

Responsibilities of the Supervisor during the Examination

www.papaCambridge.com 1 The Supervisor, or other competent chemist, must, out of sight of the candidates, carry experiments in Question 1 and complete tables of readings on a spare copy of the question which should be labelled 'Supervisor's Results'.

This should be done for:

each session held and each laboratory used in that session, and each set of solutions supplied.

N.B. The question paper cover requests the candidate to fill in details of the examination session and the laboratory used for the examination.

It is essential that each packet of scripts contains a copy of the applicable Supervisor's Results as the candidates' work cannot be assessed accurately without such information.

The Supervisor must complete the Report Form on page 7 to show which candidates attended 2 each session. If all candidates took the examination in one session, please indicate this on the Report Form. A copy of the Report Form must accompany each copy of the Supervisor's Results in order for the candidates' work to be assessed accurately.

The Supervisor must give details on page 8 of any particular difficulties experienced by a candidate, especially if the Examiner would be unable to discover this from the written answers.

After the Examination

Each envelope returned to Cambridge must contain the following items.

- 1 The scripts of those candidates specified on the bar code label provided.
- 2 A copy of the Supervisor's Results relevant to the candidates in 1.
- 3 A copy of the Report Form, including details of any difficulties experienced by candidates (see pages 7 and 8).
- The Attendance Register. 4

5 A Seating Plan for each session/laboratory.

Failure to provide appropriate documentation in each envelope may cause candidates to be penalised.

COLOUR BLINDNESS

With regard to colour blindness – a minor handicap, relatively common in males – it is permissible to advise candidates who request assistance on colours of, for example, precipitates and solutions (especially titration end-points). Please include with the scripts a note of the candidate numbers of such candidates.

Experience suggests that candidates who are red/green colour-blind – the most common form – do not generally have significant difficulty. Reporting such cases with the scripts removes the need for a 'Special Consideration' application for this handicap.

•	7 REPORT FORM is form must be completed and sent to the Examiner in the envelope with the scripts. entre number
	7 · · · Papac
	REPORT FORM
Th	is form must be completed and sent to the Examiner in the envelope with the scripts.
Ce	entre number Name of Centre
1	Supervisor's Results
	Please submit details of the readings obtained in Question 1 on a spare copy of the question paper clearly marked 'Supervisor's Results' and showing the Centre number and appropriate session/laboratory number.
2	The candidate numbers of candidates attending each session were:
	First Session Second Session

- **3** The Supervisor is required to give details overleaf of any difficulties experienced by particular candidates, giving names and candidate numbers. These should include reference to:
 - (a) any general difficulties encountered in making preparation;
 - (b) difficulties due to faulty apparatus or materials;
 - (c) accidents to apparatus or materials;
 - (d) assistance with respect to colour blindness.

Other cases of hardship, e.g. illness, temporary disability, should be reported direct to CIE on the normal 'Application for Special Consideration' form.

4 A plan of work benches, giving details by candidate numbers of the places occupied by the candidates for each experiment for each session, must be enclosed with the scripts.

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Report on any difficulties experienced by candidates.

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