Cambridge International AS & A Level

Cambridge International Examinations
Cambridge International Advanced Subsidiary and Advanced Level

CHEMISTRY **9701/36**

Paper 3 Advanced Practical Skills 2 **October/November 2017**

CONFIDENTIAL INSTRUCTIONS

1360697506

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 queries regarding these Confidential Instructions, please contact Cambridge stating the Centre number, the nature of the query and the syllabus number quoted above.

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This document consists of **8** printed pages.

CAMBRIDGE International Examinations

Safety

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

Only those tests described in the Question Paper should be attempted.

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. The following codes are used where relevant.

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

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

Hazard data sheets should be available from your chemical suppliers.

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.

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

3 Labelling of materials

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

4 Identity of materials

It should be noted that descriptions of materials given in the Question Paper may not correspond with the specifications in these Confidential Instructions. **The candidates must assume the descriptions given in the Question Paper.**

5 Size of group

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

1 In addition to the fittings ordinarily contained in a chemical laboratory, the apparatus and materials specified below will be necessary.

2 Pipette fillers (or equivalent safety devices), suitable eye protection and disposable gloves should be used where necessary.

3 *For each candidate*

1 × 25 cm^3 pipette
1 × funnel (for filling burette)
1 × white tile
2 × burette stand and clamp
1 × thermometer (–10 °C to +110 °C at 1 °C)
2 × 50 cm^3 burette
1 × 50 cm^3 measuring cylinder
2 × 150 cm^3 or 250 cm^3 conical flask
1 × Bunsen burner
1 × heatproof mat
1 × tripod and gauze
1 × test-tube holder
8 × test-tube*
1 × hard-glass test-tube
1 × test-tube rack
4 × teat / dropping pipette
1 × spatula
1 × wash bottle containing distilled water
1 × pen (for labelling glassware)
paper towels

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

[Turn over

Chemicals required

1 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 It should be noted that descriptions of substances given in the question paper may not correspond with the specifications in these Confidential Instructions.

3 Particular requirements

hazard	label	per candidate	identity	notes (hazards given in this column are for the raw materials)
	FB 1	200 cm^3	solution that contains 0.0200 mol dm^{-3} ethanedioic acid and 0.0300 mol dm^{-3} sodium ethanedioate	Dissolve 2.52 g of $(COOH)_2.2H_2O$ **[MH]** and 4.02 g $(COONa)_2$ **[MH]** in each dm^3 of solution.
	FB 2	150 cm^3	0.0200 mol dm^{-3} potassium manganate(VII)	Dissolve 3.16 g of $KMnO_4$ **[O] [MH] [N]** in each dm^3 of solution.
[MH]	**FB 3**	150 cm^3	1.00 mol dm^{-3} sulfuric acid	See preparation instructions in the current syllabus.
	FB 4	120 cm^3	0.0400 mol dm^{-3} sodium hydroxide	Dissolve 1.60 g of NaOH **[C]** in each dm^3 of solution.
[F][MH] [HH]	**thymol blue indicator**	5 cm^3	thymol blue indicator	See preparation instructions in the current syllabus.
	FB 5	10 cm^3	0.2 mol dm^{-3} manganese(II) chloride	Dissolve 25.2 g of $MnCl_2$ **[MH]** or 39.6 g of $MnCl_2.4H_2O$ **[MH]** in each dm^3 of solution.
	FB 6	10 cm^3	0.2 mol dm^{-3} iron(II) ammonium sulfate	Dissolve 78.4 g of $Fe(NH_4)_2(SO_4)_2.6H_2O$ **[MH]** in each dm^3 of solution.
	FB 7	10 cm^3	0.02 mol dm^{-3} potassium manganate(VII)	See preparation instructions for **FB 2**.
[O] [MH] [N]	**FB 8**	0.4–0.5 g	potassium manganate(VII)	0.4 g–0.5 g of $KMnO_4$ **[O] [MH] [N]** provided in a stoppered container.
	aqueous starch	5 cm^3	starch solution	See preparation instructions for starch indicator in the current syllabus.
	hydrogen peroxide	5 cm^3	5 'vol' hydrogen peroxide	Dilute 50 cm^3 of 100 'vol' H_2O_2 **[C]** to make 1 dm^3.
	potassium iodide	5 cm^3	0.1 mol dm^{-3} potassium iodide	See preparation instructions in the current syllabus.

4 The reagents below should also be provided. Unless otherwise stated, each candidate should require no more than 10 cm^3 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.

hazard	label	notes
	dilute hydrochloric acid	**See identity details and preparation instructions in the current syllabus.**
[C]	**dilute nitric acid**	
[MH]	**dilute sulfuric acid**	
[C] **[MH]** **[N]**	**aqueous ammonia**	
[C]	**aqueous sodium hydroxide**	
	0.1 mol dm^{-3} barium chloride **or** **0.1 mol dm^{-3} barium nitrate**	
[N]	**0.05 mol dm^{-3} silver nitrate**	
[MH]	**limewater**	
[MH]	**acidified aqueous potassium manganate(VII)**	

5 The following materials and apparatus should be available.

red and blue litmus papers, aluminium foil for testing nitrate/nitrite, wooden splints and the apparatus normally used in the Centre for use with limewater in testing for carbon dioxide

Responsibilities of the Supervisor during the examination

1 The Supervisor, or other competent chemist, **must, out of sight of the candidates, carry out the experiments in Question 1(a)** and **Question 1(e)** and complete tables of readings on a spare copy of the Question Paper. This should be labelled 'Supervisor's Results' and show the Centre number and appropriate session / laboratory number.

This should be done for **each session** held and **each laboratory** used in that session, and **each batch** of solutions supplied.

N.B. The Question Paper front 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.

2 The Supervisor must complete the Supervisor's Report on page 7 to show which candidates attended each session. If all candidates took the examination in one session, please indicate this on the Supervisor's Report. A copy of the Supervisor's Report 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 barcode label provided.

2 A copy of the Supervisor's Results relevant to the candidates in **1**.

3 A copy of the Supervisor's Report, including details of any difficulties experienced by candidates (see pages 7 and 8).

4 The Attendance Register.

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 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 Form.

SUPERVISOR'S REPORT

This form must be completed and returned in the envelope with the scripts, the Supervisor's Results, the Attendance Register and the Seating Plan.

Centre number ..... Name of Centre .....

The candidate numbers of candidates attending each session were:

first session	*second session*

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:

- any general difficulties encountered in preparation of materials;
- difficulties due to faulty apparatus or materials;
- accidents to apparatus or materials;
- assistance with respect to colour blindness.

Other cases of hardship, e.g. illness, temporary disability, should be reported directly to Cambridge on the Special Consideration Form.

[Turn over

Report on any difficulties experienced by candidates.

Declaration (to be signed by the Supervisor)

The preparation of this practical examination has been carried out so as to maintain fully the security of the examination.

Signed .....

Name (in block capitals) ..... (Supervisor)