

CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

CHEMISTRY

5070/03

Paper 3 Practical Test
CONFIDENTIAL INSTRUCTIONS

May/June 2003

1 hour 30 minutes

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

INSTRUCTIONS TO SUPERVISORS

Teachers responsible for the examination are **NOT** allowed to consult the question paper before the day of the examination. However, they are asked to carry out a titration between solutions **P** and **Q** to ensure that the concentrations of the two solutions fall within the range given on page 2.

On the day of the examination, the Supervisor is asked to perform the experiments in **Questions 1 and 2** and to record the results on a spare copy of the question paper clearly labelled 'Supervisor's Results', followed by the number of the Centre. This must be enclosed with the scripts. **Unless this is done, candidates may be unavoidably penalised.**

It is essential that candidates accept the descriptions of the solutions as they appear in the question paper.

If candidates from more than one Centre are taking the examination, it is **essential** that a copy of the Supervisor's Results should be sent with the scripts for each Centre.

If you have any problems or queries regarding these Instructions, please contact CIE

by e-mail: International@ucles.org.uk,

by phone: +44 1223 553554,

by fax: +44 1223 553558,

stating the nature of the query and the syllabus number quoted above.

This document consists of 5 printed pages and 3 blank pages.



For Question 1

Candidates will require the following.

- (a) A solution of acidified hydrogen peroxide, labelled **P**. This solution may be prepared by diluting 500 cm³ of a **fresh sample** of '20-volume' hydrogen peroxide with 0.5 mol/dm³ sulphuric acid until the final volume is 1.0 dm³.

Allow each candidate approximately 30 cm³.

- (b) A solution of 0.05 mol/dm³ aqueous hydrogen peroxide, labelled **Q**. This solution may be prepared by diluting 28 cm³ of a **fresh sample** of '20-volume' hydrogen peroxide with 0.5 mol/dm³ sulphuric acid until the final volume is 1.0 dm³.

Allow each candidate approximately 150 cm³.

- (c) A solution of 0.020 mol/dm³ potassium manganate(VII) (3.2 g KMnO₄ dissolved in 1 dm³ of distilled water), labelled **R**.

Allow each candidate approximately 150 cm³.

'Pipette a 25.0 cm³ portion of **Q** into a flask and titrate with **R**. At first the purple colour disappears rapidly. As the titration proceeds, this disappearance is less rapid. At the end-point, one drop of **R** produces a pink colour that does not disappear on swirling.'

Note: Some variation in the above concentrations is acceptable but it is **essential** that 25.0 cm³ of **Q** reacts with between 23.0 cm³ and 27.0 cm³ of **R** (or 20.0 cm³ of **Q** reacts with between 18.0 cm³ and 22.0 cm³ of **R**).

The following apparatus should be provided for each candidate;

a 50 cm³ burette;

a 25 cm³ (or 20 cm³) pipette;

a flask or other suitable vessel for titration.

All candidates at a Centre should have pipettes of the same capacity.

For Question 2

Each candidate will require the following.

A solution containing 50 g of hydrated zinc sulphate, $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$, dissolved in 1 dm^3 of distilled water, labelled **T**.

Allow each candidate approximately 30 cm^3 .

For both Questions

Candidates will require the following.

(a) Access to

- (i) approximately 0.1 mol/dm^3 potassium dichromate(VI),
- (ii) approximately 0.20 mol/dm^3 potassium iodide,
- (iii) approximately 0.20 mol/dm^3 aqueous iron(II) sulphate (a small volume of dilute sulphuric acid should be added to this solution to prevent hydrolysis),
- (iv) approximately 1.0 mol/dm^3 aqueous sodium hydroxide,
- (v) solid manganese(IV) oxide labelled **S**,
- (vi) approximately 1.0 mol/dm^3 aqueous ammonia,
- (vii) approximately 0.05 mol/dm^3 aqueous silver nitrate,
- (viii) approximately 1.0 mol/dm^3 nitric acid,
- (ix) approximately 0.2 mol/dm^3 aqueous barium nitrate (or approximately 0.2 mol/dm^3 aqueous barium chloride, labelled 'barium nitrate'),
- (x) the usual reagents needed to test for the gases mentioned in the syllabus, including limewater, approximately 0.1 mol/dm^3 aqueous potassium dichromate(VI), $\text{K}_2\text{Cr}_2\text{O}_7$, red and blue litmus paper or Universal Indicator paper, splints.

(b) A supply of test-tubes, approximately $125 \text{ mm} \times 16 \text{ mm}$.

(c) A stirring rod.

In both questions, more material may be issued without penalty but this should not be necessary.

It is advisable to issue candidates with a pipette filler (or equivalent safety device) and safety goggles.

The standard Report Form to be included with the scripts is given on pages 7 and 8. Please detach and enclose it with the scripts in the normal way.

See also the side lined notes on pages 1, 7 and 8.

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This form must be completed and returned in the envelope with the scripts.

REPORT ON PRACTICAL CHEMISTRY

ORDINARY LEVEL, JUNE 2003

1 (a) Supervisor's results

Supervisors must use a spare copy of the question paper to report their results for **Q.1 and Q.2** and enclose this copy of the question paper with the candidates' answers. This copy of the question paper should be clearly labelled 'Supervisor's Results'. Failure to enclose these results and this report form may lead to candidates being unavoidably penalised.

|| If candidates from more than one Centre are taking the examination, it is **essential** that a copy of the 'Supervisor's Results' should be sent with the scripts from **each Centre**. At larger centres where scripts are to be despatched in more than one envelope, it is essential that a copy of the Supervisor's Results is enclosed in each envelope. ||

(b) The index number of the candidates in each session were as follows.

First session

Second session

- 2 The Supervisor is invited to report details of any difficulties experienced by candidates, giving names and index numbers.

This report should include reference to:

- (a) any general difficulties encountered in making preparation;
- (b) difficulties due to faulty apparatus or material;
- (c) accidents to apparatus or materials.

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

NAME OF CENTRE

SIGNED

Supervisor

CENTRE NUMBER

|| If the candidates' Centre number is different from the number of the Centre at which the examination was taken, the Supervisor should write **both Centre numbers in the space provided.** ||

Declaration (to be signed by the Principal).

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)