UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
Joint Examination for the School Certificate
and General Certificate of Education Ordinary Level

CHEMISTRY **5070/03**

Paper 3 Practical Test

October/November 2004

CONFIDENTIAL INSTRUCTIONS

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 to ensure that the concentrations of the two solutions fall within the given range 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 on 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 0.0166 mol/dm^3 aqueous sodium iodate(V), $NaIO_3$, (3.3 g of $NaIO_3$ dissolved in 1 dm^3 of distilled water), labelled **P**. If sodium iodate(V) is not available **P** may be prepared using potassium iodate(V), (3.6 g of KIO_3 dissolved in 1 dm^3 of distilled water).

Allow each candidate approximately 150 cm^3.

(b) A solution of 0.10 mol/dm^3 sodium thiosulphate (24.8 g of $Na_2S_2O_3.5H_2O$ dissolved in 1 dm^3 of distilled water), labelled **Q**.

Allow each candidate approximately 150 cm^3.

(c) A freshly prepared solution of approximately 0.5 mol/dm^3 potassium iodide (84 g of KI dissolved in 1 dm^3 of distilled water), labelled 'aqueous potassium iodide'.

Allow each candidate approximately 100 cm^3.

(d) 2% aqueous starch.

[This reagent may be made as follows. Mix 2 g of soluble starch with a little cold water until a firm paste is obtained. Add 100 cm^3 of boiling water and stir. Boil until a clear solution is obtained (about 5 min.) **This solution should be freshly prepared**.]

Allow each candidate approximately 10 cm^3.

(e) Access to 1.0 mol/dm^3 sulphuric acid.

Pipette a 25.0 cm^3 portion of **P** into a flask and add about a test-tubeful of dilute sulphuric acid followed by about a test-tubeful of aqueous potassium iodide (see (c)). The solution should turn red-brown. Do **not** add the starch indicator at this stage.

Add **Q** from the burette until the red-brown colour fades to pale yellow, **then** add a few drops of the starch indicator. This will give a dark blue solution. Continue adding **Q** slowly from the burette until one drop of **Q** causes the blue colour to disappear, leaving a colourless solution.

A 25 cm^3 portion of **P** should react with between 24.0 cm^3 and 26.0 cm^3 of **Q**.

The following apparatus should be provided for each candidate:
a 50 cm^3 burette;
a 25 cm^3 (or 20 cm^3) 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) A solution containing 56 g of hydrated nickel(II) sulphate ($NiSO_4.7H_2O$) dissolved in 1 dm^3 of distilled water, labelled **R**.

Allow each candidate approximately 30 cm^3.

(b) A solution containing 50 g of hydrated copper(II) sulphate, ($CuSO_4.5H_2O$), dissolved in 1 dm^3 of distilled water, labelled **S**.

Allow each candidate approximately 30 cm^3.

(c) A solution containing 40 g of hydrated cobalt(II) nitrate, ($Co(NO_3)_2.6H_2O$), dissolved in 1 dm^3 of distilled water, labelled **T**.

Allow each candidate approximately 30 cm^3.

(d) Access to:

(i) approximately 1.0 mol/dm^3 aqueous sodium hydroxide,

(ii) approximately 1.0 mol/dm^3 aqueous ammonia,

(iii) approximately '20 volume' hydrogen peroxide (this solution should be freshly prepared),

(iv) approximately 0.2 mol/dm^3 aqueous barium nitrate (or approximately 0.2 mol/dm^3 aqueous barium chloride, labelled 'barium nitrate'),

(v) approximately 0.05 mol/dm^3 aqueous silver nitrate,

(vi) approximately 1.0 mol/dm^3 nitric acid,

(vii) 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), $K_2Cr_2O_7$, red and blue litmus paper or Universal Indicator paper, and splints.

(e) A supply of test-tubes, approximately 125 mm $\times$ 16 mm,

(f) At least one boiling tube, approximately 150 mm x 25 mm.

(g) A stirring rod.

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

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

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, NOVEMBER 2004

1 **(a)** *Supervisor's Results*

Supervisors are asked to use a spare copy of the question paper to report their results for **Q.1** and **Q.2** and to 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**.

(b) The index numbers of candidates attending each session were:

First Session	*Second Session*

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

The 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, disability, should be reported in the normal manner.

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 the Practical examination has been carried out so as to maintain fully the security of the examination.

SIGNED.....

NAME (in block capitals).....