

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

CHEMISTRY

5070/3

PAPER 3 Practical Test

CONFIDENTIAL INSTRUCTIONS

OCTOBER/NOVEMBER SESSION 2002

1 hour 30 minutes

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

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 on the question paper.**

**Small amounts of an irritant gas will be produced in Question 2. In a badly ventilated laboratory, this may cause respiratory distress to asthmatic students.**

|| 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 Centre number, the nature of the query and the syllabus number quoted above.

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**These instructions consists of 5 printed pages and 3 blank pages.**

**For Question 1**

Each candidate will require the following.

- (a) A freshly prepared solution containing 27.0 g of hydrated iron(II) sulphate,  $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ , dissolved in  $1 \text{ dm}^3$  of approximately  $0.5 \text{ mol/dm}^3$  sulphuric acid, labelled **P**.

Allow each candidate approximately  $150 \text{ cm}^3$ .

- (b) A solution of  $0.020 \text{ mol/dm}^3$  potassium manganate(VII) ( $3.2 \text{ g KMnO}_4$  dissolved in  $1 \text{ dm}^3$  of distilled water), labelled **Q**.

Allow each candidate approximately  $150 \text{ cm}^3$ .

'Pipette a  $25.0 \text{ cm}^3$  portion of **P** into a flask and titrate with **Q**. At first the purple colour disappears rapidly. As the titration proceeds, this disappearance is less rapid. At the end-point, one drop of **Q** produces a pink colour that does not disappear on swirling.'

**Note:** Some variation in the above concentrations is acceptable but it is essential that  $25.0 \text{ cm}^3$  of **P** reacts with between  $23.0 \text{ cm}^3$  and  $27.0 \text{ cm}^3$  of **Q** (or  $20.0 \text{ cm}^3$  of **P** reacts with between  $18.0 \text{ cm}^3$  and  $22.0 \text{ cm}^3$  of **Q**).

The following apparatus should be provided for each candidate;

- a  $50 \text{ cm}^3$  burette;
- a  $25 \text{ cm}^3$  (or  $20 \text{ cm}^3$ ) 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 50 g of hydrated sodium thiosulphate,  $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ , dissolved in  $1 \text{ dm}^3$  of distilled water, labelled **R**.

A small volume of aqueous sodium hydroxide should be added to this solution to ensure that it is not acidic.  $5 \text{ cm}^3$  of  $1.0 \text{ mol/dm}^3$  sodium hydroxide per  $1 \text{ dm}^3$  of solution **R** should be sufficient.

Allow each candidate approximately  $30 \text{ cm}^3$ .

**See also the warning note on Page 1 of these instructions.**

- (b) Access to
- (i) approximately  $1.0 \text{ mol/dm}^3$  hydrochloric acid, labelled as such,
  - (ii) approximately  $0.020 \text{ mol/dm}^3$  potassium manganate(VII) dissolved in approximately  $0.5 \text{ mol/dm}^3$  sulphuric acid, labelled 'acidified potassium manganate(VII)',
  - (iii) approximately  $0.05 \text{ mol/dm}^3$  aqueous silver nitrate, labelled as such,
  - (iv) a solution made by dissolving approximately 30 g of hydrated iron(III) chloride ( $\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ ) in  $1 \text{ dm}^3$  aqueous sodium chloride containing  $10 \text{ g/dm}^3$   $\text{NaCl}$ , labelled 'aqueous iron(III) chloride',
  - (v) approximately  $1.0 \text{ mol/dm}^3$  aqueous sodium hydroxide, labelled as such,
  - (vi) approximately  $0.2 \text{ mol/dm}^3$  aqueous copper(II) sulphate, which should be acidified with a small volume of dilute sulphuric acid to prevent hydrolysis,
  - (vii) approximately  $0.5 \text{ mol/dm}^3$  sulphuric acid, labelled as such,
  - (viii) the usual reagents needed to test for the gases mentioned in the syllabus, including limewater, approximately  $0.1 \text{ mol/dm}^3$  aqueous potassium dichromate(VI),  $\text{K}_2\text{Cr}_2\text{O}_7$ , red and blue litmus paper or Universal Indicator paper, splints.
- (c) A supply of test tubes, approximately 125 mm x 16 mm.
- (d) 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







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

**REPORT ON PRACTICAL CHEMISTRY**

SCHOOL CERTIFICATE/ORDINARY LEVEL, NOVEMBER 2002

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

SIGNED.....

NAME (in block capitals).....