

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

Advanced GCE

CHEMISTRY

2816/03/INST

Practical Examination 2

Instructions for the Planning Exercise and Practical Test

To be opened immediately

Planning Exercise – for issue on or after:

15 MARCH 2006

Practical Test:

Thursday

25 MAY 2006

Morning

1 hour 30 minutes

This document is for the **Head of Centre** and for the use of the **Chemistry teacher and/or technician** who prepares the apparatus and materials for the examination.

A packet containing **two** copies of the Chemistry Practical Test, 2816/03/TEST, accompanies the packet containing these Instructions.

These should be issued to the Chemistry teacher immediately they arrive at the Centre, but they **must be kept in a secure place at all times**.

These documents are provided so that the Chemistry teacher and/or technician can ensure that the Centre's apparatus and chemicals are suitable for carrying out the Chemistry Practical Test.

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

These instructions consist of 7 printed pages, 3 blank pages and a Report Form.

PLANNING EXERCISE

The Planning Exercise should be issued to candidates on or after the date shown on the front of this document. The candidates' Plans must be collected in, on or before the date of the Practical Test. These arrangements may be made at the discretion and convenience of the Centre.

It should be recognised that each Planning Exercise makes only a small contribution to the overall assessment and candidates should therefore be guided to spend an appropriate amount of time on the work. Candidates should be given **between 7 and 10 days** to complete it.

The mark scheme for the Planning Exercise is based closely on the coursework mark descriptors for Skill P given in the Specification and a copy of these descriptors should be made available to candidates to assist them in their work.

Candidates may be given access, if they request it and at the discretion of the Centre, to laboratory space and facilities in order to be able to carry out preliminary work which will help in constructing their Plan. However, it should be noted that the responsibility for Health and Safety during this period rests with the Centre, and the attention of teachers is drawn to the Health and Safety section in the Specification. Access to suitable library and other resources may also be required and, while time at home or in private study will be necessary to complete the task to a high standard, sufficient work must be completed under direct supervision to allow the teacher to authenticate the work with confidence as that of the candidates concerned. Many Centres find that this can best be managed by allowing candidates a set period of time to research the topic but requiring the Plan to be written under supervision. The supervising teacher should complete the statement of authentication for each candidate on the front cover page of the Plan. Details should be provided on the Report Form for the Practical Test of any assistance given to candidates.

After candidates' work has been collected, it must be kept securely until the date of the Practical Test (or must be collected on the day of the Practical Test) and must be included with the scripts for the Practical Test when these are despatched to the Examiner. Please tie together **loosely** (or use a treasury tag) the Planning Exercise and Practical Test for each candidate **with the Practical Test on the top**.

Guidance for Teachers/Tutors on authenticating work

The Work submitted by candidates for assessment must be entirely their own.

Candidates may however:

- quote from books or any other source; this should be referenced in the work and all sources acknowledged;
- receive guidance from someone other than their teacher/tutor; the course teacher must be informed of the name of the person giving external guidance and the nature of the assistance given;
- produce work at a location away from the examination Centre provided that the work remains under the supervision of the teacher/tutor.

In cases of privately entered candidates or distant tutored candidates, the Centre must ensure that:

- the teacher/tutor has acquainted themselves thoroughly with the general standard of candidates' work before accepting work for assessment;
- sufficient on-going regular monitoring of candidates' work has taken place.

Before authenticating work, the teacher/tutor should ask themselves the following basic questions.

- Has the **Declaration by candidate** been signed by the candidate?
- Was at least part of the work done under your direct supervision?
- Did you check the work during its production?
- Is the standard of finished work consistent with your professional judgement of the candidate's ability?

If you have answered 'YES' to the above questions you may authenticate the work.

The following notes for guidance are issued to candidates

- 1 Your Plan should have a clear and helpful structure and should be illustrated by diagrams, tables, charts, graphs etc. as appropriate. Remember that these can often be used to replace words in the text. Diagrams should be relevant to the content of your Plan and positioned appropriately. Labels on diagrams, flow charts or tables should be clear and concise. Large blocks of text should be included in the word count.
- 2 You should take care to use technical and scientific terms correctly and to write in clear and correct English.
- 3 Your Plan should be hand-written or word-processed on A4 paper, which should have a hole punched at the top left-hand corner. Pages should be numbered and should have a clear margin on the right-hand side. You should write (or print) on one side of the paper only and each sheet should be marked with your Centre number and Candidate number.
- 4 You should show that you have consulted an appropriate range and variety of sources. At the end of your Plan you should list clearly the sources you have used. You should refer to these references in your Plan where appropriate. Where you have incorporated material which has been copied directly from a source such as a book or the Internet, this must be acknowledged in your Plan and details included in the references at the end. However, it should be noted that the inclusion of copied material will not in itself gain credit. The list of references should not be included in the word count.
- 5 Your Plan should be based on the use of standard equipment, apparatus, chemicals and other materials available in a school or college science laboratory.
- 6 Your Plan should be **500–800** words. A Plan that is in excess of 800 words is likely to have poor structure and unselective choice of material, so that full credit may not be available. You should indicate the number of words in the margin of the Plan at approximately **100** word intervals.
- 7 When you have finished, tie the pages **loosely** together (or use a treasury tag), with this sheet on the top, so that the pages turn over freely. Your Centre will give you the date by which your Plan must be handed in.

PRACTICAL TEST

General Instructions

The attention of teachers is drawn to the details of this examination given in the Specification in Appendix E, on pages 124–127 in the second edition.

The Chemistry teacher and/or technician must be granted access to the question paper in advance of the Practical Test in order to be satisfied that apparatus and materials are in accordance with these instructions and are fully suitable for the performance of the experiments. To this end, the Chemistry teacher and/or technician should perform Parts 1, 2 and 3 of the Practical Test and be satisfied that the candidates will be able to collect suitable results with the apparatus and materials provided.

If the apparatus or materials that are provided to candidates differ significantly from these instructions, then full details of the changes must be given on the Report Form. Candidates will not be disadvantaged provided that the nature of the experiments has not been changed. The Chemistry teacher and/or technician is advised to contact OCR well before the date of the examination if, for example, there are difficulties with obtaining materials or particular pieces of apparatus.

Candidates should be informed that, if they find themselves in real difficulty, they may ask the Invigilator for assistance but the extent of this assistance will be reported to the Examiner, who may make a deduction of marks. If the Invigilator becomes aware that a candidate is having difficulty, then the Invigilator is expected to give the minimum amount of help required to enable the candidate to obtain a set of results from the apparatus. A note of the type of help given should be made on the Report Form on the last page of the candidate's script. **Under no circumstances should help be given to candidates with the presentation or analysis of experimental data.**

In cases of faulty apparatus (not arising from a candidate's mishandling) that prevents the required readings from being taken, extra time must be allowed so that the candidate has a fair opportunity of performing the experiment as though the fault had not been present. Details of such cases of time compensation should be made on the Report Form.

Cases of individual hardship, e.g. illness, disability etc. should be reported direct to OCR using the 'Special Considerations' form and **not** included on the Report Form.

HEALTH AND SAFETY

Attention is drawn to the section on Health and Safety on pages 101-102 in Appendix B of the Chemistry (3882/7882) Specification for teaching from SEPTEMBER 2004. This section covers Practical Tests as well as coursework. Centres are reminded that, in UK law, the responsibility for Health and Safety lies with the employer.

Materials used in the examination should display their appropriate hazard symbols.

1 Administration and supervision

- (a) Part **B** of the Practical Test must be carried out under full examination conditions. The normal 'Warning to Candidates' must be read at the start of the examination. Candidates must not communicate in any way during the examination.
- (b) Candidates are allowed to use **only** the following reference material during Part **B** of the Practical Test:
- the *Data Sheet for Chemistry*;
 - their own plan produced for Part **A**.
- No reference to any text books or laboratory notebooks is allowed.**
- (c) Chemicals of laboratory quality are sufficient for this examination.
- (d) Each laboratory used should be supervised throughout the examination by two responsible adults, one of whom should be a qualified chemistry teacher/lecturer. This arrangement enables one adult to collect extra apparatus or materials if they are required.
- (e) As a general rule, the supervisor should **not** give assistance to any candidate, except in the case of a fault in the apparatus the candidate is using. Candidates must **not** be given any advice, beyond what is on the question paper, about how to conduct their experiments.
- (f) The supervisor should intervene if he or she feels that a candidate is working in an unsafe manner. A **brief report** of the circumstances of any such intervention **must** be sent to the Examiner, attached to the front of the candidate's script.
- (g) **At the end of Part B of the Practical Test, the supervisor should also collect the candidates' work from Part A (Planning).**

This work should be clearly labelled with the candidate's name and number and the sheets of paper should be joined at the top left-hand corner using a treasury tag.

Parts **B** and **A** should be attached using the same treasury tag, with Part **B** on top.

2 Supervisor's results.

The supervising chemistry teacher/lecturer must carry out the measurements and calculations described in Parts 1 and 2, using the same equipment and materials as the candidates. The experiment should be carried out under the same conditions as the candidates, shortly before or after the candidates work the examination. Failure to complete this accurately is likely to be to the candidates' disadvantage.





The supervisor should write his/her results and calculations using red ink in a clearly labelled copy of the question booklet. It should be sent to the examiner on top of the candidates' scripts.

If the examination is carried out in two or more sessions, or using two or more different batches of aqueous potassium dichromate(VI), **G**, separate sets of supervisor's results should be sent to the examiner. A list of candidates in each group should also be sent.

3 Materials to be prepared.

Candidates must not be told any information about these materials apart from what is given on the question paper.

Each candidate will require **F**, **G**, **H** and **J** in suitable containers, **labelled by letter only** and the hazard warning symbol.

<p>Solid F: Between 9.0 – 9.2 g of hydrated iron(II) ammonium sulphate, $\text{FeSO}_4(\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$ in a stoppered weighing bottle. A freshly-opened stock bottle of solid should be used.</p>	<p>Harmful</p>	
<p>Solution G: A solution of aqueous potassium dichromate(VI) containing 5.00 g dm^{-3} of $\text{K}_2\text{Cr}_2\text{O}_7$. Each candidate will require about 100 cm^3 of solution in a suitable bottle.</p>	<p>Irritant</p>	
<p>Solution H: Aqueous (dilute) sulphuric acid of concentration 1.0 mol dm^{-3}. Each candidate will require about 100 cm^3 in a suitable bottle.</p>	<p>Irritant</p>	
<p>Solution J: Aqueous phosphoric acid of approximate concentration 2.4 mol dm^{-3}. This solution is made up by slowly and carefully adding 150 cm^3 of orthophosphoric acid, H_3PO_4, to about 500 cm^3 of pure water, with constant stirring. Then make the solution up to 1.0 dm^3 using distilled water. Each candidate will require about 75 cm^3 in a stoppered bottle.</p>	<p>Corrosive</p>	

All candidates should be supplied with solid **F** and solution **G** from the same stocks. If this is not possible because the centre has a large number of candidates, refer to the Supervisor's Results at the end of **2**, on page 5.

Candidates may be given extra quantities of these materials, without penalty, if requested, although the quantities prescribed should be sufficient. Centres should keep at least 10% of all solutions in reserve:

- for the supervisor to carry out the experiment personally – see **2**, on page 5.
- for candidates who may require extra quantities.

4 Other Equipment and Materials

(a) Each candidate will require the following:

Safety spectacles
 Burette and white tile
 Pipette (25.0 cm³) and filler
 Clamp stand, with boss and clamp (for supporting the burette)
 Filter funnel
 Measuring cylinder (25 cm³)
 Glass rod
 Spatula
 Dropping pipette
 Volumetric flask (250 cm³)
 Wash bottle containing distilled or de-ionised water (about 300 cm³ will be required)
 Two conical flasks *or* conical beakers (250 cm³)
 Glass beaker (250 cm³)
 Two small self-adhesive labels (for test tubes)
 Two test tubes with bungs
 Test tube rack
 Suitable containers with chemicals **F**, **G**, **H** and **J** (see section 3)

All equipment should be laid out in the laboratory places where candidates will work, prior to the start of the examination.

(b) Each candidate will also need access to the following:

A top pan balance weighing 0.01 g (at least one for every eight candidates).

Indicator K: aqueous barium diphenylamine sulphonate.

Irritant



This solid is available as a solution from some suppliers.

If the solid is used, dissolve 0.20 g in 100 cm³ of water and filter off any undissolved solid.

The solution should be supplied in dropping bottles, at least one for every four candidates.

Two “unknown organic”, solids, R and S.

Both bottles should be labelled only with the code letter (see below).

No further information must be available to candidates.

Each candidate will require about 0.5 g of each solid.

At least one bottle of each should be supplied for every eight candidates.

R **Glucose**, C₆H₁₂O₆

No hazard

S **Sodium chloride**, NaCl

No hazard

Note for teachers: sodium chloride is being used for **S** to produce a reliable negative result.

Candidates may also be supplied with other standard laboratory equipment, such as extra glassware, on request during the examination.

REPORT FORM, JUNE 2006

This form must be completed and sent to the Examiner in the envelope with the scripts.

Centre Number Name of Centre

1 Supervisor's Results

Please submit details of the readings and calculations in Parts 1, 2 and 3 on a spare copy of the question paper clearly marked 'Supervisor's Results' and **showing the Centre 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 index numbers. These should include reference to:

- (a) any 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 OCR on the normal 'Application for Special Consideration' form.

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



Report on any difficulties experienced by candidates.

A supervisor's script with results and calculations is included with this report.

Supervisor's signature Date

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