



Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2014

Centre Number

71	
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Candidate Number

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Chemistry

Assessment Unit AS 3

assessing

Module 3: Practical Examination

Practical Booklet A

[AC133]

WEDNESDAY 7 MAY, MORNING



TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Answer **both** questions.

Write your answers in the spaces provided.

INFORMATION FOR CANDIDATES

The total mark for this paper is 22.

Question 1 is a practical exercise worth 8 marks.

Question 2 is a practical exercise worth 14 marks.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

A Periodic Table of Elements (including some data) is provided.

You may not have access to notes, textbooks and other material to assist you.

Question Number	Marks	
	Examiner Mark	Remark
1		
2		

Total Marks		
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1 Titration exercise

Calcium carbonate is present in some indigestion tablets.

You are required to carry out a back titration to find the mass of calcium carbonate in an indigestion tablet.

You are provided with:

Solution **A** made by reacting **two** indigestion tablets with 25 cm^3 of 2.0 mol dm^{-3} hydrochloric acid and then making the solution up to 250 cm^3

A solution of 0.10 mol dm^{-3} sodium hydroxide

Phenolphthalein indicator

Carry out the titration by:

- rinsing out the burette with the 0.10 mol dm^{-3} sodium hydroxide solution
- filling the burette with the 0.10 mol dm^{-3} sodium hydroxide solution
- transferring 25.0 cm^3 of solution **A** to the conical flask
- adding 2–3 drops of phenolphthalein indicator to the solution in the conical flask and titrating until the end point is reached

Present your results in a suitable table and calculate the average titre.

Results table

Examiner Mark	Remark

[8]

2 Observation

Safety glasses should be worn at all times and care should be taken during this practical examination.

- (a) You are provided with a mixture of two salts, labelled **B**, which have a common cation. Carry out the following tests on the mixture. Record your observations in the spaces below.

Test	Observations
<p>1 Place a spatula measure of B in a test tube and heat strongly. Bubble any gas given off through limewater.</p>	[2]
<p>2 Make a solution of B by dissolving a half spatula measure of B in a test tube one third full of dilute hydrochloric acid.</p> <p>Add 1 cm³ of barium chloride solution to the test tube.</p>	[1] [1]
<p>3 Make a solution of B by dissolving a half spatula measure of B in a test tube one third full of deionised water.</p> <p>Add 1 cm³ of magnesium sulfate solution to the test tube.</p>	[1]
<p>4 Make a solution of B by dissolving a quarter spatula measure of B in a test tube one third full of dilute nitric acid.</p> <p>Add 1 cm³ of silver nitrate solution and then, in a fume cupboard, 1 cm³ of concentrated ammonia solution.</p>	[2]
<p>5 Dip a nichrome wire loop in concentrated hydrochloric acid; touch B with the wire and then hold it in a blue Bunsen flame.</p>	[1]

Examiner Mark	Remark

- (b) You are provided with an organic liquid **C**. Carry out the following tests on the liquid. Record your observations in the spaces below.

Test	Observations
1 Place 1 cm ³ of C in a test tube and add 1 cm ³ of deionised water.	[1]
2 Place 10 drops of C on a watch glass placed on a heatproof mat and ignite it using a burning splint.	[2]
3 In a fume cupboard add approximately 0.5 cm ³ of C to a test tube one quarter full of bromine water and mix well.	[2]
4 Place 1 cm ³ of C in a test tube. Add 2 cm ³ of potassium dichromate solution acidified by adding 2 cm ³ of dilute sulfuric acid. Warm the mixture gently, swirl, and leave to stand for 5 minutes.	[1]

Examiner Mark	Remark

THIS IS THE END OF THE QUESTION PAPER

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Chemistry
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[AC133]

WEDNESDAY 7 MAY



AC133

**APPARATUS
AND
MATERIALS
LIST**

Advice for centres

- All chemicals used should be at least laboratory reagent specification and labelled with appropriate safety symbols, e.g. irritant.
- For centres running multiple sessions – candidates for the later session should be supplied with clean, dry glassware. If it is not feasible then glassware from the first session should be thoroughly washed, rinsed with deionised water and allowed to drain.
- **Ensure all chemicals are in date otherwise expected observations may not be seen.**

Each candidate must be supplied with safety goggles or glasses.

Question No. 1

Each candidate must be supplied with:

- one 50 cm³ burette of at least class B quality;
- a funnel for filling the burette;
- a retort stand and clamp;
- two beakers of 100 cm³ capacity;
- one 25 cm³ pipette of at least class B quality;
- a safety pipette filler;
- three conical flasks of 250 cm³ capacity;
- phenolphthalein indicator with dropper;
- a white tile or white paper;
- a wash bottle containing deionised/distilled water;
- 150 cm³ of 0.1 mol dm⁻³ sodium hydroxide solution labelled **0.1 mol dm⁻³ sodium hydroxide solution** and **corrosive/irritant**;
- 150 cm³ of 0.1 mol dm⁻³ hydrochloric acid labelled **Solution A** and **corrosive/irritant**.

Question No. 2

Each candidate must be supplied with:

- ten test tubes;
- a test tube/boiling tube holder;
- a test tube/boiling tube rack;
- a spatula;
- a heatproof mat;
- a Bunsen burner;
- nichrome wire;
- eight droppers with teats;
- two watch glasses;
- a rubber bung to fit a test tube;
- two wooden splints;
- deionised water;
- about 5 g of a mixture of 2.5 g of sodium iodide and 2.5 g of sodium hydrogen carbonate in a 50/100 cm³ beaker labelled **B**;
- about 10 cm³ of a saturated solution of calcium hydroxide in a reagent bottle/beaker labelled **limewater** (made fresh) and delivery tube (optional);
- about 10 cm³ of dilute hydrochloric acid in a stoppered reagent bottle labelled **dilute hydrochloric acid** and **irritant**. This solution should be approximately 2 mol dm⁻³;
- about 10 cm³ of barium chloride solution in a stoppered reagent bottle labelled **barium chloride solution** and **harmful**. This solution should be approximately 0.1 mol dm⁻³;
- about 10 cm³ of magnesium sulfate solution in a reagent bottle/beaker labelled **magnesium sulfate solution**. This solution should be approximately 0.5 mol dm⁻³ (60 g dm⁻³ of anhydrous magnesium sulfate);
- about 10 cm³ of dilute nitric acid in a reagent bottle/beaker labelled **dilute nitric acid** and **irritant**. This solution should be approximately 0.5 mol dm⁻³;
- about 10 cm³ of silver nitrate solution in a reagent bottle/beaker labelled **silver nitrate solution**. This solution should be approximately 0.1 mol dm⁻³ (17 g dm⁻³ of silver nitrate);
- about 10 cm³ of concentrated ammonia solution (8 mol dm⁻³) in a stoppered reagent bottle labelled **concentrated ammonia** and **corrosive/irritant**;

- about 10 cm^3 of concentrated hydrochloric acid in a stoppered reagent bottle labelled **concentrated hydrochloric acid** and **corrosive/irritant**;
- about 15 cm^3 of a mixture of equal volumes of cyclohexanol and cyclohexene in a reagent bottle/beaker labelled **C**;
- about 10 cm^3 of bromine water in a stoppered reagent bottle labelled **bromine water** and **harmful**. This solution should be approximately 0.02 mol dm^{-3} (i.e. 0.1% v/v);
- about 5 cm^3 of dilute sulfuric acid in a stoppered reagent bottle and labelled **dilute sulfuric acid** and **corrosive/irritant**. This solution should be approximately 2 mol dm^{-3} ;
- about 10 cm^3 of potassium dichromate(VI) solution in a stoppered reagent bottle labelled **potassium dichromate(VI) solution** and **irritant**. This solution should be approximately 0.1 mol dm^{-3} , made by dissolving 30 g of potassium dichromate(VI) in 100 cm^3 of deionised water and made up to 1 dm^3 with deionised water.



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General Certificate of Education
2014**

Chemistry

Assessment Unit AS 3

Internal Assessment

Practical Booklet A

[AC133]

WEDNESDAY 7 MAY

Confidential Instructions to the Supervisor of the Practical Examination

INSTRUCTIONS TO THE SUPERVISOR OF THE PRACTICAL EXAMINATION

General

1. The instructions contained in this document are for the use of the Supervisor **and are strictly confidential**. Under no circumstances may information concerning apparatus or materials be given before the examination to a candidate or other unauthorised person.
2. In a centre with a large number of candidates it may be necessary for two or more examination sessions to be organised. **It is the responsibility of the schools to ensure that there should be no contact between candidates taking each session.**
3. A suitable laboratory must be reserved for the examination and kept locked throughout the period of preparation. Unauthorised persons not involved in the preparation for the examination must not be allowed to enter. Candidates must not be admitted until the specified time for commencement of the examination.
4. The Supervisor must ensure that the solutions provided for the candidates are of the nature and concentrations specified in the Apparatus and Materials List.
5. **The Supervisor is to be granted access to the Teacher's Copy of Practical Booklet A, showing parts of questions 1 and 2, on Thursday 1 May 2014.** The Supervisor is asked to check, at the earliest opportunity, that the experiments and tests in the question paper may be completed satisfactorily using the apparatus, materials and solutions that have been assembled. **This question paper must then be returned to safe custody** at the earliest possible moment after the Supervisor has ensured that all is in order. **No access to the question paper should be allowed before 1 May 2014.**
6. Centres may need to carry out multiple sessions to accommodate all their candidates sitting Practical Booklet A in a laboratory. Supervision must take place from 30 minutes after the scheduled starting time of the examination, as set out in the timetable, until the time when the candidate(s) begin(s) their examination(s). This is in order to ensure that there is no contact with other candidates. The centre must appoint a member of staff from the centre to supervise the candidate at all times while he/she is on the premises.
7. Pipettes and burettes should be checked before the examination, and there should be an adequate supply of spare apparatus in case of breakages. The Apparatus and Materials List should be regarded as a minimum and there should be no objection to candidates being supplied with more than the minimum amount of apparatus and materials.
8. **Candidates may not use text books and laboratory notes for reference during the examination, and must be informed of this beforehand.**

9. Clear instructions must be given by the Supervisor to all candidates at the beginning of the examination concerning appropriate safety procedures and precautions. Supervisors are also advised to remind candidates that all substances in the examination must be treated with caution. **Only those tests specified in the question paper should be attempted. Candidates must not attempt any additional confirmatory tests.** Anything spilled on the skin should be washed off immediately with plenty of water. The use of appropriate eye protection is essential.
10. Supervisors are reminded that they may not assist candidates during the examination. However if, in the opinion of the Supervisor, a candidate is about to do something which may endanger him/herself or others, the Supervisor should intervene. A full written report must be sent to CCEA at once.
11. Upon request, a candidate may be given additional quantities of materials (answer paper, reagents and unknowns) without penalty. No notification need be sent to CCEA.
12. The examination room must be cleared of candidates immediately after the examination.
13. No materials will be supplied by CCEA.

