



Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2019

Centre Number

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Candidate Number

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Chemistry

Assessment Unit AS 3

assessing

Module 3: Basic

Practical Chemistry

Practical Booklet A

[SCH31]

WEDNESDAY 1 MAY, MORNING

MV18

Time

1 hour 15 minutes, plus your additional time allowance.

Instructions to Candidates

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

You must answer the questions in the spaces provided.

Do not write on blank pages.

Complete in black ink only.

Answer **both** questions.

Information for Candidates

The total mark for this paper is 25.

Figures in brackets printed at the end of each question indicate the marks awarded to each question or part question.

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

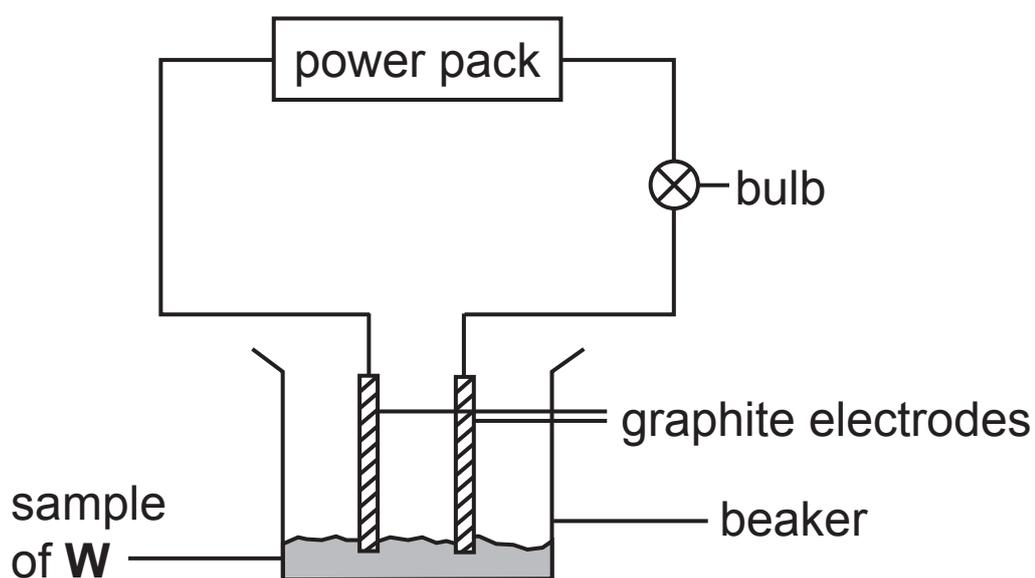
You may not have access to notes, textbooks and other material to assist you.

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

1 You are provided with a white solid labelled **W**.

(a) Place 4 spatula measures of solid **W** into a 50 cm³ beaker. Carry out the following steps.

- Set up a circuit as shown below
- Use a 6 V power pack
- Dip the electrodes into solid **W**, ensuring the electrodes do not touch each other
- Switch on the power pack



(i) Record any observations. [1 mark]

- (ii) Switch off the power pack and remove the electrodes from the beaker. Add 40 cm³ of deionised water to the beaker containing **W**. Stir to dissolve the solid. Dip the electrodes into the aqueous solution of **W** ensuring the electrodes do not touch and then switch on the power pack. Record any observations.
[3 marks]

- (iii) Explain why the observations made in (a)(i) and (a)(ii) show that **W** is an ionic salt. [1 mark]

- (b) Solid **W** will decompose when heated. Place two spatula measures of solid **W** in a boiling tube. Place a rubber bung fitted with a delivery tube in the top of the boiling tube. Heat gently, bubbling any gases produced through limewater, contained in a second boiling tube. Remove the delivery tube from the limewater when you stop heating the boiling tube.

- (i) Describe what you observe in the heated boiling tube. [1 mark]

- (ii) Describe what you observe in the limewater. [1 mark]

(c) Dissolve 5 spatula measures of solid **W** in 20 cm³ of warm deionised water (from a kettle) in a 100 cm³ beaker. Measure out 20 cm³ of copper(II) sulfate solution and add it **slowly** to the solution of **W**.

(i) Describe what you observe happening in the beaker. [2 marks]

(ii) Lower a lighted splint into the beaker and record any observation. [1 mark]

(d) (i) Separate the mixture, obtained in (c), by filtration. Keep the residue and the filtrate. Transfer half a spatula measure of the wet residue to a watch glass. Add 2 cm³ of dilute hydrochloric acid to the residue on the watch glass using a dropping pipette. Gently swirl the watch glass. Describe what is observed on the watch glass. [2 marks]

(ii) Add a few drops of silver nitrate solution to the contents on the watch glass. Describe what is observed on the watch glass. [1 mark]

(iii) Transfer 2 cm³ of the filtrate to a boiling tube using a dropping pipette. Add 1 cm³ of barium chloride solution using a dropping pipette. Describe what is observed in the boiling tube. [1 mark]

(iv) Carry out a flame test on the filtrate using a clean piece of nichrome wire. What colour is produced in the Bunsen flame? [1 mark]

2 You are provided with three liquids **X**, **Y** and **Z**, in three separate containers.

(a) Measure out 10 cm^3 of liquids **X** and **Y** and transfer them into separate boiling tubes. Add a half spatula measure of solid **W** to both boiling tubes and stir. Record the observations made in each boiling tube. [2 marks]

(b) Measure out 10 cm^3 of liquids **X** and **Y** and transfer them into separate boiling tubes. Using a spatula or tweezers add a calcium granule to each boiling tube.

(i) Record **two** observations that are **the same** in both boiling tubes on addition of calcium metal to **X** and to **Y**. [2 marks]

(ii) Record **one** observation which is **different** in each boiling tube on addition of calcium metal to **X** and to **Y**. [1 mark]

(c) Measure out 5 cm^3 of liquid **Y** and 5 cm^3 of liquid **Z** and transfer them to separate boiling tubes. Add 10 cm^3 of deionised water to each boiling tube. Stopper and gently shake the boiling tubes. Allow the mixtures to settle.

(i) Record the observations made in each boiling tube.
[1 mark]

(ii) Add 5 cm^3 of iodine solution to each of the boiling tubes. Replace the bungs and gently shake the boiling tubes. Allow the mixtures to settle. Describe the observations made. [2 marks]

(iii) From the tests carried out in both (c)(i) and (c)(ii) it can be deduced that liquid **Z** is an organic liquid which is saturated. Explain how these observations support this deduction. [2 marks]

THIS IS THE END OF THE QUESTION PAPER



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WEDNESDAY 1 MAY, MORNING

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.
- It is the responsibility of the centre to be cognisant of all health and safety issues and to carry out a thorough risk assessment. Up to date information can be obtained at www.cleapss.org.uk
- Please note that for question 1(a) candidates are required to have a power pack within their supplied materials. CCEA stipulate that candidates must work on an individual basis in GCE chemistry practical examinations. Therefore, if centres do not have access to power packs for every individual candidate, they should manage the practical session so that half the class are completing question 1 whilst the other half are completing question 2. Then rotate.

Practical Examination

Each candidate must be supplied with safety goggles or glasses.

Question No. 1

Each candidate must be supplied with:

- access to 6V dc power pack and bulb;
- two graphite electrodes;
- electrical leads and crocodile clips;
- a small spatula, e.g. Nuffield Raised Centre Spatula (or similar);
- one beaker with 50 cm³ capacity;
- one beaker with 100 cm³ capacity;
- one glass stirring rod;
- one measuring cylinder with 50 cm³ capacity;
- a boiling tube rack;
- a boiling tube holder;
- three boiling tubes;
- one Bunsen burner;
- one heatproof mat;
- two wooden splints;
- one bung (to fit boiling tube) fitted with a delivery tube;
- one filter funnel;
- filter paper;
- one conical flask with 100 cm³ capacity;
- six dropping pipettes;
- one watch glass;
- one clean nichrome wire loop;
- a wash bottle containing deionised water;
- approximately 10 g of sodium hydrogencarbonate labelled **W** (for use in questions 1 and 2)
- access to a kettle of warm deionised water

- approximately 10 cm³ of a saturated solution of calcium hydroxide in a reagent bottle/beaker labelled **limewater**;
- approximately 40 cm³ of 0.5 mol dm⁻³ copper(II) sulfate solution (125 g dm⁻³ hydrated copper(II) sulfate) labelled **copper(II) sulfate solution** and **corrosive**.
- approximately 20 cm³ of 1.0 mol dm⁻³ hydrochloric acid labelled **dilute hydrochloric acid** and **corrosive/irritant**
- approximately 20 cm³ of barium chloride solution in a reagent bottle labelled **barium chloride solution** and **harmful**. This solution should be approximately 0.1 mol dm⁻³ (21 g dm⁻³ for BaCl₂ or 24 g dm⁻³ for BaCl₂·2H₂O).
- approximately 20 cm³ of silver nitrate solution in a reagent bottle labelled **silver nitrate solution**. This should be approximately 0.1 mol dm⁻³ (17 g dm⁻³).

Question No. 2

Each candidate must be supplied with:

- one boiling tube rack;
- six boiling tubes;
- three stoppers (to fit boiling tubes);
- a small spatula, e.g. Nuffield Raised Centre Spatula (or similar);
- three × measuring cylinders with 10 cm³ capacity;
- two glass stirring rods;
- access to plastic graduated dropping pipettes;
- tweezers
- approximately 50 cm³ of 1.0 mol dm⁻³ ethanoic acid labelled **X**.
- approximately 50 cm³ of deionised water labelled **Y**.
- approximately 10 cm³ of hexane in a sealed container labelled **Z** and **caution** and **flammable**.
- two calcium granules in a sealed container labelled **calcium** and **flammable** and **caution**.
- approximately 10 cm³ of 0.01 mol dm⁻³ iodine solution labelled **iodine solution** and **caution**.



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Chemistry

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Practical Assessment

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WEDNESDAY 1 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 on Monday 29 April 2019.** 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 29 April 2019.**
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(s) at all times while he/she is on the premises.
7. All apparatus 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 is 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.
14. All JCQ procedures for conducting examinations should be followed for this practical examination including displaying JCQ posters with examination information in the laboratory and removal of mobile phones. Posters should be available from your Examinations Officer.

