



GCE A LEVEL

1410U50-1C



S25-1410U50-1C

For MAY 2025

To be opened on receipt in JANUARY 2025

CHEMISTRY – A2 unit 5

Practical Examination

INSTRUCTIONS TO TEACHERS/EXAMS OFFICERS

Experimental Task

TESTS 1 and 2

CONFIDENTIAL

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This document must be stored securely by the exams officer when not in use by the teacher/technician. This document must not be stored within the science department when not in use by the teacher/technician. The contents of pages 4–5 should not be divulged except to those concerned with the preparation of the assessment.

The information on page 7 about the main themes or topic areas to be assessed in both parts of Unit 5 should be copied and distributed to candidates as soon as possible.

A. General Instructions

1. The Experimental Task will be completed in one session of up to 3 hours. Two versions of the test will be set for use on the following dates:

Test 1 – Wednesday, 7 May 2025 (day 1)

Test 2 – Thursday, 8 May 2025 (day 2)

The vast majority of candidates will take Test 1. Test 2 should only be used in centres where it is **not practically possible** to accommodate all candidates on day 1. Centres requiring Test 2 (for use on day 2) should already have informed WJEC that this is the case. Please contact the subject support officer at WJEC (science@wjec.co.uk) as a matter of urgency if this has not been done. **No individual candidate may undertake both tests.**

Centres must schedule the Experimental Task as early as is possible on the appropriate date and where more than one session is required on a single day, centres must ensure that candidates in later sessions have no opportunity to communicate with those who have already done the task.

2. Both parts of the Practical Examination must be **invigilated** by a person other than an A level Chemistry teacher.
3. The Experimental Task must be **supervised** at all times by a member of staff responsible for teaching A level Chemistry. Centres may use multiple laboratories, provided that a subject teacher is available to supervise all groups at all times.
4. Teachers must ensure that all candidates have adequate working space and that they are set a reasonable distance apart. Each candidate must have a complete set of glassware and ready access to a weighing balance.
5. Centres will receive sufficient copies of the candidate booklets for Test 1 (and Test 2 if applicable).
6. Teachers may open the “**Setting up Instructions**” document one week before **Test 1** (i.e. Wednesday, 30 April 2025). This is for the purpose of preparing the necessary solutions and apparatus. The method for Parts A and B must be trialled to ensure that the solutions give the expected results. **The confidentiality of the assessment must be preserved and the candidate booklets must not be opened until the day of the examination.**
7. Candidates are to be given a list of the main themes or topic areas to be assessed in the Experimental Task and in the Practical Methods and Analysis Task before the examinations. In order to implement this, **page 7 of this document should be copied and given to candidates as soon as possible after it is received.** This information is also published on the WJEC GCE Chemistry webpage.
8. Marks will be awarded by teachers for two aspects directly observed whilst candidates carry out practical work. **These marks must be written on the front cover of each candidate’s booklet.** Guidance on the awarding of these marks will be provided in the “**Setting up Instructions**” document.

9. Completed candidate booklets must be returned to the exams officer immediately after the session. They should be stored until the completion of the Practical Methods and Analysis Task on Friday, 9 May 2025. Candidate booklets should be paired-up, placed in candidate number order and posted to the allocated examiner **as soon as possible**. **Teachers must not be given access to the completed booklets after they have been handed to the exams officer.**
10. Examiners will require teachers' results for Part A. These must be recorded clearly on the form at the back of the "**Setting up Instructions**" document and given to the exams officer with candidates' work. When different groups of candidates have been given different solutions, separate teacher results forms must be completed and steps taken to clearly identify which candidates' work should be marked against which teacher results. **This information must be sent to examiners along with candidates' work.**
11. The Experimental Task and the Practical Methods and Analysis Task will be marked by the same WJEC examiner. The name and address of the examiner will be issued to centres by the end of April.
12. WJEC monitors will visit a random sample of centres on 7, 8 and 9 May 2025 to ensure the Practical Examination is being administered correctly. **Visiting monitors will require access to candidates' "lab books" which should be available on all of these dates.**

B. Specific Instructions

Details of the apparatus and chemicals required for the tests follow.

WJEC should be informed immediately of any difficulty in providing the required apparatus or chemicals.

Contacts:

Subject Officer	Jonathan Owen	029 2240 4252	science@wjec.co.uk
Support Officer	Eira Morgan	029 2240 4252	science@wjec.co.uk

Apparatus and chemicals required

TEST 1

Part A – Determine the molar mass of ethanedioic acid and hence the value of x in $(\text{COOH})_2 \cdot x\text{H}_2\text{O}$

Apparatus

Note that ethanedioic acid is toxic and appropriate care should be taken when handling the solid and the solution.

Each candidate will need eye protection, gloves and the following apparatus:

- 1 × weighing bottle + lid containing approximately 2.0 g of $(\text{COOH})_2 \cdot 2\text{H}_2\text{O}$ (toxic)
- 2 × 100 cm³ beaker
- 1 × large funnel (to transfer ethanedioic acid solution to volumetric flask)
- 1 × stirring rod
- 1 × 25 cm³ measuring cylinder
- 1 × 250 cm³ volumetric flask
- 1 × wash bottle containing deionised water
- 1 × 50 cm³ burette
- 1 × burette stand
- 1 × small funnel (to fill burette)
- 2 × 25 cm³ volumetric pipette
- 1 × pipette filler
- 2 × 250 cm³ conical flask
- 1 × plastic dropping pipette

Ready access to ideally a 3 decimal place weighing balance (although 2 is acceptable)

Chemicals

In addition to approximately 2.0 g of $(\text{COOH})_2 \cdot 2\text{H}_2\text{O}$ in the weighing bottle, each candidate will need:

approximately 200 cm³ of approximately 0.15 mol dm⁻³ hydrochloric acid solution, HCl(aq)
(irritant)

approximately 200 cm³ of approximately 0.20 mol dm⁻³ sodium hydroxide solution, NaOH(aq)
(irritant)

phenolphthalein indicator (flammable)

deionised water

The **exact concentration** of the hydrochloric acid, HCl(aq), **must be given to candidates**.

The concentration of the sodium hydroxide solution, NaOH(aq), **must not be given to candidates**.

Both concentrations must be recorded by centre staff.

Part B – Qualitative organic tests on the reaction mixture at each stage of the production of ethanedioic acid**Apparatus**

Each candidate will need eye protection and the following apparatus:

- 4 × plastic dropping pipette
- 1 × test tube rack
- 1 × spatula

Chemicals

Each candidate will need:

- 1 × stoppered test tube labelled **1**, containing approximately 3 cm³ of 2-chloro-2-methylpropane
- 1 × stoppered test tube labelled **2**, containing approximately 3 cm³ of 2-chloro-2-methylpropane (the same as in tube **1**)
- 1 × stoppered test tube labelled **3**, containing approximately 3 cm³ of ethanoic acid

deionised water

- approximately 10 cm³ of 1 mol dm⁻³ nitric acid solution, HNO₃(aq) (corrosive)
- approximately 2 cm³ of 0.1 mol dm⁻³ silver nitrate solution, AgNO₃(aq) (irritant)
- approximately 5 cm³ of 1 mol dm⁻³ sodium hydroxide solution, NaOH(aq) (corrosive)
- approximately 1 g of solid sodium carbonate, Na₂CO₃(s) (irritant)
- approximately 2 cm³ of 0.002 mol dm⁻³ acidified potassium manganate(VII), KMnO₄/H⁺(aq) (irritant)

TEST 2

All candidates should complete the Experimental Task on day 1.

If the number of entries at your centre makes this impossible, you should contact WJEC immediately to discuss the use of TEST 2 on day 2 with those candidates who cannot be accommodated on day 1.

Test 2 involves the same apparatus and the following adaptations:

In **Part A** the mass of (COOH)₂·2H₂O should be increased to approximately 2.5 g

In **Part B** the test tube labelled **1** should contain cyclohexene and the test tube labelled **2** should contain 2-chloro-2-methylpropane

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CHEMISTRY – A2 unit 5

Practical Examination

MAIN THEMES OR TOPIC AREAS FOR ASSESSMENT IN UNIT 5 IN SUMMER 2025

(To be copied and given to candidates)

Knowledge, understanding and skills related to the following themes or topic areas will be assessed in the **Experimental Task**:

- acid-base titration
- organic analysis

Knowledge, understanding and skills related to the following themes or topic areas will be assessed in the **Practical Methods and Analysis Task**:

- qualitative inorganic analysis
- quantitative analysis and calorimetry
- organic compounds containing oxygen

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