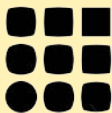
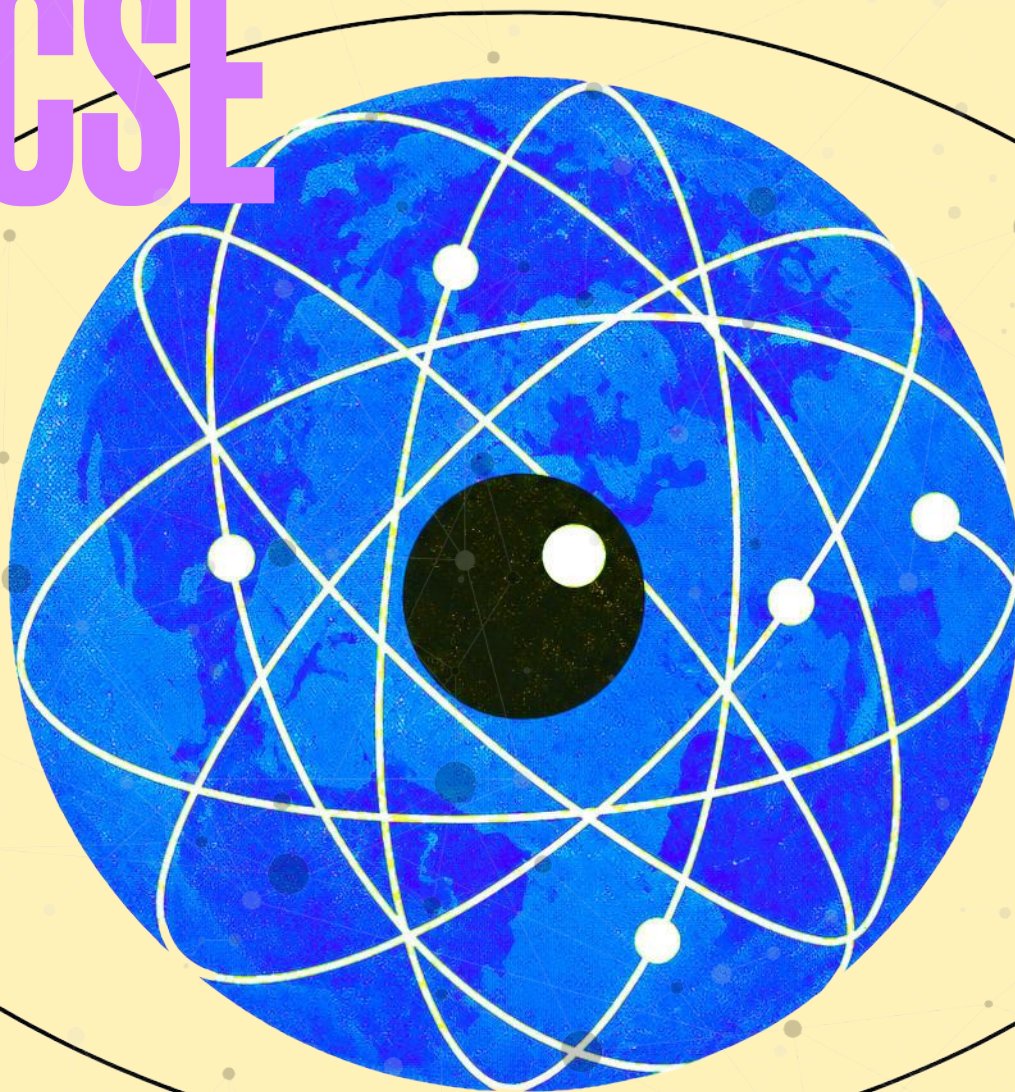


edexcel 

CHEMISTRY

IGCSE



Full Solved Papers

LATEST SYLLABUS

Paper 1



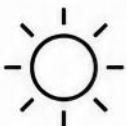
Edexcel Chemistry IGCSE

Paper 1 • Solved Past Papers

Contents



All Paper 1 past papers in one place.

1.	June 2019 1C		3
2.	June 2019 1CR		49
3.	January 2020 1C		87
4.	January 2020 1CR		125
5.	October 2020 1C		165
6.	October 2020 1CR		202
7.	January 2021 1C		240
8.	January 2021 1CR		277
9.	June 2021 1C		313
10.	October 2021 1C		348
11.	January 2022 1C		391
12.	January 2022 1CR		431
13.	June 2022 1C		468



Smart revision. Better results.

Use these past papers to build confidence, sharpen exam technique and achieve your best.

Edexcel Chemistry IGCSE

Paper 1 • Solved Past Papers

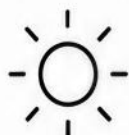
Contents continued



All Paper 1
past papers in one place.

14.

June
2022
1CR



507

19.

October
2023
1C



692

15.

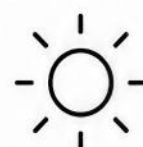
January
2023
1C



543

20.

June
2024
1C



730

16.

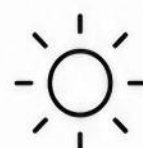
January
2023
1CR



584

21.

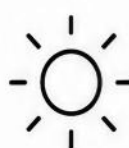
June
2024
1CR



768

17.

June
2023
1C



619

22.

October
2024
1C



804

18.

June
2023
1CR



654

23.

October
2025
1C



843



You've got this!

Consistent practice today,
success tomorrow.

Edexcel IGCSE - Solved Past Paper

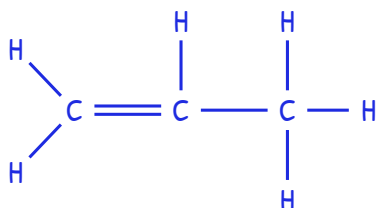
October 2025 · Chemistry Paper 1C (4CH1/1C) · Question 9 · Propene and propane

● hard ● medium ● easy

● 9 (a)

Complete · [3 marks]

Complete the table about propene: give its displayed formula, its empirical formula and its relative formula mass. (Its molecular formula C_3H_6 is given.)



Displayed formula of propene, $CH_2=CH-CH_3$ - every bond is shown, including the $C=C$ double bond.

Relative formula mass of propene (C_3H_6)

$$RFM = (3 \times 12) + (6 \times 1) = 36 + 6 = 42$$

relative formula mass = 42

What each of the 3 marks wants

- ✓ Displayed formula of propene with ALL the bonds shown (including the $C=C$ double bond).
- ✓ Empirical formula = CH_2 (divide C_3H_6 by 3 - the simplest whole-number ratio). ✓
- Relative formula mass = 42.

Mark scheme 3 marks

- ✓ displayed formula showing ALL the bonds (1)
- ✓ empirical formula CH_2 (1)

ignore the working

- ✓ relative formula mass 42 (1)

Ignore: the calculation shown for the RFM

Where marks are lost

Giving the empirical formula as C_3H_6 (that is the molecular formula) instead of CH_2 , or a simple slip in the RFM sum.

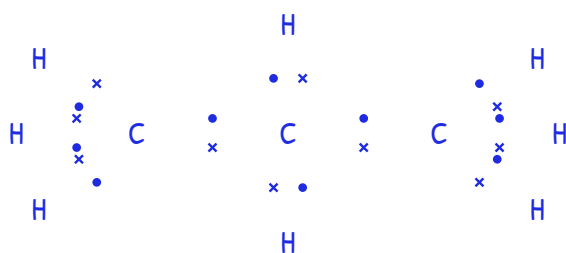
Examiner's insight

Marks were evenly spread; the empirical formula was the most common wrong response, with some RFM slips.

● 9 (b)

Draw · [2 marks]

Draw a dot-and-cross diagram for propane. Include only the outer shell electrons.



Dot-and-cross for propane C_3H_8 (outer electrons only). Each bond is a shared pair - one dot and one cross. Carbon shares 4 pairs; every hydrogen shares 1 pair. No lone pairs on carbon.

What each of the 2 marks wants

✓ Correct electron sharing between the three carbon atoms (two C-C shared pairs). ✓

The rest of the structure correct: a shared pair between each carbon and each of the eight hydrogens (C_3H_8).

Mark scheme 2 marks

✓ correct electron sharing between the 3 carbon atoms (1)

M2 dependent on M1

✓ rest of the structure correctly drawn (1)

Accept: any combination of dots and crosses

Where marks are lost

Drawing propENE (a $C=C$ double bond) instead of propane, too few hydrogens, or missing the shared electrons between atoms.

Examiner's insight

Many drew clear, acceptable diagrams; some drew propene by mistake, or left out hydrogens or bonding electrons.

● **9 (c)(i)**

Which · [1 mark]

Which row shows the correct number of products for the reactions of propene with bromine and propane with bromine?

Answer

- ☐ A propene 1 product, propane 1 product
- ☒ B propene 1 product, propane 2 products
- ☐ C propene 2 products, propane 1 product
- ☐ D propene 2 products, propane 2 products

The logic

✓ Propene has a $C=C$ double bond, so bromine ADDS across it to give ONE product (1,2-dibromopropane). Propane is saturated, so bromine SUBSTITUTES a hydrogen (in UV light), giving TWO products (1-bromopropane and 2-bromopropane).

Why the others fail

- A propane gives more than one substitution product
- C reverses propene and propane
- D propene addition gives only one product, not two

Examiner's insight

Tested addition vs substitution - propene adds to one product, propane substitutes to give more.

9 (c)(ii)

Give · [1 mark]

Give the reaction condition needed for propane and bromine to react together.

Model answer

✓ Ultraviolet (UV) light - it provides the energy to start the substitution reaction.

Mark scheme 1 mark

✓ ultraviolet radiation / UV light (1)

Ignore: 'sunlight'

Where marks are lost

Giving general conditions (heat, catalyst) or a reaction TYPE (substitution). The specific condition is UV light.

Examiner's insight

UV light was fairly well known; weaker learners gave general conditions or a reaction type.

9 (c)(iii)

Calculate · [3 marks]

A compound from the reaction of bromine water with an alkene has composition by mass: C 25.9%, H 5.0%, O 11.5%, Br 57.6%. Calculate the empirical formula.

Working

divide each % by the relative atomic mass:

✓ $C \ 25.9/12 = 2.16$ $H \ 5.0/1 = 5.0$ $O \ 11.5/16 = 0.72$ $Br \ 57.6/80 = 0.72$

divide all by the smallest (0.72):

✓ $C \ 2.16/0.72 = 3$ $H \ 5.0/0.72 = 6.94 \sim 7$ $O \ 0.72/0.72 = 1$ $Br \ 0.72/0.72 = 1$

ratio C : H : O : Br = 3 : 7 : 1 : 1

✓ so the empirical formula is C_3H_7OBr

empirical formula = C_3H_7OBr

Mark scheme 3 marks

✓ divide each % by the relative atomic mass (2.16, 5.0, 0.72, 0.72) (1)

✓ divide all by the smallest to reach 3, 6.94~7, 1, 1 (1)

✓ C_3H_7OBr (1)

Do not accept: 0 marks for an upside-down calculation or using atomic numbers (6/8/35)

Accept: error carried forward from M2 if one wrong A_r was used (not an atomic number)

Where marks are lost

Rounding 6.94 down to 6 instead of up to 7, dividing by atomic numbers, or doing the division upside down.

Examiner's insight

Answered successfully by most; the occasional slip was rounding 6.94 to 6, or using atomic numbers.

● **9 (d)(i)**

State · [1 mark]

Ethene and propene contain the same functional group. State what is meant by the term functional group.

Model answer

✓ A functional group is the **atom** or group of atoms in a **molecule** that determines the compound's chemical properties (its reactions) – for alkenes, the $C=C$ double bond.

Mark scheme 1 mark

✓ atom / group of atoms (part of a molecule) that determines its chemical properties / reactions (1)

Where marks are lost

Confusing it with a homologous series or thinking it means a group of SUBSTANCES. It is a group of ATOMS within one molecule.

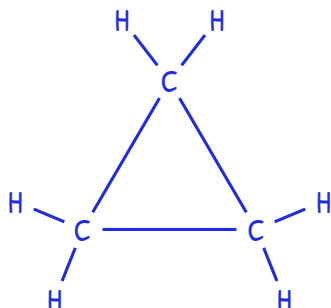
Examiner's insight

Not well known; often confused with the features of a homologous series, or taken to mean a group of substances.

● **9 (d)(ii)**

Draw · [1 mark]

Draw an isomer of propene that does NOT have the same functional group.



Cyclopropane C_3H_6 - an isomer of propene with the SAME molecular formula but a ring (no $C=C$ double bond), so a different functional group (it is not an alkene).

What the mark wants

✓ Cyclopropane - same **molecular formula** as propene (C_3H_6) but arranged as a ring with

no C=C double bond, so it is not an alkene (a different functional group).

Mark scheme 1 mark

✓ structure of cyclopropane (a C₃H₆ ring with no C=C) (1)

Where marks are lost

Just re-drawing propene in a different orientation. Rotating a molecule does NOT make an isomer - you must change the actual structure (here, a ring instead of a double bond).

Examiner's insight

Only stronger learners scored; many rotated propene rather than changing the structure.

Revise from your notes

- Displayed, molecular and empirical formulae 13.2
 - Dot-and-cross diagrams for covalent molecules 6.3
 - Alkenes, functional groups and isomerism 15.1
-

Edexcel IGCSE - Solved Past Paper

October 2025 · Chemistry Paper 1C (4CH1/1C) · Question 10 · Aluminium sulfate and yield

● hard ● medium ● easy

● 10 (a)

Which · [1 mark]

What is the total number of ELEMENTS in the formula $\text{Al}_2(\text{SO}_4)_3$?

Answer

☒ A 3

☐ B 5

☐ C 14

☐ D 17

How to get there

✓ List the different element symbols: Al, S, O → 3 different elements (the numbers just tell you how many ATOMS of each).

3 elements

Why the others fail

B there are not 5 different elements

C 14 is not the count of elements or atoms

D 17 is the total number of ATOMS (2 Al + 3 S + 12 O), not elements

Where marks are lost

Counting atoms instead of elements. There are 17 atoms but only 3 different elements (Al, S, O).

Examiner's insight

Distinguishes atoms from elements - D (17) counts every atom.

● 10 (b)(i)

Identify · [2 marks]

Excess powdered aluminium is added to dilute sulfuric acid, then the mixture is filtered (step 3). Identify the substance that remains in the filter paper and the substances in the beaker after this filtration.

Model answer

✓ Filter paper: the excess (unreacted) aluminium. ✓ Beaker: aluminium sulfate AND water (the aluminium sulfate solution).

Mark scheme 2 marks

✓ filter paper: (excess) aluminium (1)

✓ beaker: aluminium sulfate AND water (1)

Accept: (leftover) water; correct symbols

Ignore: 'aluminium sulfate solution' unless water is also stated

Where marks are lost

This is stage 3, not stage 6 - there are no crystals yet. The filter paper holds the leftover aluminium; the beaker holds the aluminium sulfate SOLUTION (salt + water). Naming only the salt loses M2.

Examiner's insight

Many got the filter-paper mark but very few got M2; some confused it with stage 6 or said the beaker held acid.

● 10 (b)(ii)

State · [1 mark]

State why the aluminium is added until it is in excess.

Model answer

✓ To make sure all the sulfuric acid reacts (is used up), so no acid is left in the product.

Mark scheme 1 mark

✓ to ensure all the (sulfuric) acid reacts (1)

Accept: 'neutralises all the acid'

Ignore: 'maximum yield'

Examiner's insight

Well understood - most gave a clear, correct response.

● 10 (b)(iii)

Explain · [2 marks]

Explain why powdered aluminium is used.

Model answer

✓ Powder has a greater surface area (to volume ratio) than a lump, ✓ so there are more frequent collisions with the acid particles and the reaction is faster.

Mark scheme 2 marks

✓ greater surface area (to volume ratio) (1)

✓ increases the rate of reaction / more frequent collisions (1)

Reject: 'more kinetic energy' for M1

Ignore: 'dissolves faster'

Where marks are lost

Saying powder has 'more energy' - surface area does not change particle energy. Powder just exposes MORE surface, giving more frequent collisions.

Examiner's insight

Very good responses - learners confidently linked powder to surface area and rate.

● 10 (c)(i)

Show · [2 marks]

The student adds 3.20 g of aluminium to 0.120 mol of dilute sulfuric acid. The equation is $2\text{Al} + 3\text{H}_2\text{SO}_4 \rightarrow \text{Al}_2(\text{SO}_4)_3 + 3\text{H}_2$. Show that the sulfuric acid is NOT in excess.

Working

✓ amount of Al = mass / A_r = $3.20 / 27 = 0.119$ mol

✓ from $2\text{Al} : 3\text{H}_2\text{SO}_4$, the Al needed for 0.120 mol acid = $0.120 \times 2/3 = 0.080$ mol

0.119 mol of Al is available - more than the 0.080 mol needed, so ALL the acid reacts

the acid is not in excess (the aluminium is in excess)

Mark scheme 2 marks

✓ amount of Al = $3.20 / 27 = 0.119$ mol (1)

✓ Al needed = $0.120 \times 2/3 = 0.080$ mol (less than 0.119, so acid all reacts) (1)

Accept: alternative: $0.119 \times 3/2 = 0.179$ mol H_2SO_4 would be needed, but only 0.120 is present

Accept: alternative: only 0.080 mol Al is needed (2.16 g), less than the 3.20 g added

Where marks are lost

Working out the moles of aluminium (0.119) but stopping there. You must compare with the acid using the 2:3 ratio to show the acid is the limiting reactant.

Examiner's insight

Many found the moles of aluminium (M1) but could not go further to M2.

● 10 (c)(ii)

Calculate · [3 marks]

The percentage yield of aluminium sulfate from 0.120 mol of sulfuric acid is 113%.

Calculate the mass, in grams, of aluminium sulfate produced.

Working

✓ amount of $\text{Al}_2(\text{SO}_4)_3$ = moles of acid / 3 = $0.120 / 3 = 0.0400$ mol

M_r of $\text{Al}_2(\text{SO}_4)_3$ = $(2 \times 27) + 3 \times (32 + 4 \times 16) = 54 + 288 = 342$

✓ theoretical mass = $0.0400 \times 342 = 13.68$ g

✓ actual mass at 113% yield = $13.68 \times 1.13 = 15.46$ g

mass = 15.46 g

Mark scheme 3 marks

✓ amount of $\text{Al}_2(\text{SO}_4)_3$ = $0.120 / 3 = 0.0400$ mol (1)

✓ theoretical mass = $0.0400 \times 342 = 13.68$ g (1)

✓ actual mass = $13.68 \times 1.13 = 15.46$ g (1)

Accept: correct answer with no working scores 3

Accept: error carried forward for an incorrect M_r ; any number of sig figs except 1

Accept: 46.38 scores 2 (forgot to divide moles by 3)

Where marks are lost

Forgetting to divide the acid moles by 3 (the 3:1 ratio), or forgetting to apply the 113% at the end. Both steps are needed.

Examiner's insight

Learners commonly gained some marks; only the strongest secured all three. Missing the /3 or the 113% were the usual errors.

● 10 (c)(iii)

Suggest · [1 mark]

Suggest a mistake in the METHOD that caused the percentage yield to be greater than 100%.

Model answer

✓ The crystals were not fully dried, so they still contained some water – this extra water added to the mass, making the measured yield too high (over 100%).

Mark scheme 1 mark - any one

- ✓ the crystals were not fully dried / still contained water (1)
- ✓ the sulfuric acid used was more concentrated than stated (1)
- ✓ a larger volume of sulfuric acid was used than stated (1)

Accept: reference to a hydrated salt / trapped water

Ignore: a calculation error

Reject: 'add more aluminium' - aluminium is in excess anyway

Where marks are lost

Blaming the calculation. The question asks for a METHOD error - the most likely is that the crystals were still wet (undried water adds to the mass).

Examiner's insight

Challenging; many framed it as a calculation error. Surprisingly few said the crystals were not fully dried.

Revise from your notes

- Preparing a soluble salt; filtration and crystallisation 8.5
 - Moles, limiting reactant and reacting masses 5.3 5.4
 - Percentage yield and sources of error 5.5
-

Everything the exam needs. Nothing it doesn't

A complete, exam-focused resource for **Edexcel IGCSE Chemistry** students. Study it in any order — two units, linear or modular — written to match the specification and examiners' expectations so you can study smarter and score higher.



100% EDEXCEL SPEC — NO FLUFF

Only what the exam tests, nothing extra.



EXAM TIPS IN EVERY TOPIC

Mark-scheme wording and the traps that lose marks.



EXAM-READY DEFINITIONS

Write answers the way examiners want them.



WORKED CALCULATIONS

Every calculation solved step by step.



"HOSNI SAYS" MNEMONICS

Memory aids that stick.



A CLEAR STUDY METHOD

Scan, read, recall, quiz, apply.



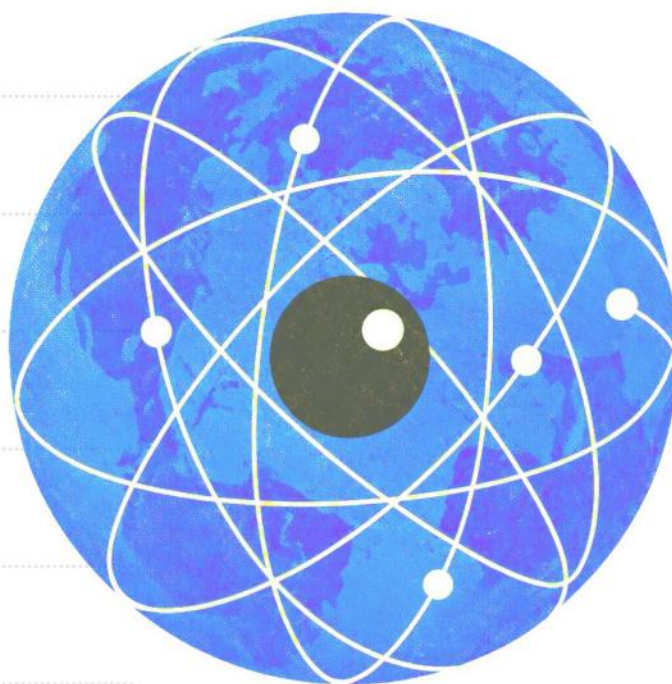
FREE ONLINE QUIZZES, FLASHCARDS & SUMMARIES

Reinforce and test yourself anytime, anywhere.



ACTIVE PROGRESS TRACKER

Tick off each topic as you go.



Continue your learning **online**

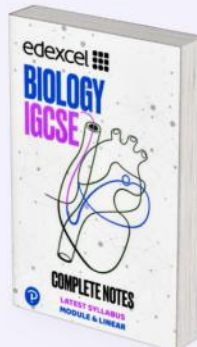


Scan to access the full course,
resources and exclusive content.



chem-bio.info/join

Also available



Edexcel IGCSE Biology

The perfect companion for
IGCSE Biology students.