

IGCSE ORGANIC CHEMISTRY PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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THE FULL VERSION STUDY GUIDE

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Introduction

Preparing for a certification exam can feel overwhelming, but with the right tools, it becomes an opportunity to build confidence, sharpen your skills, and move one step closer to your goals. At Examzify, we believe that effective exam preparation isn't just about memorization, it's about understanding the material, identifying knowledge gaps, and building the test-taking strategies that lead to success.

This guide was designed to help you do exactly that.

Whether you're preparing for a licensing exam, professional certification, or entry-level qualification, this book offers structured practice to reinforce key concepts. You'll find a wide range of multiple-choice questions, each followed by clear explanations to help you understand not just the right answer, but why it's correct.

The content in this guide is based on real-world exam objectives and aligned with the types of questions and topics commonly found on official tests. It's ideal for learners who want to:

- Practice answering questions under realistic conditions,
- Improve accuracy and speed,
- Review explanations to strengthen weak areas, and
- Approach the exam with greater confidence.

We recommend using this book not as a stand-alone study tool, but alongside other resources like flashcards, textbooks, or hands-on training. For best results, we recommend working through each question, reflecting on the explanation provided, and revisiting the topics that challenge you most.

Remember: successful test preparation isn't about getting every question right the first time, it's about learning from your mistakes and improving over time. Stay focused, trust the process, and know that every page you turn brings you closer to success.

Let's begin.

How to Use This Guide

This guide is designed to help you study more effectively and approach your exam with confidence. Whether you're reviewing for the first time or doing a final refresh, here's how to get the most out of your Examzify study guide:

1. Start with a Diagnostic Review

Skim through the questions to get a sense of what you know and what you need to focus on. Your goal is to identify knowledge gaps early.

2. Study in Short, Focused Sessions

Break your study time into manageable blocks (e.g. 30 – 45 minutes). Review a handful of questions, reflect on the explanations.

3. Learn from the Explanations

After answering a question, always read the explanation, even if you got it right. It reinforces key points, corrects misunderstandings, and teaches subtle distinctions between similar answers.

4. Track Your Progress

Use bookmarks or notes (if reading digitally) to mark difficult questions. Revisit these regularly and track improvements over time.

5. Simulate the Real Exam

Once you're comfortable, try taking a full set of questions without pausing. Set a timer and simulate test-day conditions to build confidence and time management skills.

6. Repeat and Review

Don't just study once, repetition builds retention. Re-attempt questions after a few days and revisit explanations to reinforce learning. Pair this guide with other Examzify tools like flashcards, and digital practice tests to strengthen your preparation across formats.

There's no single right way to study, but consistent, thoughtful effort always wins. Use this guide flexibly, adapt the tips above to fit your pace and learning style. You've got this!

Questions

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- 1. What happens when halogenoalkanes react with aqueous sodium hydroxide?**
- A. Alkene
 - B. Carboxylic acid
 - C. Alcohol
 - D. Aldehyde
- 2. General formula for alkenes?**
- A. C_nH_{2n}
 - B. C_nH_{2n+2}
 - C. C_nH_{2n-2}
 - D. C_nH_{2n+4}
- 3. How can you distinguish an alkene from an alkane in a simple test?**
- A. Alkanes decolorize bromine water.
 - B. Alkenes decolorize bromine water.
 - C. Bromine water adds across the triple bond.
 - D. Bromine water changes color with both alkanes and alkenes.
- 4. Which of the following is the displayed formula for methane?**
- A. CH_4
 - B. C_2H_6
 - C. C_3H_8
 - D. C_4H_{10}
- 5. Which statement is true about ester formation from carboxylic acids and alcohols?**
- A. Esters are formed by reaction of a carboxylic acid with an alcohol in the presence of an acid catalyst
 - B. Esters are formed by reacting an alcohol with a base
 - C. Esters are formed by oxidizing an aldehyde
 - D. Esters are formed by hydrolyzing an ether

6. Describe the trend in a fractionating column at high temperature.
- A. Large molecules with high boiling points
 - B. Small molecules with low boiling points
 - C. Volatility decreases with carbon count
 - D. All molecules condense at bottom
7. Which of the following is an ester?
- A. Ethanoic acid
 - B. Ethene
 - C. Ethyl ethanoate
 - D. Ethyl alcohol
8. What is the molecular formula for ethane?
- A. CH₄
 - B. C₂H₆
 - C. C₃H₈
 - D. C₅H₁₂
9. What is the molecular formula for butane?
- A. CH₄
 - B. C₂H₆
 - C. C₃H₈
 - D. C₄H₁₀
10. The structural formula CH₃ CH₂ CH₃ corresponds to which alkane?
- A. Methane
 - B. Ethane
 - C. Propane
 - D. Butane

Answers

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1. C
2. A
3. B
4. A
5. A
6. A
7. C
8. B
9. D
10. C

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Explanations

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1. What happens when halogenoalkanes react with aqueous sodium hydroxide?

- A. Alkene
- B. Carboxylic acid
- C. Alcohol**
- D. Aldehyde

The main idea is nucleophilic substitution: hydroxide ion acts as a strong nucleophile and replaces the halogen on the haloalkane. In aqueous NaOH, the OH⁻ attacks the carbon attached to the halogen, the halogen leaves as X⁻, and a C–O bond forms, giving an alcohol (R–OH) along with the sodium halide (NaX) as a by-product. For less hindered (primary or secondary) haloalkanes this happens readily via S_N2; for highly substituted (tertiary) haloalkanes an S_N1 pathway can also lead to the same alcohol product under these conditions. Under some conditions, such as hot, concentrated base, elimination to an alkene could compete, but with standard aqueous NaOH the substitution to alcohol is the dominant outcome.

2. General formula for alkenes?

- A. C_nH_{2n}**
- B. C_nH_{2n+2}
- C. C_nH_{2n-2}
- D. C_nH_{2n+4}

Alkenes have a carbon–carbon double bond. Introducing a double bond reduces the hydrogen count by two compared with the corresponding alkane, which has the formula C_nH_{2n+2}. So for an open-chain alkene with *n* carbon atoms, the hydrogen count is 2*n*, giving the general formula C_nH_{2n}. This matches common examples like ethene (C₂H₄) and propene (C₃H₆). If the molecule forms a ring or contains more than one unsaturation, the formula changes (cycloalkenes have C_nH_{2n-2}, and alkynes have C_nH_{2n-2}).

3. How can you distinguish an alkene from an alkane in a simple test?

- A. Alkanes decolorize bromine water.
- B. Alkenes decolorize bromine water.**
- C. Bromine water adds across the triple bond.
- D. Bromine water changes color with both alkanes and alkenes.

Bromine water is a test for unsaturation. Alkenes have a C=C double bond that reacts with bromine through electrophilic addition; the Br₂ molecule adds across the double bond to form a dibromo compound, and this reaction uses up the Br₂, turning the orange-brown solution colorless. Alkanes, which lack double bonds, don't react with bromine water under ordinary conditions, so the orange color stays. This simple color change is why bromine water decolorizes with alkenes but not with alkanes. (Note: alkynes would also decolorize bromine water because they can add Br₂ across the triple bond.)

4. Which of the following is the displayed formula for methane?

- A. CH₄**
- B. C₂H₆
- C. C₃H₈
- D. C₄H₁₀

Methane is the simplest alkane, so its formula must reflect one carbon atom bonded to four hydrogens. Carbon forms four bonds, and in methane all four are to hydrogen, giving the molecular formula CH₄. The displayed formula should show one carbon center with four hydrogen atoms around it, which matches CH₄. The other options correspond to larger alkanes with more carbon atoms: ethane has two carbons and six hydrogens, propane has three carbons and eight hydrogens, and butane has four carbons and ten hydrogens. In general, alkanes follow the formula C_nH_{2n+2}, and for methane (n = 1) that gives CH₄, which aligns with the correct displayed formula.

5. Which statement is true about ester formation from carboxylic acids and alcohols?

- A. Esters are formed by reaction of a carboxylic acid with an alcohol in the presence of an acid catalyst**
- B. Esters are formed by reacting an alcohol with a base
- C. Esters are formed by oxidizing an aldehyde
- D. Esters are formed by hydrolyzing an ether

Esters form by an acid-catalyzed condensation between a carboxylic acid and an alcohol, known as Fischer esterification. The acid catalyst protonates the carbonyl oxygen of the carboxylic acid, making the carbonyl carbon more electrophilic so the alcohol can attack. After a sequence of proton transfers, water is eliminated and the ester is formed. This setup is a true condensation because a molecule of water is removed in forming the ester bond, and the reaction is typically driven by removing water or using excess alcohol. The other statements don't fit this process: reacting an alcohol with a base wouldn't generate an ester under normal conditions; oxidizing an aldehyde yields an oxidized product like a carboxylic acid rather than an ester from acid and alcohol; and hydrolyzing an ether produces alcohols, not an ester, so they don't describe ester formation from a carboxylic acid and an alcohol.

6. Describe the trend in a fractionating column at high temperature.

- A. Large molecules with high boiling points**
- B. Small molecules with low boiling points
- C. Volatility decreases with carbon count
- D. All molecules condense at bottom

In a fractionating column, the bottom is heated and the temperature drops as you move up. The separation happens because components boil at different temperatures. Heavy, large molecules have high boiling points, so they only vaporize enough to rise where the column is hot enough, and as the vapor climbs and meets cooler regions, these heavy molecules tend to condense lower down. So the common trend is that large molecules with high boiling points end up near the bottom, while lighter, more volatile molecules rise higher and can be collected there. That's why describing the trend as large molecules with high boiling points being present at the bottom fits best. The other ideas don't capture the main vertical separation: light, low-boiling components aren't the defining bottom-trend, volatility versus carbon count is a general property but not the column's top-to-bottom behavior, and not all components condense at the bottom.

7. Which of the following is an ester?

- A. Ethanoic acid
- B. Ethene
- C. Ethyl ethanoate**
- D. Ethyl alcohol

An ester has a specific functional group: a carbonyl carbon double-bonded to oxygen and single-bonded to an oxygen that is connected to another carbon chain (-COO-). Ethyl ethanoate contains this -COO- linkage, with the structure $\text{CH}_3\text{-CO-O-CH}_2\text{-CH}_3$, which makes it an ester. It's the ester formed from ethanoic acid and ethanol, commonly called ethyl acetate. The other possibilities are a carboxylic acid (ethanoic acid), an alkene (ethene), and an alcohol (ethyl alcohol), none of which have the ester -COO- group.

8. What is the molecular formula for ethane?

- A. CH_4
- B. C_2H_6**
- C. C_3H_8
- D. C_5H_{12}

Ethane is an alkane with two carbon atoms, and alkanes follow the formula $\text{C}_n\text{H}_{2n+2}$ because they are saturated with single bonds. With two carbons ($n = 2$), the hydrogen count is $2 \times 2 + 2 = 6$, giving the molecular formula C_2H_6 . So ethane has two carbons and six hydrogens. The other options have the wrong number of carbons: one carbon would be CH_4 (methane), three carbons would be C_3H_8 (propane), and five carbons would be C_5H_{12} (pentane).

9. What is the molecular formula for butane?

- A. CH_4
- B. C_2H_6
- C. C_3H_8
- D. C_4H_{10}**

Molecular formulas show exactly how many carbon and hydrogen atoms are in a molecule. For alkanes, the pattern is $\text{C}_n\text{H}_{2n+2}$, where n is the number of carbon atoms. Butane has four carbon atoms, so its hydrogens are $2(4) + 2 = 10$. The formula is C_4H_{10} . The other formulas correspond to molecules with fewer carbons: CH_4 is methane (one carbon), C_2H_6 is ethane (two carbons), and C_3H_8 is propane (three carbons).

10. The structural formula $\text{CH}_3\text{CH}_2\text{CH}_3$ corresponds to which alkane?

- A. Methane
- B. Ethane
- C. Propane**
- D. Butane

Counting the carbon atoms in the chain shows three carbons here: $\text{CH}_3\text{-CH}_2\text{-CH}_3$. In alkanes, the name matches the number of carbons in the chain. One carbon is methane, two carbons is ethane, three carbons is propane, and four carbons is butane. The end carbons are CH_3 and the middle carbon is CH_2 , giving the formula C_3H_8 , which is propane.

Next Steps

Congratulations on reaching the final section of this guide. You've taken a meaningful step toward passing your certification exam and advancing your career.

As you continue preparing, remember that consistent practice, review, and self-reflection are key to success. Make time to revisit difficult topics, simulate exam conditions, and track your progress along the way.

If you need help, have suggestions, or want to share feedback, we'd love to hear from you. Reach out to our team at hello@examzify.com.

Or visit your dedicated course page for more study tools and resources:

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We wish you the very best on your exam journey. You've got this!

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