

WJEC GCSE Chemistry Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

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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. Which statement about the outer electrons of alkali metals is true?**
 - A. One electron in the outermost shell**
 - B. Seven electrons in the outermost shell**
 - C. Eight electrons in the outermost shell**
 - D. Five electrons in the outermost shell**
- 2. In a flame test, which color is produced by sodium?**
 - A. Yellow**
 - B. Lilac**
 - C. Orange-red**
 - D. Crimson-red**
- 3. What is the general formula for alkanes, and are they saturated?**
 - A. C_nH_{2n+2} ; unsaturated**
 - B. C_nH_{2n} ; unsaturated**
 - C. C_nH_{2n+2} ; saturated**
 - D. C_nH_{2n+1} ; saturated**
- 4. Why is energy efficiency important in chemical manufacturing?**
 - A. Reduces energy costs and emissions; improves sustainability.**
 - B. Increases energy consumption to speed up processes.**
 - C. Has no effect on environmental impact.**
 - D. Only affects product yield, not emissions.**
- 5. Which particle is outside the nucleus and orbits the nucleus?**
 - A. Proton**
 - B. Neutron**
 - C. Positron**
 - D. Electron**

- 6. Which term refers to the supercontinent that existed about 225 million years ago?**
- A. Pangaea**
 - B. Gondwana**
 - C. Laurasia**
 - D. Atlantis**
- 7. What is a substance composed of only one type of atom and cannot be broken down by chemical reactions?**
- A. Mixtures**
 - B. Ionic compound**
 - C. Elements**
 - D. Compound**
- 8. How is crude oil separated into fractions?**
- A. By filtration**
 - B. By fractional distillation based on boiling points**
 - C. By electrolysis**
 - D. By chemical reaction with acid**
- 9. Which process separates liquids based on boiling points and includes condensation of the vapor?**
- A. Filtration**
 - B. Evaporation**
 - C. Distillation**
 - D. Chromatography**
- 10. Approximately what percentage of Earth's atmosphere is oxygen?**
- A. 21%**
 - B. 78%**
 - C. 1%**
 - D. 0%**

Answers

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

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Explanations

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1. Which statement about the outer electrons of alkali metals is true?

- A. One electron in the outermost shell**
- B. Seven electrons in the outermost shell**
- C. Eight electrons in the outermost shell**
- D. Five electrons in the outermost shell**

Alkali metals have one valence electron in their outermost shell, which is the electron they readily lose to form a +1 ion. This single outer electron sits in the highest energy level (the ns subshell), giving them the characteristic reactivity and chemistry of Group 1 elements. So the true statement is that there is one electron in the outer shell. The other options describe different groups: seven valence electrons would belong to halogens, eight would be a full outer shell like noble gases, and five doesn't match the common valence of alkali metals.

2. In a flame test, which color is produced by sodium?

- A. Yellow**
- B. Lilac**
- C. Orange-red**
- D. Crimson-red**

When you heat a metal ion, its electrons gain energy and then drop back to lower levels, releasing light at specific wavelengths unique to that element. For sodium, the main emission occurs around 589 nanometres, in the yellow part of the spectrum. That strong, characteristic emission makes the flame look bright yellow, which is why the color produced by sodium in a flame test is yellow. It's a fingerprint of sodium's electron structure, which is why it stands out so clearly. Other metals give different colors—potassium glows lilac, calcium gives orange-red, and lithium or strontium can produce crimson-red—because each element has its own distinct set of energy levels and corresponding emission colors.

3. What is the general formula for alkanes, and are they saturated?

- A. C_nH_{2n+2} ; unsaturated**
- B. C_nH_{2n} ; unsaturated**
- C. C_nH_{2n+2} ; saturated**
- D. C_nH_{2n+1} ; saturated**

Alkanes are saturated hydrocarbons, meaning all carbon-carbon bonds are single bonds and each carbon has as many hydrogens as possible. With n carbon atoms, there are n-1 C-C bonds and the remaining bonds are C-H, which adds up to $2n + 2$ hydrogens. So the general formula for open-chain alkanes is C_nH_{2n+2} . This maximum hydrogen content is what makes them saturated. For example, CH_4 , C_2H_6 , and C_3H_8 fit the pattern as n = 1, 2, and 3, respectively. If you see C_nH_{2n} , that indicates an unsaturated hydrocarbon (such as an alkene) or a cycloalkane, not a standard alkane. A formula like C_nH_{2n+1} would not represent a complete, stable alkane.

4. Why is energy efficiency important in chemical manufacturing?

- A. Reduces energy costs and emissions; improves sustainability.**
- B. Increases energy consumption to speed up processes.**
- C. Has no effect on environmental impact.**
- D. Only affects product yield, not emissions.**

Energy efficiency means using less energy to achieve the same output in a process. In chemical manufacturing, this is important because most energy comes from burning fuels that release CO₂ and other pollutants. By using energy more efficiently, you cut operating costs and reduce emissions, which lowers the environmental footprint and helps meet regulations. It also supports sustainability by conserving resources and can boost competitiveness through lower energy bills and less heat waste. The idea isn't about changing product yield alone; it's about running processes in a smarter, cleaner way so costs and environmental impact go down.

5. Which particle is outside the nucleus and orbits the nucleus?

- A. Proton**
- B. Neutron**
- C. Positron**
- D. Electron**

Electrons are the particles that sit outside the nucleus and orbit around it. In an atom, the nucleus houses protons and neutrons, held together by the strong force. The electrons, being negatively charged, are attracted to the positively charged nucleus by the electromagnetic force, so they occupy regions around the nucleus called electron shells or orbitals. They are much lighter than the nucleons, and they exist outside the nucleus rather than inside. Protons and neutrons stay inside the nucleus, forming the dense core. A positron is the antimatter counterpart of an electron and isn't part of a normal atomic structure; it would not form a stable orbit around the nucleus. So the particle that lies outside the nucleus and moves around it is the electron.

6. Which term refers to the supercontinent that existed about 225 million years ago?

- A. Pangaea**
- B. Gondwana**
- C. Laurasia**
- D. Atlantis**

Think about how Earth's landmasses have moved over time. A supercontinent is a huge landmass formed when several continents join together due to plate tectonics. About 225 million years ago, almost all the Earth's continents were joined to form a single supercontinent called Pangaea, from a Greek phrase meaning "all land." This massive landmass later began to break apart, first splitting into two large continents—Laurasia in the north and Gondwana in the south—which eventually separated into the continents we know today. The other option is a mythical place with no geological basis.

7. What is a substance composed of only one type of atom and cannot be broken down by chemical reactions?

- A. Mixtures**
- B. Ionic compound**
- C. Elements**
- D. Compound**

Elements are substances that contain only one type of atom. Because they're made of a single kind of atom, chemical reactions can rearrange the atoms but cannot break the substance down into simpler substances—the identity of the atom remains the same. To actually split an element into something simpler you'd need nuclear changes, not ordinary chemical reactions. This is what sets elements apart from mixtures and compounds: mixtures are just blends of different substances that can be separated by physical methods, and compounds are formed from two or more elements joined together in fixed ratios and can be decomposed by chemical reactions into their elements or simpler compounds. For example, oxygen gas is an element, while water is a compound, and air is a mixture.

8. How is crude oil separated into fractions?

- A. By filtration**
- B. By fractional distillation based on boiling points**
- C. By electrolysis**
- D. By chemical reaction with acid**

Separating crude oil into fractions relies on differences in boiling points. Crude oil is a mixture of many hydrocarbons, each with its own boiling point. When you heat the crude oil in a fractionating column, the lighter, more volatile components (those with lower boiling points) vaporize first and rise up the column. The column has a temperature gradient: hotter at the bottom, cooler as you go higher. As the vapour rises and cools, different hydrocarbons condense at different heights where the temperature matches their boiling point. Each section collects a fraction containing hydrocarbons with similar boiling points. Heavier components don't vaporize as easily and stay lower in the column or condense into heavier fractions, while the lighter ones are collected at the top. This process is called fractional distillation because the column provides many tiny distillations in one go, improving separation so you can obtain distinct fractions like gases, petrol, kerosene, diesel, and heavier oils, rather than a single mixed distillate. Filtration wouldn't work here because it separates solids from liquids, not mixtures of liquids. Electrolysis or reacting with acid would chemically alter the substances and isn't how you separate components by their boiling points.

9. Which process separates liquids based on boiling points and includes condensation of the vapor?

- A. Filtration**
- B. Evaporation**
- C. Distillation**
- D. Chromatography**

Distillation separates liquids using differences in boiling points, and it involves condensing the vapor back into a liquid. When the mixture is heated, the liquid with the lower boiling point turns into vapor first. That vapor rises into a cooler condenser, where it loses energy and becomes liquid again, and is collected separately. The remaining liquid with the higher boiling point stays behind. This condensation step is what makes distillation effective. Filtration removes solids, evaporation just turns a liquid into vapor without collecting a separate liquid, and chromatography separates substances by how they move through a medium, not by boiling points.

10. Approximately what percentage of Earth's atmosphere is oxygen?

- A. 21%**
- B. 78%**
- C. 1%**
- D. 0%**

The main idea here is knowing how the air is composed by volume. Oxygen makes up roughly one-fifth of the atmosphere, about 21%. The largest portion is nitrogen, around 78%, with the rest being small amounts of other gases. So 21% is the best estimate for the oxygen content. The other options are either a much larger share (nitrogen) or far too small to be correct.

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:

<https://wjecgcsechemistry.examzify.com>

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

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