INTERNATIONAL GENERAL CERTIFICATE OF SECONDARY EDUCATION (IGCSE) CHEMISTRY PRACTICE EXAM (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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Table of Contents

Copyright 1
Table of Contents 2
Introduction 3
How to Use This Guide 4
Questions 5
Answers 8
Explanations 10
Next Steps 15

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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.

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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!

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Questions

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1. What is a key reason for neon's unreactivity?

A. It has no electrons

B. It has 8 electrons in its outer shell

C. It is a gas

D. It has a high atomic mass

2. What type of energy change occurs during the formation of ionic bonds?

A. Energy is absorbed

B. Energy is released

C. There is no energy change

D. Depends on the type of ions

3. What defines a reducing agent in a chemical reaction?

A. A substance that takes oxygen or gives electrons

B. A substance that only oxidises other substances

C. A substance that is formed as a product

D. A substance that remains unchanged in the reaction

4. Which element in group 7 is the least reactive?

A. Fluorine

B. Chlorine

C. Iodine

D. Bromine

5. How can you test for the presence of hydrogen gas?

A. By using a lit splint to check for a pop sound

B. By exposing it to a flame to check for combustion

C. By observing a color change in litmus paper

D. By measuring its density with a scale

6. Why does no reaction occur when iodine is added to sodium bromide solution?

A. Iodine is more reactive than bromine

B. Iodine is less reactive than bromine

C. Iodine is less reactive than chlorine

D. Iodine reacts with sodium

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7. Why is aluminum a suitable material for aircraft manufacturing?

A. High melting point and strong
B. Low density and resists corrosion
C. Good conductor of heat and malleable
D. Conducts electricity and heavy

8. What is the nature of metal oxides?

A. Acidic
B. Neutral
C. Basic
D. Corrosive

9. In which solution would methyl orange appear yellow?

A. Acidic
B. Neutral
C. Weak acid
D. Alkaline

10. What is an isotope?

A. Atoms with the same number of neutrons
B. Atoms with different numbers of protons
C. Atoms of the same element with different numbers of neutrons
D. Atoms of different elements with the same mass

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Answers

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

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Explanations

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1. What is a key reason for neon's unreactivity?

A. It has no electrons

B. It has 8 electrons in its outer shell

C. It is a gas

D. It has a high atomic mass

Neon's unreactivity can primarily be attributed to its electron configuration, specifically that it has 8 electrons in its outer shell. This outer shell configuration is known as being "noble" or "stable," as it fulfills the octet rule, which states that atoms are most stable when they have eight electrons in their valence shell. As a result, neon does not tend to gain, lose, or share electrons with other atoms, leading to its characteristic inertness. While other elements might react to achieve a full outer shell, neon already possesses the optimum configuration for stability, making it unreactive under standard conditions. Thus, this stable electron arrangement is the fundamental reason neon remains largely non-reactive compared to elements that do not have a full outer shell.

2. What type of energy change occurs during the formation of ionic bonds?

A. Energy is absorbed

B. Energy is released

C. There is no energy change

D. Depends on the type of ions

The formation of ionic bonds is an exothermic process, which means that energy is released. When oppositely charged ions come together to form an ionic compound, the potential energy of the system decreases as the ions stabilize each other through electrostatic attraction. This release of energy typically manifests as heat, which can be observed as an increase in temperature in the surroundings or as energy that could otherwise do work. In contrast, when ionic bonds are formed, the energy of the enthalpy change is negative, signifying that energy is exiting the system. This is a fundamental concept in understanding ionic bonding, and it indicates that ionic bonds are generally stable and energetically favorable because they lead to a lower energy state compared to the separate ions. The options that suggest energy is absorbed or that there is no energy change do not reflect the nature of ionic bond formation. Additionally, stating that energy change depends on the type of ions is misleading since, while the magnitude of energy change can vary based on ionic size and charge, the fundamental process still results in energy being released when ionic bonds form.

3. What defines a reducing agent in a chemical reaction?

A. A substance that takes oxygen or gives electrons

B. A substance that only oxidises other substances

C. A substance that is formed as a product

D. A substance that remains unchanged in the reaction

A reducing agent is defined as a substance that donates electrons to another substance during a chemical reaction. This process of donating electrons often leads to the reduction of the other substance, typically involving the addition of electrons or the removal of oxygen. In many reactions, the reducing agent itself gets oxidized in the process, which means it loses electrons. In this context, the correct choice highlights that a reducing agent can take on oxygen and give away electrons. This dual characteristic is essential for identifying a reducing agent in various chemical transformations. By gaining oxygen, it can facilitate a reaction where it helps reduce other substances. The other choices lack the comprehensive definition needed. One option inaccurately restricts a reducing agent's role to merely oxidizing other substances, which misrepresents the broader function of such agents. Another option suggests a defining characteristic that is contingent upon the formation of a product, which is not essential to the role of a reducing agent. Lastly, stating that a reducing agent remains unchanged misunderstands the concept, as reducing agents are typically transformed during the reaction, indicating their participation.

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4. Which element in group 7 is the least reactive?

A. Fluorine

B. Chlorine

C. Iodine

D. Bromine

Iodine is considered the least reactive element in group 7, also known as the halogens. Reactivity in the halogen group decreases as you move down the group from fluorine to iodine. This trend is due to the increasing atomic size, which results in a greater distance between the valence electrons and the nucleus. The larger atomic radius in iodine means that its outer electrons are held less tightly compared to those of the smaller halogens like fluorine, chlorine, and bromine. This makes iodine less likely to gain an electron to form a negative ion, which is the characteristic behavior of reactive halogens. In practical terms, iodine's reactivity is significantly lower, which is observed in its chemical behavior and reaction with other elements. For example, while fluorine and chlorine readily react with many substances, iodine tends to react more sluggishly, only forming compounds under specific conditions. This lack of reactivity is a defining characteristic of iodine compared to its counterparts in group 7.

5. How can you test for the presence of hydrogen gas?

A. By using a lit splint to check for a pop sound

B. By exposing it to a flame to check for combustion

C. By observing a color change in litmus paper

D. By measuring its density with a scale

The presence of hydrogen gas can be tested by using a lit splint to check for a pop sound. This is a classic method in chemistry known for its simplicity and reliability. When hydrogen gas is ignited, it reacts with oxygen in the air to produce water vapor, and this reaction is highly exothermic. The characteristic "pop" sound that occurs is due to the rapid expansion of gases from the reaction, which creates a small explosion. This auditory signal is a clear indicator of hydrogen. Other testing methods mentioned, while valid for other gases or substances, do not specifically indicate hydrogen. For example, exposing hydrogen to a flame may not produce a specific identifiable sound, making it less reliable for distinction. Observing a color change in litmus paper is inappropriate, as hydrogen is a neutral gas and does not affect acid-base indicators. Measuring density would also not provide direct evidence of hydrogen's presence, as density alone is not a qualitative test for gases without context or comparison. Therefore, the lit splint test is the most effective way to confirm hydrogen gas.

6. Why does no reaction occur when iodine is added to sodium bromide solution?

A. Iodine is more reactive than bromine

B. Iodine is less reactive than bromine

C. Iodine is less reactive than chlorine

D. Iodine reacts with sodium

The correct answer is that iodine is less reactive than bromine. In the context of halogen chemistry, reactivity is a crucial concept. Halogens can displace each other in chemical reactions based on their reactivity series. Bromine is more reactive than iodine, meaning that when sodium bromide, which contains the bromide ion (Br^-), is in solution, iodine (I_2) cannot displace the bromide ions. Since iodine cannot effectively displace the bromine from the sodium bromide solution, no reaction occurs when iodine is added. This illustrates the principle that a less reactive halogen cannot replace a more reactive halogen in a compound. While other options mention reactivity of iodine with chlorine or sodium, they do not directly relate to the specific scenario of iodine's interaction with bromine, emphasizing the importance of understanding the relative reactivities of the halogens involved in this reaction.

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7. Why is aluminum a suitable material for aircraft manufacturing?

A. High melting point and strong

B. Low density and resists corrosion

C. Good conductor of heat and malleable

D. Conducts electricity and heavy

Aluminum is an excellent choice for aircraft manufacturing primarily due to its low density and resistance to corrosion. The low density of aluminum makes it lightweight, which is crucial for aircraft as it helps improve fuel efficiency and overall performance in flight. A lighter aircraft requires less energy to lift off and maintain altitude, which contributes to operating efficiency. Moreover, aluminum naturally forms a thin protective oxide layer when exposed to air, which helps it resist corrosion. This property is essential in the aviation industry, where materials are subjected to harsh weather conditions and the potential for exposure to moisture and other corrosive elements. Using materials that resist corrosion extends the lifespan of aircraft and reduces maintenance costs over time, making aluminum an ideal material for this application. The other choices, while they highlight certain beneficial properties of materials, do not capture the critical balance of low density and corrosion resistance that makes aluminum particularly advantageous in aircraft design.

8. What is the nature of metal oxides?

A. Acidic

B. Neutral

C. Basic

D. Corrosive

Metal oxides are generally characterized as basic in nature. When metal oxides react with acids, they typically form salt and water, demonstrating their basic properties. For example, when magnesium oxide reacts with hydrochloric acid, it produces magnesium chloride and water: $$\text{MgO} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2\text{O}$$ This basicity is a defining trait of most metal oxides, particularly those formed from alkaline and alkaline earth metals, such as sodium oxide (Na2O) and calcium oxide (CaO). While some metal oxides can exhibit neutral characteristics or behave differently in specific conditions, the predominant behavior classifies them as basic. This distinction helps in predicting their behavior in chemical reactions, particularly in acid-base chemistry. Other options, such as acidic or corrosive, do not accurately reflect the typical behavior of metal oxides in reactions with acids and bases. Similarly, although some may exhibit neutral properties in very specific contexts, the overall classification aligns with them being basic.

9. In which solution would methyl orange appear yellow?

A. Acidic

B. Neutral

C. Weak acid

D. Alkaline

Methyl orange is a pH indicator that exhibits different colors depending on the pH of the solution. In acidic solutions (with a pH below 3.1), methyl orange appears red. As the pH increases, moving towards neutral and alkaline conditions, it transitions through orange and finally becomes yellow in more basic environments. In a solution that is alkaline (basic), with a pH above 4.4, methyl orange will display a yellow color. This characteristic makes methyl orange particularly useful in titrations involving strong acids and weak bases, as the color change indicates the point at which the solution shifts from acidic to basic. Understanding this behavior of methyl orange clarifies why the correct answer indicates it appears yellow specifically in alkaline solutions.

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10. What is an isotope?

A. Atoms with the same number of neutrons

B. Atoms with different numbers of protons

C. Atoms of the same element with different numbers of neutrons

D. Atoms of different elements with the same mass

An isotope refers to atoms of the same element that have the same number of protons but different numbers of neutrons. This characteristic means that while isotopes of an element exhibit the same chemical properties due to having identical electron configurations, they will have different mass numbers as a result of the varying neutron counts. For example, carbon-12 and carbon-14 are both isotopes of carbon. They each contain six protons, which defines them as carbon, but carbon-12 has six neutrons, while carbon-14 has eight neutrons. This difference in neutrons leads to variations in the stability and some physical properties of isotopes, which can influence behaviors in chemical reactions and nuclear processes. The other options are not accurate definitions of isotopes. Atoms with the same number of neutrons point to a specific scenario that does not hold true for isotopes, which are defined by their differing neutron counts. Atoms with different numbers of protons would actually represent different elements altogether, not isotopes. Lastly, the notion of different elements sharing the same mass does not align with the definition of isotopes, as isotopes must be variations of a single element rather than differing entities.

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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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