

INTERNATIONAL GENERAL CERTIFICATE OF SECONDARY EDUCATION (IGCSE) CHEMISTRY PRACTICE EXAM (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. Why do elements in the same group of the Periodic Table share similar chemical properties?**
 - A. They all have the same mass number
 - B. They have similar atomic radii
 - C. They have the same number of electrons in their outer shell
 - D. They are all metals
- 2. What does the term "general formula" refer to in chemistry?**
 - A. A formula that represents the structure of a molecule
 - B. A formula to calculate the amount of substance
 - C. A formula to work out the number of each type of atom in a molecule
 - D. A formula that indicates the physical properties of a compound
- 3. Which substance would likely be separated from a mixture using fractional distillation?**
 - A. Salt from water
 - B. Sugar from water
 - C. Kerosene from crude oil
 - D. Red dye from petals
- 4. What is a primary reason carbon monoxide is considered dangerous to humans?**
 - A. It causes respiratory disorders
 - B. It reduces the capacity of the blood to carry oxygen
 - C. It leads to carbon dioxide buildup
 - D. It affects the nervous system
- 5. How does graphite conduct electricity?**
 - A. Via moving ions in its structure
 - B. Through delocalised electrons that can move freely
 - C. By the presence of fixed electrons
 - D. Through covalent bonds

- 6. What is the term used to describe the movement of gases?**
- A. Convection
 - B. Diffusion
 - C. Conduction
 - D. Evaporation
- 7. What is a common use of fuel oil?**
- A. Fuel for cars
 - B. Heating residential buildings
 - C. Fuel for ships
 - D. Industrial lubricant
- 8. What is the charge of an electron?**
- A. +1
 - B. 0
 - C. -1
 - D. +2
- 9. Which of the following best describes the nature of a covalent bond?**
- A. Sharing of protons between two atoms
 - B. Transfer of electrons from one atom to another
 - C. Attraction between a shared pair of electrons and two nuclei
 - D. Formation of a crystal lattice
- 10. In which process is chlorine primarily produced as a byproduct?**
- A. Electrolysis of saltwater
 - B. Combustion of fossil fuels
 - C. Photosynthesis in plants
 - D. Decomposition of water

Answers

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

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Explanations

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1. Why do elements in the same group of the Periodic Table share similar chemical properties?

- A. They all have the same mass number
- B. They have similar atomic radii
- C. They have the same number of electrons in their outer shell**
- D. They are all metals

Elements in the same group of the Periodic Table share similar chemical properties primarily because they have the same number of electrons in their outer shell. The outermost electrons, also known as valence electrons, play a crucial role in chemical reactions. They determine how an element interacts with others; elements with the same number of valence electrons tend to form similar types of bonds and exhibit comparable reactivity. For instance, elements in Group 1, such as lithium and sodium, each have one electron in their outer shell. This similarity explains why they both readily lose that electron to form positive ions and react vigorously with water. Similarly, Group 17 elements, known as the halogens, have seven valence electrons and tend to gain one electron to achieve a stable octet, leading to similar chemical behavior across the group. The other options do not account for the primary reason behind the shared properties. Mass number varies even among elements in the same group, making it irrelevant to their chemical behavior. While atomic radii can be somewhat similar within a group, it does not dictate their chemical reactivity directly. Lastly, not all elements in a group are metals; for instance, Group 14 contains both metals (like tin) and nonmetals (like carbon).

2. What does the term "general formula" refer to in chemistry?

- A. A formula that represents the structure of a molecule
- B. A formula to calculate the amount of substance
- C. A formula to work out the number of each type of atom in a molecule**
- D. A formula that indicates the physical properties of a compound

The term "general formula" in chemistry refers to a shorthand representation that conveys the composition of a family of compounds, indicating the number and types of atoms in a molecule. Option C accurately describes this concept, as it signifies a formula that allows chemists to work out the number of each type of atom present in a molecule. For example, in organic chemistry, the general formula for alkanes is C_nH_{2n+2} , which provides a way to determine the molecular structure of any alkane based on the number of carbon atoms (n). In contrast, the other options do not align with the meaning of a general formula. A formula representing the structure of a molecule emphasizes the spatial arrangement of atoms, which is more detailed than the general formula provides. A formula to calculate the amount of substance pertains to quantitative relationships in chemistry, not specifically about the molecular composition. Finally, a formula indicating the physical properties of a compound relates to characteristics such as boiling point or solubility, rather than the molecular formula itself.

3. Which substance would likely be separated from a mixture using fractional distillation?

- A. Salt from water
- B. Sugar from water
- C. Kerosene from crude oil**
- D. Red dye from petals

Fractional distillation is a technique used to separate components in a mixture based on differences in their boiling points. It is particularly effective in separating liquids that have close boiling points, as it allows for the more efficient separation of these components compared to simple distillation. Kerosene is a complex mixture derived from crude oil and contains various hydrocarbons with different boiling points. During fractional distillation, the crude oil is heated, and as the temperature rises, different fractions of hydrocarbons vaporize at different temperatures. The vapors are then condensed and collected at various stages, allowing for the separation of kerosene from the other fractions, such as gasoline, diesel, or heavier oils. In contrast, separating salt from water, sugar from water, or a dye from petals typically involves processes like evaporation or solvent extraction rather than fractional distillation. These methods are more suited for separating substances that do not have significant differences in boiling points or are in a non-liquid state, leading to the conclusion that kerosene from crude oil is the most appropriate answer for fractional distillation.

4. What is a primary reason carbon monoxide is considered dangerous to humans?

- A. It causes respiratory disorders
- B. It reduces the capacity of the blood to carry oxygen**
- C. It leads to carbon dioxide buildup
- D. It affects the nervous system

Carbon monoxide is considered dangerous primarily because it reduces the capacity of the blood to carry oxygen. When carbon monoxide enters the body, it binds to hemoglobin in red blood cells more effectively than oxygen does, forming carboxyhemoglobin. This binding prevents oxygen from attaching to hemoglobin, which is crucial for transporting oxygen to tissues and organs. As a result, even a small amount of carbon monoxide can lead to significant oxygen deprivation in the body, which can cause serious health issues or even be fatal. While it is true that carbon monoxide exposure can lead to respiratory issues, it is primarily the interference with oxygen transport that poses the most immediate risk. Similarly, while carbon monoxide does not lead to carbon dioxide buildup in the same way as respiratory failure, its primary threat lies in causing hypoxia (lack of oxygen) rather than accumulating carbon dioxide. Although there are potential central nervous system effects from high levels of exposure, the key danger remains the reduced oxygen-carrying capacity of the blood, which underscores the life-threatening nature of carbon monoxide exposure.

5. How does graphite conduct electricity?

- A. Via moving ions in its structure
- B. Through delocalised electrons that can move freely**
- C. By the presence of fixed electrons
- D. Through covalent bonds

Graphite conducts electricity effectively due to the presence of delocalised electrons within its structure. In a graphite crystal, each carbon atom is bonded to three other carbon atoms in a planar arrangement, using three of its four outer-shell electrons to form covalent bonds. The fourth electron from each carbon atom is free to move, creating a sea of delocalised electrons that are not bound to any specific atom. These delocalised electrons can move freely throughout the layers of graphite, allowing for electrical conductivity. The structure of graphite also consists of layers held together by weak van der Waals forces, which allows layers to slide over each other. This layered structure enhances the movement of delocalised electrons and contributes to the overall conductivity. In contrast, conductivity via moving ions would be typical in ionic compounds, and fixed electrons do not contribute to conductivity at all. Covalent bonds also do not conduct electricity, as they do not allow for the free movement of charge. Hence, the ability of graphite to conduct electricity is due to its delocalised electrons.

6. What is the term used to describe the movement of gases?

- A. Convection
- B. Diffusion**
- C. Conduction
- D. Evaporation

The movement of gases is best described by the term diffusion. This process refers to the spontaneous movement of gas particles from an area of higher concentration to an area of lower concentration, leading to an overall equalization of concentration throughout the space. In gases, the particles are in constant motion and have high energy, allowing them to spread out rapidly and mix with other gases. For instance, when a small amount of perfume is sprayed in a room, the scent will gradually spread throughout the area until it is evenly distributed. This is due to diffusion, as the perfume particles move to balance the concentration gradient. Understanding diffusion is crucial in various scientific fields, including chemistry and biology, as it affects gas exchange in living organisms and influences reactions in gaseous states.

7. What is a common use of fuel oil?

- A. Fuel for cars
- B. Heating residential buildings
- C. Fuel for ships**
- D. Industrial lubricant

Fuel oil is commonly used as a fuel for ships. This is due to its high energy content and efficient burning properties, which make it suitable for large marine engines. Ships require a robust and consistent fuel source to sustain long journeys, and fuel oil meets these needs effectively. Using fuel oil for maritime transport allows vessels to achieve the necessary power for propulsion while also storing a significant amount of energy in a compact form, which is crucial for ships operating over extended periods away from port facilities. In contrast, while some other options mention potential uses, they are not as prevalent or practical in comparison to the primary role of fuel oil in marine applications.

8. What is the charge of an electron?

- A. +1
- B. 0
- C. -1**
- D. +2

The charge of an electron is negative one, denoted as -1. This fundamental property of electrons plays a crucial role in chemistry as it impacts the behavior of atoms and molecules. Electrons are subatomic particles that orbit the nucleus of an atom and carry a charge that is equal in magnitude but opposite in sign to that of a proton, which has a charge of +1. Understanding the negative charge of an electron is essential when considering how atoms bond with each other. For instance, the attraction between positively charged protons in the nucleus and negatively charged electrons is what keeps electrons in orbit around the nucleus, shaping the structure of atoms. Additionally, this charge is integral to the concepts of ionic and covalent bonding, where the transfer and sharing of electrons result in the formation of different types of compounds. Moreover, the charge of zero (0) represents neutrons, which have no charge and contribute to the mass of an atom but do not influence chemical bonding. A positive charge (+1) or +2 does not represent any stable subatomic particle within an atom but rather indicates a proton's charge or potential ionization states of atoms, respectively. Hence, the understanding of an electron's -1 charge helps form the basis for many topics in

9. Which of the following best describes the nature of a covalent bond?

- A. Sharing of protons between two atoms
- B. Transfer of electrons from one atom to another
- C. Attraction between a shared pair of electrons and two nuclei**
- D. Formation of a crystal lattice

A covalent bond is defined as the attraction between a shared pair of electrons and the nuclei of the two atoms involved in the bond. This occurs when two non-metal atoms come closely together and share electrons to achieve a more stable electronic configuration, typically filling their outer electron shells according to the octet rule. The shared electrons create a mutual attraction that holds the atoms together, thus forming a strong bond. This description highlights the essential nature of covalent bonding, where the focus is on the shared electrons rather than on the movement or transfer of electrons that characterize ionic bonding. In ionic bonds, one atom donates electrons to another, leading to the formation of charged ions, which is distinctly different from the concept of covalent bonding. Additionally, the formation of a crystal lattice pertains to ionic compounds rather than covalent bonds, as it describes the organized arrangement of ions in a solid state, which does not apply in the same way to covalent compounds. The sharing of protons is not a mechanism involved in bonding between atoms; instead, protons remain within the atomic nucleus. Hence, the only correct description of a covalent bond focuses on the attraction between shared electrons and the respective nuclei of the atoms involved.

10. In which process is chlorine primarily produced as a byproduct?

- A. Electrolysis of saltwater**
- B. Combustion of fossil fuels**
- C. Photosynthesis in plants**
- D. Decomposition of water**

Chlorine is primarily produced as a byproduct in the electrolysis of saltwater, which involves the electrolysis of sodium chloride (NaCl) solution. During this process, a direct electrical current is passed through the saltwater, causing the sodium ions and chloride ions to separate and migrate to respective electrodes. At the anode (positive electrode), chlorine gas is generated from the oxidation of chloride ions. This reaction effectively produces chlorine gas as a valuable byproduct along with hydrogen gas and sodium hydroxide at the cathode (negative electrode). On the other hand, the combustion of fossil fuels mainly results in products such as carbon dioxide, water, and other pollutants, but does not produce chlorine. Photosynthesis in plants is primarily a process involving the conversion of carbon dioxide and water into glucose and oxygen using sunlight, which does not involve chlorine production. Decomposition of water, typically understood as the breakdown of water molecules into hydrogen and oxygen gases, also does not lead to the formation of chlorine. Therefore, the electrolysis of saltwater stands out as the process specifically associated with the production of chlorine.

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://igcse-chemistry.examzify.com>

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

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