

GENERAL CHEMISTRY PLACEMENT 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 do molecular compounds usually involve when being written?**
 - A. Prefixes to indicate the number of each element
 - B. Empirical formulas only
 - C. Ion charges for each element
 - D. Metal ions listed first in the formula
- 2. How is an ionic bond formed?**
 - A. A metal atom loses an electron to form a positive ion
 - B. Two nonmetal atoms share electrons
 - C. A nonmetal atom loses an electron to form a negative ion
 - D. An atom forms a bond by transferring protons
- 3. Which hydrocarbon type has both single and double bonds?**
 - A. Alkane
 - B. Alkyne
 - C. Alkene
 - D. Saturated hydrocarbon
- 4. How are elements arranged in the modern periodic table?**
 - A. By increasing atomic mass
 - B. By decreasing atomic mass
 - C. By increasing atomic number
 - D. By decreasing atomic number
- 5. What example best illustrates a physical property?**
 - A. Flammability
 - B. Melting point
 - C. Reactivity
 - D. Toxicity
- 6. Which particle is primarily responsible for determining the charge of an ion?**
 - A. Neutron
 - B. Proton
 - C. Electron
 - D. Positron

- 7. What is the significance of the 180-degree bond angle in a linear molecule?**
- A. It indicates the presence of multiple bonds
 - B. It signifies maximum electron repulsion
 - C. It indicates that atoms are arranged in a straight line
 - D. It defines the polarity of the molecule
- 8. What defines an ion?**
- A. An atom with a balanced number of protons and electrons
 - B. An atom or molecule with a net electrical charge
 - C. An atom with a specific number of neutrons
 - D. An atom that must share electrons
- 9. Which group is known as the noble gases and is characterized by having a full octet of valence electrons?**
- A. Transition Metals
 - B. Halogens
 - C. Alkali Earth Metals
 - D. Noble Gases
- 10. What happens to boiling point (BP) and freezing point (FP) as the number of solute particles increases?**
- A. Both BP and FP decrease
 - B. BP decreases and FP increases
 - C. BP increases and FP decreases
 - D. Both BP and FP increase

Answers

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

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Explanations

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1. What do molecular compounds usually involve when being written?

- A. Prefixes to indicate the number of each element
- B. Empirical formulas only
- C. Ion charges for each element
- D. Metal ions listed first in the formula

Molecular compounds are typically composed of nonmetal elements that share electrons to form covalent bonds. When writing the formulas for these compounds, prefixes are used to denote the number of atoms of each element present in the molecule. These prefixes, such as mono-, di-, tri-, tetra-, etc., help in accurately describing the composition of the compound. For example, in carbon dioxide (CO₂), the "di-" prefix indicates there are two oxygen atoms bonded to one carbon atom. The other options do not apply to molecular compounds. Instead of empirical formulas, which represent the simplest whole-number ratio of elements in a compound, molecular formulas provide the actual number of each type of atom. Ion charges are relevant for ionic compounds, where metals and nonmetals interact; however, molecular compounds do not involve ions in this way. Finally, the arrangement of metal ions at the beginning of the formula pertains to ionic compounds, not molecular ones, where the emphasis is on the specific number of atoms involved.

2. How is an ionic bond formed?

- A. A metal atom loses an electron to form a positive ion
- B. Two nonmetal atoms share electrons
- C. A nonmetal atom loses an electron to form a negative ion
- D. An atom forms a bond by transferring protons

An ionic bond is formed when a metal atom loses one or more electrons to become a positively charged ion, known as a cation. This process occurs because metals generally have a low electronegativity and can easily lose electrons. Once the metal atom loses an electron, there is a resultant positive charge. In contrast, a nonmetal atom, which has a higher electronegativity, tends to gain the electron lost by the metal, thereby becoming a negatively charged ion called an anion. The electrostatic attraction between the positively charged cation and negatively charged anion results in the formation of the ionic bond. This transfer of electrons and the resulting attraction between oppositely charged ions is characteristic of ionic bonds, distinguishing them from covalent bonds, where two nonmetal atoms share electrons. The other options involving the loss of electrons by nonmetals and the transfer of protons do not accurately represent the mechanism of ionic bond formation, as ionic bonds specifically require electron transfer from metals to nonmetals.

3. Which hydrocarbon type has both single and double bonds?

- A. Alkane
- B. Alkyne
- C. Alkene
- D. Saturated hydrocarbon

The correct answer is alkene because alkenes are defined as hydrocarbons that contain at least one carbon-carbon double bond, while also having the potential to exhibit single bonds between carbon atoms. This dual presence of bonding types is characteristic of alkenes, distinguishing them from other hydrocarbon classes. In contrast, alkanes only have single bonds between carbon atoms, making them saturated hydrocarbons with no double or triple bonds. Alkynes, on the other hand, have at least one carbon-carbon triple bond and therefore do not feature both types of bonding. Saturated hydrocarbons specifically refer to compounds containing only single bonds (like alkanes), which further supports why the presence of both single and double bonds points specifically to alkenes.

4. How are elements arranged in the modern periodic table?

- A. By increasing atomic mass
- B. By decreasing atomic mass
- C. By increasing atomic number**
- D. By decreasing atomic number

Elements in the modern periodic table are arranged by increasing atomic number, which corresponds to the number of protons in an atom's nucleus. This organization creates a systematic arrangement that reflects the periodic law, which states that the properties of elements are a periodic function of their atomic numbers. As one moves across a period or down a group in the periodic table, not only do the atomic numbers increase, but this arrangement also reveals trends in elemental properties, such as electronegativity, ionization energy, and atomic radius. The use of atomic number over atomic mass stems from the realization that atomic mass can vary due to isotopes, which may lead to inconsistencies in the arrangement. Therefore, organizing elements by atomic number provides a more reliable and consistent framework for understanding chemical behavior and relationships among elements. This method distinctly highlights the periodicity observed in elemental properties.

5. What example best illustrates a physical property?

- A. Flammability
- B. Melting point**
- C. Reactivity
- D. Toxicity

A physical property is a characteristic of a substance that can be observed or measured without changing the substance's chemical identity. The melting point is an excellent example of a physical property because it describes the temperature at which a solid transitions to a liquid, while the chemical structure of the substance remains unchanged. In contrast, flammability, reactivity, and toxicity are classified as chemical properties. These properties involve a substance's ability to undergo a chemical change or reaction. Flammability refers to the ability of a substance to catch fire and combust, reactivity pertains to how a substance interacts with other substances to form new compounds, and toxicity involves the potential to cause harm or adverse effects through chemical interaction. These properties cannot be assessed without altering the chemical nature of the substance, which distinguishes them from physical properties like melting point.

6. Which particle is primarily responsible for determining the charge of an ion?

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

The charge of an ion is primarily determined by the difference in the number of protons and electrons present in an atom. Protons, which are positively charged particles located in the nucleus of an atom, provide the positive charge, while electrons are negatively charged particles that orbit the nucleus. When an atom gains or loses electrons, it becomes charged and forms an ion. If an atom loses one or more electrons, it results in a net positive charge, which is characteristic of a cation. Conversely, if an atom gains electrons, it obtains a net negative charge, forming an anion. In this context, while protons play a crucial role in defining the inherent positive charge of the atom, the actual charge of an ion is influenced directly by the number of electrons compared to the protons. Therefore, the electrons are key to determining whether an ion will have a positive or negative charge. The options of neutron, positron, and proton are not responsible for changing the charge of an existing ion—neutrons are neutral and do not affect charge, and positrons are not typically found in stable atoms, serving more as a concept in particle physics rather than in standard ion formation in chemistry.

7. What is the significance of the 180-degree bond angle in a linear molecule?

- A. It indicates the presence of multiple bonds
- B. It signifies maximum electron repulsion
- C. It indicates that atoms are arranged in a straight line**
- D. It defines the polarity of the molecule

The significance of the 180-degree bond angle in a linear molecule lies in its representation of the atoms being arranged in a straight line. In a linear molecular geometry, like that of carbon dioxide (CO_2), the central atom is bonded to two other atoms on opposite sides, creating a straight alignment. This arrangement minimizes steric hindrance and optimizes the spatial distribution of electron pairs, adhering to VSEPR (Valence Shell Electron Pair Repulsion) theory, which dictates that electron pairs (bonding or non-bonding) will position themselves to be as far apart as possible. Because the atoms are oriented in a straight line, the bond angle of 180 degrees is the characteristic feature of linear geometries. This provides a concise way to describe the structural nature of such molecules, making it evident that they possess a specific geometric shape essential for understanding their chemical properties and reactivity.

8. What defines an ion?

- A. An atom with a balanced number of protons and electrons
- B. An atom or molecule with a net electrical charge**
- C. An atom with a specific number of neutrons
- D. An atom that must share electrons

An ion is defined as an atom or molecule that carries a net electrical charge, which occurs when the number of protons and electrons in it is not equal. When an atom loses one or more electrons, it becomes a positively charged ion (cation), while gaining electrons leads to a negatively charged ion (anion). This phenomenon is foundational in understanding chemical reactivity and bonding, as the presence of charged particles allows for interactions with other ions and molecules, thereby influencing the behavior of substances in a chemical system. The other choices do not capture the defining feature of an ion. A balanced number of protons and electrons signifies a neutral atom, while the specific number of neutrons pertains to isotopes and does not relate to charge. The concept of sharing electrons is part of covalent bonding, not ion formation. Therefore, the choice that correctly identifies an ion is the one that emphasizes the presence of a net electrical charge.

9. Which group is known as the noble gases and is characterized by having a full octet of valence electrons?

- A. Transition Metals
- B. Halogens
- C. Alkali Earth Metals
- D. Noble Gases**

The group known as noble gases consists of elements that have a full octet of valence electrons, which typically results in them being very stable and unreactive under standard conditions. This full octet refers to having eight electrons in their outermost electron shell, leading to a complete and stable electronic configuration. The elements classified as noble gases include helium, neon, argon, krypton, xenon, and radon. This stability is due to the fact that these elements do not need to lose, gain, or share electrons to achieve a stable configuration, making them largely inert and non-reactive. This characteristic contrasts with other groups such as the transition metals, halogens, and alkali earth metals, which either have incomplete outer shells or actively seek to reach a stable electron configuration through chemical reactions. The noble gases are unique because their atomic structures naturally fulfill the octet rule, thereby rendering them particularly stable and less likely to participate in chemical bonding compared to other elements on the periodic table.

10. What happens to boiling point (BP) and freezing point (FP) as the number of solute particles increases?

- A. Both BP and FP decrease
- B. BP decreases and FP increases
- C. BP increases and FP decreases**
- D. Both BP and FP increase

As the number of solute particles increases in a solution, the boiling point (BP) actually increases, while the freezing point (FP) decreases. This phenomenon is attributed to colligative properties, which are properties that depend on the number of solute particles in a solvent rather than the identity of the solute. When a solute is added to a solvent, it disrupts the solvent's ability to form a solid (ice) at its normal freezing point, effectively lowering the freezing point of the solution. This is known as freezing point depression. In contrast, the presence of solute particles elevates the boiling point of the solution compared to the pure solvent; this is referred to as boiling point elevation. Essentially, the solute particles interfere with the solvent's ability to vaporize, thus requiring a higher temperature to reach the boiling point. This is why the correct understanding highlights that as the number of solute particles increases, the boiling point increases and the freezing point decreases.

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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