

General Chemistry Placement Practice Test (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

- 1. What is a compound?**
 - A. A mixture of two or more different substances**
 - B. A pure substance made of two or more elements chemically combined**
 - C. A single element in its natural state**
 - D. A type of homogeneous mixture**
- 2. What does a mole measure in chemistry?**
 - A. The volume of a substance**
 - B. The mass of a substance**
 - C. The amount of substance, defined as 6.022×10^{23} particles**
 - D. The density of a substance**
- 3. What is unique about oxidation-reduction (redox) reactions?**
 - A. They do not involve electron transfer**
 - B. They occur only in acidic solutions**
 - C. They involve the transfer of electrons between species**
 - D. They are exclusively precipitation reactions**
- 4. Which of the following best describes the characteristics of polymers?**
 - A. Consist of repeating units called monomers**
 - B. Always have a linear structure**
 - C. Form only from ionic compounds**
 - D. Contain only carbon and nitrogen**
- 5. Who proposed that all matter is composed of tiny particles called atoms?**
 - A. John Dalton**
 - B. Democritus**
 - C. JJ Thomson**
 - D. Erwin Schrödinger**

- 6. When does a chemical reaction release energy?**
- A. When it is endothermic**
 - B. When it is exothermic**
 - C. When temperature is constant**
 - D. When the reactants are at a lower energy level**
- 7. Which of the following best describes metalloids?**
- A. Elements that are highly conductive metals**
 - B. Elements that possess properties of both metals and nonmetals**
 - C. Reactive nonmetals**
 - D. Elements that can only exist as anions**
- 8. What is an amorphous solid?**
- A. An amorphous solid has a well-defined, ordered structure.**
 - B. An amorphous solid is a solid lacking a well-defined, ordered structure with particles arranged randomly.**
 - C. An amorphous solid only exists at extremely high temperatures.**
 - D. An amorphous solid can easily change to a crystalline structure.**
- 9. What role does a catalyst play in a chemical reaction?**
- A. A catalyst is consumed during the reaction**
 - B. A catalyst slows down the reaction**
 - C. A catalyst speeds up the reaction without being consumed**
 - D. A catalyst changes the products formed in the reaction**
- 10. Colligative properties are affected by what aspect of the solute?**
- A. The type of solute used**
 - B. The amount of solute particles produced when dissolved**
 - C. The temperature of the solvent**
 - D. The pressure exerted on the solution**

Answers

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

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Explanations

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1. What is a compound?

- A. A mixture of two or more different substances
- B. A pure substance made of two or more elements chemically combined**
- C. A single element in its natural state
- D. A type of homogeneous mixture

A compound is defined as a pure substance that consists of two or more different elements chemically combined in fixed proportions. This means that the elements within a compound are bonded together through chemical interactions, resulting in a substance with distinct chemical properties that are different from those of the individual elements. For example, water (H_2O) is a compound formed from the chemical combination of hydrogen and oxygen in a 2:1 ratio. The characteristics of water cannot be deduced just by looking at hydrogen or oxygen alone, highlighting how compounds achieve unique properties through the combination of different elements. In contrast, a mixture of substances does not involve any chemical bonding, meaning the properties of the individual components are retained. Similarly, a single element in its natural state does not fit the definition of a compound, as it does not involve multiple elements. Lastly, homogeneous mixtures consist of different substances that are uniformly distributed but are not chemically bonded, thus they also fail to meet the criteria that define a compound.

2. What does a mole measure in chemistry?

- A. The volume of a substance
- B. The mass of a substance
- C. The amount of substance, defined as 6.022×10^{23} particles**
- D. The density of a substance

A mole is a fundamental concept in chemistry used to measure the amount of substance. Specifically, one mole contains exactly 6.022×10^{23} entities, which can be atoms, molecules, ions, or other particles. This number, known as Avogadro's number, allows chemists to convert between the number of particles and the mass of a substance, enabling the calculation of how many individual entities are present in a sample. In practical terms, using moles allows scientists to work with manageable quantities of materials, as dealing directly with such large numbers of particles would be impractical. For example, when a chemist measures out one mole of water, they are working with approximately 18 grams, which corresponds to Avogadro's number of water molecules. The concept of a mole is essential for stoichiometry, which is the calculation of reactants and products in chemical reactions. Thus, the mole is fundamental for understanding the quantitative aspects of chemistry, facilitating calculations that involve atomic and molecular scales.

3. What is unique about oxidation-reduction (redox) reactions?

- A. They do not involve electron transfer
- B. They occur only in acidic solutions
- C. They involve the transfer of electrons between species**
- D. They are exclusively precipitation reactions

Oxidation-reduction (redox) reactions are characterized by the transfer of electrons between chemical species. In a redox reaction, one species undergoes oxidation, meaning it loses electrons, while another species undergoes reduction, meaning it gains those electrons. This transfer of electrons is what defines the process as a redox reaction, making it unique compared to other types of chemical reactions. For example, in the reaction between zinc and copper sulfate, zinc is oxidized as it loses electrons and copper ions are reduced as they gain those electrons. This interplay of electron loss and gain is central to the concept of redox chemistry, impacting various fields such as energy production, corrosion, and metabolic processes in biological systems. The other options describe situations that don't align with the fundamental nature of redox reactions. There can be redox reactions in basic or neutral solutions, and while some may involve precipitation, they are not exclusive to this type. This means that the defining feature of redox reactions is their involvement in electron transfer, making the understanding of electron dynamics crucial in the study of chemistry.

4. Which of the following best describes the characteristics of polymers?

- A. Consist of repeating units called monomers**
- B. Always have a linear structure
- C. Form only from ionic compounds
- D. Contain only carbon and nitrogen

Polymers are indeed characterized by their composition of repeating units known as monomers. These monomers can be simple molecules that bond together through chemical reactions to form long chains or networks, resulting in the variety of physical properties exhibited by polymers. This structure is fundamental to understanding how polymers function in both natural and synthetic materials. For example, proteins are natural polymers made up of amino acid monomers, and plastics are synthetic polymers derived from various monomers such as ethylene or styrene. The other options describe characteristics that do not apply to all polymers. Polymers can be branched, cross-linked, or even in a nonlinear arrangement, so they do not always have a linear structure. Furthermore, polymers can be formed from a variety of compounds, not just ionic ones; they can form through covalent bonding. Lastly, polymers can include a wide range of elements, including, but not limited to, carbon and nitrogen; they can contain other elements such as oxygen, sulfur, and chlorine, which add to their diversity and functionality. Thus, the defining characteristic of polymers being composed of repeating monomer units is why the first choice is the accurate description.

5. Who proposed that all matter is composed of tiny particles called atoms?

- A. John Dalton**
- B. Democritus**
- C. JJ Thomson**
- D. Erwin Schrödinger**

The proposition that all matter is composed of tiny particles called atoms can be traced back to the ancient philosopher Democritus. He was among the first to suggest that everything in the universe is made up of indivisible particles, which he named "atomos," meaning "indivisible." His ideas laid the groundwork for later scientific developments, even though they were not based on experimental evidence, as modern atomic theory would be. Democritus's vision was philosophical and speculative, as he lacked the tools and methodologies of modern science. It wasn't until centuries later, particularly with the work of John Dalton, that the atomic theory was formalized into a scientific framework supported by experimental data. Dalton built upon such ideas to formulate his own atomic theory, which included a more structured understanding of atoms and their combinations in chemical reactions. In contrast to the other figures mentioned, JJ Thomson contributed to atomic theory by discovering the electron, and Erwin Schrödinger developed quantum mechanical models of atoms, but neither proposed the original concept that all matter consists of atoms as fundamental particles.

6. When does a chemical reaction release energy?

- A. When it is endothermic**
- B. When it is exothermic**
- C. When temperature is constant**
- D. When the reactants are at a lower energy level**

A chemical reaction releases energy during an exothermic reaction. In this context, exothermic reactions are defined as processes that release energy in the form of heat or light to the surroundings. During such reactions, the total energy of the products is lower than that of the reactants, which results in the release of excess energy. This release often causes the surrounding temperature to increase. In contrast, endothermic reactions absorb energy from their surroundings, leading to a drop in temperature of the surroundings. When reactions occur at constant temperature, it indicates that there is no net energy being absorbed or released, which is not the same as releasing energy. The mention of reactants being at a lower energy level is also misleading; energy levels of reactants don't determine the energy change; rather, it is the comparison of energy levels between reactants and products that determines whether energy is released or absorbed. Thus, exothermic reactions clearly exemplify the concept of energy release in chemical processes.

7. Which of the following best describes metalloids?

- A. Elements that are highly conductive metals
- B. Elements that possess properties of both metals and nonmetals**
- C. Reactive nonmetals
- D. Elements that can only exist as anions

Metalloids are defined as elements that exhibit properties intermediate between metals and nonmetals. This dual characteristic is what makes them unique in the periodic table. For instance, metalloids can conduct electricity better than nonmetals but not as well as metals, making them semiconductors, which are crucial in electronics. Additionally, they often have physical attributes like a metallic luster and can be brittle, setting them apart from typical metals. This description aligns perfectly with the nature of metalloids, making it the best choice. The other options do not accurately capture the defining traits of metalloids. Some options, like those that suggest they are highly conductive metals or only exist as anions, mischaracterize their behavior and properties. Others, such as stating that they are reactive nonmetals, fail to encompass the full range of behaviors exhibited by metalloids. Therefore, the ability to show both metallic and nonmetallic properties reinforces why this particular choice is the most fitting description of metalloids.

8. What is an amorphous solid?

- A. An amorphous solid has a well-defined, ordered structure.
- B. An amorphous solid is a solid lacking a well-defined, ordered structure with particles arranged randomly.**
- C. An amorphous solid only exists at extremely high temperatures.
- D. An amorphous solid can easily change to a crystalline structure.

An amorphous solid is characterized by its lack of a well-defined, ordered structure, with its particles arranged randomly. This means that unlike crystalline solids, which have a regular and repeating arrangement of atoms or molecules, amorphous solids do not have long-range order. This disordered arrangement of atoms gives rise to unique physical properties, such as varying mechanical strength and different thermal characteristics compared to crystalline materials. Additionally, this randomness in the structure enables amorphous solids to exhibit behavior similar to liquids under certain conditions, despite being solid at room temperature. Examples of amorphous solids include glass and certain types of plastics, where the atoms or molecules are arranged in a non-repetitive manner, leading to a lack of sharp melting points and other distinctive phase transitions that are typical of crystalline solids.

9. What role does a catalyst play in a chemical reaction?

- A. A catalyst is consumed during the reaction**
- B. A catalyst slows down the reaction**
- C. A catalyst speeds up the reaction without being consumed**
- D. A catalyst changes the products formed in the reaction**

A catalyst plays a crucial role in chemical reactions by speeding up the rate of reaction without itself being consumed in the process. This means that while it facilitates the reaction, it can be recovered at the end in its original form. Catalysts achieve this by providing an alternative pathway for the reaction that has a lower activation energy compared to the uncatalyzed reaction. This allows more reactant molecules to have sufficient energy to collide effectively and convert into products, thus increasing the reaction rate. In addition, a catalyst does not alter the position of equilibrium in reversible reactions; it simply helps the system reach equilibrium more quickly. This is important in both industrial and laboratory settings as it can lead to more efficient reactions, saving time and resources. Understanding this role of a catalyst is essential because it highlights how reaction rates can be manipulated without changing the overall outcome of the reaction or consuming reactants in the process.

10. Colligative properties are affected by what aspect of the solute?

- A. The type of solute used**
- B. The amount of solute particles produced when dissolved**
- C. The temperature of the solvent**
- D. The pressure exerted on the solution**

Colligative properties are characteristics of solutions that depend primarily on the number of solute particles in a given amount of solvent rather than the identity or type of those solute particles. This means that when a solute is dissolved, it disrupts the physical properties of the solvent to an extent determined by how many particles are present, which can be individual molecules or ions. For example, when a non-volatile solute is added to a solvent, it lowers the vapor pressure, increases the boiling point, decreases the freezing point, and can affect osmotic pressure, all of which are classified as colligative properties. These changes occur proportional to the concentration of solute particles in the solution, which is why the amount of solute particles produced when dissolved is the key factor influencing these properties. The identity of the solute (the type of solute used) does not directly affect the colligative properties, hence not the primary focus. Similarly, while temperature and pressure can influence the behavior of a solution, they are not factors that determine colligative properties themselves. Instead, colligative properties arise from the interactions of solute particles in the solvent and their concentrations.

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://genchemplacement.examzify.com>

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