

NLN NEX CHEMISTRY PRACTICE TEST (SAMPLE)

STUDY GUIDE



SAMPLE STUDY GUIDE WITH LIMITED QUESTIONS

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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 is the formula unit of calcium fluoride?
- A. CaF
 - B. CaF₃
 - C. Ca₂F₂
 - D. CaF₂
2. A gas sample at STP has a mass of 44.0 g and occupies 11.2 L. What is its molar mass?
- A. 44.0 g/mol
 - B. 22.4 g/mol
 - C. 66.0 g/mol
 - D. 88.0 g/mol
3. A dilution by a factor of 4 reduces concentration by what factor?
- A. One-quarter of the original
 - B. Four times higher
 - C. Two times lower
 - D. Unchanged
4. Temperature and pressure affect solubility. Which statement is correct?
- A. Agitation and surface area affect solubility
 - B. Pressure alone affects solubility
 - C. Solubility is independent of temperature and pressure
 - D. Temperature and pressure affect solubility
5. Which type of covalent bond involves two electron pairs and is stronger and shorter than a single bond?
- A. Single Bonds
 - B. Triple Bonds
 - C. Double Bonds
 - D. Ionic Bonds

- 6. Which gas diffuses faster: H₂ or CO₂?**
- A. CO₂
 - B. He
 - C. H₂
 - D. O₂
- 7. The number of protons in the nucleus of an atom is called what?**
- A. Mass Number
 - B. Atomic Number
 - C. Isotopes
 - D. Average Atomic Mass
- 8. In a solution, how are the solute and solvent distributed?**
- A. The solute is uniformly distributed within the solvent
 - B. The solute forms a separate phase
 - C. The solute remains undissolved at the bottom
 - D. The solute chemically reacts with the solvent
- 9. Define molality.**
- A. Moles of solvent per kilogram of solute
 - B. Moles of solute per liter of solvent
 - C. Mass percent of solute
 - D. Moles of solute per kilogram of solvent
- 10. The breakdown of a compound by heat is called what?**
- A. Thermal decomposition
 - B. Electrolysis
 - C. Photolysis
 - D. Catalysis

Answers

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

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Explanations

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1. What is the formula unit of calcium fluoride?

- A. CaF
- B. CaF₃
- C. Ca₂F₂
- D. CaF₂**

Ionic compounds are described by the smallest whole-number ratio of ions that balances charge to zero. Calcium forms a Ca²⁺ ion, while fluoride forms F⁻. To cancel the +2 from calcium, two fluoride ions are needed, giving CaF₂. This is the simplest, neutral formula unit for calcium fluoride. The other options misbalance charge or aren't in the simplest ratio, so they don't represent the compound correctly.

2. A gas sample at STP has a mass of 44.0 g and occupies 11.2 L. What is its molar mass?

- A. 44.0 g/mol
- B. 22.4 g/mol
- C. 66.0 g/mol
- D. 88.0 g/mol**

At STP, one mole of any gas occupies 22.4 liters. The amount of gas here is $n = 11.2 \text{ L} \div 22.4 \text{ L/mol} = 0.5 \text{ mol}$. Molar mass is mass per mole, so $M = 44.0 \text{ g} \div 0.5 \text{ mol} = 88.0 \text{ g/mol}$. So the molar mass is 88.0 g/mol. (Half a mole has 44.0 g, so a full mole would weigh 88.0 g.)

3. A dilution by a factor of 4 reduces concentration by what factor?

- A. One-quarter of the original**
- B. Four times higher
- C. Two times lower
- D. Unchanged

Dilution lowers concentration by the same factor you increase the volume. If you dilute by a factor of four, you quadruple the total volume while the amount of solute stays the same, so the concentration becomes one quarter of the original. In math terms, $C_{\text{final}} = C_{\text{initial}} / 4$. That means the concentration is reduced to one-quarter of what it was. The other ideas would imply increasing the concentration, halving it, or leaving it unchanged, which isn't what happens in this dilution.

4. Temperature and pressure affect solubility. Which statement is correct?

- A. Agitation and surface area affect solubility
- B. Pressure alone affects solubility
- C. Solubility is independent of temperature and pressure
- D. Temperature and pressure affect solubility**

Solubility depends on both temperature and pressure because they change the balance of interactions that hold the solute and solvent together. When you raise the temperature, you're supplying energy to break the solute's lattice and form new interactions with the solvent. If the dissolution process is endothermic, heating makes it more favorable, so more solute dissolves. For many solids in liquids, solubility tends to increase with temperature, though there are exceptions when dissolution is exothermic. Pressure comes into play mainly for gases dissolving in liquids. According to Henry's law, increasing the partial pressure of a gas above a solution pushes more gas into solution, so its solubility increases. For most solids, changing pressure has little effect on how much can dissolve. Agitation and surface area affect how fast dissolution occurs but not the total amount that can dissolve at equilibrium. So the true statement is that temperature and pressure do affect solubility.

5. Which type of covalent bond involves two electron pairs and is stronger and shorter than a single bond?

- A. Single Bonds
- B. Triple Bonds
- C. Double Bonds**
- D. Ionic Bonds

In covalent bonding, how many electron pairs are shared between two atoms directly affects bond strength and length. A double covalent bond involves two electron pairs shared between the same two atoms. This higher bond order pulls the atoms closer together, making the bond shorter and stronger than a single bond, which shares only one electron pair. A triple bond, with three shared pairs, is even stronger and shorter than a double bond, but the description in the question specifically points to two electron pairs. Ionic bonds, on the other hand, result from transfer of electrons and electrostatic attraction between ions, not shared electron pairs, so they are not covalent.

6. Which gas diffuses faster: H₂ or CO₂?

- A. CO₂
- B. He
- C. H₂**
- D. O₂

Diffusion rates for gases depend on molecular mass: at the same temperature, lighter molecules move faster and spread through a mixture more quickly. Since diffusion arises from random molecular motion, the lighter the molecule, the quicker it diffuses. Hydrogen has a molar mass about 2 g/mol, while carbon dioxide is about 44 g/mol. With the same temperature, the lighter hydrogen moves faster on average and diffuses through the gas more quickly than CO₂. So hydrogen diffuses faster than carbon dioxide.

7. The number of protons in the nucleus of an atom is called what?

- A. Mass Number
- B. Atomic Number**
- C. Isotopes
- D. Average Atomic Mass

The number of protons in the nucleus defines the atomic number, which uniquely identifies an element and determines its position in the periodic table. This count is what you use to distinguish carbon (six protons) from nitrogen (seven protons), and so on. Mass number, on the other hand, is the total number of protons and neutrons in the nucleus, so it tells you how heavy the nucleus is but not which element it is. Isotopes are atoms that share the same number of protons (same element) but have different numbers of neutrons, leading to different mass numbers. Average atomic mass is the weighted average of the masses of all isotopes, reflecting their natural abundances.

8. In a solution, how are the solute and solvent distributed?

- A. The solute is uniformly distributed within the solvent**
- B. The solute forms a separate phase
- C. The solute remains undissolved at the bottom
- D. The solute chemically reacts with the solvent

In a solution, the solute is dissolved in the solvent so the mixture is uniform on a molecular level. The solute particles become surrounded and stabilized by solvent molecules, spreading throughout the entire liquid rather than staying as a separate mass. This leads to the same composition everywhere in the solution, so samples taken from any part have the same concentration. If all of the solute dissolves, you get a homogeneous solution. If some of it doesn't dissolve, you'd see undissolved material or a cloudy mixture, which means it isn't a true solution.

9. Define molality.

- A. Moles of solvent per kilogram of solute
- B. Moles of solute per liter of solvent
- C. Mass percent of solute
- D. Moles of solute per kilogram of solvent**

Molality is a concentration measure based on the amount of solute relative to the mass of solvent. It is defined as the number of moles of solute per kilogram of solvent ($m = n_{\text{solute}} / \text{mass}_{\text{solvent in kg}}$). Because it uses mass rather than volume, molality stays essentially the same when the temperature changes, since mass doesn't change with temperature while volumes can. That's why this unit is especially useful in colligative properties like boiling-point elevation and freezing-point depression. The option that matches this definition is the one describing moles of solute per kilogram of solvent. For example, dissolving 2 moles of solute in 0.5 kg of solvent gives a molality of 4 mol/kg.

10. The breakdown of a compound by heat is called what?

A. Thermal decomposition

B. Electrolysis

C. Photolysis

D. Catalysis

Heating a compound to break it into simpler substances is called thermal decomposition. When heat is applied, the energy helps overcome the bonds holding the atoms together, causing the substance to decompose into smaller pieces. A classic example is heating calcium carbonate to produce calcium oxide and carbon dioxide. Electrolysis uses electrical energy to drive bond breaking, not heat. Photolysis uses light energy to break bonds. Catalysis refers to a substance that speeds up a reaction without being consumed, and it isn't defined by heat-driven decomposition.

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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:

<https://nlnnexchemistry.examzify.com>

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

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