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.

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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. **A buffer solution resists changes in pH when small amounts of acid or base are added. Which statement best describes this property?**

   A. pH changes only slightly

   B. pH changes drastically

   C. pH becomes neutral instantly

   D. pH cannot be measured

2. **Cathode rays are composed of which particles?**

   A. Electrons

   B. Protons

   C. Neutrons

   D. Photons

3. **What term describes a substance formed when two or more elements are chemically bonded?**

   A. Molecule

   B. Atom

   C. Element

   D. Compound

4. **Which quantum number describes the spin direction of an electron in an orbital?**

   A. Magnetic Quantum Number

   B. Spin Quantum Number

   C. Subshell Quantum Number

   D. Principal Quantum Number

5. **Which statement correctly describes a reaction at equilibrium when the equilibrium constant Kc is greater than 1?**

   A. The reactants are favored

   B. The products are favored

   C. The rate of the forward reaction is zero

   D. Temperature has no effect on equilibrium

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6. In a solution, the substance in which the solute dissolves is called

A. Solute

B. Medium

C. Solvent

D. base

7. Hydrolysis involves a reaction with water that breaks bonds.

A. A reaction with water that forms water

B. A reaction where water is produced

C. A reaction with water that breaks bonds

D. A reaction where water acts as a solvent

8. Which covalent bond occurs when electrons are shared equally between atoms?

A. Polar Covalent Bonds

B. Covalent Bonds

C. Ionic Bonds

D. Nonpolar Covalent Bonds

9. What is the mass percent of solute in a solution containing 5.0 g solute and 95.0 g solvent?

A. 95.0%

B. 5.0%

C. 0.005%

D. 50.0%

10. An example of a homogeneous mixture is

A. Salt Water

B. Salad

C. Granite

D. Air

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Answers

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

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Explanations

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1. A buffer solution resists changes in pH when small amounts of acid or base are added. Which statement best describes this property?

A. pH changes only slightly

B. pH changes drastically

C. pH becomes neutral instantly

D. pH cannot be measured

A buffer works by having a weak acid and its conjugate base in the solution, ready to neutralize added H+ or OH-. When a little acid is added, the conjugate base grabs the extra proton to form more of the weak acid, so the pH doesn't rise much. When a little base is added, the weak acid donates a proton to neutralize it, forming more of the conjugate base, again limiting how far the pH shifts. Because the pH is tied to the ratio of conjugate base to weak acid (often near the pKa), small changes in that ratio don't produce large pH changes. So the best description is that the pH changes only slightly. The other statements describe outcomes that don't reflect how buffers dampen pH shifts.

2. Cathode rays are composed of which particles?

A. Electrons

B. Protons

C. Neutrons

D. Photons

Cathode rays are streams of negatively charged particles emitted from the cathode in a vacuum tube. They bend in electric and magnetic fields, indicating they carry charge and have mass, and measurements of their charge-to-mass ratio match that of electrons. Protons are positively charged and located in the nucleus, so they aren't what's produced as a beam from the cathode in this context. Neutrons carry no charge and wouldn't respond to electric or magnetic fields, so they wouldn't form the observed ray. Photons are massless packets of light, not moving charged particles, so they aren't the constituents of the cathode ray either. Therefore, cathode rays are composed of electrons.

3. What term describes a substance formed when two or more elements are chemically bonded?

A. Molecule

B. Atom

C. Element

D. Compound

The main idea is that when two or more elements are bonded together chemically, you get a compound—a substance with its own definite composition and properties distinct from the individual elements. A molecule is just a bonded group of atoms, and it can be made from atoms of the same element (like O2) or different elements (like H2O). An atom is the basic unit of an element, and an element is a pure substance consisting of only one type of atom. So the term for a substance formed when two or more elements are chemically bonded is compound.

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4. Which quantum number describes the spin direction of an electron in an orbital?

A. Magnetic Quantum Number

B. Spin Quantum Number

C. Subshell Quantum Number

D. Principal Quantum Number

Spin direction is described by the spin quantum number, which tells you whether an electron's intrinsic spin is up or down (+1/2 or -1/2). In atoms, the four quantum numbers include the principal number for energy level, the azimuthal number for subshell type and shape, the magnetic number for the orbital's orientation in space, and the spin number for the spin orientation. The spin quantum number specifically fixes the electron's spin projection along a chosen axis, independent of the orbital it occupies. This is also why two electrons in the same orbital must have opposite spins: their spin numbers must be different to satisfy the Pauli exclusion principle. The magnetic quantum number describes where the orbital sits in space, not the spin direction, and the principal and azimuthal numbers describe energy/size and subshell characteristics, not spin.

5. Which statement correctly describes a reaction at equilibrium when the equilibrium constant Kc is greater than 1?

A. The reactants are favored

B. The products are favored

C. The rate of the forward reaction is zero

D. Temperature has no effect on equilibrium

When the equilibrium constant Kc is greater than 1, the products are favored at equilibrium because Kc is a ratio of product concentrations to reactant concentrations (each raised to their stoichiometric powers). A value greater than 1 means the product side dominates at equilibrium, so the mixture has higher product concentrations than reactant concentrations. The forward and reverse rates are equal at equilibrium, so the forward rate is not zero. Temperature can affect equilibrium by changing Kc, so the idea that temperature has no effect isn't generally true. Therefore, the statement that products are favored is the correct description.

6. In a solution, the substance in which the solute dissolves is called

A. Solute

B. Medium

C. Solvent

D. base

In a solution, the substance doing the dissolving is the solvent. The solute is the substance that gets dissolved. The solvent is the component present in the larger amount and largely determines the solution's characteristics, such as polarity and how well different solutes dissolve. For example, when table salt dissolves in water, water is the solvent and salt is the solute. The term medium is a broader, less precise word in chemistry, while base refers to a different concept related to acid–base reactions.

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7. Hydrolysis involves a reaction with water that breaks bonds.

A. A reaction with water that forms water

B. A reaction where water is produced

C. A reaction with water that breaks bonds

D. A reaction where water acts as a solvent

Hydrolysis is a reaction that uses water to break bonds. In this process, a water molecule participates directly, adding across the bond so that it splits: the hydrogen attaches to one fragment and the hydroxyl attaches to the other. Water is consumed in the reaction to cleave the bond, producing two smaller molecules that incorporate parts of the water. This is different from reactions where water is formed as a product—that's dehydration synthesis, the opposite process where bonds form and a molecule of water is released. It's also different from a scenario where water is merely present as a solvent; in hydrolysis, water is actively involved in breaking the bond, not just dissolving reactants. In biology, this mechanism explains how complex molecules are broken down during digestion, such as the cleavage of glycosidic bonds in carbohydrates or peptide bonds in proteins by adding water.

8. Which covalent bond occurs when electrons are shared equally between atoms?

A. Polar Covalent Bonds

B. Covalent Bonds

C. Ionic Bonds

D. Nonpolar Covalent Bonds

Equal sharing of electrons happens when the two atoms have similar electronegativities, so neither atom pulls the shared electrons more than the other. This distributes the electron density evenly around both nuclei and results in a nonpolar covalent bond, with no significant partial charges on either atom. If sharing is unequal, the bond is polar covalent, and if electrons are transferred rather than shared, an ionic bond forms. Covalent bonds in general involve sharing, but only when that sharing is equal do we call it nonpolar covalent. Examples include the bond in O2 or H2, where the electrons are shared evenly.

9. What is the mass percent of solute in a solution containing 5.0 g solute and 95.0 g solvent?

A. 95.0%

B. 5.0%

C. 0.005%

D. 50.0%

Mass percent tells you what portion of the total solution mass is the solute, calculated as (mass of solute / mass of solution) × 100%. The solute mass is 5.0 g and the total mass of the solution is 5.0 g + 95.0 g = 100.0 g. So the mass percent = (5.0 / 100.0) × 100% = 5.0%. This reflects that 5 grams out of 100 grams of solution are solute. The other options would require different ratios: 95.0% would mean the solute is 95 g out of 100 g, 0.005% would be an extremely tiny fraction, and 50.0% would require equal masses of solute and solvent.

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10. An example of a homogeneous mixture is

A. Salt Water

B. Salad

C. Granite

D. Air

Homogeneous mixtures have a uniform composition throughout, so every part of the sample looks the same and has the same properties. Salt water fits this idea because the salt dissolves in water to form a single-phase solution; any portion you sample has the same salt-to-water ratio and you can't distinguish the salt particles from the water. Salad, with visibly distinct pieces like lettuce, tomatoes, and dressing, isn't uniform. Granite is made of different mineral grains that you can see, so it's not uniform either. Air is a mixture of gases and, while well mixed, it's not a dissolved solution like salt water, so the clearest example of a homogeneous mixture in this set is salt water.

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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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