

HONORS CHEMISTRY 10 TEST 1 PRACTICE (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. Which is NOT a method of physical separation?**
- A. Filtration
 - B. Evaporation
 - C. Chemical reaction
 - D. Crystallizing
- 2. If a gas expands from 3.0 L to 6.0 L at constant n and T, what happens to the pressure?**
- A. Halves
 - B. Doubles
 - C. Remains the same
 - D. Increases twofold
- 3. Which expression describes the ideal gas law?**
- A. P plus V equals nRT
 - B. P V equals nT R
 - C. PV equals nR T²
 - D. PV = nRT
- 4. If 1.00 mole of C₂H₆ combusts with excess O₂, how many moles of CO₂ are formed?**
- A. 1.00
 - B. 1.50
 - C. 3.00
 - D. 2.00
- 5. In the Lewis dot structure for water, which description best matches the molecule?**
- A. O with two lone pairs and two single bonds to H; ~104.5 degrees
 - B. O with four lone pairs and two bonds to H; ~109.5 degrees
 - C. O with one lone pair and one bond angle 90 degrees
 - D. O with three lone pairs and three bonds

6. Which term describes a chemical reaction or physical change that releases heat; ΔH is negative.
- A. Endothermic
 - B. Exothermic
 - C. Thermodynamic
 - D. Isothermal
7. Which process involves vaporization that occurs at the surface of a non-boiling liquid and can happen at any temperature?
- A. Vaporization
 - B. Boiling
 - C. Sublimation
 - D. Evaporation
8. Graphite, diamond, fullerenes, and buckyball (C-60) are examples of which concept?
- A. Allotropes
 - B. Melting Point
 - C. Definite Volume of Solids
 - D. Carbon Allotropes
9. Which law states that mass remains constant in chemical and physical changes?
- A. Law of Conservation of Mass
 - B. Law of Definite Proportions
 - C. Dalton's Atomic Theory
 - D. Avogadro's Law
10. Which statement best describes the trend of atomic radius across a period and down a group?
- A. Increases across a period; decreases down a group
 - B. Decreases across a period; increases down a group
 - C. Decreases across a period; decreases down a group
 - D. Increases across a period; increases down a group

Answers

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

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Explanations

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1. Which is NOT a method of physical separation?

- A. Filtration
- B. Evaporation
- C. Chemical reaction
- D. Crystallizing

Physical separation relies on differences in physical properties to split mixtures without changing the substances' identities. Filtration uses particle size to separate a solid from a liquid, evaporation removes the solvent and leaves the dissolved material behind, and crystallizing relies on solubility and supersaturation to form solid crystals without altering the chemicals. A chemical reaction, on the other hand, changes substances into new substances by forming or breaking chemical bonds, which is a chemical transformation rather than a separation. Therefore, the method that is not a physical separation is chemical reaction.

2. If a gas expands from 3.0 L to 6.0 L at constant n and T , what happens to the pressure?

- A. Halves
- B. Doubles
- C. Remains the same
- D. Increases twofold

When n and T are fixed, the gas follows $PV = nRT$, so P is inversely proportional to V . If the volume doubles from 3.0 L to 6.0 L, the product $P \times V$ must stay constant, so P must drop by the same factor: $P_2 = P_1 \times (V_1/V_2) = P_1 \times (3.0/6.0) = P_1/2$. Thus the pressure halves.

3. Which expression describes the ideal gas law?

- A. P plus V equals nRT
- B. $P V$ equals $nT R$
- C. PV equals $nR T^2$
- D. $PV = nRT$

The ideal gas law expresses a direct relationship among pressure, volume, temperature, and amount of gas: $PV = nRT$. It shows that the product of pressure and volume is proportional to the number of moles times the absolute temperature, with the constant R setting the scale for units. Temperature must be in Kelvin for this relationship to hold, and R changes with the unit system used. This form is correct because it uses multiplication of the variables and places PV on one side and nRT on the other, capturing how changing any one quantity affects the others in a consistent, unit-aware way. Forms that add quantities, involve squared temperature, or rearrange the variables in a way that breaks dimensional consistency do not reflect how the four properties interrelate in the ideal gas model.

4. If 1.00 mole of C₂H₆ combusts with excess O₂, how many moles of CO₂ are formed?

- A. 1.00
- B. 1.50
- C. 3.00
- D. 2.00**

In a combustion reaction, the amount of CO₂ produced follows the mole ratio in the balanced equation. Ethane has two carbon atoms, so complete combustion converts those two carbons into two CO₂ molecules for each ethane molecule burned. With 1.00 mole of C₂H₆ and oxygen in excess, the CO₂ produced is determined by this ratio: 1.00 mole C₂H₆ × (2 mol CO₂ / 1 mol C₂H₆) = 2.00 moles CO₂. The balanced form can be written as C₂H₆ + 3.5 O₂ → 2 CO₂ + 3 H₂O, showing 2 CO₂ per 1 C₂H₆. Therefore, 2.00 moles of CO₂ are formed.

5. In the Lewis dot structure for water, which description best matches the molecule?

- A. O with two lone pairs and two single bonds to H; ~104.5 degrees**
- B. O with four lone pairs and two bonds to H; ~109.5 degrees
- C. O with one lone pair and one bond angle 90 degrees
- D. O with three lone pairs and three bonds

Understanding how electron pairs arrange around the central atom is the key. In water, the oxygen atom has two bonding pairs of electrons (to the two hydrogens) and two lone pairs. That gives four electron domains total, which would arrange in a tetrahedral pattern if we looked only at electron geometry. But lone pairs take up space and repel bonding pairs more strongly than bonds do, so the two O–H bonds are pushed slightly closer together. The result is a bent shape with a bond angle a bit less than the perfect tetrahedral angle, about 104.5 degrees. So the description that matches is an oxygen with two lone pairs and two single bonds to hydrogen, with a bond angle around 104.5 degrees. The other options would require impossible or different electron-domain counts (for example, four lone pairs or three lone pairs with three bonds) or angles that don't reflect the actual lone-pair repulsion in water.

6. Which term describes a chemical reaction or physical change that releases heat; ΔH is negative.

- A. Endothermic
- B. Exothermic**
- C. Thermodynamic
- D. Isothermal

Enthalpy changes tell us whether heat is released or absorbed during a reaction or phase change. When ΔH is negative, the system loses enthalpy to the surroundings, so heat flows out and the process is exothermic. You can think of it as the reaction giving off energy as heat, which is why the surroundings often get warmer. If heat were absorbed, ΔH would be positive, and that would be an endothermic process. The term thermodynamic is a broad description of energy and state changes in systems and doesn't specify heat flow. Isothermal describes a constant temperature, which can occur in various processes and doesn't by itself indicate whether heat is released or absorbed.

7. Which process involves vaporization that occurs at the surface of a non-boiling liquid and can happen at any temperature?

- A. Vaporization
- B. Boiling
- C. Sublimation
- D. Evaporation**

The main idea is vaporization that occurs at the surface of a non-boiling liquid. This happens when molecules at the surface gain enough energy to overcome the attractive forces holding them in the liquid and escape into the air. It can occur at any temperature below the boiling point, which is the temperature where vapor pressure equals atmospheric pressure and bubbles form within the liquid. Evaporation is driven by temperature (hotter liquid evaporates faster), surface area (more surface allows more molecules to escape), and airflow (removing vapor speeds the process). A familiar example is a puddle shrinking on a sunny day. By contrast, boiling involves rapid vapor formation throughout the liquid at a specific temperature, and sublimation is a solid turning directly into gas. So the described process is evaporation.

8. Graphite, diamond, fullerenes, and buckyball (C-60) are examples of which concept?

- A. Allotropes
- B. Melting Point
- C. Definite Volume of Solids
- D. Carbon Allotropes**

Allotropy is the idea that an element can exist in multiple structural forms. Graphite, diamond, fullerenes, and buckyballs are all forms of carbon, each with a unique arrangement of bonds and shape. Graphite has layered hexagonal sheets with strong in-plane bonds and weaker interlayer interactions; diamond forms a rigid three-dimensional network of covalent bonds; fullerenes and buckyballs are spherical cage-like structures. These different bonding patterns produce very different properties, illustrating carbon allotropes—the specific case of allotropy for carbon.

9. Which law states that mass remains constant in chemical and physical changes?

- A. Law of Conservation of Mass**
- B. Law of Definite Proportions
- C. Dalton's Atomic Theory
- D. Avogadro's Law

Mass conservation in chemical and physical changes. In a closed system, the total amount of mass before a change equals the total mass after, because atoms are not created or destroyed— they simply rearrange to form new substances. This is why balancing chemical equations works: the same types and numbers of atoms must appear on both sides, ensuring the mass stays the same overall. The idea comes from careful measurements of reactants and products in experiments, showing that mass is conserved even as substances react or change state. If you ever see a mass difference, it's usually because some material escaped as a gas or vapor or because measurements weren't made in a sealed system. Other choices relate to different ideas—definite proportions concerns fixed composition of a compound, Avogadro's law links volume to particle amount in gases, and Dalton's atomic theory describes atoms and their combinations but not the conservation of mass during changes.

10. Which statement best describes the trend of atomic radius across a period and down a group?

- A. Increases across a period; decreases down a group
- B. Decreases across a period; increases down a group**
- C. Decreases across a period; decreases down a group
- D. Increases across a period; increases down a group

Atomic size is controlled by how strongly the nucleus pulls on outer electrons and how many electron shells are present. Across a period, protons increase while electrons fill the same shell, so shielding stays about the same but the effective nuclear charge felt by outer electrons rises. That stronger pull squeezes the electron cloud tighter, making the atomic radius smaller. Down a group, each step adds a new electron shell, and shielding increases, so outer electrons feel less attraction to the nucleus overall and the cloud expands. So the radius gets smaller across a period and larger down a group.

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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://honorschem10test1.examzify.com>

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

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