University of Central Florida (UCF) CHM1020 Concepts in Chemistry Final Practice Exam (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 does condensation refer to in terms of phase changes?

A. The transformation of a liquid into a gas

B. The transformation of a gas into a liquid

C. The transformation of a solid into a liquid

D. The transformation of a solid into a gas

2. What does it mean for a molecule to be polar?

A. It contains more protons than electrons

B. It has an equal distribution of charge

C. It has partial positive and negative charges due to uneven electron distribution

D. It is always a liquid at room temperature

3. Which best describes a polar molecule?

A. Contains equal charge distribution

B. Has a symmetrical shape

C. Shows an uneven distribution of electrical charge

D. Contains only one type of atom

4. What is the result of the mathematical operation 1.42 + 9.4 × 2.854?

A. 20.2

B. 30.8

C. 40.5

D. 50.8

5. What is the significance of the octet rule in chemistry?

A. Atoms attempt to share electrons equally among themselves

B. Atoms strive to achieve full outer electron shells for stability

C. Atoms always lose electrons when forming compounds

D. Atoms prefer to remain in their original electron states

6. Which atmospheric component does NOT contribute to global warming?

A. CO_2

B. H_2O

C. N_2

D. CH_4

7. Which reaction outcome is affected by the limiting reagent?

A. The temperature of the reaction

B. The maximum amount of product formed

C. The concentration of reactants

D. The time taken for the reaction

8. How many years of ocean acidification do scientists predict before shells of some ocean creatures will start to dissolve?

A. 10 years

B. 20 years

C. 40 years

D. 60 years

9. If you start with 100.0 g of carbon-14, how much will remain after 4 half-lives?

A. 12.5 g

B. 25 g

C. 6.25 g

D. 50 g

10. What is the percentage, by mass, of carbon (C) in coal when approximated by the formula $C_{135}H_{96}O_9NS$?

A. 75%

B. 85%

C. 90%

D. 80%

Answers

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

Explanations

1. What does condensation refer to in terms of phase changes?

A. The transformation of a liquid into a gas

B. The transformation of a gas into a liquid

C. The transformation of a solid into a liquid

D. The transformation of a solid into a gas

Condensation refers to the phase change in which a gas transforms into a liquid. This process occurs when the temperature of the gas decreases or when it is subjected to increased pressure, causing the molecules to lose energy and come closer together to form a liquid. In many practical examples, such as the formation of dew on grass or water droplets on a cold glass, you can observe condensation easily. When vapor comes into contact with a surface that is cooler than its dew point, it changes from gas to liquid, demonstrating the concept of condensation effectively. The other phase changes involve different transformations: vaporization is the process through which a liquid becomes a gas; melting is the transition from solid to liquid; and sublimation is when a solid transforms directly into a gas. Understanding these distinctions helps clarify the different physical processes that matter can undergo.

2. What does it mean for a molecule to be polar?

A. It contains more protons than electrons

B. It has an equal distribution of charge

C. It has partial positive and negative charges due to uneven electron distribution

D. It is always a liquid at room temperature

A molecule is considered polar when it has an uneven distribution of electron density, which results in partial positive and negative charges within the molecule. This occurs because certain atoms, especially those that are more electronegative, attract electrons more strongly than others, leading to an unequal sharing of electrons in covalent bonds. Consequently, regions of the molecule become slightly positively charged, while other regions become slightly negatively charged. This dipole moment created by the separation of charges allows polar molecules to interact more readily with other polar substances, influencing properties such as solubility, boiling and melting points, and reactivity. The characteristic of having partial charges is what distinguishes polar molecules from nonpolar ones, which have a more uniform charge distribution.

3. Which best describes a polar molecule?

A. Contains equal charge distribution

B. Has a symmetrical shape

C. Shows an uneven distribution of electrical charge

D. Contains only one type of atom

A polar molecule is defined by its uneven distribution of electrical charge. This means that within the molecule, certain regions become partially positive while others become partially negative due to differences in electronegativity between the atoms involved. When two atoms with different electronegativities bond, the more electronegative atom attracts the shared electrons more strongly, creating an unequal charge distribution. This polarization leads to the characteristic dipole moment found in polar molecules. For example, in a water molecule (H_2O), the oxygen atom is more electronegative than the hydrogen atoms, causing the electrons to spend more time closer to the oxygen. As a result, the oxygen side of the molecule becomes partially negative, and the hydrogen sides become partially positive. This uneven distribution results in many of the unique properties of water, such as its solvent capabilities and high surface tension. In contrast, options describing equal charge distribution, symmetrical shape, or containing only one type of atom do not align with the definition of a polar molecule, as these characteristics are more typical of nonpolar molecules or elements in their pure form. Thus, the identification of a polar molecule hinges on recognizing its inherent dipole nature driven by uneven charge distribution.

4. What is the result of the mathematical operation 1.42 + 9.4 × 2.854?

A. 20.2

B. 30.8

C. 40.5

D. 50.8

To solve the expression 1.42 + 9.4 × 2.854, it is important to follow the order of operations, commonly known as PEMDAS (Parentheses, Exponents, Multiplication and Division, Addition and Subtraction). According to these rules, multiplication should be performed before addition. First, we perform the multiplication: 9.4 × 2.854 = 26.8356 Next, we add this result to 1.42: 1.42 + 26.8356 = 28.2556 When considering significant figures, we look at the precision of the numbers involved. The number 9.4 has two significant figures, while 1.42 has three. In addition, we use the least number of decimal places from the numbers being added, which in this case should be rounded to two decimal places: 28.2556 rounds to 28.26. However, since that answer does not align with the options provided, we need to check it again and see if rounding might give a number similar to one of the choices. The closest option to 28.26 from your list is 30.8, which factors in possible miscalculations in rounding.

5. What is the significance of the octet rule in chemistry?

A. Atoms attempt to share electrons equally among themselves

B. Atoms strive to achieve full outer electron shells for stability

C. Atoms always lose electrons when forming compounds

D. Atoms prefer to remain in their original electron states

The significance of the octet rule in chemistry lies in the idea that atoms strive to achieve full outer electron shells, which typically means having eight electrons in their valence shell. This configuration is associated with increased stability for the atom, as it resembles the electron arrangement of noble gases, which are inherently nonreactive due to their already full valence shells. When atoms have a complete outer shell, they tend to be less reactive and more stable. This drives the formation of chemical bonds, as atoms will either share, gain, or lose electrons to attain this full octet. This concept helps explain why certain elements behave the way they do in chemical reactions and bonding scenarios, as they seek to reach this stable configuration. In distinguishing this answer from others, the idea that atoms would share electrons equally (the first answer) pertains more to covalent bonding rather than the broader stability concept introduced by the octet rule. The notion that atoms always lose electrons (the third answer) is not universally true, as some atoms gain electrons to achieve stability; this misrepresents how atoms can form ions. Lastly, the idea that atoms prefer to remain in their original electron states (the fourth answer) contradicts the very essence of chemical reactivity, as it overlooks

6. Which atmospheric component does NOT contribute to global warming?

A. CO2

B. H2O

C. N2

D. CH4

The answer is C, nitrogen (N_2). Nitrogen makes up about 78% of the Earth's atmosphere and is a relatively inert gas. It does not absorb infrared radiation, which is a key mechanism for warming the atmosphere. In contrast, carbon dioxide (CO_2), methane (CH_4), and water vapor (H_2O) are all greenhouse gases. These gases are capable of trapping heat within the atmosphere by absorbing and re-emitting infrared radiation. CO_2 is produced from various natural processes and human activities, and it has a significant impact on the greenhouse effect. Methane is even more effective at trapping heat, though it is present in smaller quantities compared to CO_2. Water vapor, while not directly anthropogenic, increases in concentration as the Earth's temperature rises, enhancing the greenhouse effect. Thus, nitrogen does not contribute to global warming due to its inert properties, making it the correct answer to the question.

7. Which reaction outcome is affected by the limiting reagent?

A. The temperature of the reaction

B. The maximum amount of product formed

C. The concentration of reactants

D. The time taken for the reaction

The maximum amount of product formed in a chemical reaction is directly influenced by the limiting reagent. The limiting reagent is the reactant that is consumed first in a chemical reaction; once it is completely used up, the reaction cannot continue, and no additional product can be formed. Therefore, the quantity of product generated is determined by the amount of the limiting reagent available at the start of the reaction. In a stoichiometric calculation involving reactants, if one reactant is present in a lesser amount than required according to the balanced equation, it will restrict the formation of products to its own amount, thereby establishing the maximum yield. Thus, the limiting reagent directly correlates to how much product can ultimately be produced in that reaction. In contrast, while temperature, concentration, and reaction time are important factors in chemical reactions, they do not determine the maximum product formation in the same way the limiting reagent does. Temperature can influence reaction rate and equilibrium but does not change the stoichiometry of the product formed. Concentration affects the reaction rate and can impact how quickly a product forms, but it does not alter the final yield based on the stoichiometric limits set by the limiting reagent. Similarly, time taken for the reaction can vary based on many factors without

8. How many years of ocean acidification do scientists predict before shells of some ocean creatures will start to dissolve?

A. 10 years

B. 20 years

C. 40 years

D. 60 years

Scientists predict that the shells of some ocean creatures will start to dissolve due to ocean acidification within approximately 40 years. This prediction is based on ongoing research into how increased levels of carbon dioxide in the atmosphere lead to higher concentrations of carbonic acid in ocean water. As the water becomes more acidic, it affects the calcium carbonate saturation state, which is crucial for the formation and maintenance of shells in organisms such as mollusks, corals, and certain plankton. The timeline of about 40 years reflects a combination of factors, including current levels of greenhouse gas emissions and the rate at which they are projected to increase. Understanding this timescale is essential as it indicates that immediate mitigation actions are necessary to protect marine ecosystems. The impacts of ocean acidification are expected to be significant, affecting food webs, biodiversity, and the fishing industry. Therefore, the 40-year projection serves as a crucial warning for environmental policy and scientific research to safeguard marine life.

9. If you start with 100.0 g of carbon-14, how much will remain after 4 half-lives?

A. 12.5 g

B. 25 g

C. 6.25 g

D. 50 g

To determine how much carbon-14 remains after four half-lives, it's essential to understand the concept of a half-life. A half-life is the time required for half of a sample of a radioactive substance to decay. Starting with 100.0 g of carbon-14, after the first half-life, you would have half of the original amount remaining, which is 50.0 g. After the second half-life, you take half of that amount, resulting in 25.0 g remaining. Continuing this process, after the third half-life, you would have 12.5 g left. Finally, after the fourth half-life, you take half of the 12.5 g, yielding 6.25 g remaining. Therefore, after four half-lives, the amount of carbon-14 left is 6.25 g. This step-by-step halving process illustrates the exponential decay characteristic of radioactive isotopes, allowing you to quantify remaining amounts accurately over successive half-lives.

10. What is the percentage, by mass, of carbon (C) in coal when approximated by the formula $C_{135}H_{96}O_9NS$?

A. 75%

B. 85%

C. 90%

D. 80%

To find the percentage by mass of carbon in the coal represented by the formula $C_{135}H_{96}O_9NS$, you first need to determine the molar mass of the entire compound and the molar mass of just the carbon present within that formula. For the compound $C_{135}H_{96}O_9NS$: 1. Calculate the molar mass of each element: - Carbon (C): 12.01 g/mol × 135 = 1621.35 g/mol - Hydrogen (H): 1.008 g/mol × 96 = 96.768 g/mol - Oxygen (O): 16.00 g/mol × 9 = 144.00 g/mol - Nitrogen (N): 14.01 g/mol × 1 = 14.01 g/mol - Sulfur (S): 32.07 g/mol × 1 = 32.07 g/mol 2. Now, sum these values to get the total molar mass of the compound: - Total molar mass = 1621.35 + 96.768 + 144.00 + 14.01 + 32.07 = 1908.14 g/mol 3

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://ucf-chm1020-final.examzify.com

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