CIE CHEMISTRY ADVANCED SUBSIDIARY (AS) LEVEL 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

1. What angle is characteristic of a trigonal bipyramidal arrangement?

A. 120 degrees

B. 90 degrees

C. 109.5 degrees

D. 104.5 degrees

2. An ionic lattice is best described as which of the following?

A. A repeating pattern of positive and negative ions forming an ionic compound

B. A lattice of neutral atoms bound by covalent bonds

C. A sea of electrons in a metal lattice

D. Simple molecules held together by weak van der Waals forces

3. Hydrolysis of DNA would ultimately yield which building blocks?

A. Amino acids

B. Fatty acids

C. Monosaccharides

D. Nucleotides

4. A carbocation is defined as which of the following?

A. A species containing a positively charged carbon

B. A carbon-centered radical

C. A carbonyl compound

D. A negatively charged carbon

5. Which molecule has a linear shape with a 180-degree bond angle?

A. Water

B. Ammonia

C. Methane

D. Carbon dioxide

6. Relative atomic mass is measured on a scale where the carbon-12 atom has a mass of 12.

A. The mass of one atom relative to 1/12 of a carbon-12 atom

B. The mass of a molecule relative to hydrogen

C. The mass per mole

D. The mass of the entire sample

7. Which molecule has octahedral geometry?

A. Methane

B. PCl_5

C. SF_6

D. H_2O

8. Which description matches heterolytic fission?

A. Bond breaks so that one electron goes to each atom

B. Bond breaking so that both electrons go to the same atom

C. Rotation about bond

D. Electron pairs are shared equally

9. Which geometry corresponds to three bonded atoms and one lone pair?

A. Tetrahedral

B. Trigonal planar

C. Bent

D. Pyramidal

10. Under standard thermodynamic conditions, what are the standard temperature and pressure?

A. 298 K and 1 atm

B. 0 K and 1 atm

C. 273 K and 1 atm

D. 298 K and 1 bar

Answers

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

Explanations

1. What angle is characteristic of a trigonal bipyramidal arrangement?

A. 120 degrees

B. 90 degrees

C. 109.5 degrees

D. 104.5 degrees

In trigonal bipyramidal geometry, three bonds lie in a plane with 120° between them, and two bonds sit above and below that plane. Because the axial bonds are perpendicular to the equatorial plane, each axial bond forms a 90° angle with every equatorial bond. This 90° interaction between axial and equatorial positions is the defining angle of this arrangement. The equatorial bonds themselves are 120° apart, and the axial bonds are 180° apart. Angles like 109.5° or 104.5° come from other geometries or distortions, not the ideal trigonal bipyramidal case.

2. An ionic lattice is best described as which of the following?

A. A repeating pattern of positive and negative ions forming an ionic compound

B. A lattice of neutral atoms bound by covalent bonds

C. A sea of electrons in a metal lattice

D. Simple molecules held together by weak van der Waals forces

An ionic lattice is an extended, three dimensional array of ions where positive and negative ions alternate in a repeating pattern, held together by strong electrostatic attractions. This description captures the essence: a crystal is built from a repeating organization of ions forming an ionic compound, not neutral atoms bound covalently, not a metallic "sea" of electrons, and not simple molecules held by weak van der Waals forces. The other pictures describe different bonding types—covalent networks, metallic bonding, or molecular solids—that don't form the regular alternating ion lattice seen in ionic compounds.

3. Hydrolysis of DNA would ultimately yield which building blocks?

A. Amino acids

B. Fatty acids

C. Monosaccharides

D. Nucleotides

DNA is a polymer built from nucleotides linked by phosphodiester bonds. When hydrolysis happens, these bonds are cleaved, releasing the monomer units. The building blocks of DNA are nucleotides, each containing a deoxyribose sugar, a phosphate group, and a nitrogenous base. So hydrolysis ultimately yields nucleotides. Amino acids form proteins, fatty acids form lipids, and monosaccharides form carbohydrates, so they're not the products here.

4. A carbocation is defined as which of the following?

A. A species containing a positively charged carbon

B. A carbon-centered radical

C. A carbonyl compound

D. A negatively charged carbon

A carbocation is a species containing a positively charged carbon atom. This happens when carbon loses enough electrons (or forms bonds in a way that leaves only six electrons around it in its valence shell), giving carbon a formal charge of +1. The positive charge is located on the carbon, which is electron-deficient and typically planar with an empty p orbital, making it highly reactive toward nucleophiles. This is different from a carbon-centered radical, which has an unpaired electron; from a carbonyl compound, which features a C=O double bond; and from a negatively charged carbon (a carbanion), which would carry a negative formal charge.

5. Which molecule has a linear shape with a 180-degree bond angle?

A. Water

B. Ammonia

C. Methane

D. Carbon dioxide

A linear shape with a 180° bond angle occurs when the central atom has only two regions of electron density and no lone pairs, so the bonding pairs repel to form a straight line. Carbon dioxide fits this description: the carbon forms two double bonds to oxygen and has no lone pairs, giving two regions of electron density that lie opposite each other and produce a straight O=C=O arrangement with a 180° angle. Water has a bent shape because the oxygen carries two lone pairs in addition to the two bonding pairs, which pushes the hydrogens closer together and reduces the angle to about 104.5°. Ammonia has three bonding pairs and one lone pair, giving a trigonal pyramidal shape with angles around 107°. Methane has four bonding pairs and no lone pairs, yielding a tetrahedral geometry with angles about 109.5°.

6. Relative atomic mass is measured on a scale where the carbon-12 atom has a mass of 12.

A. The mass of one atom relative to 1/12 of a carbon-12 atom

B. The mass of a molecule relative to hydrogen

C. The mass per mole

D. The mass of the entire sample

Relative atomic mass is a way to express how heavy an atom is compared with 1/12 of a carbon-12 atom. Because carbon-12 is defined to have a mass of exactly 12, the mass of any atom on this scale is given as a number that tells you how many times bigger or smaller it is than 1/12 of a carbon-12 atom. This makes the relative atomic mass a dimensionless quantity (often tied to the atomic mass unit), reflecting the atom's mass in units of 1/12 of carbon-12. For example, an atom with a relative atomic mass of about 16 is about 16 times as heavy as 1/12 of carbon-12. The other descriptions refer to different concepts: mass per mole is molar mass (g/mol), the mass of a molecule relative to hydrogen describes relative molecular mass, and the mass of an entire sample is just total mass, not the atomic comparison.

7. Which molecule has octahedral geometry?

A. Methane

B. PCl5

C. SF6

D. H2O

Octahedral geometry comes from a central atom with six electron domains arranged around it, all of which are bonding pairs and no lone pairs to distort the shape. In sulfur hexafluoride, sulfur is bonded to six fluorine atoms and has no lone pairs on sulfur, so the six S–F bonds arrange in an octahedral pattern. The other molecules don't have six bonding pairs around a single center: methane has four C–H bonds in a tetrahedral arrangement; water has two bonding pairs plus two lone pairs on oxygen, giving a bent shape; phosphorus pentachloride has five bonds around phosphorus in a trigonal bipyramidal arrangement.

8. Which description matches heterolytic fission?

A. Bond breaks so that one electron goes to each atom

B. Bond breaking so that both electrons go to the same atom

C. Rotation about bond

D. Electron pairs are shared equally

Heterolytic fission happens when a bond breaks and both electrons go to the same atom, producing ions. For example, when a polar bond like H–Cl breaks heterolytically, Cl takes both electrons to form Cl− and H becomes H+, giving ions. This contrasts with homolytic fission, where the bond breaks and each atom takes one electron, forming two radicals. The idea of rotation about a bond isn't about breaking the bond, and sharing electrons equally describes a nonpolar covalent situation, not how a bond cleaves.

9. Which geometry corresponds to three bonded atoms and one lone pair?

A. Tetrahedral

B. Trigonal planar

C. Bent

D. Pyramidal

In VSEPR, the shape around a central atom is determined by the number of electron domains (bonding pairs plus lone pairs). Four electron domains arrange in a tetrahedral pattern, but if one of those domains is a lone pair, the three bonding pairs are pushed into a pyramid shape. That gives a pyramidal geometry for the molecule, specifically trigonal pyramidal, which matches three bonded atoms with one lone pair. The other shapes don't fit: four bonding pairs produce a tetrahedral arrangement, three bonds with no lone pair would be trigonal planar, and two bonds with a lone pair produce a bent shape.

10. Under standard thermodynamic conditions, what are the standard temperature and pressure?

A. 298 K and 1 atm

B. 0 K and 1 atm

C. 273 K and 1 atm

D. 298 K and 1 bar

Standard conditions in thermodynamics are defined as a temperature of 298 K (25°C) and a pressure of 1 atm. This pair is used as a reference state for many tabulated gas properties and reactions, so that quantities like standard molar volumes or standard enthalpies are comparable. At 298 K and 1 atm, an ideal gas would have a molar volume of about 24.5 L per mole (Vm ≈ RT/P). The choice that lists 298 K with 1 atm matches this widely used convention. Other options pair different temperatures with these or near values: 0 K is absolute zero and unattainable; 273 K is 0°C (an older convention for standard state in some texts); 1 bar (100 kPa) is close but not the standard 1 atm definition.

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://ciechemaslevel.examzify.com

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