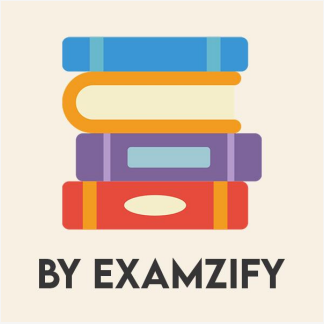
International General Certificate of Secondary Education (IGCSE) Chemistry Practice Exam (Sample)

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. Don't worry about getting everything right, 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, and take breaks to retain information better.

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.

7. Use Other Tools

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. **Which characteristic is common in addition polymers like poly(ethene)?**
   - **A. They are all colored**
   - **B. They decompose easily**
   - **C. They are made from monomers with double bonds**
   - **D. They can conduct electricity**

2. **What is the molecular formula of ethane?**
   - **A. C2H4**
   - **B. C2H6**
   - **C. C3H8**
   - **D. C4H10**

3. **What is the approximate mass of an electron?**
   - **A. 1**
   - **B. Almost 0**
   - **C. 0.5**
   - **D. 0.003**

4. **What is the general formula for alkanes?**
   - **A. CnH2n**
   - **B. CnH2n+2**
   - **C. CnH2n-2**
   - **D. CnH2n+1**

5. **In the process of galvanising, which metal is used to protect iron from rusting?**
   - **A. Copper**
   - **B. Aluminium**
   - **C. Zinc**
   - **D. Lead**

6. Which compound would you expect to be alkaline when dissolved in water?

A. Sodium chloride

B. Sodium hydroxide

C. Hydrochloric acid

D. Chlorine gas

7. Which molecule is represented by the dot and cross diagram with two pairs of shared electrons?

A. Hydrogen chloride, HCl

B. Oxygen, O_2

C. Chlorine, Cl_2

D. Methane, CH_4

8. What describes the structure of metals?

A. They have a molecular structure

B. They consist of individual atoms held together by covalent bonds

C. They have a giant regular structure of positive ions

D. They consist of weak intermolecular forces

9. What is the ionic equation for the anode reaction during the electrolysis of copper chloride?

A. $Cu^{2+} + 2e^- \rightarrow Cu$

B. $2Cl^- \rightarrow Cl_2 + 2e^-$

C. $2H_2O \rightarrow O_2 + 4e^-$

D. $Pb^{2+} + 2e^- \rightarrow Pb$

10. What is crude oil primarily composed of?

A. A single hydrocarbon

B. A mixture of hydrocarbons

C. Water and salts

D. Carbon and sulfur

Answers

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

Explanations

1. Which characteristic is common in addition polymers like poly(ethene)?

A. They are all colored

B. They decompose easily

C. They are made from monomers with double bonds

D. They can conduct electricity

Addition polymers, such as poly(ethene), are synthesized through the process of addition polymerization, which specifically involves monomers that contain double bonds. In the case of poly(ethene), the monomer is ethene (C2H4), which has a carbon-carbon double bond. During polymerization, these double bonds open up, allowing the monomers to link together in long chains to form the polymer. This process is a characteristic feature of addition polymers. The presence of double bonds in the monomers is essential for the polymerization reaction to occur, resulting in the formation of a large molecular structure from smaller repeat units. This distinguishes addition polymers from other types of polymers, which may be formed through different mechanisms involving other types of monomers or functional groups.

2. What is the molecular formula of ethane?

A. C2H4

B. C2H6

C. C3H8

D. C4H10

Ethane is an alkane, which is a type of hydrocarbon that has only single bonds between the carbon atoms. The general formula for alkanes is CnH(2n+2), where "n" represents the number of carbon atoms in the molecule. For ethane, "n" is 2 since it has two carbon atoms. Using the formula: - When n = 2, the number of hydrogen atoms can be calculated as: H = 2(2) + 2 = 6. Thus, the molecular formula for ethane is C2H6, which indicates it consists of two carbon atoms and six hydrogen atoms. This aligns perfectly with the characteristics of ethane as a saturated hydrocarbon, where each carbon atom is fully bonded with hydrogen, maximizing the number of hydrogen atoms it can carry without forming double or triple bonds.

3. What is the approximate mass of an electron?

A. 1

B. Almost 0

C. 0.5

D. 0.003

The approximate mass of an electron is indeed very small, often referred to as being "almost 0" in comparison to the mass of protons and neutrons, which make up the nucleus of an atom. The actual mass of an electron is about 9.11 x 10^-31 kilograms, which is significantly less than that of a proton (approximately 1.67 x 10^-27 kg). This tiny mass is crucial in various aspects of chemistry and physics, particularly in atomic theory and quantum mechanics. Electrons are involved in chemical bonding and reactions, and their mass (being so small) means that they have a relatively insignificant impact on the overall mass of an atom compared to the nucleus. Thus, referring to the mass of an electron as "almost 0" effectively captures the practical relevance of its mass when considering atomic and molecular weight calculations. Understanding the remarkably small mass of electrons helps illustrate why, in many scenarios, their contribution to the overall mass of an atom can be overlooked in simplified calculations.

4. What is the general formula for alkanes?

A. CnH2n

B. CnH2n+2

C. CnH2n-2

D. CnH2n+1

Alkanes are a class of hydrocarbons characterized by their single bonds between carbon atoms. The general formula for alkanes is CnH2n+2, where "n" represents the number of carbon atoms in the molecule. This formula indicates that for each carbon atom (C), there are twice as many hydrogen atoms (H) required, plus an additional two hydrogen atoms to account for the tetrahedral geometry of sp3 hybridized carbon atoms in alkanes. This leads to a saturated compound, meaning that alkanes have the maximum number of hydrogen atoms bonded to their carbon skeleton, giving them stability and the characteristic properties of this family of hydrocarbons. The presence of only single bonds differentiates alkanes from other families of hydrocarbons, such as alkenes and alkynes, which have double and triple bonds, respectively, affecting their hydrogen atom counts and reactivity. Therefore, the formula CnH2n+2 is essential for identifying and understanding alkanes in organic chemistry.

5. In the process of galvanising, which metal is used to protect iron from rusting?

A. Copper

B. Aluminium

C. Zinc

D. Lead

In the process of galvanizing, zinc is used to protect iron from rusting. This method involves coating iron with a thin layer of zinc, which serves as a sacrificial anode. Zinc is more reactive than iron, meaning it will corrode first if exposed to moisture and oxygen. This reactivity effectively prevents corrosion of the underlying iron, thereby prolonging its life and maintaining its structural integrity. The protective mechanism relies on zinc's ability to oxidize preferentially. Even if the zinc layer is damaged, the exposed iron will still be safeguarded as long as there is surrounding zinc available to corrode in its place. This process is particularly useful in outdoor and marine environments where iron is susceptible to rust due to high moisture levels. Other metals such as copper, aluminium, and lead do not provide the same protective effect in galvanizing applications. Copper can form a patina that protects it but is not effective for iron. Aluminium has some resistance to corrosion but is not commonly used for galvanizing iron. Lead shows poor corrosion resistance in these contexts and is not practical for this purpose either. Thus, zinc remains the ideal choice for galvanizing iron against rust.

6. Which compound would you expect to be alkaline when dissolved in water?

A. Sodium chloride

B. Sodium hydroxide

C. Hydrochloric acid

D. Chlorine gas

Sodium hydroxide is expected to be alkaline when dissolved in water because it is a strong base. When it dissolves, it dissociates into sodium ions and hydroxide ions. The presence of hydroxide ions increases the pH of the solution, making it alkaline. In contrast, sodium chloride is a neutral salt formed from the reaction of a strong acid and a strong base, and it does not affect the pH of the solution significantly when dissolved. Hydrochloric acid is a strong acid that would lower the pH of a solution, making it acidic rather than alkaline. Chlorine gas, being a non-metal gas, does not produce hydroxide ions in water and therefore does not contribute to an alkaline solution.

7. Which molecule is represented by the dot and cross diagram with two pairs of shared electrons?

A. Hydrogen chloride, HCl

B. Oxygen, O_2

C. Chlorine, Cl_2

D. Methane, CH_4

The dot and cross diagram with two pairs of shared electrons accurately depicts a molecule with a double bond between two atoms. In the case of chlorine (Cl_2), each chlorine atom shares one pair of electrons with the other, resulting in the formation of a single covalent bond. In the scenario presented, if the diagram represents two pairs of electrons being shared, it corresponds to a double bond, which is characteristic of molecules like oxygen (O_2). Oxygen has six valence electrons and shares two pairs (a total of four electrons) with another oxygen atom to satisfy the octet rule, forming a double bond. Hydrogen chloride (HCl) involves a single bond between hydrogen and chlorine, not two pairs of shared electrons. Methane (CH_4) contains four pairs of shared electrons with carbon forming four single covalent bonds with four hydrogen atoms, which does not fit the description of two pairs of shared electrons. Therefore, chlorine (Cl_2) is not the correct answer, as it involves only a single bond. Thus, the correct choice represents a molecule where two pairs of electrons are shared, which would typically be oxygen (O_2), making it the correct molecular representation relative to the description given in the question.

8. What describes the structure of metals?

A. They have a molecular structure

B. They consist of individual atoms held together by covalent bonds

C. They have a giant regular structure of positive ions

D. They consist of weak intermolecular forces

Metals are characterized by a giant regular structure, often referred to as a metallic lattice, which consists of a three-dimensional arrangement of positively charged metal ions surrounded by a 'sea' of delocalized electrons. This structure allows metals to exhibit unique properties such as electrical conductivity, malleability, and ductility. The arrangement of the positive ions in a regular pattern contributes to the strength and stability of the metal, while the delocalized electrons facilitate the conduction of electricity and heat. This combination of atomic structure and electron behavior is crucial in understanding metallic bonding and the distinctive properties of metals. In contrast, the other options describe different types of structures. Molecular structures refer to covalent compounds that consist of discrete molecules. Individual atoms held together by covalent bonds are typical of covalent networks or simple molecular compounds, not metals. Weak intermolecular forces are characteristics of molecular substances rather than metals, which rely on strong metallic bonds for their structural integrity.

9. What is the ionic equation for the anode reaction during the electrolysis of copper chloride?

A. $Cu^{2+} + 2e^- \rightarrow Cu$

B. $2Cl^- \rightarrow Cl_2 + 2e^-$

C. $2H_2O \rightarrow O_2 + 4e^-$

D. $Pb^{2+} + 2e^- \rightarrow Pb$

During the electrolysis of copper(II) chloride, the anode is where oxidation occurs. The correct ionic equation for the reaction at the anode involves the chloride ions. At the anode, chloride ions (Cl^-) lose electrons to form chlorine gas (Cl_2). The reaction is represented as: $2Cl^- \rightarrow Cl_2 + 2e^-$. This shows that two chloride ions are participating in the reaction, losing a total of two electrons to produce one molecule of chlorine gas. The process of oxidation is characterized by the loss of electrons, which is precisely what happens in this reaction. In the context of the question, the other reactions listed do not occur at the anode during the electrolysis of copper(II) chloride. For instance, the reduction of copper ions at the cathode is represented by $Cu^{2+} + 2e^- \rightarrow Cu$, while the oxidation of water to produce oxygen gas and electrons does not occur under typical conditions for copper chloride electrolysis. Additionally, the reduction of lead ions is unrelated to the electrolysis of copper(II) chloride.

10. What is crude oil primarily composed of?

A. A single hydrocarbon

B. A mixture of hydrocarbons

C. Water and salts

D. Carbon and sulfur

Crude oil is primarily composed of a mixture of hydrocarbons. Hydrocarbons are organic compounds that consist entirely of hydrogen and carbon atoms, and they can vary widely in their molecular structure. This variation leads to a complex mixture of different hydrocarbon molecules such as alkanes, cycloalkanes, aromatics, and their derivatives. The presence of various hydrocarbons is significant because it allows for the separation and refinement of crude oil into valuable products, including fuels like petrol and diesel, as well as various chemical feedstocks used in the production of plastics, chemicals, and other materials. The complexity of this mixture is what makes crude oil a vital resource in the energy and petrochemical industries. Other options provided do not represent the composition of crude oil accurately. For instance, a single hydrocarbon would imply that the crude oil is uniform, which it is not. Crude oil is not composed of significant amounts of water and salts, nor is it primarily made of carbon and sulfur, as those elements do not represent the bulk composition of the oil itself. The correct answer emphasizes the real nature of crude oil as a complex and diverse mixture.

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://igcse-chemistry.examzify.com

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