WJEC GCSE Chemistry Practice Exam (Sample)

Study Guide

BY EXAMZIFY

Everything you need from our exam experts!

Table of Contents

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. Which statement best describes condensation polymerisation?

A. It forms polymers with loss of a small molecule such as water; examples include polyesters.

B. It forms polymers with no by-products; example polyethylene.

C. It only forms polymers from monomers that contain double bonds.

D. It is the same as addition polymerisation.

2. Which statement best defines atom economy?

A. The energy efficiency of a process.

B. Atom economy = (mass of desired product / total mass of reactants) x 100.

C. The rate at which reactants are consumed.

D. The percentage yield of the reaction.

3. During esterification, what is the role of an acid catalyst?

A. It speeds up the reaction.

B. It is consumed in stoichiometric amounts.

C. It becomes part of the ester product.

D. It acts as a base to neutralize the acid.

4. Which statement best defines rate of reaction?

A. The energy released per mole of product formed.

B. The change in concentration of reactants or products per unit time.

C. The total mass of products formed per unit time.

D. The energy change required to activate the reaction.

5. What is the mass number of an atom with 3 protons and 4 neutrons?

A. 7

B. 3

C. 4

D. 1

6. Which layer lies between the mantle and the inner core?

- **A. Crust**
- **B. Outer Core**
- **C. Mantle**
- **D. Inner Core**

7. What is a key reason for the high reactivity of alkali metals with water?

- **A. One electron in the outer shell**
- **B. Seven electrons in the outer shell**
- **C. Full outer shell**
- **D. Noble gases**

8. How do you work out the number of neutrons?

- **A. Atomic number minus Mass number**
- **B. Mass number minus Atomic number**
- **C. Protons minus Neutrons**
- **D. Electrons minus Protons**

9. How does increasing the surface area of a solid reactant influence the rate of a reaction?

- **A. Surface area has no effect on rate.**
- **B. Larger surface area provides more collision sites, increasing rate.**
- **C. Larger surface area reduces rate.**
- **D. Surface area only affects final outcome, not rate.**

10. Which term describes the semi-liquid layer of the Earth's interior composed mainly of iron, silicon, and magnesium?

- **A. Core**
- **B. Mantle**
- **C. Crust**
- **D. Atmosphere**

Answers

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

Explanations

1. Which statement best describes condensation polymerisation?

A. It forms polymers with loss of a small molecule such as water; examples include polyesters.

B. It forms polymers with no by-products; example polyethylene.

C. It only forms polymers from monomers that contain double bonds.

D. It is the same as addition polymerisation.

Condensation polymerisation occurs when monomers with two reactive groups join together and a small molecule is released each time a bond forms, commonly water. This release of a by-product is what gives polymers like polyesters their characteristic structure, since the linking steps create ester bonds while water is expelled. This is different from addition polymerisation, which links unsaturated monomers such as alkenes without producing any small molecular by-products; polyethylene is made this way, so it doesn't fit condensation polymerisation. The description about forming polymers with no by-products and about double bonds in all monomers aren't accurate for condensation polymerisation, so the statement that best describes it is the one that highlights loss of a small molecule (often water) during polymer formation, with polyesters as a classic example.

2. Which statement best defines atom economy?

A. The energy efficiency of a process.

B. Atom economy = (mass of desired product / total mass of reactants) x 100.

C. The rate at which reactants are consumed.

D. The percentage yield of the reaction.

Atom economy is about how much of the reactants' mass ends up in the desired product, so a high atom economy means less waste and a more efficient process. The best way to express this is with the formula for atom economy: atom economy = (mass of the desired product / total mass of reactants) × 100. In more precise terms for a balanced equation, it's often written using molar masses: atom economy = (molar mass of the desired product) ÷ (sum of molar masses of all reactants) × 100. This directly links the amount of material that actually becomes the product to the total material you started with. The other ideas describe different things. Energy efficiency looks at how much energy is used or wasted, not how much of the reactants' mass goes into the product. The rate at which reactants are consumed is about how fast the reaction happens, not how much mass ends up in the target product. The percentage yield tells you how much product you obtained compared with the theoretical maximum, which is about yield, not the proportion of reactant mass converted into the desired product.

3. During esterification, what is the role of an acid catalyst?

A. It speeds up the reaction.

B. It is consumed in stoichiometric amounts.

C. It becomes part of the ester product.

D. It acts as a base to neutralize the acid.

The main idea is that an acid catalyst speeds up the reaction without being used up. In esterification, the acid donates protons to activate the reactants. Protonating the carbonyl oxygen of the carboxylic acid makes the carbonyl carbon more electrophilic, so the alcohol can attack it more readily. The acid may also protonate the alcohol to help it depart later as a good leaving group. As the reaction proceeds, the catalyst is regenerated at the end, so it's not consumed in stoichiometric amounts and it does not become part of the final ester. This is different from being a base or being incorporated into the product. Concentrated acid can also help remove water, pushing the equilibrium toward the ester.

4. Which statement best defines rate of reaction?

A. The energy released per mole of product formed.

B. The change in concentration of reactants or products per unit time.

C. The total mass of products formed per unit time.

D. The energy change required to activate the reaction.

The main idea is that rate of reaction tells us how fast the reaction proceeds by looking at how quickly the amounts of substances change with time. It's defined as the change in concentration per unit time. In other words, how much the concentration of a reactant drops or how much the concentration of a product rises each second (usually measured in molarity per second, mol/L/s). You can express it as rate = -Δ[reactant]/Δt = Δ[product]/Δt. The negative sign for a reactant isn't about the speed dropping; it's just convention to keep rate a positive number by focusing on the magnitude of change. Activation energy describes the energy barrier to start the reaction, and the energy change per mole of product formed describes how exo- or endothermic the reaction is—these relate to energy, not how quickly the reaction happens. Similarly, total mass per unit time isn't the standard way we define rate because it doesn't directly reflect how concentration is changing in a given volume. To see it in use: if a reactant's concentration falls from 0.50 M to 0.40 M over 5 seconds, the rate is (0.50 − 0.40) / 5 = 0.02 M/s. If you're tracking product formation, you'd use the increase in product concentration over the same time.

5. What is the mass number of an atom with 3 protons and 4 neutrons?

A. 7

B. 3

C. 4

D. 1

Mass number is the total number of nucleons in the nucleus, which means protons plus neutrons. With 3 protons and 4 neutrons, you add them to get 3 + 4 = 7. So the mass number is 7. The other numbers would only represent the count of protons (3) or neutrons (4), not their sum, so they don't describe the mass number.

6. Which layer lies between the mantle and the inner core?

A. Crust

B. Outer Core

C. Mantle

D. Inner Core

Understanding how Earth's layers are stacked helps answer this. Between the mantle and the inner core lies the outer core. From outside to inside, the sequence is crust, mantle, outer core, inner core. The mantle sits above the outer core, and the inner core is at the center, so the outer core is the layer that lies between them. The crust sits above the mantle, and the inner core is the central solid sphere surrounded by the outer core. The outer core is a liquid layer of iron and nickel, and its movement generates Earth's magnetic field.

7. What is a key reason for the high reactivity of alkali metals with water?

A. One electron in the outer shell

B. Seven electrons in the outer shell

C. Full outer shell

D. Noble gases

Having one electron in the outer shell makes alkali metals highly reactive with water because they can easily lose that electron to form a stable, positively charged ion. This loss releases energy and drives the reaction with water, producing hydroxide ions and hydrogen gas. The single valence electron is held loosely due to low ionization energy, so it's readily donated when the metal meets water. As you go down the group, the outer electron is further from the nucleus and more shielded, so removing it becomes even easier, explaining the increasing vigour of the reaction down the series. If the outer shell had seven electrons, the tendency would be to gain rather than lose electrons to reach a full octet, which would make the substance far less reactive with water. A full outer shell is characteristic of very unreactive, stable species. Noble gases have full outer shells and are largely inert, so they don't react with water.

8. How do you work out the number of neutrons?

A. Atomic number minus Mass number

B. Mass number minus Atomic number

C. Protons minus Neutrons

D. Electrons minus Protons

Neutrons are found by subtracting the number of protons from the total number of particles in the nucleus. The mass number counts protons plus neutrons, while the atomic number counts only protons. So neutrons = mass number − atomic number. For example, carbon-12 has mass number 12 and atomic number 6, so it has 12 − 6 = 6 neutrons. This remains true even if the atom has gained or lost electrons (ionized), because ionization changes electrons, not the nucleus. The other ideas mix up what's being counted or ignore the relationship between mass number, atomic number, and neutrons.

9. How does increasing the surface area of a solid reactant influence the rate of a reaction?

A. Surface area has no effect on rate.

B. Larger surface area provides more collision sites, increasing rate.

C. Larger surface area reduces rate.

D. Surface area only affects final outcome, not rate.

Increasing surface area makes more of the solid reactant exposed to the other reactant, so more particles can collide per second. Reactions happen at the contact points between reactants, so when you grind a solid into powder, there are many more surface sites for collisions. That higher collision frequency speeds up the rate, even though the total amount of reactants is unchanged. So the rate goes up with larger surface area. The idea that surface area has no effect, or that it slows the reaction, or only changes the final amount, doesn't match what happens in practice because more exposed surface directly increases how often effective collisions occur.

10. Which term describes the semi-liquid layer of the Earth's interior composed mainly of iron, silicon, and magnesium?

A. Core

B. Mantle

C. Crust

D. Atmosphere

Understanding Earth's internal layout and how each layer behaves is what this question hinges on. The semi-liquid layer is the mantle, which sits between the crust and the core. It’s made mainly of silicate minerals that contain magnesium and iron, with silicon as a key component. The temperatures and pressures here let rocks flow very slowly, especially in the upper part known as the asthenosphere, giving the mantle a partly molten, ductile character. This is different from the crust above, which is rigid and solid, and from the core below, which is mostly iron (the outer core is liquid and the inner core is solid). The atmosphere is a gaseous shell around the planet and isn’t part of the interior.

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://wjecgcsechemistry.examzify.com

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