IGCSE SCIENCE PAPER 6 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.

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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!

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Questions

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1. **Which gas is produced at the anode when chloride ions are present in the electrolyte during electrolysis?**

   A. Oxygen

   B. Chlorine

   C. Hydrogen

   D. Nitrogen

2. **Which half-reaction occurs at the anode for chloride ions to form chlorine gas?**

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

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

   C. $Cl^- \rightarrow Cl + e^-$

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

3. **What does concentrated mean?**

   A. A solution that contains a large number of solute molecules or little amount of water is involved.

   B. A solution with a lot of water.

   C. A solution with no solute.

   D. A solution at high temperature.

4. **Zinc ions with sodium hydroxide yield which observation?**

   A. White ppt; insoluble in excess

   B. White ppt; soluble in excess; colourless solution

   C. No reaction

   D. Green solution

5. **What happens when iron(III) ions are treated with aqueous sodium hydroxide?**

   A. Red/brown precipitate insoluble in excess.

   B. Green precipitate.

   C. White precipitate soluble in excess.

   D. No reaction.

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6. How can you tell which reactant is in excess at the end of a reaction?

A. The excess reactant will be visible.

B. The mixture changes color.

C. The gas evolves.

D. The temperature drops.

7. What happens to the rate of reaction when the temperature increases and particles gain kinetic energy?

A. Rate decreases

B. Rate increases due to more collisions

C. Rate stays the same

D. Rate decreases due to faster movement

8. What does a precise, sharp boiling point indicate about a solvent's purity?

A. A precise, sharp boiling point indicates purity

B. A high boiling point indicates purity

C. Boiling point cannot indicate purity

D. The solvent should not boil

9. What is the last step in the crystal-making process?

A. Filter, dry and collect the crystals.

B. Heat again to crystallisation.

C. Stir the solution.

D. Allow to warm to room temperature.

10. Why is a pencil used to draw the origin line in chromatography experiments?

A. Because pen inks can dissolve in the solvent, causing colors to spread and distort results.

B. Because pencils are easier to see.

C. Because pencil marks are permanent.

D. Because black ink dries slower.

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Answers

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

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Explanations

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1. Which gas is produced at the anode when chloride ions are present in the electrolyte during electrolysis?

A. Oxygen

B. Chlorine

C. Hydrogen

D. Nitrogen

At the anode, oxidation occurs, so the species that loses electrons there determines what gas is released. When chloride ions are present, they are oxidized to chlorine gas: two Cl– ions lose two electrons to form Cl2. So the gas evolved at the anode is chlorine. Water would have to be oxidized to produce oxygen, but in a chloride-containing electrolyte the oxidation of chloride ions to Cl2 is the dominant process at the anode, giving chlorine gas as the product.

2. Which half-reaction occurs at the anode for chloride ions to form chlorine gas?

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

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

C. $Cl^- \rightarrow Cl + e^-$

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

The key idea is oxidation at the anode during electrolysis. Chloride ions lose electrons here to form chlorine gas. The balanced half-reaction is $2 Cl^- \rightarrow Cl_2 + 2 e^-$. Each chloride ion donates one electron, and two such ions combine to make Cl2, with those two electrons flowing out through the external circuit. Why this fits at the anode: oxidation means loss of electrons, which is exactly what's happening to the chloride ions to produce chlorine gas. The other possibilities represent reduction (gaining electrons) or forming a single chlorine atom, neither of which matches the oxidation process at the anode. Reduction of chlorine gas to chloride ions would occur at the cathode, not the anode.

3. What does concentrated mean?

A. A solution that contains a large number of solute molecules or little amount of water is involved.

B. A solution with a lot of water.

C. A solution with no solute.

D. A solution at high temperature.

Concentration describes how much solute is dissolved in a solvent, i.e., the amount of dissolved substance relative to the amount of solvent. When a solution has a large amount of solute compared with the solvent (or very little solvent), it is described as concentrated. That's why the option stating a solution with a large amount of solute or little water best matches the idea of concentration. Having a lot of water means there's much solvent relative to solute, which makes the solution dilute, not concentrated. A solution with no solute is just pure solvent, so it isn't concentrated. Temperature doesn't define concentration; it can affect how much dissolves, but concentration itself is about the ratio of solute to solvent.

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4. Zinc ions with sodium hydroxide yield which observation?

A. White ppt; insoluble in excess

B. White ppt; soluble in excess; colourless solution

C. No reaction

D. Green solution

When a metal ion reacts with sodium hydroxide, you often get a metal hydroxide precipitate. For zinc, the zinc ions form zinc hydroxide as a white, gelatinous solid: $Zn2+ + 2\ OH-$ $Zn(OH)2(s)$. In excess NaOH, this solid doesn't stay put; it dissolves to form a complex ion, giving a colourless solution: $Zn(OH)2 + 2\ OH- [Zn(OH)4]2-(aq)$. So the observable sequence is a white precipitate that dissolves in excess to yield a colourless solution.

5. What happens when iron(III) ions are treated with aqueous sodium hydroxide?

A. Red/brown precipitate insoluble in excess.

B. Green precipitate.

C. White precipitate soluble in excess.

D. No reaction.

When metal ions meet hydroxide in solution, they form metal hydroxide precipitates whose color and whether they dissolve in excess base help identify the ion. For iron(III), reacting with hydroxide gives iron(III) hydroxide, $Fe(OH)3$, which appears as a reddish-brown solid. This precipitate is not soluble in excess sodium hydroxide, so it remains as a precipitate even when more base is added. That combination of reddish-brown color and insolubility in excess base matches the observed result. If the ion were iron(II), you'd expect a greenish $Fe(OH)2$ precipitate, which can oxidize to Fe(III). A white precipitate that dissolves in excess base would point to amphoteric hydroxides like aluminium or zinc, not iron(III) hydroxide. No reaction would mean no precipitate forms at all.

6. How can you tell which reactant is in excess at the end of a reaction?

A. The excess reactant will be visible.

B. The mixture changes color.

C. The gas evolves.

D. The temperature drops.

When a reaction has a limiting reactant and an excess, the reaction can only go on until the limiting reactant is used up. After that, any leftover amount of the other reactant remains in the mixture. So the clearest sign that one reactant is in excess is that some of it is still present once the reaction seems to have stopped. In many setups this leftover is visible, especially if that reactant is a solid. For example, if a metal reacts with an acid, the acid is used up first and solid metal pieces that didn't react will still be there, showing which reactant was in excess. The other observations aren't reliable indicators of which reagent is excess: a color change, gas evolution, or a temperature change can occur during the reaction regardless of which reactant is leftover.

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7. What happens to the rate of reaction when the temperature increases and particles gain kinetic energy?

A. Rate decreases

B. Rate increases due to more collisions

C. Rate stays the same

D. Rate decreases due to faster movement

Raising the temperature gives particles more kinetic energy and makes them move faster. This causes collisions to occur more often and increases the likelihood that a collision has enough energy to overcome the activation energy. As a result, more collisions lead to a successful reaction per unit time, so the rate of reaction increases.

8. What does a precise, sharp boiling point indicate about a solvent's purity?

A. A precise, sharp boiling point indicates purity

B. A high boiling point indicates purity

C. Boiling point cannot indicate purity

D. The solvent should not boil

A pure liquid has a single, well-defined boiling point at a given pressure. When a liquid is pure, all its molecules reach vaporization at roughly the same temperature, so the boiling point shows up as a precise, sharp temperature. If impurities are present, other substances with different boiling points are in the mixture, causing boiling to occur over a range of temperatures rather than at one exact point, and often raising the observed boiling point slightly. So a precise, sharp boiling point is a sign of purity, whereas a broad or shifted boiling range suggests impurities. The other statements either ignore the effect of impurities on the boiling range or mix up what a high boiling point alone implies.

9. What is the last step in the crystal-making process?

A. Filter, dry and collect the crystals.

B. Heat again to crystallisation.

C. Stir the solution.

D. Allow to warm to room temperature.

When crystals are ready, the final step is to separate and prepare them for use. Filtering removes the remaining liquid, leaving the solid crystals on the paper. Drying is important so the crystals aren't left wet, which could dissolve or alter them, and to make them easy to weigh or observe. Collecting brings the dry crystals together for storage or further analysis. This order—separating from the solution, drying, and then gathering the crystals—is what yields a clean sample of solid crystals. Stirring helps form crystals, and warming or reheating can drive crystallisation earlier in the process, but they aren't the final step.

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10. Why is a pencil used to draw the origin line in chromatography experiments?

A. Because pen inks can dissolve in the solvent, causing colors to spread and distort results.

B. Because pencils are easier to see.

C. Because pencil marks are permanent.

D. Because black ink dries slower.

In chromatography, the origin line must stay fixed and not be carried along by the developing solvent. Pen inks contain dyes that can dissolve in the solvent, so drawing the line with ink would allow the solvent to move the ink up the plate, smearing the baseline and distorting the pattern of spots. Pencil marks, made with graphite, are largely insoluble in the common solvents used for chromatography, so the origin line remains in place and does not contaminate the developing front. This gives a clean, reliable reference point for measuring how far substances travel.

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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://igcsesciencepaper6.examzify.com

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

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