Chemistry and Sustainability Concepts for STEM Students Practice Test (Sample)

Study Guide

BY EXAMZIFY

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 is Goal 6 focused on?

A. Promoting renewable energy development.

B. Increasing agricultural productivity.

C. Enhancing climate resilience.

D. Ensuring access to water and sanitation for all.

2. Which of the following is NOT a type of matter?

A. Element

B. Compound

C. Energy

D. Mixture

3. What is the scientific notation for the mass of Halley's Comet?

A. 2.2 x 10^12 kg

B. 2.2 x 10^15 kg

C. 2.2 x 10^14 kg

D. 2.2 x 10^13 kg

4. Which practice helps ensure data reliability?

A. Supporting results with a single data point.

B. Ignoring sources of error.

C. Conducting multiple trials to verify results.

D. One-off measurement without replication.

5. Tin's atomic symbol is:

A. Sb

B. Zn

C. Sn

D. Pb

6. What do chemical formulas indicate?

A. A model of reaction pathways.

B. The energy of formation.

C. Symbolic representations of the composition of a compound, indicating the types and numbers of atoms present.

D. The spatial arrangement of atoms in three dimensions.

7. What is the role of feedback in scientific inquiry?

A. It has no role in science.

B. It delays progress in experiments.

C. It allows scientists to improve their experiments and understanding.

D. It is optional and rarely used.

8. In a solution, what is the term for the substance dissolved?

A. The solvent.

B. The medium.

C. The solute.

D. The solution.

9. What is data in scientific experiments?

A. Data are final results after experimentation.

B. Data are numbers and observations collected before, during, and after an experiment.

C. Data are opinions used to justify conclusions.

D. Data are theoretical models not verified by experiments.

10. Which action is a key way individuals can support the Sustainable Development Goals (SDGs)?

A. Volunteer exclusively for international campaigns.

B. Invest in businesses without regard to sustainability.

C. Contribute to their community and take local actions to help achieve the SDGs.

D. Rely entirely on government policies without personal action.

Answers

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

Explanations

1. What is Goal 6 focused on?

A. Promoting renewable energy development.

B. Increasing agricultural productivity.

C. Enhancing climate resilience.

D. Ensuring access to water and sanitation for all.

Goal 6 centers on ensuring access to water and sanitation for all and the sustainable management of water resources. It emphasizes universal access to safe drinking water, adequate sanitation, improved water quality, and efficient, equitable use of water resources to protect ecosystems and reduce pollution. This focus supports health, dignity, and development by guaranteeing essential water services for everyone, now and in the future. While renewable energy, agricultural productivity, and climate resilience are important topics in sustainability, they pertain to other goals and topics rather than the specific aim of Goal 6.

2. Which of the following is NOT a type of matter?

A. Element

B. Compound

C. Energy

D. Mixture

Energy is not a type of matter. Matter is anything that has mass and takes up space, and it comes in forms we classify as elements, compounds, or mixtures. An element is a pure substance made of one kind of atom, a compound is formed when elements chemically bond together, and a mixture is a physical combination of two or more substances that retain their own identities. Energy, on the other hand, is the ability to do work or cause change and exists as different forms—kinetic, potential, thermal, chemical, light, etc.—but it does not have mass and does not occupy space in the way matter does. Matter and energy are distinct, though energy often changes as matter changes.

3. What is the scientific notation for the mass of Halley's Comet?

A. 2.2 x 10^12 kg

B. 2.2 x 10^15 kg

C. 2.2 x 10^14 kg

D. 2.2 x 10^13 kg

The idea being tested is recognizing the right scale for a celestial object's mass and expressing it in scientific notation. Halley’s Comet is a small solar-system body, so its mass is huge in everyday terms but still tiny compared with planets. Estimates place its nucleus mass around a few times 10^14 kilograms. Among the options, 2.2×10^14 kg fits that order of magnitude and is a plausible, commonly cited value for the comet’s mass. The other numbers differ by large factors, implying masses that are either far too small or far too large for a single comet nucleus given its size and density. So, 2.2×10^14 kg is the appropriate scientific notation for Halley’s Comet’s mass.

4. Which practice helps ensure data reliability?

A. Supporting results with a single data point.

B. Ignoring sources of error.

C. Conducting multiple trials to verify results.

D. One-off measurement without replication.

Reproducibility through repeated measurements helps data reliability. When measurements are done multiple times under the same conditions, random errors show up as variation, and averaging those results gives a more accurate estimate while the spread indicates precision. This approach confirms that a result isn't just a one-time fluke and provides a sense of uncertainty to report. In contrast, a single data point can't reveal how variable measurements might be, ignoring sources of error hides bias, and a one-off measurement cannot show precision or reproducibility. By conducting multiple trials, you can spot outliers, assess consistency, and build confidence in the data.

5. Tin's atomic symbol is:

A. Sb

B. Zn

C. Sn

D. Pb

Elements often have symbols that come from Latin or historical names rather than their English names. Tin is represented by Sn because its Latin name is stannum, and early chemists adopted that form for the symbol. The other symbols map to different elements: Sb for antimony (stibium), Zn for zinc, and Pb for lead (plumbum). So tin's symbol is Sn.

6. What do chemical formulas indicate?

A. A model of reaction pathways.

B. The energy of formation.

C. Symbolic representations of the composition of a compound, indicating the types and numbers of atoms present.

D. The spatial arrangement of atoms in three dimensions.

Chemical formulas indicate the types and numbers of atoms in a substance, i.e., its composition. For example, H_2O means each molecule contains two hydrogen atoms and one oxygen atom, while CO_2 has one carbon and two oxygens. They reveal what the substance is made from, not how those atoms are connected or arranged in space. A formula doesn't show bonding patterns or geometry, which you'd need structural formulas or 3D models to understand. It also doesn't provide information about energy changes during formation or the steps of a reaction—that requires thermodynamic data and reaction mechanisms. So, the formula is a concise representation of composition (and it can be the empirical or molecular form), not a map of structure or energetics.

7. What is the role of feedback in scientific inquiry?

A. It has no role in science.

B. It delays progress in experiments.

C. It allows scientists to improve their experiments and understanding.

D. It is optional and rarely used.

Feedback in scientific inquiry is the mechanism by which results and observations loop back to influence the next steps in investigation. It lets scientists test predictions, then use what they learn to refine hypotheses, improve experimental design, adjust measurement methods, and reinterpret data. When results align with expectations, confidence grows and methods can be fine-tuned for greater accuracy. When results differ, scientists examine possible errors, reconsider assumptions, identify new variables, or develop better models. This iterative process is how scientific understanding becomes more reliable over time. Saying there is no role for feedback, that it delays progress, or that it's optional and rarely used would ignore how experiments are actually done. In practice, feedback accelerates learning and self-correction, not the other way around.

8. In a solution, what is the term for the substance dissolved?

A. The solvent.

B. The medium.

C. The solute.

D. The solution.

In a solution, the substance dissolved in another is called the solute. The dissolving medium is the solvent, and together they form the solution. For example, when table salt dissolves in water, salt is the solute and water is the solvent; the resulting mixture is the salt solution. The term solute applies whether the dissolved substance is a solid, liquid, or gas, and it can be one substance or multiple dissolved substances.

9. What is data in scientific experiments?

A. Data are final results after experimentation.

B. Data are numbers and observations collected before, during, and after an experiment.

C. Data are opinions used to justify conclusions.

D. Data are theoretical models not verified by experiments.

Data are the empirical evidence collected in an experiment—measurements, counts, and observations that come from planning, carrying out, and reviewing the study. They can be numerical values like temperatures, masses, or pH, or descriptive notes about what was seen or felt during the procedure. This information provides the factual basis for analyzing results and deciding whether the hypothesis is supported. Data are gathered before, during, and after an experiment to capture all relevant information and to allow reliable conclusions. That's why the best description is the one that includes both numbers and observations across the different stages of the experiment. Data are not final results by themselves, nor are they opinions used to justify conclusions. They are not theoretical models; those are ideas or predictions that experiments can test.

10. Which action is a key way individuals can support the Sustainable Development Goals (SDGs)?

A. Volunteer exclusively for international campaigns.

B. Invest in businesses without regard to sustainability.

C. Contribute to their community and take local actions to help achieve the SDGs.

D. Rely entirely on government policies without personal action.

Local action and community engagement are powerful drivers of the SDGs because sustainable development grows from everyday choices and collective efforts where people live and work. When individuals contribute to their community and take local actions—such as supporting local sustainable businesses, reducing energy and water use, volunteering, or participating in local planning and service projects—they create tangible progress toward improvements in health, education, poverty reduction, clean energy, and ecosystem protection. These actions are practical, measurable, and can inspire broader change by modeling sustainable behaviors and building networks. Relying exclusively on international campaigns, investing without sustainability criteria, or depending entirely on government policies misses the immediate impact individuals can have in their own places and the way local efforts scale up to global targets. Therefore, contributing to their community and taking local actions to help achieve the SDGs is the best choice.

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://chemsustainabilityforstemstudents.examzify.com

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