SAChE Chemical Reactivity Hazards (ELA962) Practice Test (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. 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. TRUE or FALSE: The CRW enables you to compare the compatibility of individual chemicals as well as reactive groups.

A. True

B. False

C. Not sure

D. N/A

2. Which hazard should you look for when assessing laboratories? (select one hazard for this question)

A. Primary/intended reactions

B. Potential for sudden release of stored chemical energy

C. Reactions from inadvertent mixing of incompatible materials

D. Potential unintended reactions

3. What is believed to have caused the uncontrolled reaction and toxic vapor release in the Bhopal disaster?

A. A failure of the temperature sensor on the caustic scrubber

B. Water was somehow added to a storage tank of MIC

C. An operator erroneously closed a valve that should have remained open

D. The refrigeration system experienced a sudden leak

4. Which of the following is the most direct hazard to consider during chemical transportation?

A. Potential unintended reactions

B. Reactions from inadvertent mixing of incompatible materials

C. Potential for sudden release of stored chemical energy

D. All of the above

5. In evaluating waste treatment, which hazard type should be considered?

A. Primary/intended reactions

B. Potential unintended reactions

C. Reactions from inadvertent mixing of incompatible materials

D. Potential for sudden release of stored chemical energy

6. TRUE or FALSE: A temperature rise will not pose a hazard as long as the equipment temperature rating is not exceeded.

A. True

B. Only if pressure involved

C. False

D. Depends on material

7. How many people died in the AZF fertilizer factory incident?

A. None, but there were dozens of injuries

B. 4

C. Hundreds

D. 31

8. _____ refers to a physical or chemical change that requires or is accompanied by the absorption of heat.

A. Exothermic

B. Thermal reactivity

C. Runaway reaction

D. Endothermic

9. Which incident involved MCMT as the chemical produced?

A. Bhopal disaster

B. T2 Laboratories incident

C. AZF explosion

D. None of the above

10. Primary containment refers to _____ or other equipment intended to serve as the primary container for, or used for the transfer of, a material.

A. transport vessels

B. vessels

C. pipes

D. tanks

Answers

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

Explanations

1. TRUE or FALSE: The CRW enables you to compare the compatibility of individual chemicals as well as reactive groups.

A. True

B. False

C. Not sure

D. N/A

This item tests whether a Chemical Reactivity Worksheet (CRW) can compare compatibility across both individual chemicals and reactive groups. The CRW brings together data for specific substances and for broader reactive groups, presenting it in a way that lets you evaluate how each chemical might behave with others and how entire groups tend to react. Because it includes both the detailed reactivity of individual chemicals and the common hazards associated with reactive groups, you can make direct comparisons between two substances and also view how a given substance relates to a broader class of reactive partners. This dual capability helps identify potential incompatibilities quickly, whether you're assessing pairwise storage, mixing, or process steps, and it supports safer decision-making without needing to test every possible combination. So the statement is true: the CRW enables you to compare the compatibility of both individual chemicals and reactive groups.

2. Which hazard should you look for when assessing laboratories? (select one hazard for this question)

A. Primary/intended reactions

B. Potential for sudden release of stored chemical energy

C. Reactions from inadvertent mixing of incompatible materials

D. Potential unintended reactions

Assessing laboratory safety focuses on identifying reactive hazards that could occur unexpectedly, not just the planned chemistry. Unintended reactions can arise from a variety of situations—impurities, inadvertent mixing, improper storage, solvent effects, temperature or shielding changes, and equipment or protocol upsets. This broad category captures the risk of reactions that suddenly occur, release energy, or produce hazardous byproducts in ways you didn't design for. Why this answer fits best is that it encompasses all the potential non-planned reactivity you might encounter in a lab, including runaway or exothermic events, gas evolution, or formation of dangerous compounds. The other options describe specific scenarios that are indeed hazards, but they're narrower in scope: one targets only energy release, another focuses on mixing incompatible materials, and the intended reactions are not hazards at all.

3. What is believed to have caused the uncontrolled reaction and toxic vapor release in the Bhopal disaster?

A. A failure of the temperature sensor on the caustic scrubber

B. Water was somehow added to a storage tank of MIC

C. An operator erroneously closed a valve that should have remained open

D. The refrigeration system experienced a sudden leak

Water reacts with methyl isocyanate in an extremely exothermic way. If water gets into a MIC storage tank, it triggers a runaway hydrolysis reaction that releases a lot of heat and rapidly raises the temperature and pressure inside the tank. In the Bhopal incident, this sudden exothermic event overwhelmed cooling and containment systems, causing relief valves to vent large amounts of toxic MIC vapor into the surrounding area. That sequence—water ingress into the MIC storage—is the widely held explanation for the uncontrolled reaction and toxic vapor release. Other scenarios, like a sensor failure or a valve change, might contribute to the severity, but the fundamental trigger identified in investigations is the unintended introduction of water into the MIC storage tank, which started the runaway reaction.

4. Which of the following is the most direct hazard to consider during chemical transportation?

A. Potential unintended reactions

B. Reactions from inadvertent mixing of incompatible materials

C. Potential for sudden release of stored chemical energy

D. All of the above

In transportation, the most direct hazard to consider is the potential for a sudden release of stored chemical energy. This means that if the container fails, a material is released, or a reactive material undergoes a rapid, uncontrolled change under transport conditions, the immediate consequence is energy and material escaping into the environment. That containment breach is the direct event that leads to fire, explosion, toxic release, or other acute hazards, so preventing leakage and maintaining intact containment is the primary focus in transit safety. Unintended reactions and reactions from inadvertent mixing are still serious concerns, but they hinge on a breach or improper separation occurring during transport. With proper packaging, labeling, segregation of incompatible materials, and handling procedures, those scenarios are mitigated and are not the immediate, direct consequence you aim to prevent during movement.

5. In evaluating waste treatment, which hazard type should be considered?

A. Primary/intended reactions

B. Potential unintended reactions

C. Reactions from inadvertent mixing of incompatible materials

D. Potential for sudden release of stored chemical energy

In waste treatment, the most important hazard to consider is the potential for a sudden release of stored chemical energy. Some wastes contain energetic or unstable substances that appear inert under ordinary conditions but can rapidly decompose, ignite, or detonate when disturbed by processing steps such as heating, grinding, mixing, or exposure to catalysts or contaminants. This kind of hazard captures the risk of a violent, energy-releasing event that can occur even if there's no ongoing reaction at rest, which is a central safety concern during treatment operations. While other hazards like unintended reactions or inadvertent mixing of incompatible materials can cause problems, the stored-energy hazard is broader and directly addresses the possibility of an abrupt, high-energy release during processing, making it the most critical type to evaluate in waste treatment.

6. TRUE or FALSE: A temperature rise will not pose a hazard as long as the equipment temperature rating is not exceeded.

A. True

B. Only if pressure involved

C. False

D. Depends on material

Rising temperature signals heat generation that may outpace removal, creating hazards regardless of a device's rated temperature. The equipment rating is a structural or material limit, not a guarantee that chemical hazards won't occur below that temperature. Reactions often speed up as temperature increases, which can increase heat production and push the system toward thermal runaway if cooling or heat transfer isn't sufficient. Even when the overall temperature stays below the rating, localized hot spots, changes in reaction kinetics, or decomposition and release of hazardous or flammable gases can occur, along with potential pressure buildup from vaporization. Because hazards depend on the chemical reactivity and heat balance, a temperature rise can be dangerous even without exceeding the equipment's temperature rating.

7. How many people died in the AZF fertilizer factory incident?

A. None, but there were dozens of injuries

B. 4

C. Hundreds

D. 31

This question is about recalling the fatality toll of a well-known industrial disaster. The AZF fertilizer factory explosion in Toulouse, France, occurred in 2001 and killed 31 people. While there were thousands of injuries (the event caused extensive damage to the surrounding area), the death count was 31, which is why the correct figure is 31. The other options don't fit because there were fatalities, not zero or just a few, and the toll was not hundreds.

8. _____ refers to a physical or chemical change that requires or is accompanied by the absorption of heat.

A. Exothermic

B. Thermal reactivity

C. Runaway reaction

D. Endothermic

Endothermic processes involve absorbing heat from the surroundings as the change occurs. This means the system must gain energy for the physical or chemical change to proceed, such as melting ice or dissolving certain salts where heat must be supplied or drawn in. Exothermic changes, by contrast, release heat to the surroundings, which is the opposite behavior. A runaway reaction is a hazardous scenario driven by rapid, often exothermic heat production, not heat absorption. The broader idea of thermal reactivity describes how a material responds to heat in general, but it does not specifically define a process that requires or accompanies heat input. So, the term that best matches a change that requires or is accompanied by heat absorption is endothermic.

9. Which incident involved MCMT as the chemical produced?

A. Bhopal disaster

B. T2 Laboratories incident

C. AZF explosion

D. None of the above

The concept tested here is matching an incident to the specific chemical involved. MCMT stands for methylcyclopentadienyl manganese tricarbonyl, a manganese-based fuel additive used to boost gasoline octane. The incident at T2 Laboratories is the one where MCMT was being produced and an explosion occurred, making it the event that involved that chemical. The Bhopal disaster centered on methyl isocyanate, not MCMT, and the AZF explosion involved ammonium nitrate. So, MCMT being produced in the T2 Laboratories incident is the correct link.

10. Primary containment refers to _____ or other equipment intended to serve as the primary container for, or used for the transfer of, a material.

A. transport vessels

B. vessels

C. pipes

D. tanks

Primary containment is the container that directly holds a material or is used to transfer it. The term vessels covers that broad idea—the equipment designed to be the primary container for a material, including various forms like tanks and other containers used to hold or transfer the substance. Pipes, by contrast, are typically transfer lines rather than the primary container, and transport vessels refer to containers used specifically for moving contents, not the general notion of the primary containment. Tanks are a type of vessel, but using the broad term vessels correctly includes all such primary containers. So the best fit is vessels.

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://sacheela962.examzify.com

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