

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

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- 1. CAMEO Chemicals can be run online.**
 - A. True**
 - B. False**
 - C. Not sure**
 - D. Can't be used online**

- 2. In the CRW exercise with Sodium Aluminum Sulphate and water, which hazard is predicted?**
 - A. Reaction products may be toxic**
 - B. Reaction products may be corrosive**
 - C. Exothermic reaction at ambient temperatures**
 - D. Reaction generates gas that may cause pressurization**

- 3. Which of the following is not a self-reactive material?**
 - A. Oxygen**
 - B. Rearranging materials**
 - C. Decomposing materials**
 - D. Polymerizing materials**

- 4. Assume a material has a heat of polymerization of -1000 kJ/kg, an average heat capacity of 2 kJ/kg-K, and the starting temperature of the material is 200 K. What is the maximum adiabatic temperature that could be reached by the polymerization of the material?**
 - A. -200 K**
 - B. -300 K**
 - C. -700 K**
 - D. -400 K**

- 5. Gaseous products in a closed vessel will generate pressure if not relieved.**
 - A. True**
 - B. False**
 - C. Depends on conditions**
 - D. Not necessarily**

- 6. 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**
- 7. _____ 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**
- 8. PPE and emergency response plans are examples of which category?**
- A. Mitigative safeguards**
 - B. Emergency relief**
 - C. An emergency process abort system**
 - D. Primary containment**
- 9. Which statement BEST describes the potential for toxic vapors in a chemical process?**
- A. Liquids could be vaporized by the heat of the reaction**
 - B. As long the temperature and pressure within a reactor are maintained within design specifications, toxic vapors will not form**
 - C. Toxic vapors could be generated as a product or by-product**
 - D. If the materials within a vessel are not toxic individually, there is little risk of them becoming toxic when combined**
- 10. Which mechanism can cause pressure inside a closed reactor to rise during a chemical reaction?**
- A. The process could generate gaseous reaction products**
 - B. Liquids could be condensed to a liquid at the same temperature**
 - C. A vent system actively removes gas**
 - D. The temperature decreases due to cooling**

Answers

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

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Explanations

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1. CAMEO Chemicals can be run online.

- A. True**
- B. False**
- C. Not sure**
- D. Can't be used online**

This question tests knowledge of online accessibility of chemical hazard tools. CAMEO Chemicals is provided as a web-based platform, so you can access it directly in a browser to look up chemical hazards, reactivity data, incompatibilities, and related emergency-planning information. This browser-based availability means it can be run online without needing to install desktop software, which is why the statement is true. The other options imply it's not online or uncertain, which doesn't match how CAMEO Chemicals is actually delivered.

2. In the CRW exercise with Sodium Aluminum Sulphate and water, which hazard is predicted?

- A. Reaction products may be toxic**
- B. Reaction products may be corrosive**
- C. Exothermic reaction at ambient temperatures**
- D. Reaction generates gas that may cause pressurization**

The key idea here is that some solid salts reacting with water can release a gas as part of the reaction. In the CRW scenario with sodium aluminum sulfate, the analysis predicts that gas will be formed during or as a result of the contact with water. If this reaction occurs in a closed or poorly vented container, the gas buildup can pressurize the vessel, creating a physical hazard from pressure rather than from heat, toxicity, or corrosivity of the products alone. The emphasis is on the potential for gas evolution to cause pressurization, which is why this option is considered the best answer. The other possibilities—toxic or corrosive products, or an exothermic reaction at room temperature—are not the primary hazard described in this case, though some heat or hazardous products could occur in different contexts.

3. Which of the following is not a self-reactive material?

- A. Oxygen**
- B. Rearranging materials**
- C. Decomposing materials**
- D. Polymerizing materials**

Self-reactive materials are those that can undergo a chemical reaction on their own, without needing a lot of external energy to start it. The danger comes from internal energy release that can heat up the material and sometimes trigger a runaway reaction. Oxygen isn't self-reactive because, by itself, it's a stable diatomic molecule and doesn't spontaneously transform or release energy. Its hazard is as an oxidizer that accelerates reactions with other materials, not a substance that reacts with itself. Rearranging materials can release energy as their internal structure shifts, sometimes forming a more energy-dense or unstable configuration. Decomposing materials break down and release heat or gas, which can continue without additional input once started. Polymerizing materials can begin to link monomers into polymers on their own or with minimal initiation, often generating heat in the process. So, oxygen is the one that does not fit the pattern of self-reactive behavior, while rearranging, decomposing, and polymerizing materials can exhibit self-reactive tendencies under the right conditions.

4. Assume a material has a heat of polymerization of -1000 kJ/kg, an average heat capacity of 2 kJ/kg-K, and the starting temperature of the material is 200 K. What is the maximum adiabatic temperature that could be reached by the polymerization of the material?

- A. -200 K
- B. -300 K
- C. -700 K**
- D. -400 K

In an adiabatic, exothermic polymerization, all the heat released by the reaction stays with the material and raises its temperature. The temperature rise per kilogram comes from the heat released divided by the material's heat capacity: $\Delta T = (-\Delta H_p) / C_p$. Here, the heat of polymerization is -1000 kJ/kg, so the magnitude of heat released is 1000 kJ/kg. With an average heat capacity of 2 kJ/kg-K, the temperature rise is $\Delta T = 1000 / 2 = 500$ K. Starting from 200 K, the maximum adiabatic temperature reached would be 200 K + 500 K = 700 K. If an answer option shows a negative temperature, that reflects a sign convention in the choices rather than a physically negative temperature. The actual final temperature is 700 K.

5. Gaseous products in a closed vessel will generate pressure if not relieved.

- A. True**
- B. False
- C. Depends on conditions
- D. Not necessarily

When gaseous products form inside a closed vessel, the pressure tends to rise because there is nowhere for the gas to escape and the volume is effectively fixed. As the reaction generates more gas (more moles) or raises the temperature, collisions of gas molecules with the container walls increase, increasing pressure. Only if the gas could vent, or the vessel could expand, or the reaction consumed the gas would the pressure stay the same or drop. In a truly closed, non-relieving system, gas generation will generate pressure.

6. 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.

7. _____ 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 changes are defined by heat entering the system. In an endothermic process, energy is absorbed from the surroundings, so the system's enthalpy increases (positive ΔH). That's why the statement says the change requires or is accompanied by heat absorption. You can think of it as the surrounding environment cooling slightly as heat is drawn into the reaction or physical process, like ice melting or ammonium nitrate dissolving in water. In contrast, exothermic processes release heat to the surroundings, which is not what the prompt describes. The other terms aren't standard descriptors for heat absorption in a change, and they don't match this definition.

8. PPE and emergency response plans are examples of which category?

- A. Mitigative safeguards**
- B. Emergency relief**
- C. An emergency process abort system**
- D. Primary containment**

Mitigative safeguards are measures that reduce the consequences or harm when a hazardous event occurs. PPE and emergency response plans fit here because they don't prevent the release itself; instead, they lessen the impact on people and help manage the incident. PPE provides personal protection to workers, lowering exposure and injury if exposure happens. Emergency response plans organize actions, roles, communications, drills, and coordination to rapidly contain effects and protect lives. In contrast, primary containment focuses on keeping the chemical from releasing in the first place (the vessel, seals, and closed systems). An emergency process abort system is an automatic control that stops the process to prevent or limit an incident. Emergency relief would involve systems that relieve pressure or hazard at the source. So PPE and response planning are best described as mitigative safeguards because their primary purpose is to reduce harm after an event rather than to prevent the event itself.

9. Which statement BEST describes the potential for toxic vapors in a chemical process?

- A. Liquids could be vaporized by the heat of the reaction**
- B. As long the temperature and pressure within a reactor are maintained within design specifications, toxic vapors will not form**
- C. Toxic vapors could be generated as a product or by-product**
- D. If the materials within a vessel are not toxic individually, there is little risk of them becoming toxic when combined**

Hazardous vapors can form during a chemical process as part of the reaction itself, so there is potential for toxic vapors even if the starting materials aren't toxic. Some reactions produce volatile toxic species as products or by-products, or generate them through decomposition or side reactions. That's why this statement best captures the risk: toxic vapors could be generated as a product or by-product. Volatility of a liquid under heat is a related concern, but it doesn't by itself address toxicity—the toxic nature depends on the actual chemical species formed. Maintaining design specifications does not guarantee that toxic vapors will not form, because unexpected reaction pathways, impurities, or heat buildup can still produce toxic vapors. And even non-toxic starting materials can react to form toxic products, so the idea that combining non-toxic materials eliminates risk isn't accurate.

10. Which mechanism can cause pressure inside a closed reactor to rise during a chemical reaction?

- A. The process could generate gaseous reaction products**
- B. Liquids could be condensed to a liquid at the same temperature**
- C. A vent system actively removes gas**
- D. The temperature decreases due to cooling**

In a closed reactor, pressure increases when the amount of gas inside the fixed volume rises or when the gas is heated. If the reaction produces gaseous products, the number of gas molecules n goes up, and with the volume V fixed, the pressure P increases (P is proportional to n and to temperature T). Temperature rise from an exothermic reaction can also push pressure higher, since warmer gas exerts more pressure in the same space. On the other hand, venting gas would relieve pressure, condensation would remove gas from the vapor phase and lower pressure, and cooling would also lower pressure. So the mechanism that can cause the pressure to rise is the formation of gaseous reaction products.

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!

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