

Acids, Bases, and Salts 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. An aqueous solution turns litmus red. The pH of the solution could be**
 - A. 14**
 - B. 11**
 - C. 8**
 - D. 4**
- 2. A solution contains 0.50 mol of HCl. How much NaOH is needed to neutralize it exactly?**
 - A. 0.50 mol**
 - B. 1.0 mol**
 - C. 0.25 mol**
 - D. 2.0 mol**
- 3. Which of the following is a salt?**
 - A. H₂SO₄**
 - B. HCl**
 - C. NaCl**
 - D. CO₂**
- 4. A solution with a pH of 7 is considered**
 - A. Acidic**
 - B. Amphoteric**
 - C. Neutral**
 - D. Basic**
- 5. Which compound is classified as a salt?**
 - A. CH₃COOH**
 - B. NaC₂H₃O₂**
 - C. C₂H₅OH**
 - D. NaOH**

6. A student observes that an unknown solution conducts electricity and turns blue litmus red. The student should conclude that the solution is most likely
- A. a base
 - B. an acid
 - C. an ester
 - D. an alcohol
7. Which of the following substances is an Arrhenius acid?
- A. LiOH
 - B. PO₄³⁻
 - C. CH₃COOH
 - D. CO₃²⁻
8. Which substance would be considered an Arrhenius acid?
- A. HNO₃
 - B. NaCl
 - C. NH₃
 - D. KOH
9. Which equation best describes a typical acid-base neutralization?
- A. Acid + base → salt + water
 - B. Acid + base → water only
 - C. Acid + base → acid + base
 - D. Acid + base → oxygen gas and water
10. As 0.1 M HCl is added to 0.1 M KOH, the pH of the basic solution
- A. Decreases and the basicity decreases
 - B. Increases and the acidity increases
 - C. Decreases and the acidity decreases
 - D. Increases and the basicity increases

Answers

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

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Explanations

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1. An aqueous solution turns litmus red. The pH of the solution could be

- A. 14
- B. 11
- C. 8
- D. 4**

Litmus turning red indicates an acidic solution. Acids have a pH below 7 on the pH scale, with lower numbers meaning stronger acidity. Among the given values, only the one that lies in the acidic range matches red litmus, while higher values correspond to neutral or basic solutions (which would turn litmus blue). So the correct choice is the option representing an acidic pH.

2. A solution contains 0.50 mol of HCl. How much NaOH is needed to neutralize it exactly?

- A. 0.50 mol**
- B. 1.0 mol
- C. 0.25 mol
- D. 2.0 mol

Neutralization in this pair happens with a 1:1 mole ratio: one mole of NaOH reacts with one mole of HCl. That means the amount of base needed to completely neutralize the acid equals the amount of acid present. You have 0.50 mole of HCl, so you need 0.50 mole of NaOH to reach the equivalence point where all the acid is consumed and just enough base is present to balance it. Choosing more NaOH would leave excess base, while too little would leave some acid unreacted. Therefore, 0.50 mole of NaOH is the exact amount required.

3. Which of the following is a salt?

- A. H₂SO₄
- B. HCl
- C. NaCl**
- D. CO₂

Salts are ionic compounds made of positively charged ions (cations) and negatively charged ions (anions). They often form when an acid and a base react, producing a salt and water as products; the key feature is the combination of ions rather than a covalent molecule. Sodium chloride fits perfectly: it consists of Na⁺ ions and Cl⁻ ions arranged in an ionic lattice, a classic example of a salt. The other items are not salts—sulfuric acid and hydrochloric acid are acids, and carbon dioxide is a covalent molecule. Therefore, the salt is sodium chloride.

4. A solution with a pH of 7 is considered

- A. Acidic
- B. Amphoteric
- C. Neutral**
- D. Basic

Understanding pH helps you see what's happening with hydrogen ions in a solution. A pH of 7 sits in the middle of the scale, meaning the concentration of hydrogen ions equals the concentration of hydroxide ions. In pure water at 25°C, $[H^+]$ and $[OH^-]$ are both 1×10^{-7} M, so $pH = -\log_{10}(1 \times 10^{-7}) = 7$. That balance makes the solution neutral, not acidic or basic. If the pH were lower than 7, it would be acidic; higher than 7, basic. Amphoteric describes a substance that can act as both an acid and a base, but that property doesn't define a specific pH. So a solution with pH 7 is neutral.

5. Which compound is classified as a salt?

- A. CH_3COOH
- B. $NaC_2H_3O_2$**
- C. C_2H_5OH
- D. $NaOH$

Salts are ionic compounds formed when an acid reacts with a base, giving a cation from the base and an anion from the acid. They dissociate into these ions in water and don't consist of H^+ or OH^- as part of the compound itself. Sodium acetate fits because it is made of Na^+ and CH_3COO^- , the conjugate base of acetic acid, and it forms from neutralizing acetic acid with sodium hydroxide: $CH_3COOH + NaOH \rightarrow CH_3COONa + H_2O$. The other substances are not salts: acetic acid is an acid, ethanol is a neutral covalent molecule, and sodium hydroxide is a strong base.

6. A student observes that an unknown solution conducts electricity and turns blue litmus red. The student should conclude that the solution is most likely

- A. a base
- B. an acid**
- C. an ester
- D. an alcohol

Electric conductivity in a solution comes from ions, and blue litmus turning red indicates acidity. Put together, these observations point to an acidic solution because acids dissociate in water to produce hydronium ions, which both conduct electricity and turn blue litmus red. A base would make red litmus blue, not red, so this isn't a base. Esters and alcohols generally don't ionize to produce significant hydronium ions in water, so they don't turn blue litmus red or conduct electricity as strongly; that's why they're not the best explanations here. So the solution is most likely an acid.

7. Which of the following substances is an Arrhenius acid?

- A. LiOH
- B. PO₄³⁻
- C. CH₃COOH**
- D. CO₃²⁻

Arrhenius acids are substances that increase the concentration of hydronium ions in water by donating a proton. Acetic acid, CH₃COOH, does exactly that: it donates a proton to water to form CH₃COO⁻ and H₃O⁺. This makes it an Arrhenius acid, even though it's a weak one. LiOH, on the other hand, dissociates to give Li⁺ and OH⁻, raising hydroxide concentration rather than hydronium, so it behaves as an Arrhenius base. The phosphate ion (PO₄³⁻) and carbonate ion (CO₃²⁻) act as bases in water as well, accepting protons or generating OH⁻ through hydrolysis, rather than donating H⁺. Therefore, the substance that fits the Arrhenius acid definition is acetic acid.

8. Which substance would be considered an Arrhenius acid?

- A. HNO₃**
- B. NaCl
- C. NH₃
- D. KOH

Arrhenius acids are substances that, when dissolved in water, increase the concentration of hydronium ions (H₃O⁺) by donating a proton (H⁺). Nitric acid releases H⁺ in solution to form H₃O⁺ and NO₃⁻, so it makes the solution acidic. Sodium chloride simply dissociates into Na⁺ and Cl⁻ and doesn't affect H₃O⁺ levels. Ammonia acts as a base in water, accepting a proton to form NH₄⁺ and OH⁻, which raises hydroxide instead of hydronium. Potassium hydroxide also provides OH⁻, not H₃O⁺. Thus, the substance that behaves as an Arrhenius acid is nitric acid.

9. Which equation best describes a typical acid-base neutralization?

- A. Acid + base -> salt + water**
- B. Acid + base -> water only
- C. Acid + base -> acid + base
- D. Acid + base -> oxygen gas and water

When an acid meets a base in a neutralization reaction, the key idea is proton transfer and ion pairing. The acid donates a hydrogen ion (H⁺), the base provides a hydroxide (OH⁻), and they combine to form water: H⁺ + OH⁻ → H₂O. The remaining ions—the base's cation and the acid's anion—stay in solution and pair up to make a salt. So the overall equation is acid + base → salt + water. For example, HCl reacts with NaOH to give NaCl and H₂O. The other possibilities don't fit because they either omit the salt, keep the reactants unchanged, or produce products (like oxygen gas) that aren't characteristic of a typical neutralization.

10. As 0.1 M HCl is added to 0.1 M KOH, the pH of the basic solution

- A. Decreases and the basicity decreases**
- B. Increases and the acidity increases**
- C. Decreases and the acidity decreases**
- D. Increases and the basicity increases**

Neutralization of a strong acid by a strong base drives the solution toward less basic conditions. When 0.1 M HCl is added to 0.1 M KOH, each mole of HCl reacts with a mole of OH^- to form water, removing hydroxide ions from the solution. Because the base's defining species (OH^-) is being consumed, the solution loses its basic character, and the pH drops. If the amounts are equal, you approach a neutral solution around pH 7; with less base left, it stays basic but weaker, and with excess acid, it becomes acidic and pH continues to fall. So the pH decreases and the basicity decreases as acid is added.

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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://acidsbasessalts.examzify.com>

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

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