CAMBRIDGE SCIENCE – STATES OF MATTER 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.

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. How is boiling different from evaporation?

A. Boiling occurs at the surface below boiling point; evaporation throughout the liquid.

B. Evaporation is slower but occurs through the liquid; boiling is rapid throughout at the boiling point.

C. Evaporation requires heat; boiling does not.

D. Boiling is rapid vaporization throughout the liquid at its boiling point; evaporation is slower at the surface.

2. Name three properties used to identify states of matter.

A. Shape, volume, and particle arrangement/motion

B. Color, density, and melting point

C. Mass, texture, and chemical reactivity

D. Size, weight, and odor

3. What happens to the kinetic energy of particles during condensation?

A. Increases as gas particles speed up to form a liquid.

B. Kinetic energy remains the same as gas condenses.

C. Kinetic energy decreases as gas particles slow and join to form a liquid.

D. Kinetic energy becomes zero when condensation occurs.

4. Which phase change corresponds to fusion?

A. Liquid to gas

B. Gas to solid

C. Solid to liquid

D. Solid to gas

5. As the solvent evaporates from a solution, what happens to the solute concentration?

A. Remains unchanged

B. Concentration decreases

C. Concentration increases

D. Solute precipitates

6. If a gas mixture has partial pressures p1, p2, and p3, how is the total pressure calculated?

A. P = p1 × p2 × p3.

B. P = p1 + p2 + p3.

C. P is the average of partial pressures.

D. P equals the largest partial pressure.

7. What is latent heat best described as?

A. Energy gained when a solid melts but temperature increases.

B. Energy absorbed or released during a phase change without a change in temperature.

C. Energy required to raise the temperature of a substance.

D. Energy released when a gas condenses to a liquid with a temperature change.

8. Water that stays on top of the land and flows back to a water source.

A. surface run-off

B. groundwater

C. open water

D. water cycle

9. A form of energy that is transferred by a difference in temperature.

A. Light energy

B. Kinetic energy

C. Heat energy

D. Sound energy

10. Which of the following expresses gas density ρ in terms of molar mass M, pressure P, the gas constant R, and temperature T?

A. $\rho = P/(R\,T)$

B. $\rho = M/(R\,T\,P)$

C. $\rho = M\,P\,/(R\,T)$

D. $\rho = R\,T\,/(P\,M)$

Answers

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

Explanations

1. How is boiling different from evaporation?

A. Boiling occurs at the surface below boiling point; evaporation throughout the liquid.

B. Evaporation is slower but occurs through the liquid; boiling is rapid throughout at the boiling point.

C. Evaporation requires heat; boiling does not.

D. Boiling is rapid vaporization throughout the liquid at its boiling point; evaporation is slower at the surface.

Boiling is rapid vaporization that happens throughout the liquid once it reaches its boiling point. At that temperature, the vapor pressure inside the liquid equals the surrounding pressure, so bubbles form inside the liquid and rise to the surface, turning the liquid into gas quickly. Evaporation is a slower process that only occurs at the surface and can happen at temperatures below the boiling point. Individual surface molecules gain enough energy to overcome the liquid's cohesive forces and escape as gas, but the bulk of the liquid doesn't need to be at the boiling point. So the best description is that boiling is rapid vaporization throughout the liquid at its boiling point, while evaporation is slower vaporization at the surface.

2. Name three properties used to identify states of matter.

A. Shape, volume, and particle arrangement/motion

B. Color, density, and melting point

C. Mass, texture, and chemical reactivity

D. Size, weight, and odor

Identifying states of matter comes down to how matter behaves in terms of shape, volume, and how its particles are arranged and move. Solid objects keep a definite shape and a definite volume because their particles are tightly packed and mainly vibrate in place. Liquids have a definite volume but take the shape of their container, since their particles can slide past one another and flow. Gases have neither a definite shape nor a definite volume because their particles are far apart and move freely, filling both the space they occupy and the space around them. Other properties like color, density, or melting point aren't universal indicators of state, since they depend on the material and conditions rather than the state itself. Similarly, mass, texture, chemical reactivity, size, weight, or odor don't reliably reveal whether matter is a solid, liquid, or gas.

3. What happens to the kinetic energy of particles during condensation?

A. Increases as gas particles speed up to form a liquid.

B. Kinetic energy remains the same as gas condenses.

C. Kinetic energy decreases as gas particles slow and join to form a liquid.

D. Kinetic energy becomes zero when condensation occurs.

During condensation, gas molecules must slow down enough to be held together by intermolecular forces as they form a liquid. Kinetic energy is tied to how fast the particles move, so as they slow, the average kinetic energy decreases. The energy released when these attractions form leaves the system as heat to the surroundings, so the gas cools while it condenses. The molecules don't stop moving entirely—they just have less kinetic energy than in the gaseous state.

4. Which phase change corresponds to fusion?

A. Liquid to gas

B. Gas to solid

C. Solid to liquid

D. Solid to gas

Fusion is the melting process: a solid absorbs heat and becomes a liquid. At the melting point, the particles gain enough energy to overcome some of the forces holding them in a rigid, fixed arrangement, so they can move past each other and form a liquid. A familiar example is ice turning into water as it warms. So, the phase change where a solid becomes a liquid is fusion. Other transitions involve different changes: liquid turning into gas is vaporization, solid turning into gas is sublimation, and gas turning into solid is deposition (the reverse of sublimation).

5. As the solvent evaporates from a solution, what happens to the solute concentration?

A. Remains unchanged

B. Concentration decreases

C. Concentration increases

D. Solute precipitates

When a solvent evaporates, the amount of solute stays the same while the solution's volume decreases. Concentration is the amount of solute per unit volume, so with less solvent and the same solute, that ratio goes up. So the solute concentration increases as evaporation continues. If the solution becomes saturated, some solute might start to precipitate, but the immediate effect of evaporation is an increasing concentration.

6. If a gas mixture has partial pressures p1, p2, and p3, how is the total pressure calculated?

A. P = p1 × p2 × p3.

B. P = p1 + p2 + p3.

C. P is the average of partial pressures.

D. P equals the largest partial pressure.

Gas mixtures follow Dalton's law: each component gas contributes its own partial pressure, and the total pressure is the sum of those contributions. So with p1, p2, and p3, the total pressure is P = p1 + p2 + p3. This reflects that each gas exerts pressure as if the others weren't there, and those pressures simply add together to give the overall pressure in the container. Multiplying, averaging, or taking only the largest partial pressure would ignore the independent contributions of the other gases.

7. What is latent heat best described as?

A. Energy gained when a solid melts but temperature increases.

B. Energy absorbed or released during a phase change without a change in temperature.

C. Energy required to raise the temperature of a substance.

D. Energy released when a gas condenses to a liquid with a temperature change.

Latent heat is the energy involved in changing a substance from one phase to another without changing its temperature. When a solid melts, energy is absorbed to break some of the bonds holding the particles in place, but the temperature stays the same until the entire solid has melted. The same idea applies to vaporization and condensation: energy is absorbed to overcome intermolecular forces during a phase change, or released when those forces reform, and the substance's temperature remains constant during that transition. That's why this description matches latent heat: it's about energy tied to changing the state, not about warming or cooling a substance during a temperature change. The other statements describe energy that goes into raising temperature (sensible heat) or mix in a temperature change with a phase change, which isn't what latent heat refers to.

8. Water that stays on top of the land and flows back to a water source.

A. surface run-off

B. groundwater

C. open water

D. water cycle

Surface runoff is the movement of water that stays on top of the land after it rains and flows toward a water source. After precipitation, some water infiltrates the soil and becomes groundwater, but when the ground is saturated or the rainfall is heavy, the surface cannot absorb it fast enough, so it runs off over the land. This runoff collects in streams and rivers and eventually returns water to lakes, rivers, or oceans. Open water refers to the bodies of water themselves, not the process of water moving across the land, and the water cycle is the whole set of processes that move and change water through the environment, which includes runoff as one part.

9. A form of energy that is transferred by a difference in temperature.

A. Light energy

B. Kinetic energy

C. Heat energy

D. Sound energy

Heat energy is the energy transferred between objects because there is a difference in temperature. When one object is hotter, its particles have more kinetic energy, and energy flows to the cooler object until both reach the same temperature. This transfer can occur by contact (conduction), through a moving fluid (convection), or via radiation (waves of heat). Light energy is energy carried by light waves and isn't defined by temperature differences. Kinetic energy is the energy of motion within an object, describing its state rather than the transfer caused by temperature differences. Sound energy is energy carried by vibrating particles as sound waves, not specifically the transfer due to a temperature gradient.

10. Which of the following expresses gas density ρ in terms of molar mass M, pressure P, the gas constant R, and temperature T?

A. $\rho = P/(R\,T)$

B. $\rho = M/(R\,T\,P)$

C. $\rho = M\,P\,/(R\,T)$

D. $\rho = R\,T\,/(P\,M)$

Gas density is how much mass sits in a given volume, $\rho = m/V$. The mass of a sample relates to moles by $m = nM$, so $\rho = nM/V$. From the ideal gas law, $PV = nRT$, which gives $n/V = P/(RT)$. Substituting this in, $\rho = M \cdot (P/(RT)) = MP/(RT)$. This shows density increases with molar mass and pressure, and decreases with temperature, in line with how gases compress and respond to heat. The other forms miss the need for the molar mass factor or reverse the dependence on pressure and temperature, leading to incorrect units or relationships.

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://cambridgescistatesofmatter.examzify.com

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