PETERSON'S

AP Chemistry Study Guide

Are you preparing for the AP Chemistry exam? This study guide covers exam basics, what's covered on the exam, and how to prepare for the exam.

To access practice tests, check out Peterson's AP Chemistry test prep.

Exam Basics

- **Test time:** 3 hours, 15 minutes
- **Section I of the exam:** 60 multiple-choice questions; 50% exam weighting; 90 minutes to complete; no calculator permitted for this section.
- **Section II of the exam:** 7 free-response questions (3 long-answer questions worth 10 points each; 4 short-answer questions worth 4 points each); 50% exam weighting; 105 minutes to complete; a scientific or graphing calculator is recommended for this section.

The exam assesses the following content:

1. Scale, proportion, and quantity
2. Structure and properties
3. Transformations
4. Energy

What's on the AP Chemistry Exam?

Atomic Structure and Properties

- Moles and molar mass
- Mass spectroscopy of elements
- Elemental composition of pure substances
- Composition of mixtures
- Atomic structure and electron configuration
- Photoelectron spectroscopy
- Periodic trends
- Valence electrons and ionic compounds

Exam weighting: 7-9%

Molecular and Ionic Compound Structure and Properties

- Types of chemical bonds
- Intramolecular force and potential energy
- Structure of ionic solids
- Structure of metals and alloys
- Lewis diagrams
- Resonance and formal charge
- VSEPR and bond hybridization

Exam weighting: 7-9%

Intermolecular Forces and Properties

- Intermolecular forces
- Solids, liquids, and gases
- Kinetic molecular theory
- Solutions and mixtures
- Photoelectric effect

Exam weighting: 18-22%

Chemical Reactions

- Introduction for reactions
- Net ionic equations
- Representations of reactions
- Physical and chemical changes
- Stoichiometry
- Types of chemical reactions

Exam weighting: 7-9%

Kinetics

- Reaction rate
- Introduction to rate law
- Elementary reactions
- Collision model
- Introduction to reaction mechanisms
- Multistep reaction energy profile
- Catalysis

Exam weighting: 7-9%

Thermodynamics

- Endothermic and exothermic processes
- Heat transfer and thermal equilibrium
- Heat capacity and calorimetry
- Energy of phase changes
- Introduction to enthalpy of reaction
- Enthalpy of formation
- Hess's law

Exam weighting: 7-9%

Equilibrium

- Introduction to equilibrium
- Calculating the equilibrium constant
- Calculating equilibrium concentrations
- Introduction to Le Châtelier's principle
- Introduction to solubility equilibria
- pH and solubility
- Free energy of dissolution

Exam weighting: 7-9%

Acids and Bases

- Introduction to acids and bases
- pH and pOH of strong acids and bases
- Acid-base reactions and buffers
- Molecular structure of acids and bases
- pH and pKa
- Properties of buffers

Exam weighting: 11-15%

Applications of Thermodynamics

- Introduction to entropy
- Gibbs free energy and thermodynamic favorability
- Thermodynamic and kinetic control
- Free energy and equilibrium
- Galvanic (voltaic) and electrolyte cells
- Electrolysis and Faraday's law

Exam weighting: 7-9%

Preparing for the AP Chemistry Exam

Make a study plan

Creating a study plan can help guide you in the right direction to ensure success on the AP Chemistry exam.

Determine how much time you have before the exam and how much time you can devote to prepare for the exam. Answering these questions will help you set a pace for your review.

Take a diagnostic test

The diagnostic test will help you identify your weak spots in the course. Based on the results of the test, plan your study time to address the areas where you need improvement.

Take practice tests

Completing practice tests will help you maintain pacing, and in understanding and answering multiple-choice question, and practice in writing timed questions.

Pacing is important! Work quickly and carefully throughout the test. Answer as many questions as you can as quickly as you can, and then go back and try to fill in the others.

Complete assignments

Complete all assignments for your regular AP Chemistry class. The test is designed to measure your development and understanding of chemistry.

Tip In the free-response sections, be neat, thorough, and very clear. You don't want those scoring your exam to guess what you wrote or what you meant.

Test Prep

To help you prepare for the AP Chemistry exam, check out Peterson's AP Chemistry test prep course, which includes two full-length practice tests, self-learning skills, and strategies.

PETERSON'S

www.petersons.com