

ACS Chemistry  
Semester 2 Final Exam  
Study Guide  
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**Note:** This study guide lists the MAIN topics studied in each chapter. This is meant to be a reminder to help you study, not an exhaustive list of what you should know for the final exam. You should also study using your book, notes, and assignments from the semester.

#### Chapter 7: Chemical Formulas and Chemical Compounds

Main topics:

- Monatomic ions
- Binary ionic compounds
- Polyatomic ions
- Naming ionic and covalent compounds, including compounds with polyatomic ions, transition elements, and hydrocarbons (ex: methane)
- Writing the formulas of compounds based on their name
- Oxidation numbers
- Acids
- Calculating formula mass and molar mass
- Calculating percentage composition
- Calculating empirical formula

#### Chapter 8: Chemical Equations and Reactions

Main topics:

- Chemical Equations
- Coefficients
- Word and Formula Equations
- Reversible Reactions
- Synthesis, Decomposition, Single-Replacement, Double-Replacement, and Combustion Reactions
- Activity Series

#### Chapter 9: Stoichiometry

Main topics:

- Composition Stoichiometry
- Reaction Stoichiometry
- Mole Ratios, Molar Mass
- Molar Conversions
- Mass-mass Calculations
- Limiting and Excess Reactant Equations
- Theoretical, Actual, and Percent Yield

Chapter 10: The Kinetic-Molecular Theory of Matter

Main topics:

- Properties of Fluids
- Properties of Solids
- Equilibrium and Changes of State
- Le Chatelier's Principle
- Equilibrium and Concentration
- Equilibrium Vapor Pressure
- Volatile Liquids
- Boiling
- Molar Heat of Vaporization
- Molar Heat of Fusion
- Sublimation/Deposition
- Phase Diagrams/ Triple Point/ Critical Point/ Critical Temperature/ Critical Pressure
- Structure/ Physical Properties of Water

Chapter 11: Gases

Main topics:

- Kinetic-molecular Theory
- Ideal Gas Law
- Properties of Gases
- Real Gas
- Pressure and Measurements of Pressure
- Standard Temperature and Pressure (STP)
- Boyle's Law
- Charles's Law
- Absolute Zero
- Gay-Lussac's Law
- Combined Gas Law
- Dalton's Law of Partial Pressures
- Gay-Lussac's Law of Combining Volumes of Gases
- Avogadro's Law
- Standard Molar Volume of a Gas
- Ideal Gas Law
- Ideal Gas Constants
- Finding Molar Mass or Density from the Ideal Gas Law
- Gas Stoichiometry
- Graham's Law of Effusion