

CHEM 1210 Lecture Notes

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COURSE ADMINISTRATIVE DETAILS

- My office hours
- Intro to my research
- Introductory Quiz
- Grading details
 - Exams - 40, Final - 20, Online Homework - 15, Book Homework - 15, Quizzes - 10
 - Online homework
 - Frequent quizzes
- Importance of reading and learning on your own
- Learning resources
 - My Office Hours
 - Tutoring services - <https://www.suu.edu/academicsuccess/tutoring/>
- Show how to access Canvas
 - Calendar, Grades, Modules, etc.
 - Achieve Homework
 - Textbook
- Introduction to chemistry
 - Ruby fluorescence
 - Levomethamphetamine
 - Rubber band elasticity
 - Structure of the periodic table
 - Salt on ice and purifying hydrogen peroxide

CHAPTER 1

ESSENTIAL IDEAS

- 1.1 Chemistry in Context**
- 1.2 Phases and Classification of Matter**
- 1.3 Physical and Chemical Properties**
- 1.4 Measurements**
- 1.5 Measurement Uncertainty, Accuracy, and Precision**
- 1.6 Mathematical Treatment of Measurement Results**

CHAPTER 2

ATOMS, MOLECULES, AND IONS

- 2.1 Early Ideas in Atomic Theory**
- 2.2 Evolution of Atomic Theory**
- 2.3 Atomic Structure and Symbolism**
- 2.4 Chemical Formulas**
- 2.5 The Periodic Table**
- 2.6 Ionic and Molecular Compounds**
- 2.7 Chemical Nomenclature**

CHAPTER 3

COMPOSITION OF SUBSTANCES AND SOLUTIONS

- 3.1 Formula Mass and the Mole Concept**
- 3.2 Determining Empirical and Molecular Formulas**
- 3.3 Molarity**
- 3.4 Other Units for Solution Concentration**

CHAPTER 4

STOICHIOMETRY OF CHEMICAL REACTIONS

4.1 Writing and Balancing Chemical Equations

4.2 Classifying Chemical Reactions

4.3 Reaction Stoichiometry

4.4 Reaction Yields

4.5 Quantitative Chemical Analysis

CHAPTER 5

THERMOCHEMISTRY

5.1 Energy Basics

5.2 Calorimetry

5.3 Enthalpy

CHAPTER 6

ELECTRONIC STRUCTURE AND PERIODIC PROPERTIES OF ELEMENTS

6.1 Electromagnetic Energy

6.2 The Bohr Model

6.3 Development of Quantum Theory

6.4 Electronic Structure of Atoms (Electron Configurations)

6.5 Periodic Variations in Element Properties

CHAPTER 7

CHEMICAL BONDING AND MOLECULAR GEOMETRY

- 7.1 Ionic Bonding**
- 7.2 Covalent Bonding**
- 7.3 Lewis Symbols and Structures**
- 7.4 Formal Charges and Resonance**
- 7.5 Strengths of Ionic and Covalent Bonds**
- 7.6 Molecular Structure and Polarity**

CHAPTER 8

ADVANCED THEORIES OF COVALENT BONDING

8.1 Valence Bond Theory

8.2 Hybrid Atomic Orbitals

8.3 Multiple Bonds

8.4 Molecular Orbital Theory

CHAPTER 9

GASES

- 9.1 Gas Pressure**
- 9.2 Relating Pressure, Volume, Amount, and Temperature: The Ideal Gas Law**
- 9.3 Stoichiometry of Gaseous Substances, Mixtures, and Reactions**
- 9.4 Effusion and Diffusion of Gases**
- 9.5 The Kinetic-Molecular Theory**
- 9.6 Non-Ideal Gas Behavior**

CHAPTER 10

LIQUIDS AND SOLIDS

10.1 Intermolecular Forces

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