

CHEM 1220 Lecture Notes

OpenStax Chemistry 2e

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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.
 - Quizzes
 - Textbook
- Introduction to chemistry
 - Ruby fluorescence
 - Levomethamphetamine
 - Rubber band elasticity
 - Structure of the periodic table
 - Salt on ice and purifying hydrogen peroxide

CHAPTER 0

1210 REVIEW

There is a whole semester of material from 1210, and these are only the topics which are *most* important for success in 1220

- Composition of atoms and ions (protons, neutrons and electrons)
- Chemical formulas and names
 - Formulas and molar masses
 - Polyatomic ion names
 - Naming ionic compounds
 - Naming binary molecular compounds
 - Naming acids
- Balancing molecular equations
- Solubility rules
- Fundamentals of acid/base chemistry
- Measurements vs. chemistry
 - Converting from measurements to moles and back
 - Stoichiometry and predicting amounts
 - Limiting reactants
- Enthalpy of reaction and heat equations
- Lewis structures

CHAPTER 10

LIQUIDS AND SOLIDS

10.1 Intermolecular Forces

10.2 Properties of Liquids

10.3 Phase Transitions

10.4 Phase Diagrams

10.5 The Solid State of Matter

10.6 Lattice Structures in Crystalline Solids

CHAPTER 11

SOLUTIONS AND COLLOIDS

11.1 The Dissolution Process

11.2 Electrolytes

11.3 Solubility

11.4 Colligative Properties

11.5 Colloids

CHAPTER 12

KINETICS

12.1 Chemical Reaction Rates

12.2 Factors Affecting Reaction Rates

12.3 Rate Laws

12.4 Integrated Rate Laws

12.5 Collision Theory

12.6 Reaction Mechanisms

12.7 Catalysis

CHAPTER 13

FUNDAMENTAL EQUILIBRIUM CONCEPTS

- 13.1 Chemical Equilibria**
- 13.2 Equilibrium Constants**
- 13.3 Shifting Equilibria: Le Châtelier's Principle**
- 13.4 Equilibrium Calculations**

CHAPTER 14

ACID-BASE EQUILIBRIA

- 14.1 Brønsted-Lowry Acids and Bases
- 14.2 pH and pOH
- 14.3 Relative Strengths of Acids and Bases
- 14.4 Hydrolysis of Salts
- 14.5 Polyprotic Acids
- 14.6 Buffers
- 14.7 Acid-Base Titrations

CHAPTER 15

EQUILIBRIA OF OTHER REACTION CLASSES

15.1 Precipitation and Dissolution

15.2 Lewis Acids and Bases

15.3 Coupled Equilibria

CHAPTER 16

THERMODYNAMICS

16.1 Spontaneity

16.2 Entropy

16.3 The Second and Third Laws of Thermodynamics

16.4 Free Energy

CHAPTER 17

ELECTROCHEMISTRY

- 17.1 Review of Redox Chemistry**
- 17.2 Galvanic Cells**
- 17.3 Electrode and Cell Potentials**
- 17.4 Potential, Free Energy, and Equilibrium**
- 17.5 Batteries and Fuel Cells**
- 17.6 Corrosion**
- 17.7 Electrolysis**

CHAPTER 21

NUCLEAR CHEMISTRY

- 21.1 Nuclear Structure and Stability**
- 21.2 Nuclear Equations**
- 21.3 Radioactive Decay**
- 21.4 Transmutation and Nuclear Energy**
- 21.5 Uses of Radioisotopes**
- 21.6 Biological Effects of Radiation**

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