A general chemistry Libretexts Textmap organized around the textbook

**Chemistry: The Central Science**

by Brown, LeMay, Busten, Murphy, and Woodward

1. **Chapter 1: Introduction: Matter and Measurement**
   2. 1.1: The Study of Chemistry
   3. 1.2: Classification of Matter
   4. 1.3: Properties of Matter
   5. 1.4: Units of Measurement
   6. 1.5: Uncertainty in Measurement
   7. 1.6: Dimensional Analysis
   8. 1.E: Matter and Measurement (Exercises)
   9. 1.S: Matter and Measurement (Summary)

• 2

1. **Chapter 2: Atoms, Molecules, and Ions**
   2. 2.1: The Atomic Theory of Matter
   3. 2.2: The Discovery of Atomic Structure
   4. 2.3: The Modern View of Atomic Structure
   5. 2.4: Atomic Mass
   6. 2.5: The Periodic Table
   7. 2.6: Molecules and Molecular Compounds
   8. 2.7: Ions and Ionic Compounds
   9. 2.8: Naming Inorganic Compounds
   10. 2.9: Some Simple Organic Compounds
   11. 2.E: Atoms, Molecules, and Ions (Exercises)
   12. 2.S: Atoms, Molecules, and Ions (Summary)

• 3

1. **Chapter 3: Stoichiometry: Chemical Formulas and Equations**
   2. 3.1: Chemical Equations
   3. 3.2: Some Simple Patterns of Chemical Reactivity
   4. 3.3: Formula Masses
   5. 3.4: Avogadro's Number and the Mole
   6. 3.5: Empirical Formulas from Analysis
   7. 3.6: Quantitative Information from Balanced Equations
   8. 3.7: Limiting Reactants
   9. 3.E: Stoichiometry (Exercises)
10. 3.5: Stoichiometry (Summary)

  4

1. Chapter 4: Reactions in Aqueous Solution
2. 4.1: General Properties of Aqueous Solutions
3. 4.2: Precipitation Reactions
4. 4.3: Acid-Base Reactions
5. 4.4: Oxidation-Reduction Reactions
6. 4.5: Concentration of Solutions
7. 4.6: Solution Stoichiometry and Chemical Analysis
8. 4.E: Reactions in Aqueous Solution (Exercises)
9. 4.S: Reactions in Aqueous Solution (Summary)

  5

1. Chapter 5: Thermochemistry
2. 5.1: The Nature of Energy
3. 5.2: The First Law of Thermodynamics
4. 5.3: Enthalpy
5. 5.4: Enthalpy of Reaction
6. 5.5: Calorimetry
7. 5.6: Hess’s Law
8. 5.7: Enthalpies of Formation
9. 5.8: Foods and Fuels
10. 5.E: Thermochemistry (Exercises)
11. 5.S: Thermochemistry (Summary)

  6

1. Chapter 6: Electronic Structure of Atoms
2. 6.1: The Wave Nature of Light
3. 6.2: Quantized Energy and Photons
4. 6.3: Line Spectra and the Bohr Model
5. 6.4: The Wave Behavior of Matter
6. 6.5: Quantum Mechanics and Atomic Orbitals
7. 6.6: 3D Representation of Orbitals
8. 6.7: Many-Electron Atoms
9. 6.8: Electron Configurations
10. 6.9: Electron Configurations and the Periodic Table
11. 6.E: Electronic Structure of Atoms (Exercises)
12. 6.S: Electronic Structure of Atoms (Summary)
1. Chapter 13: Properties of Solutions
   2. 13.1: The Solution Process
   3. 13.2: Saturated Solutions and Solubility
   4. 13.3: Factors Affecting Solubility
   5. 13.4: Ways of Expressing Concentration
   6. 13.5: Colligative Properties
   7. 13.6: Colloids
   8. 13.E: Properties of Solutions (Exercises)
   9. 13.S: Properties of Solutions (Summary)

• 14

1. Chapter 14: Chemical Kinetics
   2. 14.1: Factors that Affect Reaction Rates
   3. 14.2: Reaction Rates
   4. 14.3: Concentration and Rates (Differential Rate Laws)
   5. 14.4: The Change of Concentration with Time (Integrated Rate Laws)
   6. 14.5: Temperature and Rate
   7. 14.6: Reaction Mechanisms
      8. 14.7: Catalysis
      9. 14.E: Exercises
   10. 14.S: Chemical Kinetics (Summary)

• 15

1. Chapter 15: Chemical Equilibrium
   2. 15.1: The Concept of Equilibrium
   3. 15.2: The Equilibrium Constant
   4. 15.3: Interpreting & Working with Equilibrium Constants
   5. 15.4: Heterogeneous Equilibria
   6. 15.5: Calculating Equilibrium Constants
   7. 15.6: Applications of Equilibrium Constants
      8. 15.7: Le Châtelier's Principle
      9. 15.E: Exercises
   10. 15.S: Chemical Equilibrium (Summary)

• 16

1. Chapter 16: Acid–Base Equilibria
   2. 16.1: Acids and Bases: A Brief Review
   3. 16.2: Brønsted–Lowry Acids and Bases
   4. 16.3: The Autoionization of Water
5. **19.4: Entropy Changes in Chemical Reactions**
6. **19.5: Gibbs Free Energy**
7. **19.6: Free Energy and Temperature**
8. **19.7: Free Energy and the Equilibrium Constant**
9. **19.E: Chemical Thermodynamics (Exercises)**

**Chapter 20: Electrochemistry**
1. **20.1: Oxidation States & Redox Reactions**
2. **20.2: Balanced Oxidation-Reduction Equations**
3. **20.3: Voltaic Cells**
4. **20.4: Cell Potential Under Standard Conditions**
5. **20.5: Gibbs Energy and Redox Reactions**
6. **20.6: Cell Potential Under Nonstandard Conditions**
7. **20.7: Batteries and Fuel Cells**
8. **20.8: Corrosion**
9. **20.9: Electrolysis**

**Chapter 21: Nuclear Chemistry**
1. **21.1: Radioactivity**
2. **21.2: Patterns of Nuclear Stability**
3. **21.3: Nuclear Transmutations**
4. **21.4: Rates of Radioactive Decay**
5. **21.6: Energy Changes in Nuclear Reactions**
6. **21.7: Nuclear Fission**
7. **21.8: Nuclear Fusion**
8. **21.9: Biological Effects of Radiation**
9. **21.E: Exercises**
10. **21.S: Nuclear Chemistry (Summary)**

**Chapter 22: Chemistry of the Nonmetals**
1. **22.1: General Concepts: Periodic Trends and Reactions**
2. **22.2: Hydrogen**
3. **22.3: Group 18: Nobel Gases**
4. **22.4: Group 17: The Halogens**
5. **22.5: Oxygen**
7. **22.6: The Other Group 16 Elements: S, Se, Te, and Po**
8. **22.7: Nitrogen**
9. **22.8: The Other Group 15 Elements: P, AS, Sb, and Bi**
10. **22.9: Carbon**
11. **22.10: The Other Group 14 Elements: Si, Ge, Sn, and Pb**
12. **22.11: Boron**
13. **22.E: Chemistry of the Nonmetals (Exercises)**
14. **22.S: Chemistry of the Nonmetals (Summary)**

**• 23**

1. **Chapter 23: Metals and Metallurgy**
2. **23.1: Occurance and Distribution of Metals**
   3. **23.2: Pyrometallurgy**
   4. **23.3: Hydrometallurgy**
   5. **23.4: Electrometallurgy**
   6. **23.5: Metallic Bonding**
   7. **23.6: Alloys**
8. **23.7: Transition Metals**
9. **23.8: Chemistry of Selected Transition Metals**

**• 24**

1. **Chapter 24: Chemistry of Coordination Chemistry**
2. **24.1: Metal Complexes**
3. **24.2: Ligands with more than one Donor Atom**
4. **24.3: Nomenclature of Coordination Chemistry**
5. **24.4: Isomerization**
6. **24.5: Color and Magnetism**
7. **24.6: Crystal Field Theory**
8. **24.E: Chemistry of Coordination Chemistry (Exercises)**

**• 25**

1. **Chapter 25: Chemistry of Life: Organic and Biological Chemistry**
2. **25.1: General Characteristics of Organic Molecules**
3. **25.2: Introduction to Hydrocarbons**
4. **25.3: Alkanes**
5. **25.4: Unsaturated Hydrocarbons**
6. **25.5: Functional Groups**
7. **25.6: Compounds with a Carbonyl Group**
8. 25.7: Chirality in Organic Chemistry
9. 25.8: Introduction to Biochemistry
10. 25.9: Proteins
11. 25.10: Carbohydrates
12. 25.11: Nucleic Acids
13. 25.E: Organic and Biological Chemistry (Exercises)
14. 25.S: Organic and Biological Chemistry (Summary)

• Homework
1. 1.E: Matter and Measurement (Exercises)
2. 2.E: Atoms, Molecules, and Ions (Exercises)
   3. 3.E: Stoichiometry (Exercises)
4. 4.E: Aqueous Reactions (Exercises)
5. 5.E: Thermochemistry (Exercises)
6. 6.E: Electronic Structure (Exercises)
7. 7.E: Periodic Trends (Exercises)
8. 8.E: Chemical Bonding Basics (Exercises)
9. 9.E: Bonding Theories (Exercises)
10. 10.E: Gases (Exercises)
11. 11.E: Liquids and Intermolecular Forces (Exercises)
13. 13.E: Properties of Solutions (Exercises)
15. 15.E: Chemical Equilibrium (Exercises)
16. 16.E: Acid–Base Equilibria (Exercises)
17. 17.E: Additional Aspects of Aqueous Equilibria (Exercises)
18. 18.E: Chemistry of the Environment (Exercises)
19. 19.E: Chemical Thermodynamics (Exercises)
   20. 20.E: Electrochemistry (Exercises)
21. 21.E: Nuclear Chemistry (Exercises)
22. 22.E: Chemistry of the Nonmetals (Exercises)
23. 23.E: Metals and Metallurgy (Exercises)
24. 24.E: Chemistry of Coordination Chemistry (Exercises)
25. 25.E: Organic and Biological Chemistry (Exercises)

This Textmap is designed for the two-semester general chemistry course and has been developed to meet the scope and sequence of most general chemistry courses. The organization follows the textbook "Chemistry: the Central Science" by Brown et al., but the content differs in detail.
Front Matter

• 1: Introduction - Matter and Measurement

• 2: Atoms, Molecules, and Ions

• 3: Stoichiometry: Chemical Formulas and Equations
4: Reactions in Aqueous Solution

5: Thermochemistry

6: Electronic Structure of Atoms

7: Periodic Properties of the Elements
8: Basic Concepts of Chemical Bonding

9: Molecular Geometry and Bonding Theories

10: Gases

11: Liquids and Intermolecular Forces
16: Acid–Base Equilibria

17: Additional Aspects of Aqueous Equilibria

18: Chemistry of the Environment

19: Chemical Thermodynamics
20: Electrochemistry

21: Nuclear Chemistry

22: Chemistry of the Nonmetals

24: Chemistry of Coordination Chemistry
25: Chemistry of Life: Organic and Biological Chemistry

- Back Matter