

# MOLECULAR LABS

## Chemical Matter

- 1** Classifying Chemical and Physical Properties

## Atoms and Periodicity

- 2** Atoms and Their Nuclei  
**3** The Quantum Model of Atoms  
**4** Comparing s- and p-Orbitals  
**5** The Structure of an Atom with d-Orbitals

## Chemical Bonding

- 6** Covalent Bonding  
**7** Electronegativity and the Formation of Bonds  
**8** Compounds with Polyatomic Ions  
**9** Predicting and Analyzing Molecular Shapes

## Chemical Formulas

- 10** Naming Molecular Compounds

## States of Matter

- 11** Examining Two-Dimensional Models for the States of Matter  
**12** Characterizing the Physical States of Bromine and Chlorine  
**13** Comparing the Density of Liquids and Gases  
**14** The Dynamic Picture of Solids, Liquids, and Gases  
**15** The Characteristics of Salt Crystals  
**16** Molecular Motion in Liquids  
**17** Probing Dipole-Dipole Forces  
**18** Hydrogen Bonding in Water  
**19** Bonding in Crystalline Solids  
**20** The Distribution of Kinetic Energies

## Gases

- 21** Measuring Gas Pressure  
**22** Temperature Scales in Chemistry  
**23** Standard Temperature and Pressure  
**24** The Ability of Gases to Mix  
**25** The Pressure-Volume Relationship  
**26** The Pressure-Temperature Relationship

- 27** How Fast Do Gas Molecules Move?

- 28** Mean Speed and Temperature

- 29** The Effusion of Gas Mixtures

## Solutions

- 30** Specifying the Concentration of a Solution

- 31** Solvation in Aqueous Ionic Solutions

## Acids and Bases

- 32** Molecular Structure and Acid Strength

## Thermochemistry

- 33** Measuring the Specific Heat

- 34** Factors That Affect the Thermal Energy

## Kinetics

- 35** Reactive Collisions between Molecules

- 36** Examining a Reaction Mechanism

## Equilibria

- 37** Chemical Equilibrium and Temperature

- 38** Chemical Equilibrium and Pressure

## Chemical Thermodynamics

- 39** The Entropy of the Phases of Iodine

- 40** Temperature Dependence of the Entropy of Gases

## Organic Chemistry

- 41** The Bonding Characteristics of Carbon

- 42** The Structure of Straight-Chain Alkanes

- 43** Isomers of the Alkanes

- 44** Alkenes and Alkynes

- 45** Cyclic Hydrocarbons

- 46** Identifying Functional Groups

## Biological Chemistry

- 47** Examining Models of Starch

- 48** The Structure of Amino Acids

- 49** Building a Model of a Protein

- 50** Building a Model of DNA