This is a textbook map of the Bruice's famous "Organic Chemistry" textbook. It is not a copy of the original textbook, but is mapped to content on the ChemWiki to simulate it.

1. Electronic Structure and Bonding (Acids and Bases)
2: An Introduction to Organic Compounds: Nomenclature, Physical Properties, and Representation of Structure

3: Alkenes: Structure, Nomenclature, and an Introduction to Reactivity • Thermodynamics and Kinetics

4: The Reactions of Alkenes


6: The Reactions of Alkynes: An Introduction to Multistep Synthesis
7: Delocalized Electrons and Their Effect on Stability, Reactivity, and pKa (More About Molecular Orbital Theory)

8: Substitution Reactions of Alkyl Halides

9: Elimination Reactions of Alkyl Halides (Competition between Substitution and Elimination)

10: Reactions of Alcohols, Ethers, Epoxides, Amine, and Sulfur-Containing Compounds
11: Organometallic Compounds

12: Radicals (Reactions of Alkanes)

13: Mass Spectrometry, Infrared Spectroscopy, and Ultraviolet/Visible Spectroscopy

14: NMR Spectroscopy
15: Aromaticity (Reactions of Benzene)

16: Reactions of Substituted Benzenes

17: Carbonyl Compounds I: Reactions of Carboxylic Acids and Carboxylic Derivatives

18: Carbonyl Compounds II: Reactions of Aldehydes and Ketones • More Reactions of Carboxylic Acid Derivatives • Reactions of α, β-Uunsaturated Carbonyl Compounds

19: Carbonyl Compounds III: Reactions at the α-Carbon

20: More About Oxidation-Reduction Reactions
21: More About Amines (Heterocyclic Compounds)

22: The Organic Chemistry of Carbohydrates

23: The Organic Chemistry of Amino Acids, Peptides, and Proteins
27: The Organic Chemistry of Lipids

28: The Chemistry of Nucleic Acids
29: Synthetic Polymers

30: Pericyclic Reactions

31: The Organic Chemistry of Drugs: Discovery and Design
Homework Solutions

1 AN INTRODUCTION TO THE STUDY OF CHEMISTRY

1 Electronic Structure and Bonding • Acids and Bases

1.1 The Structure of an Atom
1.2 How Electrons in an Atom are Distributed
1.3 Ionic and Covalent Bonds
1.4 How the Structure of a Compound is Represented
1.5 Atomic Orbitals
1.6 An Introduction to Molecular Orbital Theory
1.7 How Single Bonds Are Formed in Organic Compounds
1.8 How a Double Bond is Formed: The Bonds in Ethene
1.9 How a Triple Bond is Formed: The Bonds in Ethyne
1.10 Bonding in the Methyl Cation, the Methyl Radical, and the Methyl Anion
1.11 The Bonds in Water
1.12 The Bonds in Ammonia and in the Ammonium Ion
1.13 The Bond in a Hydrogen Halide
1.14 Summary: Hybridization, Bond Lengths, Bond Strengths, and Bond Angles
1.15 The Dipole Moments of Molecules
1.16 An Introduction to Acids and Bases
1.17 pKa and pH
1.18 Organic Acids and Bases
1.19 How to Predict the Outcome of an Acid-Base Reaction
1.20 How to Determine the Position of Equilibrium
1.21 How the Structure of an Acid Affects its pKa Value
1.22 How Substituents Affect the Strength of an Acid
1.23 An Introduction to Delocalized Electrons
1.24 A Summary of the Factors that Determine Acid Strength
1.25 How pH Affects the Structure of an Organic Compound
1.26 Buffer Solutions
1.27 Lewis Acids and Bases

2 An Introduction to Organic Compounds: Nomenclature, Physical Properties, and Representation of Structure
2.1 How Alkyl Substituents Are Named
2.2 The Nomenclature of Alkanes
2.3 The Nomenclature of Cycloalkanes • Skeletal Structures
2.4 The Nomenclature of Alkyl Halides
2.5 The Nomenclature of Ethers
2.6 The Nomenclature of Alcohols
2.7 The Nomenclature of Amines
2.8 The Structures of Alkyl Halides, Alcohols, Ethers, and Amines
2.9 The Physical Properties of Alkanes, Alkyl Halides, Alcohols, Ethers, and Amines
2.10 Rotation Occurs About Carbon-Carbon Single Bonds
2.11 Some Cycloalkanes Have Angle Strain
2.12 Conformers of Cyclohexane
2.13 Conformers of Monosubstituted Cyclohexanes
Conformers of Disubstituted Cyclohexanes
Fused Cyclohexane Rings

II ELECTROPHILIC ADDITION REACTIONS, STEREOCHEMISTRY, AND ELECTRON DELOCALIZATION

3 Alkenes: Structure, Nomenclature, and an Introduction to Reactivity • Thermodynamics and Kinetics
3.1 Molecular Formulas and the Degree of Unsaturation
3.2 The Nomenclature of Alkenes
3.3 The Structures of Alkenes
3.4 Alkenes Can Have Cis and Trans Isomers
3.5 Naming Alkenes Using the E,Z System
3.6 How Alkenes React • Curved Arrows Show the Flow of Electrons
3.7 Thermodynamics and Kinetics
3.8 The Rate of a Reaction and the Rate Constant for a Reaction
3.9 A Reaction Coordinate Diagram Describes the Energy Changes That Take Place During a Reaction

4 The Reactions of Alkenes
4.1 The Addition of a Hydrogen Halide to an Alkene
4.2 Carbocation Stability Depends on the Number of Alkyl Groups Attached to the Positively Charged Carbon
4.3 What Does the Structure of the Transition State Look Like?
4.4 Electrophilic Addition Reactions Are Regioselective
4.5 The Addition of Water to an Alkene
4.6 The Addition of an Alcohol to an Alkene
4.7 A Carbocation Will Rearrange If It Can Form a More Stable Carbocation
4.8 The Addition of a Halogen to an Alkene
4.9 Oxymercuration-Reduction and Alkoxymercuration-Reduction Are Other Ways to Add Water or an Alcohol to an Alkene
4.10 The Addition of a Peroxyacid to an Alkene
4.11 The Addition of Borane to an Alkene: Hydroboration-Oxidation
4.12 The Addition of Hydrogen to an Alkene
4.13 The Relative Stabilities of Alkenes
4.14 Reactions and Synthesis

5 Stereochemistry: The Arrangement of Atoms in Space; The Stereochemistry of Addition Reactions
5.1 Cis-Trans Isomers Result from Restricted Rotation
5.2 A Chiral Object Has a Nonsuperimposable Mirror Image
5.3 An Asymmetric Center Is a Cause of Chirality in a Molecule
5.4 Isomers with One Asymmetric Center
5.5 Asymmetric Centers and Stereocenters
5.6 How to Draw Enantiomers
5.7 Naming Enantiomers by the R,S System
5.8 Chiral Compounds Are Optically Active
5.9 How Specific Rotation is Measured
5.10 Enantiomeric Excess
5.11 Isomers with More than One Asymmetric Center
5.12 Meso Compounds Have Asymmetric Centers but Are Optically Inactive
5.13 How to Name Isomers with More than One Asymmetric Center
5.14 Reactions of Compounds that Contain an Asymmetric Center
5.15 Using Reactions that Do Not Break Bonds to an Asymmetric Center to Determine Relative Configurations
5.16 How Enantiomers Can Be Separated
5.17 Nitrogen and Phosphorus Atoms Can Be Asymmetric Centers
5.18 Stereochemistry of Reactions: Regioselective, Stereoselective, and Stereospecific Reactions
5.19 The Stereochemistry of Electrophilic addition Reactions of Alkenes
5.20 The Stereochemistry of Enzyme-Catalyzed Reactions
5.21 Enantiomers Can Be Distinguished by Biological Molecules

6 The Reactions of Alkynes: An Introduction to Multistep Synthesis
6.1 The Nomenclature of Alkynes
6.2 How to Name a Compound That Has More than One Functional Group
6.3 The Physical Properties of Unsaturated Hydrocarbons
6.4 The Structure of Alkynes
6.5 How Alkynes React
6.6 The Addition of Hydrogen Halides and Addition of Halogens to an Alkyne
6.7 The Addition of Water to an Alkyne
6.8 The Addition of Borane to an Alkyne: Hydroboration-Oxidation
6.9 The Addition of Hydrogen to an Alkyne
6.10 A Hydrogen Bonded to an sp Carbon is “Acidic”
6.11 Synthesis Using Acetylide Ions
6.12 Designing a Synthesis I: An Introduction to Multistep Synthesis

7 Delocalized Electrons and Their Effect on Stability, Reactivity, and pKa • More About Molecular Orbital Theory
7.1 Delocalized Electrons Explain Benzene’s Structure
7.2 The Bonding in Benzene
7.3 Resonance Contributors and the Resonance Hybrid
7.4 How to Draw Resonance Contributors
7.5 The Predicted Stabilities of Resonance Contributors
7.6 Delocalized Energy Is the Additional Stability Delocalized Electrons Give to a Compound
7.7 Examples That Show How Delocalized Electrons Affect Stability
7.8 A Molecular Orbital Description of Stability
7.9 How Delocalized Electrons Affect pKa Values
7.10 Delocalized Electrons Can Affect the Product of a Reaction
Thermodynamic Versus Kinetic Control of Reactions

The Diels-Adler Reaction Is a 1,4-Addition Reaction

III  SUBSTITUTION AND ELIMINATION REACTIONS

8  Substitution Reactions of Alkyl Halides
8.1  The Mechanism For an SN2 Reaction
8.2  Factors That Affect SN2 Reactions
8.3  The Reversibility of an SN2 Reaction Depends on the Basicities of the Leaving Groups in the Forward and Reverse Directions
8.4  The Mechanism for an SN1 Reaction
8.5  Factors That Affect SN1 Reactions
8.6  More About the Stereochemistry of SN2 and SN1 Reactions
8.7  Benzylic Halides, Allylic Halides, Vinylic Halides, and Aryl Halides
8.8  Competition Between SN2 and SN1 Reactions
8.9  The Role of the Solvent in SN2 and SN1 Reactions
8.10  Intermolecular Versus Intramolecular Reactions
8.11  Biological Methylating Reagents Have Good Leaving Groups

9  Elimination Reactions of Alkyl Halides • Competition between Substitution and Elimination
9.1  The E2 Reaction
9.2  An E2 Reaction is Regioselective
9.3  The E1 Reaction
9.4  Competition between E2 and E1 Reactions
9.5  E2 and E1 Reactions are Stereoselective
9.6  Elimination from Substituted Cyclohexanes
9.7  A Kinetic Isotope Effect Can Help Determine a Mechanism
9.8  Competition between Substitution and Elimination
9.9  Substitution and Elimination Reactions in Synthesis
9.10  Designing a Synthesis II: Approaching the Problem

10  Reactions of Alcohols, Ethers, Epoxides, Amines, and Sulfur-Containing Compounds
10.1  Nucleophilic Substitution Reactions of Alcohols: Forming Alkyl Halides
10.2  Other Methods Used to Convert Alcohols into Alkyl Halides
10.3  Converting an Alcohol to a Sulfonate Ester
10.4  Elimination Reactions of Alcohols: Dehydration
10.5  Oxidation of Alcohols
10.6  Nucleophilic Substitution Reactions of Ethers
10.7  Nucleophilic Substitution Reactions of Epoxides
10.8  Amines Do Not Undergo Substitution or Elimination Reactions
10.9 Quaternary Ammonium Hydroxides Undergo Elimination Reactions
10.10 Phase-Transfer Catalysts
10.11 Thiols, Sulfides, and Sulfonium Salts

11 Organometallic Compounds
11.1 Organolithium and Organomagnesium Compounds
11.2 The Reaction Organolithium Compounds and Grignard Reagents with Electrophiles
11.3 Transmetallation
11.4 Coupling Reactions
11.5 Palladium-Catalyzed Coupling Reactions
11.6 Alkene Metathesis

12 Radicals • Reactions of Alkanes
12.1 Alkanes Are Unreactive Compounds
12.2 Chlorination and Bromination of Alkanes
12.3 Radical Stability Depends on the Number of Alkyl Groups Attached to the Carbon with the Unpaired Electron
12.4 The Distribution of Products Depends on Probability and Reactivity
12.5 The Reactivity-Selectivity Principle
12.6 Formation of Explosive Peroxides
12.7 The Addition of Radicals to an Alkene
12.8 The Stereochemistry of Radical Substitution and Addition Reactions
12.9 Radical Substitution of Benzylic and Allylic Hydrogens
12.10 Designing a Synthesis III: More Practice with Multistep Synthesis
12.11 Radical Reactions Occur in Biological Systems
12.12 Radicals and Stratospheric Ozone

IV IDENTIFICATION OF ORGANIC COMPOUNDS

13 Mass Spectrometry, Infrared Spectroscopy, and Ultraviolet/Visible Spectroscopy
13.1 Mass Spectrometry
13.2 The Mass Spectrum • Fragmentation
13.3 Isotopes in Mass Spectrometry
13.4 High-Resolution Mass Spectrometry Can Reveal Molecular Formulas
13.5 Fragmentation Patterns of Functional Groups
13.6 Other Ionization Methods
13.7 Spectroscopy and the Electromagnetic Spectrum
13.8 Infrared Spectroscopy
13.9 Characteristic Infrared Absorption Bands
13.10 The Intensity of Absorption Bands
13.11 The Position of Absorption Bands
13.12 The Position of an Absorption Band is Affected by Electron Delocalization, Election Donation and Withdrawal, and Hydrogen Bonding

13.13 The Shape of Absorption Bands

13.14 The Absence of Absorption Bands

13.15 Some Vibrations Are Infrared Inactive

13.16 How to Interpret An Infrared Spectrum

13.17 Ultraviolet and Visible Spectroscopy

13.18 The Beer-Lambert Law

13.19 The Effect of Conjugation on \( \lambda_{\text{max}} \)

13.20 The Visible Spectrum and Color

13.21 Some Uses of UV/Vis Spectroscopy

14 NMR Spectroscopy

14.1 An Introduction to NMR Spectroscopy

14.2 Fourier Transform NMR

14.3 Shielding Causes Different Hydrogens to Show Signals at Different Frequencies

14.4 The Number of Signals in an 1H NMR Spectrum

14.5 The Chemical Shift Tells How Far the Signal Is from the Reference Signal

14.6 The Relative Positions of 1H NMR Signals

14.7 Characteristic Values of Chemical Shifts

14.8 Dismagnetic Anisotropy

14.9 The Integration of NMR Signals Reveals the Relative Number of Protons Causing the Signal

14.10 The Splitting of the Signals is Described by the N + 1 Rule

14.11 More Examples of 1H NMR Spectra

14.12 Coupling Constants Identify Coupled Protons

14.13 Splitting Diagrams Explain the Multiplicity of a Signal

14.14 Diastereotopic Hydrogens Are Not Chemically Equivalent

14.15 The Time Dependence of NMR Spectroscopy

14.16 Protons Bonded to Oxygen and Nitrogen

14.17 The Use of Deuterium in 1H NMR Spectroscopy

14.18 The Resolution of 1H NMR Spectra

14.19 13C NMR Spectroscopy

14.20 DEPT 13C NMR Spectra

14.21 Two-Dimensional NMR Spectroscopy

14.22 NMR Used in Medicine is Called Magnetic Resonance Imaging

14.23 X-Ray Crystallography

V. AROMATIC COMPOUNDS

15 Aromaticity • Reactions of Benzene
15.1 Aromatic Compounds Are Unusually Stable
15.2 The Two Criteria for Aromaticity
15.3 Applying the Criteria for Aromaticity
15.4 Aromatic Heterocyclic Compounds
15.5 Some Chemical Consequences of Aromaticity
15.6 Antiaromaticity
15.7 A Molecular Orbital Description of Aromaticity and Antiaromaticity
15.8 The Nomenclature of Monosubstituted Benzenes
15.9 How Benzene Reacts
15.10 The General Mechanism for Electrophilic Aromatic Substitution Reactions
15.11 The Halogenation of Benzene
15.12 The Nitration of Benzene
15.13 The Sulfonation of Benzene
15.14 The Friedel-Crafts Acylation of Benzene
15.15 The Friedel-Crafts Alkylation of Benzene
15.16 The Alkylation of Benzene by Acylation-Reduction
15.17 Using Coupling Reactions to Alkylate Benzene
15.18 It Is Important to Have More Than One Way to Carry Out a Reaction
15.19 Polycyclic Benzole Hydrocarbons
15.20 Arene Oxides

16 Reactions of Substituted Benzenes
16.1 How Some Substituents on a Benzene Ring Can Be Chemically Changed
16.2 The Nomenclature of Disubstituted and Polysubstituted Benzenes
16.3 The Effect of Substituents on Reactivity
16.4 The Effect of Substituents on Orientation
16.5 The Effect of Substituents on pKa
16.6 The Ortho-Para Ratio
16.7 Additional Considerations Regarding Substituent Effects
16.8 Designing a Synthesis IV: Synthesis of Monosubstituted and Disubstituted Benzenes
16.9 The Synthesis of Trisubstituted Benzenes
16.10 The Synthesis of Substituted Benzenes Using Arenediazonium Salts
16.11 The Arenediazonium Ion as an Electrophile
16.12 The Mechanism for the Reaction of Amines with Nitrous Acid
16.13 Nucleophilic Aromatic Substitution: An Addition-Elimination Mechanism
16.14 Nucleophilic Aromatic Substitution: An Elimination-Addition Mechanism That Forms a Benzene

VI. CARBONYL COMPOUNDS

17 Carbonyl Compounds I: Reactions of Carboxylic Acids and Carboxylic Derivatives
17.1 The Nomenclature of Carboxylic Acids and Carboxylic Acid Derivatives
17.2 The Structures of Carboxylic Acids and Carboxylic Derivatives
17.3 The Physical Properties of Carbonyl Compounds
17.4 Naturally Occurring Carboxylic Acids and Carboxylic Acid Derivatives
17.5 How Class I Carbonyl Compounds React
17.6 Relative Reactivities of Carboxylic Acids and Carboxylic Acid Derivatives
17.7 General Mechanism for Nucleophilic Addition-Elimination Reactions
17.8 Reactions of Acyll Halides
17.9 Reactions of Acid Anhydrides
17.10 Reactions of Esters
17.11 Acid-Catalyzed Ester Hydrolysis and Transesterification
17.12 Hydroxide-Ion-Promoted Ester Hydrolysis
17.13 How the Mechanism for Nucleophilic Addition-Elimination was Confirmed
17.14 Soaps, Detergents, and Micelles
17.15 Reactions of Carboxylic Acids
17.16 Reactions of Amides
17.17 The Hydrolysis of Amides Is Catalyzed by Acids
17.18 The Hydrolysis of an Imide: A Way to Synthesize Primary Amines
17.19 The Hydrolysis of Nitriles
17.20 Designing a Synthesis V: The Synthesis of Cyclic Compounds
17.21 How Chemists Activate Carboxylic Acids
17.22 How Cells Activate Carboxylic Acids
17.23 Dicarboxylic Acids and Their Derivatives

18 Carbonyl Compounds II: Reactions of Aldehydes and Ketones • More Reactions of Carboxylic Acid Derivatives • Reactions of α, β- Unsaturated Carbonyl Compounds
18.1 The Nomenclature of Aldehydes and Ketones
18.2 The Relative Reactivities of Carbonyl Compounds
18.3 How Aldehydes and Ketones React
18.4 The Reactions of Carbonyl Compounds with Gringard Reagents
18.5 The Reactions of Carbonyl Compounds with Acetylide Ions
18.6 The Reactions of Carbonyl Compounds with Hydride Ion
18.7 The Reactions of Aldehydes and Ketones with Hydrogen Cyanide
18.8 The Reactions of Aldehydes and Ketones with Amines and Amine Derivatives
18.9 The Reactions of Aldehydes and Ketones with Water
18.10 Reactions of Aldehydes and Ketones with Alcohols
18.11 Protecting Groups
18.12 Addition of Sulfur Nucleophiles
18.13 The Wittig Reaction Forms an Alkene
18.14 Stereochemistry of Nucleophilic Addition Reactions: Re and Si Faces
18.15 Designing a Synthesis VI: Disconnections, Synthons, and Synthetic Equivalents
18.16 Nucleophilic Addition to α, β- Unsaturated Aldehydes and Ketones
18.17 Nucleophilic Addition to α, β- Unsaturated Carboxylic Acid Derivatives
18.18 Enzyme-Catalyzed Additions to α, β- Unsaturated Carbonyl Compounds

19 Carbonyl Compounds III: Reactions at the α- Carbon
19.1 The Acidity of an α- Hydrogen
19.2 Keto-Enol Tautomers
19.3 Keto-Enol Interconversion
19.4 How Enolate Ions and Enols
19.5 Halogenation of the α- Carbon and Aldehydes and Ketones
19.6 Halogenation of the α- Carbon of Carboxylic Acids: The Hell-Volhard-Zelinski Reaction
19.7 α- Halogenated Carbonyl Compounds Are Useful in Synthesis
19.8 Using LDA to Form an Enolate Ion
19.9 Alkylating the α-Carbon of Carbonyl Compounds
19.10 Alkylation and Acylation of the α-Carbon Using an Enamine Intermediate
19.11 Alkylation of the β-Carbon: The Michael Reaction
19.12 An Aldol Addition Forms β-Hydroxaldehydes or β-Hydroxyketones
19.13 Dehydration of Aldol Addition Products Form α, β-Unsaturated Aldehydes and Ketones
19.14 The Crossed Aldol Addition
19.15 A Claisen Condensation Forms a β-Keto Ester
19.16 Other Crossen Condensations
19.17 Intramolecular Condensation and Addition Reactions
19.18 The Robinson Annulation
19.19 Carboxylic Acids with a Carbonyl Group at the 3-Position can be Decarboxylated
19.20 The Malonic Ester Synthesis: A Way to Synthesize a Carboxylic Acid
19.21 The Acetoacetic Ester Synthesis: A Way to Synthesize a Methyl Ketone
19.22 Designing a Synthesis VII: Making New Carbon-Carbon Bonds
19.23 Reactions at the α-Carbon in Biological Systems

VII MORE ABOUT OXIDATION-REDUCTION REACTIONS AND AMINES

20 More About Oxidation-Reduction Reactions
20.1 Oxidation-Reduction Reactions of Organic Compounds: An Overview
20.2 Reduction Reactions
20.3 Chemoselective Reactions
20.4 Oxidation of Alcohols
20.5 Oxidation of Aldehydes and Ketones
20.6 Designing a Synthesis VIII: Controlling Stereochemistry
20.7 Oxidation of Alkenes to 1,2 Diols
20.8 Oxidative Cleavage of 1,2 Diols
20.9 Oxidative Cleavage of Alkenes
20.10 Designing a Synthesis IX: Functional Group Interconversion

21 More About Amines • Heterocyclic Compounds
21.1 More about Amine Nomenclature
21.2 More About the Acid-Base Properties of Amines
21.3 Amines React as Bases and as Nucleophiles
21.4 Synthesis of Amines
21.5 Aromatic Five-Membered-Ring Heterocycles
21.6 Aromatic Six-Membered-Ring Heterocycles
21.7 Amine Heterocycles Have Important Roles in Nature

VIII BIOORGANIC COMPOUNDS

22 The Organic Chemistry of Carbohydrates
22.1 Classification of Carbohydrates
22.2 The D and L Notation
22.3 The Configurations of Aldoses
22.4 The Configurations of Ketoses
22.5 The Reactions of Monosaccharides in Basic Solutions
22.6 The Oxidation-Reduction Reactions of Monosaccharides
22.7 Monosaccharides Form Crystalline Osazones
22.8 Lengthening the Chain: The Kiliani-Fischer Synthesis
22.9 Shortening the Chain: The Wohl Degradation
22.10 The Stereochemistry of Glucose: The Fischer Proof
22.11 Monosaccharides Form Cyclic Hemiacetals
22.12 Glucose is the Most Stable Aldohexose
22.13 Formation of Glycosides
22.14 The Anomeric Effect
22.15 Reducing and Nonreducing Sugars
22.16 Disaccharides
22.17 Polysaccharides
22.18 Some Naturally Occurring Products Derived from Carbohydrates
22.19 Carbohydrates on Cell Surfaces
22.20 Synthetic Sweeteners

23 The Organic Chemistry of Amino Acids, Peptides, and Proteins
23.1 Classification and Nomenclature of Amino Acids
23.2 The Configuration of the Amino Acids
23.3 The Acid-Base Properties of Amino Acids
23.4 The Isoelectric Point
23.5 Separating Amino Acids
23.6 The Synthesis of Amino Acids
23.7 The Resolution of Racemic Mixtures of Amino Acids
23.8 Peptide Bonds and Disulfide Bonds
23.9 Some Interesting Peptides
23.10 The Strategy of Peptide Bond Synthesis: N-Protection and C-Activation
23.11 Automated Peptide Synthesis
23.12 An Introduction to Protein Structure
23.13 How to Determine the Primary Structure of a Polypeptide or Protein
23.14 The Secondary Structure of Proteins
23.15 The Tertiary Structure of Proteins
23.16 The Quaternary Structure of Proteins
23.17 Protein Denaturation

24 Catalysis
24.1 Catalysis in Organic Reactions
24.2 Acid Catalysis
24.3 Base Catalysis
24.4 Nucleophilic Catalysis
24.5 Metal-Ion Catalysis
24.6 Intramolecular Reactions
24.7 Intramolecular Catalysis
24.8 Catalysis in Biological Reactions
24.9 Enzyme-Catalyzed Reactions
24.10 The Organic Mechanisms of the Coenzymes

25 Compounds Derived from Vitamins
25.1 The Vitamin Needed for Many Redox Reactions: Vitamin B3
25.2 Flavin Adenine Dinucleotide and Flavin Mononucleotind: Vitamin B
25.3 Thiamine Pyrophosphate: Vitamin B1
25.4 Biotin: Vitamin H
25.5 Pyridoxal Phosphate: Vitamin B6
25.6 Coenzyme B12: Vitamin B12
25.7 Tetrahydrofolate: Folic Acid
25.8 Vitamin KH2: Vitamin K

26 The Organic Chemistry of Metabolic Pathways
26.1 ATP is Used for Phosphoryl Transfer Reactions
26.2 The Three Mechanisms for Phosphoryl Transfer Reactions
26.3 The “High-Energy” Character of Phosphoanhydride Bonds
29 Synthetic Polymers
29.1 There Are Two Major Classes of Synthetic Polymers
29.2 Chain-Growth Polymers
29.3 Stereochemistry of Polymerization • Ziegler- Natta Catalysts
29.4 Polymerization of Dienes • The Manufacture of Rubber
29.5 Copolymers
29.6 Step-Growth Polymers
29.7 Classes of Step-Growth Polymers
29.8 Physical Properties of Polymers
29.9 Biodegradable Polymers

30 Pericyclic Reactions
30.1 There Are Three Kinds of Pericyclic Reactions
30.2 Molecular Orbitals and Orbital Symmetry
30.3 Electro cyclic Reactions
30.4 Cycloaddition Reactions
30.5 Sigmatropic Rearrangements
30.6 Pericyclic Reactions in Biological Systems
30.7 Summary of the Selection Rules for Pericyclic Reactions

31 The Organic Chemistry of Drugs: Discovery and Design
31.1 Naming Drugs
31.2 Lead Compounds
31.3 Molecular Modification
31.4 Random Screening
31.5 Serendipity in Drug Development
31.6 Receptors
31.7 Drugs as Enzyme Inhibitors
31.8 Designing a Suicide Substrate
31.9 Quantitative Structure-Activity Relationships (QSAR)
31.10 Molecular Modeling
31.11 Combinatorial Organic Synthesis
31.12 Antiviral Drugs
31.13 Economics of Drugs • Governmental Regulations - See more at: http://www.pearsonhighered.com/educa....FITL3xMH.dpuf