

Detailed Licensing

Overview

Title: Map: Organic Chemistry I (Wade)

Webpages: 209

Applicable Restrictions: Noncommercial

All licenses found:

- **Undeclared:** 98.6% (206 pages)
- **CC BY-NC-SA 4.0:** 1.4% (3 pages)

By Page

- Map: Organic Chemistry I (Wade) - *Undeclared*
 - Front Matter - *Undeclared*
 - TitlePage - *Undeclared*
 - InfoPage - *Undeclared*
 - Table of Contents - *Undeclared*
 - Licensing - *Undeclared*
 - 1: Introduction and Review - *Undeclared*
 - 1.1: The Origins of Organic Chemistry - *CC BY-NC-SA 4.0*
 - 1.2: Principles of Atomic Structure (Review) - *Undeclared*
 - 1.3: Electronic Structure (Review) - *Undeclared*
 - 1.4: Electron Configurations and Electronic Orbital Diagrams (Review) - *Undeclared*
 - 1.5: Octet Rule - Ionic and Covalent Bonding (Review) - *Undeclared*
 - 1.6: Lewis Structures and Formal Charges (Review) - *Undeclared*
 - 1.7: Common Bonding Patterns for Organic Chemistry - *Undeclared*
 - 1.8: Structural Formulas - Lewis, Kekule, Bond-line, Condensed, and Perspective - *Undeclared*
 - 1.9: Electronegativity and Bond Polarity (Review) - *Undeclared*
 - 1.10: Resonance - *Undeclared*
 - 1.11: Arrhenius Acids and Bases (Review) - *Undeclared*
 - 1.12: Lewis Acids and Bases - *Undeclared*
 - 1.13: Distinguishing between pH and pKa - *Undeclared*
 - 1.14: Predicting Relative Acidity - *Undeclared*
 - 1.15: Molecular Formulas and Empirical Formulas (Review) - *Undeclared*
 - 1.16: Additional Exercises - *Undeclared*
 - 1.17: Solutions to Additional Exercises - *Undeclared*
 - 1.18: Brønsted-Lowry Acids and Bases (Review) - *Undeclared*
 - 2: Structure and Properties of Organic Molecules - *Undeclared*
 - 2.1: Pearls of Wisdom - *Undeclared*
 - 2.2: Molecular Orbital (MO) Theory (Review) - *Undeclared*
 - 2.3: Hybridization and Molecular Shapes (Review) - *Undeclared*
 - 2.4: 2.4 Conjugated Pi Bond Systems - *Undeclared*
 - 2.5: Lone Pair Electrons and Bonding Theories - *Undeclared*
 - 2.6: Bond Rotation - *Undeclared*
 - 2.7: Isomerism Introduction - *Undeclared*
 - 2.8: Hydrocarbons and the Homologous Series - *Undeclared*
 - 2.9: Organic Functional Groups - *Undeclared*
 - 2.10: Intermolecular Forces (IMFs) - Review - *Undeclared*
 - 2.11: Intermolecular Forces and Relative Boiling Points (bp) - *Undeclared*
 - 2.12: Intermolecular Forces and Solubilities - *Undeclared*
 - 2.13: Additional Practice Problems - *Undeclared*
 - 2.14: Organic Functional Groups- H-bond donors and H-bond acceptors - *Undeclared*
 - 2.15: Solutions to Additional Exercises - *Undeclared*
 - 2.16: Additional Exercises - *Undeclared*
 - 3: Functional Groups and Nomenclature - *Undeclared*
 - 3.1: Generic (Abbreviated) Structures (aka R Groups) - *Undeclared*
 - 3.2: Overview of the IUPAC Naming Strategy - *Undeclared*
 - 3.3: Alkanes - *Undeclared*
 - 3.4: Cycloalkanes - *Undeclared*
 - 3.5: Haloalkane - Classification and Nomenclature - *Undeclared*
 - 3.6: Alkenes - *Undeclared*
 - 3.7: Alkynes - *CC BY-NC-SA 4.0*

- 3.8: 3.8 Alcohols - Classification and Nomenclature - *Undeclared*
- 3.9: Ethers, Epoxides and Sulfides - *Undeclared*
- 3.10: Benzene and its Derivatives - *Undeclared*
- 3.11: Aldehydes and Ketones - *Undeclared*
- 3.12: Amines - Classification and Nomenclature - *Undeclared*
- 3.13: Carboxylic Acids - *Undeclared*
- 3.14: The Carboxylic Acid Derivatives - *CC BY-NC-SA 4.0*
- 3.15: Additional Exercises - *Undeclared*
- 3.16: Solutions to Additional Exercises - *Undeclared*
- 3.17: Appendix - IUPAC Nomenclature Rules - *Undeclared*
- 4: Structure and Stereochemistry of Alkanes - *Undeclared*
 - 4.1: Hydrocarbon Functional Groups - *Undeclared*
 - 4.2: Physical Properties of Alkanes - *Undeclared*
 - 4.3: Structure and Conformations of Alkanes - *Undeclared*
 - 4.4: Conformations of Butane - *Undeclared*
 - 4.5: Conformations of Higher Alkanes - *Undeclared*
 - 4.6: Cycloalkanes and Ring Strain - *Undeclared*
 - 4.7: Cyclohexane Conformations - *Undeclared*
 - 4.8: Conformations of Monosubstituted Cyclohexanes - *Undeclared*
 - 4.9: Cis-trans Isomerism in Cycloalkanes - *Undeclared*
 - 4.10: Conformations of Disubstituted Cyclohexanes - *Undeclared*
 - 4.11: Joined Rings - *Undeclared*
 - 4.12: Uses and Sources of Alkanes - *Undeclared*
 - 4.13: Reactions of Alkanes - a Brief Overview - *Undeclared*
 - 4.14: Additional Exercises - *Undeclared*
 - 4.15: Solutions to Additional Exercises - *Undeclared*
- 5: An Introduction to Organic Reactions using Free Radical Halogenation of Alkanes - *Undeclared*
 - 5.1: Types of Organic Reactions - *Undeclared*
 - 5.2: Reaction Mechanism Notation and Symbols - *Undeclared*
 - 5.3: Polar Reactions- the Dance of the Nucleophile and Electrophile - *Undeclared*
 - 5.4: Describing a Reaction - Equilibrium and Free Energy Changes - *Undeclared*
 - 5.5: Homolytic Cleavage and Bond Dissociation Energies - *Undeclared*
 - 5.6: Reaction Energy Diagrams and Transition States - *Undeclared*
 - 5.7: Reactive Intermediates - Carbocations - *Undeclared*
 - 5.8: Reactive Intermediates - Radicals - *Undeclared*
- 5.9: Reactive Intermediates- Carbanions and Carbon Acids - *Undeclared*
- 5.10: The Free-Radical Halogenation of Alkanes - *Undeclared*
- 5.11: Reactivity and Selectivity - *Undeclared*
- 5.12: A Comparison between Biological Reactions and Laboratory Reactions - *Undeclared*
- 5.13: Additional Exercises - *Undeclared*
- 5.14: Solutions to Additional Exercises - *Undeclared*
- 6: Stereochemistry at Tetrahedral Centers - *Undeclared*
 - 6.1: Chirality - *Undeclared*
 - 6.2: Fischer Projections to communicate Chirality - *Undeclared*
 - 6.3: Absolute Configuration and the (R) and (S) System - *Undeclared*
 - 6.4: Diastereomers - more than one chiral center - *Undeclared*
 - 6.5: Meso Compounds - *Undeclared*
 - 6.6: Isomerism Summary Diagram - *Undeclared*
 - 6.7: Optical Activity and Racemic Mixtures - *Undeclared*
 - 6.8: Resolution (Separation) of Enantiomers - *Undeclared*
 - 6.9: Stereochemistry of Molecules with Three or More Asymmetric Carbons - *Undeclared*
 - 6.10: Absolute and Relative Configuration - the distinction - *Undeclared*
 - 6.11: Chirality at Nitrogen, Phosphorus, and Sulfur - *Undeclared*
 - 6.12: Biochemistry of Enantiomers - *Undeclared*
 - 6.13: The Discovery of Enantiomers - *Undeclared*
 - 6.14: Additional Exercises - *Undeclared*
 - 6.15: Solutions to Additional Exercises - *Undeclared*
- 7: Alkyl Halides- Nucleophilic Substitution and Elimination - *Undeclared*
 - 7.1: Alkyl Halides - Structure and Physical Properties - *Undeclared*
 - 7.2: Common Uses of Alkyl Halides - *Undeclared*
 - 7.3: Preparation of Alkyl Halides - *Undeclared*
 - 7.4: Reactions of Alkyl Halides- Substitution and Elimination - *Undeclared*
 - 7.5: The S_N2 Reaction - *Undeclared*
 - 7.6: Characteristics of the S_N2 Reaction - *Undeclared*
 - 7.7: Stereochemistry of the S_N2 Reaction - *Undeclared*
 - 7.8: The S_N1 Reaction - *Undeclared*
 - 7.9: Characteristics of the S_N1 Reaction - *Undeclared*
 - 7.10: Rearrangements of the Carbocation and S_N1 Reactions - *Undeclared*
 - 7.11: The Hammond Postulate and Transition States - *Undeclared*

- 7.12: Comparison of SN1 and SN2 Reactions - *Undeclared*
- 7.13: Characteristics of the E2 Reaction - *Undeclared*
- 7.14: Zaitsev's Rule - *Undeclared*
- 7.15: Characteristics of the E1 Reaction - *Undeclared*
- 7.16: E2 Regiochemistry and Cyclohexane Conformations - *Undeclared*
- 7.17: The E2 Reaction and the Deuterium Isotope Effect - *Undeclared*
- 7.18: Comparison of E1 and E2 Reactions - *Undeclared*
- 7.19: Comparing Substitution and Elimination Reactions - *Undeclared*
- 7.20: Biological Substitution Reactions - *Undeclared*
- 7.21: Biological Elimination Reactions - *Undeclared*
- 7.22: Additional Exercises - *Undeclared*
- 7.23: Solutions to Additional Exercises - *Undeclared*
- 8: Structure and Synthesis of Alkenes - *Undeclared*
 - 8.1: Alkene Structure - *Undeclared*
 - 8.2: Physical Properties and Important Common Names - *Undeclared*
 - 8.3: The Alkene Double Bond and Stereoisomerism - *Undeclared*
 - 8.4: Degrees of Unsaturation - *Undeclared*
 - 8.5: The E/Z System (when cis/trans does not work) - *Undeclared*
 - 8.6: Stability of Alkenes - *Undeclared*
 - 8.7: Alkene Synthesis by Elimination of Alkyl Halides - *Undeclared*
 - 8.8: Alkene Synthesis by Dehydration of Alcohols - *Undeclared*
 - 8.9: Uses and Sources of Alkenes - *Undeclared*
 - 8.10: Additional Exercises - *Undeclared*
 - 8.11: Solutions to Additional Exercises - *Undeclared*
- 9: Reactions of Alkenes - *Undeclared*
 - 9.1: Electrophilic Addition Reactions (EARs) - *Undeclared*
 - 9.2: Addition of Hydrogen Halides to Symmetrical Alkenes - *Undeclared*
 - 9.3: Alkene Asymmetry and Markovnikov's Rule - *Undeclared*
 - 9.4: Hydration- Acid Catalyzed Addition of Water - *Undeclared*
 - 9.5: Hydration- Oxymercuration-Demercuration - *Undeclared*
 - 9.6: Hydration - Hydroboration-Oxidation - *Undeclared*
 - 9.7: Stereochemistry of Reactions - Hydration of Achiral Alkenes - *Undeclared*
 - 9.8: Stereochemistry of Reactions - Hydration of Chiral Alkenes - *Undeclared*
 - 9.9: Addition of Halogens - *Undeclared*
 - 9.10: Formation of Halohydrins - *Undeclared*
 - 9.11: Reduction of Alkenes - Catalytic Hydrogenation - *Undeclared*
 - 9.12: Oxidation of Alkenes - Epoxidation - *Undeclared*
 - 9.13: Dihydroxylation of Alkenes - *Undeclared*
 - 9.14: Opening of Epoxides - Acidic versus Basic Conditions - *Undeclared*
 - 9.15: Oxidative Cleavage of Alkenes - *Undeclared*
 - 9.16: Addition of Carbenes to Alkenes - Cyclopropane Synthesis - *Undeclared*
 - 9.17: Radical Chain-Growth Polymerization - *Undeclared*
 - 9.18: Biological Additions of Radicals to Alkenes - *Undeclared*
 - 9.19: Additional Exercises - *Undeclared*
 - 9.20: Solutions to Additional Exercises - *Undeclared*
- 10: Alkynes - *Undeclared*
 - 10.1: Structure and Physical Properties - *Undeclared*
 - 10.2: 10.2 Synthesis of Alkynes - Elimination Reactions of Dihalides - *Undeclared*
 - 10.3: Reactions of Alkynes - Addition of HX and X₂ - *Undeclared*
 - 10.4: Hydration of Alkynes for Markovnikov Products - *Undeclared*
 - 10.5: Hydration of Alkynes for Anti-Markovnikov Products - *Undeclared*
 - 10.6: 10.6 Reduction of Alkynes - *Undeclared*
 - 10.7: Oxidation of Alkynes - *Undeclared*
 - 10.8: Acidity of Terminal Alkynes and Acetylide Ions - *Undeclared*
 - 10.9: Synthesis of Larger Alkynes from Acetylides - *Undeclared*
 - 10.10: An Introduction to Multiple Step Synthesis - *Undeclared*
 - 10.11: Additional Exercises - *Undeclared*
 - 10.12: Solutions to Additional Exercises - *Undeclared*
- 11: Infrared Spectroscopy and Mass Spectrometry - *Undeclared*
 - 11.1: The Electromagnetic Spectrum and Spectroscopy - *Undeclared*
 - 11.2: Infrared (IR) Spectroscopy - *Undeclared*
 - 11.3: IR-Active and IR-Inactive Vibrations - *Undeclared*
 - 11.4: Interpreting IR Spectra - *Undeclared*
 - 11.5: Infrared Spectra of Some Common Functional Groups - *Undeclared*
 - 11.6: Summary and Tips to Distinguish between Carbonyl Functional Groups - *Undeclared*
 - 11.7: Mass Spectrometry - an introduction - *Undeclared*

- 11.8: Fragmentation Patterns in Mass Spectrometry - *Undeclared*
- 11.9: Useful Patterns for Structure Elucidation - *Undeclared*
- 11.10: Determination of the Molecular Formula by High Resolution Mass Spectrometry - *Undeclared*
- 12: Nuclear Magnetic Resonance Spectroscopy - *Undeclared*
 - 12.1: Theory of Nuclear Magnetic Resonance (NMR) - *Undeclared*
 - 12.2: NMR Spectra - an introduction and overview - *Undeclared*
 - 12.3: Chemical Shifts and Shielding - *Undeclared*
 - 12.4: ^1H NMR Spectroscopy and Proton Equivalence - *Undeclared*
 - 12.5: Functional Groups and Chemical Shifts in ^1H NMR Spectroscopy - *Undeclared*
 - 12.6: Integration of ^1H NMR Absorptions- Proton Counting - *Undeclared*
 - 12.7: Spin-Spin Splitting in ^1H NMR Spectra - *Undeclared*
 - 12.8: More Complex Spin-Spin Splitting Patterns - *Undeclared*
 - 12.9: Uses of ^1H NMR Spectroscopy - *Undeclared*
 - 12.10: ^{13}C NMR Spectroscopy - *Undeclared*
 - 12.11: Chemical Shifts and Interpreting ^{13}C NMR Spectra - *Undeclared*
 - 12.12: ^{13}C NMR Spectroscopy and DEPT - *Undeclared*
 - 12.13: Uses of ^{13}C NMR Spectroscopy - *Undeclared*
 - 12.14: More NMR Examples - *Undeclared*
 - 12.15: Sample NMR Spectra - *Undeclared*
- Back Matter - *Undeclared*
 - Index - *Undeclared*
 - Glossary - *Undeclared*
 - Detailed Licensing - *Undeclared*
 - Detailed Licensing - *Undeclared*