

The book was found

Organic Chemistry Reactions (Quick Study Academic)

Quick Study Academic

ORGANIC CHEMISTRY REACTIONS

Features of an Organic Reaction

- Mechanism:** Describes the overall reaction with a series of smaller steps.
- Thermodynamics:** Calculates reagents and products using the balanced equation and molar masses.
- Kinetics:** Study of the reaction rate and mechanism.
- Theoretical Yield:** Mass of product given by a complete reaction; % yield = $\frac{\text{Actual yield}}{\text{Theoretical yield}} \times 100\%$ = % product mass / theoretical yields.
- Equilibrium:** Reaction does not proceed to completion, instead, it reaches a balanced state of reactants and products.

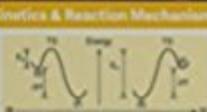
Major Reaction Types

- Acid
- Base
- Oxidation-reduction
- Condensation
- Substitution (S_N1 , S_N2)
- Addition
- Isomerization
- Witting: Converting aldehydes/ketones to alcohols

Important Named Reactions

- Wittig-Horner: Form cyclic ethers
- Friedel-Crafts: Add aryl or alkyl group
- Griegard: Add alkyl or aryl group
- Wolff-Kishner, Clemmensen: Reduce ketones/aldehydes
- Grignard: Witting alkyl/ketone to alkene

Acid-Base & Reaction Mechanism



Organic Acid & Base

Acid:

- Electron-pair acceptor (Lewis acid)
- Proton donor (Bronsted-Lowry acid)
- KA: Carboxylic acid

Base:

- Electron-pair donor (Lewis base)
- Proton acceptor (Bronsted-Lowry base)
- KA: Amine

Factors Enhancing Acid Strength (KA):

- Weaker H-A bond
- Greater electronegativity of "A"
- Inductive effect of substituents on "A" (electron-withdrawing)
- More "A" character in hybrid orbital (orbital is lower in energy than p-orbital)
- Resonance-stabilized conjugate base (KA')

Factors Enhancing Base Strength

- Resonance of acid strength (induction)
- A base is a nucleophilic, electron-rich species which shifts electron density to the atom with the lone pair increases basic strength

Alkane $\text{C}_n\text{H}_{2n+2}$

Properties:

- Similar to alkanes: non-polar, flammable
- Nonconductors

Isotopes:

- Isotopes: $\text{C}_n\text{H}_{2n+2}$
- Constitution: $\text{C}_n\text{H}_{2n+2}$
- Polymerization: Paraffin: 2 or more $\text{C}_n\text{H}_{2n+2}$
- Alkanes: Alkanes: $\text{C}_n\text{H}_{2n+2}$
- Methane: CH_4 (1C, 4H)
- Alkyl Group: $\text{R}_n\text{C}_m\text{H}_{2m+2-n}$
- Alkyl Halide: Halide replaces H on $\text{C}_n\text{H}_{2n+2}$
- Conjugation: Alternates C-C and C-C (isomers)

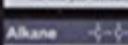
Alkenes:

- 2 conjugated C=C (e.g., butadiene, isobutene and isobutene isotene about C=C bond)
- Alkene: 2 conjugated C=C
- Alkene: Cyclohexene: monocyclic compound C_6H_{10} (cyclohexane + hexene)
- Aromatic Cyclic Base: Cyclopentadiene anion; cyclopentadiene cation (6 electrons)

Isomers:

- 2D: 3D isomers of $\text{C}_n\text{H}_{2n+2}$
- 2D: 3D isomers by atomic weight (2D: higher priority groups on the same side)

Alkanes



Properties:

- Hydrocarbons
- Weak intermolecular forces
- Non-Cyclic: General formula $\text{C}_n\text{H}_{2n+2}$
- Terahedral: $\text{C}_n\text{C}_m\text{H}_{2m+2-n}$

Noncyclic:

- Add "n" to prefix
- Locate substituents by position #
- Halohexane: Substrate halide for H

Cyclohexane (C_6H_{12})

- Boat: Two fused or bridged rings
- Cyclohexane: $n = 3$ (highly strained)
- Cyclohexane: $n = 4$ (some flexibility)
- Cyclohexane: $n = 5$ (slight packing)
- Cyclohexane: $n = 6$ (no strain)

Chair Conformation: Stable conformation

Boat Conformation: Less stable

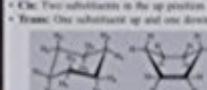
Axial Position: Perpendicular to ring

Equatorial Position: In ring plane

See H, and H₂ in chair diagram below.

Cl: Two substituents in the up position

Trans: One substituent up and one down



Synthesis:

- Hydrogenate alkene or alkyne (H_2 , Pt catalyst)
- Free-radical reaction of alkene
- Reduction: LiAlD_4 (LiAlD_4)
- Friedel-Crafts alkylation

Reactions:

- Combustion (O_2):**
- Alkanes and 1D alcohols (H_2O_2 , O_2) from $\text{C}_n\text{H}_{2n+2}$ and $\text{C}_n\text{H}_{2n+1}\text{OH}$ from $\text{C}_n\text{H}_{2n+1}\text{OH}$
- Hydrogenate alkene: H_2O_2 (aqueous, anti-Markovnikov)
- Oxidative cleavage to alcohols
- Hydroboration (LiBH_4) (Markovnikov)
- Hydrogenate (LiAlD_4) via alkylaluminate ($\text{C}_n\text{H}_{2n+1}\text{LiAlD}_4$) and D_2O , anti-addition
- Hydrogenate to form a 1,2-diol (KMO_4 , cold CH_3OH , anti-addition)
- Oxidative to carboxylic acid (KMnO_4 , hot CH_3OH)
- Oxidative to ketone ($\text{Cr}_2\text{O}_7\text{H}_2\text{O}_2$)
- Hydrogenate to alkane (H_2 , Pt , syn-addition)
- Free-radical polymerization
- Alkylation: $\text{R}_3\text{Al} + \text{R}'\text{X}$
- Add: H_2S (Sulphide) (C_2H_2 , heat)
- Wittig: $\text{Alkyl}\text{CH}_2\text{P}(\text{O})(\text{OEt})_2 + \text{Ph}_3\text{C=CH}_2$
- Wittig-Horner: Cyclohexane from diene + alkene/alcohol



Synopsis

Quick Reference for the core essentials of a subject and class that is challenging at best and that many students struggle with. In 6 laminated pages our experienced chemistry author and professor gathered key elements organized and designed to use along with your text and lectures, as a review before testing, or as a memory companion that keeps key answers always at your fingertips. As many students have said "a must have" study tool. Suggested uses: o Quick Reference âœ instead of digging into the textbook to find a core answer you need while studying, use the guide to reinforce quickly and repeatedly o Memory âœ refreshing your memory repeatedly is a foundation of studying, have the core answers handy so you can focus on understanding the concepts o Test Prep âœ no student should be cramming, but if you are, there is no better tool for that final review

Book Information

Series: Quick Study Academic

Paperback: 6 pages

Publisher: QuickStudy; Lam Rfc Cr edition (December 1, 2015)

Language: English

ISBN-10: 1423228189

ISBN-13: 978-1423228189

Product Dimensions: 8.5 x 11 x 0.1 inches

Shipping Weight: 4 ounces (View shipping rates and policies)

Average Customer Review: 5.0 out of 5 stars 5 customer reviews

Best Sellers Rank: #25,483 in Books (See Top 100 in Books) #69 in Books > Science & Math > Chemistry > Organic #160 in Books > Science & Math > Chemistry > General & Reference #190 in Books > Textbooks > Science & Mathematics > Chemistry

Customer Reviews

This really helps me like chemistry equations and answers. This is a must have for going to college and trying to be a chemist or a biologist. Bless you.

Great resource.

Very easy to work with. Quick service. A++++

great product good condition

High quality product, a great gift.

[Download to continue reading...](#)

Study Guide: Ace Organic Chemistry I - The EASY Guide to Ace Organic Chemistry I: (Organic Chemistry Study Guide, Organic Chemistry Review, Concepts, Reaction Mechanisms and Summaries) Organic Chemistry Reactions (Quick Study Academic) Organic Chemistry Reactions (Quickstudy: Academic) Cycloaddition Reactions in Organic Synthesis, Volume 8 (Tetrahedron Organic Chemistry) Organic Chemistry Fundamentals (Quick Study Academic) Organic Chemistry Reactions: An Overview (Quick Review Notes) Medical Coding: ICD-9 & ICD-10-CM: Quick Study Guide (Quick Study Academic) Ace General Chemistry I and II (The EASY Guide to Ace General Chemistry I and II): General Chemistry Study Guide, General Chemistry Review Experimental Organic Chemistry: A Miniscale & Microscale Approach (Cengage Learning Laboratory Series for Organic Chemistry) The Organic Chemistry of Drug Synthesis, Volume 3 (Organic Chemistry Series of Drug Synthesis) Organic Chemistry of Enzyme-Catalyzed Reactions, Revised Edition, Second Edition March's Advanced Organic Chemistry: Reactions, Mechanisms, and Structure Organic Chemistry by Inquisition, 1. General Reactions Advanced Organic Chemistry: Reactions, Mechanisms, and Structure Foundations of Organic Chemistry: Unity and Diversity of Structures, Pathways, and Reactions Organic Chemistry of Enzyme-Catalyzed Reactions, Revised Edition Reactions and Syntheses: In the Organic Chemistry Laboratory CHEMISTRY 14D THINKBOOK (Organic Reactions and Pharmaceuticals) Free Radical Reactions in Preparative Organic Chemistry The Organic Chemistry of Enzyme-Catalyzed Reactions

[Contact Us](#)

[DMCA](#)

[Privacy](#)

[FAQ & Help](#)