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Organic Chemistry Fundamentals (Quick Study Academic)

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ORGANIC CHEMISTRY

FUNDAMENTALS

AP®

Quick Study

ACADEMIC

Types of Organic Compounds

Organic chemistry is the study of natural and synthetic materials that have carbon atoms in the key chemical feature. There are many that are natural, many are organic compounds. HYDROCARBON ALKANE • Ethane: C_2H_6 • Methane: CH_4 • Ethyl: C_2H_5 ALKENE • Ethene: C_2H_4 • Butene: C_4H_8 • Isomer: There's C=C ALKYNE • Ethyne: C_2H_2	AROMATIC • Benzene: C_6H_6 • Amino: $-NH_2$ ADDED ALCOHOL • Methanol: CH_3OH (methyl alcohol) • Ethanol: C_2H_5OH • Butylalcohol: C_4H_9OH • Glycol: $C_2H_4(OH)_2$ ETHER • Dimethyl ether: C_2H_6O (laquer thinner) EPOXY • Epoxide: C_3H_4O (epoxy glue) PEROXIDE • Acetone Peroxide: $C_6H_{10}O_5$	• Peroxy Peroxide: $C_2H_6O_2$ • >C=O ADDED ALDEHYDE • Methanal: $HCHO$ (formaldehyde) • Benzaldehyde: $ArCHO$ KETONE • 2-propanone: $MeCOCH_3$ (acetone) • Butanone: $CH_3CH_2COCH_3$ >COO ADDED CARBOXYLIC ACID • Ethanoic Acid: $MeCOOH$ (acetic acid) • Acrylic Acid: $MeCOO^+$ • Benzoic Acid: $ArCOOH$ Disubstituted Acid $HOOC-R-COOH$	ESTER • Ethyl Acetate: $MeCOOCH_2CH_3$ • Other derivatives • Propylacetate: $CH_3COOC_3H_7$ • Acetyl Salicylate: $HOOCOC_6H_4COOCH_3$ NITROGEN ADDED AMINE • Methyl Amine: CH_3NH_2 • Fluoramine: CH_3NF_2 • R-NH₂ (1°), R₂NH (2°), R₃N (3°) NITRO $R-NO_2$ DIAZO $R-N=N$ NITRILE $R-CN$	• Methylene Nitride: CH_2N_2 AMIDE • Acetamide: $MeCONH_2$ SULFUR ADDED • Thiols: $R-SH$ • Thioether: $R-S-R'$ • Disulfide: $R-S-S-R'$ • Thiol Ester: $R-CO-SR'$ • Sulfonide: $R-SO_2R'$ • Sulfonic Acid: $R-SO_3H$ HALOGEN ADDED • Halocarbon • Methyl Chloromethane: $Me-Cl$ • Halobenzene: $Ar-X$ • Chlorobenzene: $Ar-Cl$ • Acetyl Halide: $Ar-CO-X$ • Acyl Halide: $Ar-X$
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Formulas & Isomers

Molecular Formula: Chemical symbols with subscript denote the composition of a compound. Empirical Formula: Subscripts denote the relative elemental composition. • Empirical Formula Real-World Example: Diagram all atoms, then formula as follows: Real-World Example: Hydrocarbon atoms are depicted as spheres, but other atoms are shown explicitly. Newman Projection: 2-d depiction Skeletal: Wedges of molecule drawn structure	• Constitutional Isomers: Different bonding connectivity (e.g., ring, head, branching, substituent position). • Enantiomers: Easily interconverted structural isomers (e.g., left and right hands). • Chiral: Not identical with its mirror image. • Asymmetric: Has a plane of symmetry (i.e., superimposable on its mirror image). • Enantiomers: Pairs of diastereomers which differ only in the configuration of one atom. • More than 1 chiral center: • n chiral centers, 2ⁿ stereoisomers • Meso: 2 chiral centers, 4 isomers, 3 stereoisomers, 1 achiral (meso-form)
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SUBDIVISIONS OF ISOMERS

Isomers: Different compounds with same empirical formula. Constitutional Isomers: Molecules with same connectivity, but differ in the arrangement of their atoms in space. Enantiomers: Molecules with same connectivity, but differ in the arrangement of their atoms in space. Diastereomers: Molecules with same connectivity, but differ in the arrangement of their atoms in space.	RS Notation: The 4 different atoms or groups attached to a central atom are ranked (1, 2, 3, 4), by atomic mass. The lowest (1) is directed away from the viewer and the sequence of 2-3-4 produces clockwise (R) or counter-clockwise (S) configuration. Chiral (Slightly Asymmetric): • or: rotation of plane-polarized light • RS: opposite effects
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Common Terms

Aliphatic: Non-aromatic Aromatic: Benzene ring Conjugation: Sequence of alternating double (or triple) and single bonds Electronic Effect: Polar solvents influence ion formation Exergonic Reaction: Releases energy	Free-Ion Energy: Released from the process of the reaction Hydrophobic: Non-carbon atoms in the ring structure Hydrocarbon: Compound of H and C Hydroxyl: Molecule made up of a hydrogen atom bonded to a hydroxyl group
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Monosaccharide: Carbohydrate that cannot be reduced by hydrolysis into another simple sugar

Office: Alkene

Paraffin: Alkane

Katodolite: Isotope that is radioactive

Saturated: Maximum # of H (all C-C single bonds)

Unsaturated: Monosaccharide with four carbon atoms

Unsaturated Alkane: C-C multiple bond

Zymurgy: The study of the process of fermentation



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 "it's a must have" • study tool. Suggested uses:

- Quick Reference "instead of digging into the textbook to find a core answer you need while studying, use the guide to reinforce quickly and repeatedly"
- Memory "refreshing your memory repeatedly is a foundation of studying, have the core answers handy so you can focus on understanding the concepts"
- Test Prep "no student should be cramming, but if you are, there is no better tool for that final review"

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Customer Reviews

My wife loves this thing for studying in her chemistry class. She has several of the other BarCharts and likes them all. Sure, you're paying a few bucks for a laminated piece of cardstock with some stuff printed on it, but it is very intelligently laid out.

I used this with the "Organic Chemistry Reactions" Quickstudy to study for the PCAT. It has been over 7 years since I took organic chemistry, and these were my primary resource to brush up on the subject. I love how portable it is and that all the information you need is in one place.

This is good for Orgo 1 topics. It has very few of what is newly encountered in Orgo 2. However, we all know that we need Orgo 1s knowledge so even if you're in Orgo 2, this little quick reference guide is helpful.

This resource sheet is so helpful when studying for organic chemistry. I purchased it before I began the class and it helped to show what I would be doing and using it as a reference when studying further material saves me time from having to look back in the text book. I will definitely hold on to it when starting Organic 2.

This is a great reference tool for my Chemistry class. Having the necessary formulas and notes in one place is very helpful. I will have a good 2 years of Chemistry and Organic Chemistry to get through to complete my degree. Tools like these are a Godsend.

I purchased this product at my school's bookstore and later returned it because it only contained basic information on the first page. The remaining three were dedicated to reactions, which are also on a separate Quick Study folder. So, if you are looking for basic essentials such as definitions and examples, this is not for you.

Organic chemistry is not easy. It never will be. However this really useful study guide will definitely make your time studying for your exams much more bearable and less frustrating. I used it daily as a reference when I was taking Ochem at my uni.

When it arrived, and I saw it was simply a laminated trifold, I felt ripped off. \$7 for a trifold laminate? The text is almost too small (but if you have 10/10 vision like most college students, it might be readable without glasses..). As far as the content goes, it's decent, but far from profound. Maybe I expect too much these days....

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