

Spectros Associates Proudly Presents the One Day Short Course

Principles of Organic Chemistry

Structures, Properties, and Nomenclature

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A 1-day introduction to the field of Organic Chemistry. Emphasis is placed on what determines chemical structures, and how chemical structure determines important physical and chemical properties. Then, this knowledge is applied to a variety of economically important chemical families including hydrocarbons, alcohols, ketones, carboxylic acids, and amines. After taking this course, you will be able to draw chemical structures, write their names properly, and understand why molecules have specific properties.

I. Introduction

- A. What is Organic Chemistry?**
- B. Review of Chemical Bonding**
 - 1. Covalent & Polar Covalent Bonding**
 - 2. Intermolecular Interactions**
- C. Structure/Property Relationships**
 - 1. Boiling Points and Melting Points**
 - 2. Solubility**
- D. The Uniqueness of Carbon**
 - 1. Carbon's Orbitals**
 - 2. Carbon Chains, Rings, and Sheets**

II. Saturated Hydrocarbons

- A. Alkanes**
 - 1. Nomenclature and Structures**
 - 2. Properties**
- B. Cyclic and Branched Alkanes**
 - 1. Steroids**
- C. Chlorinated Hydrocarbons**

III. Isomers

- A. Structural Isomers**
- B. Stereoisomers**
 - 1. Chirality**
 - 2. Enantiomers**

IV. Unsaturated Hydrocarbons

- A. Alkenes & Their Isomers**
- B. Aromatic Compounds**
 - 1. Benzene**
 - 2. Substituted Benzenes**
 - 3. Heterocyclic and Aromatic Heterocyclic Molecules**
 - 4. Polycyclic Aromatic Hydrocarbons**

V. Compounds of Carbon, Hydrogen, and Oxygen

- A. Alcohols**
 - 1. Hydrogen Bonding
 - 2. Properties
- B. Ethers**
- C. Ketones**
- D. Aldehydes**
- E. Carboxylic Acids**
 - 1. Properties
 - 2. Reactions
- F. Esters**

VI. Compounds of Carbon, Hydrogen, and Nitrogen

- A. Amides**
 - 1. Properties
 - 2. Isomerism
- B. Amines**
 - 1. Amine Types
 - 2. Bonding & Properties
 - 3. Chemistry
- C. The Nitro Group**

Wrap-up. Time for individual consultations and questions.