Level: bachelor

Course title: Organic Chemistry II Z-203

Status: obligatory

ECTS: 8

Requirements: none

Learning objectives

Developing the ability to understand the relationship between the structure of organic compounds and their reactivity in chemical reactions. Developing the ability to interpret the reaction mechanism and the transformation of selected organic compounds in solving practical problems in organic chemistry. Further development experimental skills necessary to work in the organic laboratory.

Learning outcomes

Demonstration of acquired knowledge about the characteristic chemical transformations of the functional groups of organic compounds. Demonstration of knowledge of basic principles and rules by which the chemical transformations of organic compounds are occurring. Formulating conclusions about the possible products of chemical reactions of organic compounds on the basis of the knowledge of the reaction mechanisms. Solving practical problems related to the synthesis of organic compounds and formulating the appropriate conclusions. Demonstrating the ability to work independently or in a team, and perform both theoretical and experimental work.

Syllabus

Theoretical instruction

Reaction Profiles, The Transition State, Intermediates, Kinetic and Thermodynamic Control, Acidity of Organic Compounds, Unimolecular and Bimolecular reactions.

Mechanisms of Organic Reactions: Classification, Bond Making and Bond Breaking. How to Study a New Organic Reaction, Mechanism of Concerted Reaction, Mechanism of Multistep Heterolytic Reactions, Mechanism of Multistep Homolytic Reactions. Substitution by Nucleophiles at sp^3-Hybridized Carbon: S_N1 and S_N2, Use of Carbon Nucleophiles. Synthetic Methods: Functional-Group Conversion. Elimination Reactions: E1 and E2. Addition to Carbon-Carbon Multiple Bonds: Electrophilic Additions, Radical Additions, Cycloadditions, Catalytic Hydrogenation. Electrophilic Aromatic Substitution, Reactions of Substituents and Side Chains of Aromatic Rings. Nucleophilic Addition and Supstitution at Carbonyl Groups. Nucleophilic Acyl Substitution of Carboxylic Acids and Derivatives. α-Substitution of Carbonyl Compounds: Alkyaltion of Ketones and Esters, Nucleophilic Addition of Enolate Anions to Carbonyl Groups, Alkylation of β-Dicarbonyl Compounds. Skeletal-Rearrangement Reactions: Carbon-Carbon, Carbon-Nitrogen, Carbon-Oxygen.

Practical instruction

Isolation and purification of organic compounds. Synthetic Application of the studied reactions.

Weekly teaching load				Other:
Lectures: 3	Exercises: 3	Other forms of teaching: 1	Student research:	