

CH 243 : ORGANIC CHEMISTRY III

Transcript title

Organic Chemistry III

Credits

5

Grading mode

Standard letter grades

Total contact hours

70

Lecture hours

40

Lab hours

30

Prerequisites

CH 242.

Course Description

Introduces additional principles of organic chemistry for chemistry, biology and chemical engineering majors. Includes electrophilic aromatic substitution, acidity and pKa of phenols, nucleophilic aromatic substitution, addition to a carbonyl, carboxylic acids and derivatives, enolate and enol nucleophiles, aldol and Claisen reactions and amines. The laboratory introduces synthetic methods and a synthesis project while using record keeping techniques acceptable in the discipline of chemistry.

Course learning outcomes

1. Propose and compare possible synthetic pathways to make a target molecule, complete with appropriate stereochemistry.
2. Apply and interpret energy diagrams, Lewis structures, transition state, intermediate state, tautomers and curved-arrow electron notation in electrophilic aromatic substitution, acid base, nucleophilic aromatic substitution, and addition reaction mechanisms.
3. Predict and interpret infrared spectra and mass spectra for small molecules.
4. Predict ranked retention times for gas chromatographic output of small molecules.
5. Safely synthesize, purify and characterize compounds in the laboratory.
6. Report experimental work in the format of standard scientific publications.
7. Collect, represent, and analyze data drawing valid conclusions based upon quantitative measurements and qualitative observations.

Content outline

1. Electrophilic aromatic substitution
2. Acidity and pKa of phenols
3. Nucleophilic aromatic substitution

4. Synthesis workshop
5. Addition to a carbonyl
6. Carboxylic acids and derivatives
7. Enolate and enol nucleophiles
8. Aldol and Claisen reactions
9. Amines

Required materials

Required workbook, textbooks, laboratory safety glasses or goggles and a scientific calculator.