

Course Title: Topics in Organic Chemistry

Course Code: CH-831

Credit Hours: 3-0

Prerequisite: Nil

Course Objectives

Students will acquire knowledge and understanding about the synthetic organic chemistry, especially the mechanism and the appropriate reagents used in various organic synthesis for functional groups transformation and synthetic organic chemistry. Moreover, the students will also be able to know the enolate chemistry of carbonyl and other related functional class of organic compounds.

Course outcomes

After successful completion of this course students will be able to Carry out different functional groups transformations to achieve desired synthetic products v Independently and critically devised synthetic scheme.

Course Objectives

Introduction to oxidation reduction, Oxidation number determination, Mechanism and applications of the following reduction reactions, Heterogenous hydrogenation, Homogenous hydrogenation, Reduction by dissolving metals, Reduction by miscellaneous reducing agent, Hydrazine, di-imide, formic acid. Silanes, stannous chloride, zinc acetate, zinc sodium hydroxide, sodium hydrogen sulphide, manganese alcohol, Photoreduction and bio-reduction methods

Miscellaneous oxidants; Oxygen, singlet oxygen, ozone, H₂O₂, t-butyl hydroperoxide, Aluminum tri-isopropoxide, lead tetra acetate, periodic acid. Selenium dioxide, nitric acid, DMSO, silver oxide and carbonates, Bismuth oxide, mercuric oxide, n-bromosuccinamide, halogen-sodium hydroxide and others. **Enolate Chemistry;** Enols and enolate synthesis, acidity of alpha hydrogen, mechanism of α-halogenation of aldehyde and ketones, determination of enol and enolate content, stabilization of enols, base and acid catalyzed enolate and enol formation, aldol condensation, Michael reaction, conjugation effect, effect of organocopper reagents, alkylation of enolate anions, ester enolates. Three topics from the recent trends in organic chemistry will be taught by the instructor after approval of HoD.

Recommended Books:

1. Timothy J. Donohoe, Oxidation and Reduction in Organic Synthesis, Oxford University press, ISBN: 9780198556640 (2000).

2. V.K. Ahluwalia, Rakesh Kumar Parashar; Organic reaction mechanism, third edition (2007).
3. Francis A. Carey, fourth Edition Organic chemistry (1987).