CH-117 Principles of Organic Chemistry

Credit Hours 2-1

Pre-requisite Nil

Course Objectives

Students will acquire knowledge about Nomenclature of Organic Chemistry, introduction to functional groups and sterochemical behaviour of oganic molecules.

Detailed Contents

Nomenclature: Nomenclature of organic compounds including IUPAC system, e.g., unsaturated hydrocarbons, Alcohols, phenols, ethers and amino groups, carbonyl compounds and their derivatives, with focus on synthesis and applications.

Stereochemistry: Conformation Analysis The concept of energy profile, transition state and intermediate. The concept of conformational analysis in ethane, propane, n-butane, cyclohexane, and substituted cycloalkanes.

Optical isomerism: Configuration, Chirality and symmetry, optical isomerism up to three chiral carbon atoms, enantiomers and diastereomers, R and S nomenclature, racemization and resolution of racemates, epimerization. Walden inversion.

Geometrical isomerism: Cis & Trans, and Z & E conventions

Course Outcome

By the end of this course, the students will be able to;

After studying this course students will be able to name the famous functional groups in organic chemistry and applications of these in daily life.

Relevant Experiments:

Qualitative analysis of compounds with different functional groups. (7 labs)

Synthesis of organic compounds using as a tool for understanding techniques like reflux, distillation, filtration, recrystallization and yield calculation(3 labs).

Organic syntheses may include preparation of benzanilide from benzoyl chloride, succinic anhydride from succinic acid, phthalimide from phthalic anhydride, oximes and hydrazones from carbonyl compounds, esterification by using a carboxylic acid and alcohol etc.(5 labs).

Recommended Books:

Solomons, T. W. G. and Fryhle, C. B., Organic Chemistry, 10th ed., John-Wiley & Sons, Inc., (2011).

John, E. M. Organic Chemistry, 8th ed., Brooks/Cole Publishing Co, USA, (2012).

Solomons, T. W. G. and Fryhle, C. B., Organic Chemistry, 10th ed., John-Wiley & Sons, Inc., (2011).

Furniss, B. S., Hannaford , A. J., Smith, P. W. G., Tatchell, A. R., Vogel sTextbook of Practical Organic Chemistry, 5th ed., Longman, UK, (1989).

Pavia, D. L., Kriz, G. S., Lampman, G. M. and Engel, R. G., A Microscale Approach to Organic Laboratory Techniques, 5th ed., Brooks/ Cole Cengage Learning, (2013).

Mayo, D. W., Pike, R. M. and Forbes, D. C., Microscale Organic to Laboratory with Multistep and Multiscale Syntheses, 5th ed., John-Wiley & Sons, Inc., (2011).

Gilbert, J. C. and Martin, S. F., Experimental Organic Chemistry: A Mini-scale and Microscale Approach, 5th ed., Brooks/ Cole Cengage Learning, (2010).

Brown, W. H., Fotte, C. S., Iverson, B. L. and Anslyn, E. V., Organic Chemistry, 6th ed., Brooks/ Cole Cengage Learning, (2012).

Current Literature and Review