

V.S.M. COLLEGE (AUTONOMOUS)
Re-accredited by NAAC with 'B' Grade at 2.69 CGPA
RAMACHANDRAPURAM

SYLLABUS FOR VI SEMESTER
III B.Sc. CHEMISTRY ELECTIVE PAPER – VII-C

No. of Credits : 3

No. of h/w : 3

GREEN CHEMISTRY

UNIT-I

10 h

Green Chemistry: Introduction - Definition of green chemistry, need of green chemistry. basic principles of green chemistry. **Green synthesis - Evaluation of the type of the reaction**
i) **Rearrangements (100% atom economic), ii) Addition reactions (100% atom economic).**
Organic reactions by Sonication method: apparatus required examples of sonochemical reactions (Heck, Hunsdiecker and Wittig reactions).

UNIT-II

10 h

Selection of solvent: i) Aqueous phase reactions ii) Reactions in ionic liquids, Heck reaction. Suzuki reactions, epoxidation. iii) Solid supported synthesis
Super critical CO₂: Preparation, properties and applications, (decaffeination, dry cleaning)

UNIT-III

10 h

Microwave and Ultrasound assisted green synthesis: Apparatus required, examples of MAOS (synthesis of fused anthro quinones, Leuckart reductive amination of ketones) - Advantages and disadvantages of MAOS. Aldol condensation-Cannizzaro reaction-Diels-Alder reactions-Strecker's synthesis.

UNIT-IV

5 h

Green catalysis: Heterogeneous catalysis, use of zeolites, silica, alumina, supported catalysis-biocatalysis: Enzymes, microbes Phase transfer catalysis (micellar/surfactant)

UNIT V

10 h

Examples of green synthesis / reactions and some real world cases: 1. Green synthesis of the following compounds: adipic acid, catechol, disodium imino diacetate (alternative Strecker's synthesis) 2. Microwave assisted reaction in water – Hoffmann elimination – methyl benzoate to benzoic acid – oxidation of toluene and alcohols – microwave assisted reactions in organic solvents. Diels-Alder reactions and decarboxylation reaction. 3. Ultrasound assisted reactions – sonochemical Simmons –Smith reaction (ultrasonic alternative to iodine).

REFERENCE BOOKS


1. Green Chemistry Theory and Practice. P.T. Anatas and J.C. Warner
2. Green Chemistry V.K. Ahluwalia Narosa, New Delhi.
3. Real world cases in Green Chemistry M.C. Cann and M.E. Connelly
4. Green Chemistry: Introductory Text M.Lancaster: Royal Society of Chemistry (London)
5. Green Chemistry: Introductory Text, M.Lancaster
6. Principles and practice of heterogeneous catalysis, Thomas J.M., Thomas M.J. John Wiley
7. Green Chemistry: Environmental friendly alternatives R S Sanghli and M.M. Srivastava, Narosa Publications

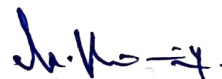

CHAIRPERSON
BOARD OF STUDIES


UNIVERSITY NOMINEE


SUBJECT EXPERT


SUBJECT EXPERT

MEMBER





MEMBER


MEMBER


MEMBER


MEMBER


MEMBER


MEMBER