

Academic Year 2018-19



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Dr. Chandrashekhhar Malba received his B.Sc. and M.Sc. degrees from Udaygiri Mahavidyalaya Durg. Later, he joined Natural and Biodegradable Polymers Group at CSIR-NCI, Pune and worked on a CSIR sponsored project dealt with bioethanol production. In 2010, he received "Italian Ministry of Education, University and Research (MIUR) fellowship" award to pursue Ph.D at Ca' Foscari University of Venice, Italy (a university ranked among top 500 in the World University Ranking (2016) by the Times Higher Education [THE]). His doctoral research focussed on luminescent (nano)materials. After obtaining his Ph.D. degree in 2013, he started his research career as a Research Associate at CSIR-National Chemical Laboratory, Pune. He has several international, peer reviewed, high impact research publications to his credit.

Presently, he is working as an Assistant Professor of chemistry in Kai. Rasika Mahavidyalaya Deoni, Dist. Latur.



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Mr. Bhaskar Ankush is working as an Assistant Professor in Chemistry at Kai. Rasika Mahavidyalaya, Deoni, Dist. Latur. He has completed M.Sc. in Organic Chemistry from Department of Chemistry, Dayanand Science College, Latur and qualified CSIR-NET examination twice in 2012. He has worked as an Assistant Professor in Chemistry (Core Teacher) for Post-Graduate at Department of Chemistry, Dayanand Science College, Latur during 2011-2013.

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He received Ph.D. degree in Organic & Medicinal Chemistry in 2012 from University of Salerno, Italy (a university ranked among top 500 in the World University Ranking (2017) by the Times Higher Education [THE]). He awarded one year research Associate Scientist Fellowship from ITQB, New University of Lisbon, Portugal.

He has been also awarded two years Post-doctoral research Associate Scientist Fellowship from Japanese ministry of education, University and research fellowship and completed his post-doctoral research from Kyoto Pharmaceutical University, Japan and Kwansai Gakuin University Japan.

His area of interest in research is Organic & Medicinal Chemistry. He has published 15 papers in international reputed journals with high impact factor. He also published 5 papers in National journals. He has authored 4 books based on B.Sc. syllabus. He has presented papers & posters at several national, international conferences & seminars.

A Text Book of Organic Chemistry

Dr. Chandrashekhhar Malba • Mr. Bhaskar Ankush • Dr. Vijaykumar More

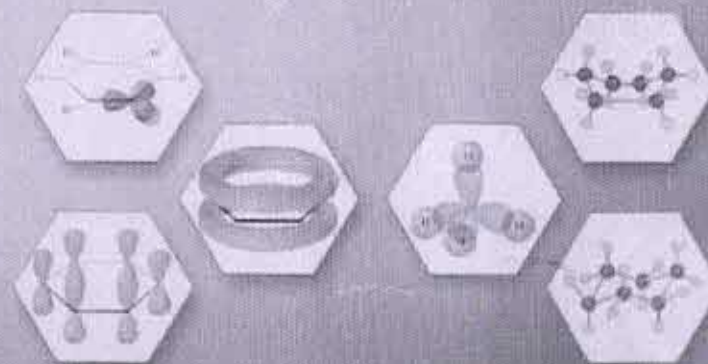
A Text Book of Organic Chemistry

B.Sc. First Year
(Semester I and II)

Dr. Chandrashekhhar Malba

Mr. Bhaskar Ankush

Dr. Vijaykumar More



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According to the revised syllabus of the Swami Ramanand Teerth Marathwada University,
Nanded (in force from June 2019)

A Text Book of Organic Chemistry

B.Sc. First Year
(Semester I and II)



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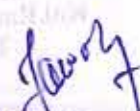
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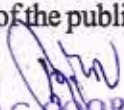
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1. Nomenclature of Organic Compounds

Functional groups and types of organic compounds, Basic rules of IUPAC Nomenclature, Nomenclature of mono and bi- functional compounds on the basis of priority order of following classes of organic compounds: alkanes, alkenes, alkynes, alcohols, ethers, aldehydes, ketones, carboxylic acid, carboxylic acid derivatives (acid halides, esters, anhydrides, amides), amines; Nomenclature of aromatic compounds: Mono, di and polysubstituted benzene (with not more than two functional groups)

2. Basic Concepts in Organic Chemistry

Basic terms: Substrate and Reagents, types of reagents (Electrophilic and Nucleophilic). Notation of arrows: curved arrow, half headed arrow, double headed arrow, straight arrow. Bond fission: Homolytic and heterolytic fission. Reaction intermediates: Carbocation, Carbanion, Free radical, (Introduction, structure & Stability), carbene, nitrene & benzyne (only introduction). Electron mobility: Inductive effect (effect on acidic strength of alpha substituted acetic acid and α -chloroacetic acid), Mesomeric effect (Aniline and Nitrobenzene), Hyperconjugation (toluene).

3. Alkanes Alkenes and alkynes

3.1 Alkanes: Introduction, Preparation of alkanes from a) Hydrolysis of Grignard reagent b) Kolbe's synthesis. Chemical reaction: a) Pyrolysis (mechanism), b) aromatization.

3.2 Alkenes: Introduction, Preparation methods a) But-1-ene from but-1-yne b) But-2-ene from butan-2-ol. Chemical reactions with mechanism: a) Electrophilic addition of Br_2 to ethene b) Electrophilic addition of HBr to propene c) Free radical addition of HBr to propene (Peroxide effect).

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4.2 Cycloalkenes: Introduction, preparation methods: a) Dehydration of cyclohexanol, b) Dehydrohalogenation of halocyclohexane. Chemical reactions: a) Epoxidation of cyclohexene, b) Allylic halogenations.

4.3 Dienes: Introduction, classification & Resonance structures. Preparation methods of 1,3-butadiene from- a) 1,4-dibromobutane, b) 1,4-butanediol. Chemical reactions: a) addition of Br_2 and HBr to 1,3-butadiene, b) addition of ethene to 1,3-butadiene (Diel's- Alder reaction).

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6. Phenols

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b) **Allyl Iodide:** synthesis of allyl iodide from 1) allyl chloride 2) glycerol and HI . Chemical reactions: reaction with NaOH , KCN , & Br_2

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synthesis. Resonance & Relative reactivity of alkyl halides v/s vinyl and aryl halides towards nucleophilic substitution reactions.

8. Carboxylic acid derivatives

8.1 Acid Chlorides

Introduction, preparation methods: 1) From acetic acid and thionyl chloride, 2) From acetic acid and phosphorous pentachloride. Chemical reactions: (Hydrolysis, Action with alcohol, Action with amines).

8.2 Acid anhydrides

Introduction, preparation methods: 1) From acetyl chloride and carboxylic acid, 2) From acetyl chloride and sodium acetate. Chemical reactions: (Hydrolysis, Action with alcohol, Action with amines).

8.3 Esters

Introduction, preparation methods: 1) From ethyl alcohol and acetic acid, 2) From ethyl alcohol and acetyl chloride. Chemical reactions: (Hydrolysis, Action of amines, Reduction).

8.4 Amides

Introduction, preparation methods: 1) From ammonia and acetyl chloride 2) From ammonia and acetic anhydride. Chemical reaction: (Hydrolysis, Action of nitrous acid).

9. Alcohols and epoxides

9.1 Alcohols

Introduction and Classification

- Dihydric alcohol (ethylene glycol):** Preparation methods: (Hydroxylation of alkene and From 1,2-dihaloalkane). Chemical reactions: [Reaction of ethylene glycol with, 1) $\text{Pb}(\text{OAc})_4$, 2) $\text{P}_2\text{O}_5/\text{ZnCl}_2$].
- Trihydric alcohol (Glycerol):** Preparation methods from: 1) Oils and fats 2) Propene. Chemical reactions: [Reactions of glycerol with, 1) Nitric acid, 2) Acetyl chloride].

9.2 Epoxides


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Introduction and nomenclature. Preparation methods: a) Oxidation of ethene in presence of Ag catalyst , b) Oxidation of ethene with per acetic acid. Chemical reactions: (Ring opening reactions of propylene oxide a) in acidic b) and basic medium/reagent.


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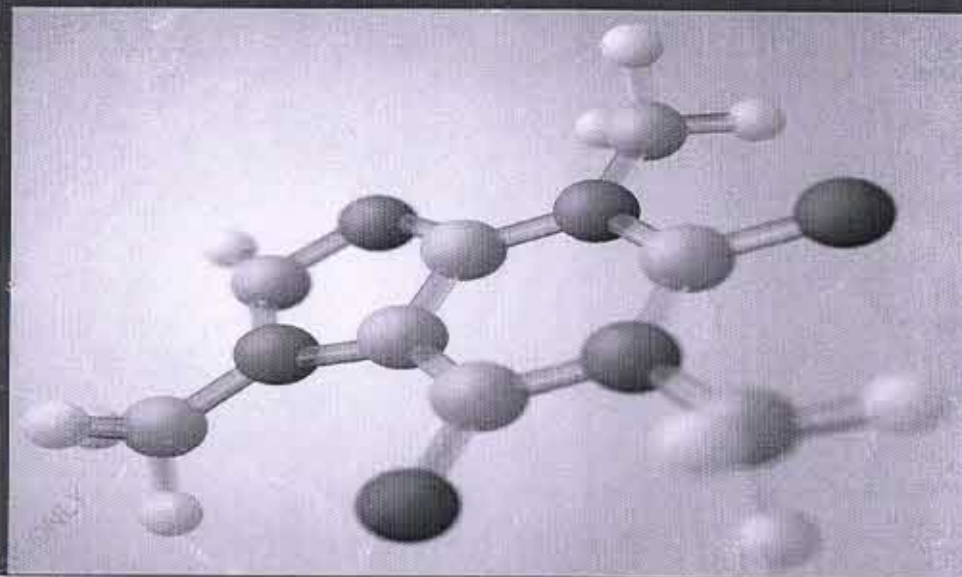

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The authors are delighted to present the "ORGANIC CHEMISTRY FOR DEGREE STUDENTS" in the hands of students. This book aims to help students not only to acquire a sound knowledge and understanding of organic chemistry, but also to make their study interesting and stimulating. We conceived the idea of writing this book with the objective to provide clarity on the concepts that will help students in their studies. The book is expected to make it easier for students to learn.

Organic Chemistry For Degree Students



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Organic Chemistry

For Degree Students



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- Vinyl Chloride: synthesis of vinyl chloride from 1) 1,2-dichloroethane
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reaction.
- Allyl iodide: synthesis of allyl iodide from 1) allyl chloride 2) glycerol and
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7.2 Haloarenes:

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synthesis. Resonance & Relative reactivity of alkyl halides w/s vinyl and aryl
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ammonia and acetic anhydride. Chemical reaction: (Hydrolysis, Action of nitrous
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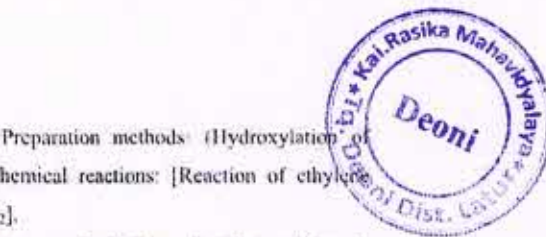
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- Trihydric alcohol (Glycerol): Preparation methods from: 1) Oils and fats 2)
Propene. Chemical reactions: [Reactions of glycerol with, 1) Nitric acid, 2) Acetyl
chloride].

9.2 Epoxides



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ADVANCEMENT AND CHALLENGES FOR COLLEGE LIBRARIES IN IT ERA

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Advancement and Challenges for College Libraries in IT Era

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ADVANCEMENT AND CHALLENGES FOR COLLEGE LIBRARIES IN IT ERA

An Informative sketch of New Libraries in this Information age is the prospect of this book. Aiming practical traits of New Libraries for this era of information and technology, the book explores the advancements and challenges to face to thrive this IT age and ages to come. The editors assembled 64 well-written and analysed articles by information specialists comprising topics like Information Technology and Libraries, Collection Development, E-Resources, Library Automation and Management, Automation Softwares, Total Quality Management, NAAC and Librarians, and Web 2.0.

Unfolding the Advancements and Challenges in this Information Technology Era for College Libraries, this book covers studies of Libraries automation tracks and solutions, Modern communication and information dissemination tools, Modern age library collection development and management, Automation hardware and software for digitisation of libraries, Researches and reviews of NAAC in Libraries, and Web 2.0 applications in Libraries. This book shall be found expedient for Library and information Science students, scholars, prospective information professionals and new librarians.

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