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March's Advanced Organic Chemistry John Wiley & Sons

Nuclear magnetic resonance (NMR) spectroscopy is one of the most powerful and widely used techniques in chemical research for investigating structures and dynamics of molecules. Advanced methods can even be utilized for structure determinations of biopolymers, for example proteins or nucleic acids. NMR is also used in medicine for magnetic resonance imaging (MRI). The method is based on spectral lines of different atomic nuclei that are excited when a strong magnetic field and a radiofrequency transmitter are applied. The method is very sensitive to the features of molecular structure because also the neighboring atoms influence the signals from individual nuclei and this is important for determining the 3D-structure of molecules. This new edition of the popular classic has a clear style and a highly practical, mostly non-mathematical approach. Many examples are taken from organic and organometallic chemistry, making this book an invaluable guide to undergraduate and graduate students of organic chemistry, biochemistry, spectroscopy or physical chemistry, and to researchers using this well-established and extremely important technique. Problems and solutions are included.

Laser Spectroscopy and Laser Imaging Springer Science & Business Media

Guanidines, amidines and phosphazenes have been attracting attention in organic synthesis due to their potential functionality resulting from their extremely strong basicity. They are also promising catalysts because of their potential for easy molecular modification, possible recyclability, and reduced or zero toxicity. Importantly, these molecules can be derived as natural products - valuable as scientists move towards "sustainable chemistry", where reagents and catalysts are derived from biomaterial sources. Superbases for Organic Synthesis is an essential guide to these important molecules for preparative organic synthesis. Topics covered include the following aspects: an introduction to organosuperbases physicochemical properties of organic superbases amidines and guanidines in organic synthesis phosphazene: preparation, reaction and catalytic role polymer-supported organosuperbases application of organosuperbases to total synthesis related organocatalysts: proton sponges and urea derivatives amidines and guanidines in natural products and medicines Superbases for Organic Synthesis is a comprehensive, authoritative and up-to-date guide to these important reagents for organic chemists, drug discovery researchers and those interested in the chemistry of natural products.

Organic Structure Determination Using 2-D NMR Spectroscopy S. Chand Publishing

Organic Spectroscopy presents the derivation of structural information from UV, IR, Raman, ¹H NMR, ¹³C NMR, Mass and ESR spectral data in such a way that stimulates interest of students and researchers alike. The application of spectroscopy for structure determination and analysis has seen phenomenal growth and is now an integral part of Organic Chemistry courses. This book provides: -A logical, comprehensive, lucid and accurate presentation, thus making it easy to understand even through self-study; -Theoretical aspects of spectral techniques necessary for the interpretation of spectra; -Salient features of instrumentation involved in spectroscopic methods; -Useful spectral data in the form of tables, charts and figures; -Examples of spectra to familiarize the reader; -Many varied problems to help build competence and confidence; -A separate chapter on 'spectroscopic solutions of structural problems' to emphasize the utility of spectroscopy. Organic Spectroscopy is an invaluable reference for the interpretation of various spectra. It can be used as a basic text for undergraduate and postgraduate students of spectroscopy as well as a practical resource by research chemists. The book will be of interest to chemists and analysts in academia and industry, especially those engaged in the synthesis and analysis of organic compounds including drugs, drug intermediates, agrochemicals, polymers and dyes.

Organic Spectroscopy John Wiley & Sons

Unique in its focus on preparative impact rather than mechanistic details, this handbook provides an overview of photochemical reactions classed according to the structural feature that is built in the photochemical step, so as to facilitate use by synthetic chemists unfamiliar with this topic. An introductory section covers practical questions on how to run a photochemical reaction, while all classes of the most important photocatalytic reactions are also included. Perfect for organic synthetic chemists in academia and industry.

Orbital Interaction Theory of Organic Chemistry CRC Press

Though the format evolved in the first edition remains intact, relevant new additions have been inserted at appropriate places in various chapters of the book. Also included are a number of sample and study problems at the end of each chapter to illustrate the approach to problem solving that involve translations of sets of spectra into chemical structures. Written primarily to stimulate the interest of students in spectroscopy and make them aware of the latest developments in this field, this book begins with a general introduction to electromagnetic radiation and molecular spectroscopy. In addition to the usual topics on IR, UV, NMR and Mass spectrometry, it includes substantial material on the currently useful techniques such as FT-IR, FT-NMR ¹³C-NMR, 2D-NMR, GC/MS, FAB/MS, Tandem and Negative Ion Mass Spectrometry for students engaged in advanced studies. Finally it gives a detailed account on Optical Rotatory Dispersion (ORD) and Circular Dichroism (CD).

Organic Spectroscopy John Wiley & Sons

A practical introduction to orbital interaction theory and its applications in modern organic chemistry Orbital interaction theory is a conceptual construct that lies at the very heart of modern organic chemistry. Comprising a comprehensive set of principles for explaining chemical reactivity, orbital interaction theory originates in a rigorous theory of electronic structure that also provides the basis for the powerful computational models and techniques with which chemists seek to describe and exploit the structures and thermodynamic and kinetic stabilities of molecules. Orbital Interaction Theory of Organic Chemistry, Second Edition introduces students to the fascinating world of organic chemistry at the mechanistic level with a thoroughly self-contained, well-integrated exposition of orbital interaction theory and its applications in modern organic chemistry. Professor Rauk reviews the concepts of symmetry and orbital theory, and explains reactivity in common functional groups and reactive intermediates in terms of orbital interaction theory. Aided by numerous examples and worked problems, he guides readers through basic chemistry concepts, such as acid and base strength, nucleophilicity, electrophilicity, and thermal stability (in terms of orbital interactions), and describes various computational models for describing those interactions. Updated and expanded, this latest edition of Orbital Interaction Theory of Organic Chemistry includes a completely new chapter on organometallics, increased coverage of density functional theory, many new application examples, and worked problems. The text is complemented by an interactive computer program that displays orbitals graphically and is available through a link to a Web site. Orbital Interaction Theory of Organic Chemistry, Second Edition is an excellent text for advanced-level undergraduate and graduate students in organic chemistry. It is also a valuable working resource for professional chemists seeking guidance on interpreting the quantitative data produced by modern computational chemists.

Side Reactions in Organic Synthesis John Wiley & Sons

High Resolution Spectroscopy discusses the underlying concepts in the different branches of spectroscopy, especially in high resolution spectroscopy. The coverage of the book includes basic principles such as the quantization of energy, as well as the interaction of electromagnetic radiation with atoms and molecules; general experimental methods and features of instrumentation; and microwave, millimeter wave, and lamb dip spectroscopy. Also covered in the book are subjects such

as the principles behind rotational spectroscopy; diatomic and polyatomic molecules in vibrational spectroscopy; and the electronic spectroscopy of atoms, as well as diatomic and polyatomic molecules. The text is recommended for engineers and physicists who would like to know more about the concepts, theories, methods, and instrumentation related to spectroscopy, particularly in the field of high resolution spectroscopy.

Qualitative Organic Analysis New Age International

This handbook provides a straightforward introduction to spectroscopy, showing what it can do and how it does it, together with a clear, integrated and objective account of the wealth of information that can be derived from spectra. The sequence of chapters covers a wide range of the electromagnetic spectrum, and the physical processes involved, from nuclear phenomena to molecular rotation processes. - A day-by-day laboratory guide: its design based on practical knowledge of spectroscopists at universities, industries and research institutes - A well-structured information source containing methods and applications sections framed by sections on general topics - Guides users to a decision about which spectroscopic method and which instrumentation will be the most appropriate to solve their own practical problem - Rapid access to essential information - Correct analysis of a huge number of measured spectra data and smart use of such information sources as databases and spectra libraries

Organic Spectroscopy Routledge

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Fundamentals of Quantum Chemistry John Wiley & Sons

"The second edition of this book comes with a number of new figures, passages, and problems. Increasing the number of figures from 290 to 448 has necessarily added considerable length, weight, and, expense. It is my hope that the book has not lost any of its readability and accessibility. I firmly believe that most of the concepts needed to learn organic structure determination using nuclear magnetic resonance spectroscopy do not require an extensive mathematical background. It is my hope that the manner in which the material contained in this book is presented both reflects and validates this belief"--

Spectroscopic Methods in Organic Chemistry Royal Society of Chemistry

Most syntheses in the chemical research laboratory fail and usually require several attempts before proceeding satisfactorily. Failed syntheses are not only discouraging and frustrating, but also cost a lot of time and money. Many failures may, however, be avoided by understanding the structure-reactivity relationship of organic compounds. This textbook highlights the competing processes and limitations of the most important reactions used in organic synthesis. By allowing chemists to quickly recognize potential problems this book will help to improve their efficiency and success-rate. A must for every graduate student but also for every chemist in industry and academia. Contents: 1 Organic Synthesis: General Remarks 2 Stereoelectronic Effects and Reactivity 3 The Stability of Organic Compounds 4 Aliphatic Nucleophilic Substitutions: Problematic Electrophiles 5 The Alkylation of Carbanions 6 The Alkylation of Heteroatoms 7 The Acylation of Heteroatoms 8 Palladium-Catalyzed C-C Bond Formation 9 Cyclizations 10 Monofunctionalization of Symmetric Difunctional Substrates

High Resolution Spectroscopy Academic Press

The second edition of this reference provides comprehensive examinations of developments in the processing and applications of carbon black, including the use of new analytical tools such as scanning tunnelling microscopy, Fourier transform infrared spectroscopy and inverse gas chromatography. Completely rewritten and updated by numerous experts in the field to reflect the enormous growth of the field since the publication of the previous edition, Carbon Black: discusses the mechanism of carbon black formation based on recent advances such as the discovery of fullerenes; elucidates micro- and macrostructure morphology and other physical characteristics; outlines the fractal geometry of carbon black as a new approach to characterization; reviews the effect of carbon black on the electrical and thermal conductivity of filled polymers; delineates the applications of carbon black in elastomers, plastics, and zerographic toners; and surveys possible health consequences of exposure to carbon black. With over 1200 literature citations, tables, and figures, this resource is intended for physical, polymer, surface and colloid chemists; chemical and plastics engineers; spectroscopists; materials scientists; occupational safety and health physicians; and upper-level undergraduate and graduate students in these disciplines.

Introduction to Organic Spectroscopy John Wiley & Sons

Recent advances in the pharmaceutical sciences and biotechnology have facilitated the production, design, formulation and use of various types of pharmaceuticals and biopharmaceuticals. This book provides detailed information on the background, basic principles, and components of techniques used for the analysis of pharmaceuticals and biopharmaceuticals. Focusing on those analytical techniques that are most frequently used for pharmaceuticals, it classifies them into three major sections and 19 chapters, each of which discusses a respective technique in detail. Chiefly intended for graduate students in the pharmaceutical sciences, the book will familiarize them with the components, working principles and practical applications of these indispensable analytical techniques.

Organic Spectroscopy Springer Nature

Stereochemistry has always occupied a central position and is pivotal to the practice of organic chemistry. A solid understanding of this subject is indeed critical to subsequent success in a science

career. Stereochemistry is, therefore, a core constituent both at the undergraduate and postgraduate chemistry courses. This seventh edition is extensively revised and enlarged by adding new material to take account of recent developments and extensive amendments have been made to improve clarity. The key features of this new addition are: a brand new design. Incorporation of basic principles in boxes directly links the students to the main text; and a large number of exercises with their solutions have been now added in each chapter. These exercises are set at appropriate places so that the students can test their command of a particular topic. New problems have been added at the end of each chapter. Chemical illustrations have been modified and developed for clarity and information. Generally the figures contain text as well, to decrease the need to refer back and forth to the text and for better understanding.

Infrared Spectroscopy Butterworth-Heinemann

"a very valuable book for graduate students and researchers in the field of Laser Spectroscopy, which I can fully recommend" —Wolfgang Demtröder, Kaiserslautern University of Technology How would it be possible to provide a coherent picture of this field given all the techniques available today? The authors have taken on this daunting task in this impressive, groundbreaking text. Readers will benefit from the broad overview of basic concepts, focusing on practical scientific and real-life applications of laser spectroscopic analysis and imaging. Chapters follow a consistent structure, beginning with a succinct summary of key principles and concepts, followed by an overview of applications, advantages and pitfalls, and finally a brief discussion of seminal advances and current developments. The examples used in this text span physics and chemistry to environmental science, biology, and medicine. Focuses on practical use in the laboratory and real-world applications Covers the basic concepts, common experimental setups Highlights advantages and caveats of the techniques Concludes each chapter with a snapshot of cutting-edge advances This book is appropriate for anyone in the physical sciences, biology, or medicine looking for an introduction to laser spectroscopic and imaging methodologies. Helmut H. Telle is a full professor at the Instituto Pluridisciplinar, Universidad Complutense de Madrid, Spain. Ángel González Ureña is head of the Department of Molecular Beams and Lasers, Instituto Pluridisciplinar, Universidad Complutense de Madrid, Spain.

Spectroscopy of Organic Compounds Longman Publishing Group

As quantum theory enters its second century, it is fitting to examine just how far it has come as a tool for the chemist. Beginning with Max Planck's agonizing conclusion in 1900 that linked energy emission in discreet bundles to the resultant black-body radiation curve, a body of knowledge has developed with profound consequences in our ability to understand nature. In the early years, quantum theory was the providence of physicists and certain breeds of physical chemists. While physicists honed and refined the theory and studied atoms and their component systems, physical chemists began the foray into the study of larger, molecular systems. Quantum theory predictions of these systems were first verified through experimental spectroscopic studies in the electromagnetic spectrum (microwave, infrared and ultraviolet/visible), and, later, by nuclear magnetic resonance (NMR) spectroscopy. Over two generations these studies were hampered by two major drawbacks: lack of resolution of spectroscopic data, and the complexity of calculations. This powerful theory that promised understanding of the fundamental nature of molecules faced formidable challenges. The following example may put things in perspective for today's chemistry faculty, college seniors or graduate students: As little as 40 years ago, force field calculations on a molecule as simple as ketene was a four to five year dissertation project.

Organic Spectroscopy Halsted Press

The Sixth Edition Of This Widely Used Text Includes New Examples / Spectra / Explanations / Expanded Coverage To Update The Topic Of Spectroscopy. The Artwork And Material In All Chapters Has Been Revised Extensively For Students Understanding. New To This Edition * New Discussion And New Ir, 1H Nmr, 13C Nmr And Ms Spectra. * More Important Basic Concepts Highlighted And Put In Boxes Throughout This Edition. * Chapters On 1H Nmr And 13C Nmr Rewritten And Enlarged. More On Cosy, Hetcor, Dept And Inadequate Spectra. * A Rational Approach For Solving The Structures Via Fragmentation Pathways In Ms. * Increased Power Of The Book By Providing Further Extensive Learning Material In This Revised Edition. * A Quick And An Easy Access To Topics In Ugc Model Curricula. With Its Comprehensive Coverage And Systematic Presentation The Book Would Serve As An Excellent Text For B.Sc. (Hons.) And M.Sc. Chemistry Students. It Provides Knowledge To Excel At Any Level, University Examination, Competitive Examinations E.G. Net And Before Interview Boards.

Principles of Instrumental Analysis Springer Science & Business Media

PRINCIPLES AND CHEMICAL APPLICATIONS FOR B.SC.(HONS) POST GRADUATE STUDENTS OF ALL INDIAN UNIVERSITIES AND COMPETITIVE EXAMINATIONS.

Modern Spectroscopy W H Freeman & Company

An understanding of spectroscopic techniques in the analysis of chemical structures is essential to all chemistry degree courses. This new addition to the Oxford Chemistry Primers series provides the essential material needed by undergraduates, in a compact form. It will be beneficial to postgraduates in organic chemistry as reference material in their daily research.

NMR Spectroscopy Free Press

The Sixth Edition of a classic in organic chemistry continues its tradition of excellence Now in its sixth edition, March's Advanced Organic Chemistry remains the gold standard in organic chemistry. Throughout its six editions, students and chemists from around the world have relied on it as an essential resource for planning and executing synthetic reactions. The Sixth Edition brings the text completely current with the most recent organic reactions. In addition, the references have been updated to enable readers to find the latest primary and review literature with ease. New features include: More than 25,000 references to the literature to facilitate further research Revised mechanisms, where required, that explain concepts in clear modern terms Revisions and updates to each chapter to bring them all fully up to date with the latest reactions and discoveries A revised Appendix B to facilitate correlating chapter sections with synthetic transformations

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