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Book Review

Modern Molecular Photochemistry of Organic Molecules

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The book will be of interest to scientists doing organic chemistry, as well as nanotechnology, chemical biology, physical chemistry and polymer and materials science. It contains a wealth of information on photochemical and photophysical processes with a systematic approach and readers will not be disappointed.

Organic photochemistry first emerged in the 1960s as a significant discipline. Now, some 50 years later, the book shows how diverse the field has become. The authors who are well-recognized photochemists connect topics old and new, from the incorporation of quantum and molecular orbital theory to the present state of the discipline. There are 15 chapters; each contains many subsections, where the authors pay close attention to the basic principles of photochemistry and photophysics of organic compounds.

Chapters 1–3 include an introduction and overview to organic photochemistry in the 21st century, and the merits for studying it. Descriptions of atomic and molecular orbitals and electronic configurations are provided, including a vector model of electron spin. I found it particularly interesting to read about the role of orbital orientation in spin–orbit coupling. The topics were written making it easy to follow, and lacked any lengthy mathematical treatments.

Chapters 4 and 5 cover radiative transitions between electronic states in processes, such as light absorption and emission of compounds. Pictorial representations are given that always help the reader in what is being explained. There are many diagrams to help visualize processes, such as spin–orbit coupling-induced radiationless transitions in intersystem crossing and other electronic relaxations.

A theoretical treatment of organic photoreactions is given in Chapter 6. This treatment is based on potential energy surfaces and correlation diagrams, among other things, including funnels that effectively ''mate'' surfaces. One discussion was aimed at an energy surface paradigm for organic photochemical reactions.

Chapters 7 and 8 describe energy transfer and electron transfer reactions, including triplet–triplet annihilation of energy transfer from electron exchange interactions. Mechanistic organic photochemistry is introduced with the focus on a great number of examples that transformed the field. Moreover, described are methods, from pulsed excitation and matrix isolation to the determination of rate constants and Stern–Volmer kinetics.

Next is a set of four chapters that use a functional group and chromophore approach to the organic photochemistry of carbonyl, alkene, enone and aromatic compounds. There are many wonderful examples given. Chapter 9 describes the photochemistry of carbonyl compounds. There is the formation of $^*R(n,\pi^*)$ species in primary photoreactions, and secondary thermal reactions of radical pairs, free radicals and biradicals. Other topics covered include intermolecular H-transfer, α-cleavage, [2 + 2] cycloadditions, and also strategies on designing phototriggers and photoprotecting groups.

Chapter 10 describes the photochemistry of alkenes and the formation of $^*R(\pi,\pi^*)$ species. Topics also covered were *cis–trans* isomerism, pericyclic reactions, di-π-methane reactions and photoinduced electron transfer reactions. This is followed by Chapters 11 and 12 that describe the photochemistry of enones and dienones, and of aromatic compounds.

Chapter 13 contains the topic of supramolecular organic photochemistry, which is a rather ''grand'' approach that has emerged more recently in the discipline (the pun is intended). This chapter describes crystals and porous solids, host/guest complexes, cavity effects, preorganization of the guest within the host, as well as the persistence of reactive intermediates *via* host incarceration. The penultimate chapter (Chapter 14) describes singlet oxygen chemistry, including its triplet-sensitized production. The final chapter (Chapter 15) describes extending paradigms to understand the photochemistry of other functional groups, such as the compounds containing nitro, azo, diazo and thioketone groups.

In conclusion, this book is a full-scale work and was written for students and researchers who conduct (or may wish to conduct) photochemistry. The book is an outgrowth of the earlier book *Modern Molecular Photochemistry*, which first appeared in 1978 and contained seven chapters. I think the readers of *Photochemistry and Photobiology* will enjoy the new book and it will stimulate new ideas. The text is written in such a way that it offers researchers of diverse backgrounds an opportunity to grasp the material to understand how it can be used to complement their own research effort.

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/Organic Chemistry Books. Modern Molecular Photochemistry of Organic Molecules. Average rating:0out of5stars, based on0reviewsWrite a review. Nicholas J Turro; V Ramamurthy; J C Scaiano. Walmart # 1891389254. This button opens a dialog that displays additional images for this product with the option to zoom in or out.Â Manufacturers, suppliers and others provide what you see here, and we have not verified it. See our disclaimer. This title presents a totally integrated theory of organic photochemistry, including the first visualization of the role of electron spin at all levels. Chapters describing how experiment and theory can be applied to an understanding of the fundamental chromophors of organic chemistry are included. Specifications. Publisher. 1 1.2 Learning Molecular Organic Photochemistry through the. Visualization of Molecular Structures and the Dynamics. of Their Transformations . 3 1.3 Why Study Molecular Organic Photochemistry? . 3 1.4 The Value of Pictorial Representations and Visualization. of Scientific Concepts . 5 1.5 Scientific Paradigms of Molecular Organic Photochemistry ...Â 176 4.6 Absorption and Emission Spectra of Organic Molecules: The State Energy Diagram as a Paradigm for Molecular. Photophysics . 178 4.7 Some Examples of Experimental Absorption and Emission. Spectra of Organic Molecules: Benchmarks . 178 4.8 The Nature of Light: From Particles to Waves to Wave. Angewandte Books Chemie Modern Molecular Photochemistry of Organic Molecules Photochemical reactions involving electronic (and spin) isomers of ground-state molecules continue to get attention, as demonstrated by the recent publication of several books in this field, e.g., two other books besides this one within the last few months.[1, 2] A problem often encountered in connection with photochemical reactions is that they. are still considered too â€œexoticâ€ and unpredictable for wide synthetic application. On the other hand, predicting how an organic molecule will behave upon absorption of light

Nicholas J. Turro, V. Ramamurthy, J.C. Scaiano. Modern Molecular Photochemistry of Organic Molecules. Is a comprehensive revision of Turro's classic text, Modern Molecular Photochemistry, which has been the standard of the field for three decades. For a crystal-clear introduction to organic photochemistry in pictorial terms, this book comprises all of the same introductory chapters that make up Principles of Molecular Photochemistry, but then goes on to provide additional chapters that cover the methods for determining the mechanisms of organic photoreactions, and describe comprehensively Molecules, an international, peer-reviewed Open Access journal.Â I would like to invite you to submit a paper to an upcoming Special Issue on â€œSupramolecular Organic Photochemistryâ€ to be published early next year in Molecules. The issue should highlight this vibrant field. Manuscripts that address photochemical processes in all types of confined environments from rigid crystals to flexible micelles, liquid crystals or solvent cages in solutions are of interest. Your contribution would be very welcome for possible publication in this issue. Please submit your article online at https://www.mdpi.com/user/manuscripts/upload/?journal=molecules. If you have any A graduate textbook that provides a qualitative description of electronic excitation in organic molecules and of the associated spectroscopy, photophysics, and photochemistry. The treatment is non- mathematical and emphasizes the use of simple qualitative models for developing an intuitive feeling for the course of photophysical and photochemical processes in terms of potential energy hypersurfaces. Special attention is paid to recent developments, particularly to the role of conical intersections. Annotation copyright Book News, Inc. Portland, Or.