Molecular Photochemistry

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Applied Photochemistry CRC Press
This is the most updated, comprehensive collection of monographs on all aspects of photochemistry and photophysics related to natural and synthetic, inorganic, organic, and biological supramolecular systems. Supramolecular Photochemistry: Controlling Photochemical Processes addresses reactions in crystals, organized assemblies, monolayers, zeolites, clays, silica, micelles, polymers, dendrimers, organic hosts, supramolecular structures, organic glass, proteins and DNA, and applications of photosystems in confined media. This landmark publication describes the past, present, and future of this growing interdisciplinary area.

Elements of Molecular and Biomolecular Electrochemistry Academic Press
Applied Photochemistry encompasses the major applications of the chemical effects resulting from light absorption by atoms and molecules in chemistry, physics, medicine and engineering, and contains contributions from specialists in these key areas. Particular emphasis is placed both on how photochemistry contributes to these disciplines and on what the current developments are. The book starts with a general description of the interaction between light and matter, which provides the general background to photochemistry for non-specialists. The following chapters develop the general synthetic and mechanistic aspects of photochemistry as applied to both organic and inorganic materials, together with types of materials which are useful as light absorbers, emitters, sensitisers, etc. for a wide variety of applications. A detailed discussion is presented on the photochemical processes occurring in the Earth ' s atmosphere, including discussion of important current aspects such as ozone depletion. Two important distinct, but interconnected, applications of photochemistry are in photocatalytic treatment of wastes and in solar energy conversion. Semiconductor photochemistry plays an important role in these and is discussed with reference to both of these areas. Free radicals and reactive oxygen species are of major importance in many chemical, biological and medical applications of photochemistry, and are discussed in depth. The following chapters discuss the relevance of using light in medicine, both with various types of phototherapy and in medical diagnostics. The development of optical sensors and probes is closely related to diagnostics, but is also relevant to many other applications, and is discussed separately. Important aspects of applied photochemistry in electronics and imaging, through processes such as photolithography, are discussed and it is shown how this is allowing the increasing miniaturisation of semiconductor devices for a wide variety of electronics applications and the development of nanometer scale devices. The final two chapters provide the basic ideas necessary to set up a photochemical laboratory and to characterise excited states. This book is aimed at those in science, engineering and medicine who are interested in applying photochemistry in a broad spectrum of areas. Each chapter has the basic theories and methods for its particular applications and directs the reader to the current, important literature in the field, making Applied Photochemistry suitable for both the novice and the experienced photochemist.

Photochemistry and Photophysics Royal Society of Chemistry
Control of molecular chirality is central to contemporary chemistry, biology, and materials-related areas. Chiral photochemistry employs molecular and supramolecular chiral interactions in the electronically excited state to induce molecular chirality, providing new and versatile strategies and surprising results unattainable by conventional therma

Modern Molecular Photochemistry of Organic Molecules Elsevier
This volume compiles unimolecular and bimolecular photochemical data for a wide range of commonly used organic molecules. This edition contains information on bimolecular quenching of both singlet and triplet states, transient absorbance of excited triplet states, and computer-generated molecular formula and name indexes.;Handbook of Photochemistry is intended for physical and organic chemists, biochemists, photobiologists, physicists, laser engineers and graduates in these disciplines.

Organic Photochemistry Elsevier
Flavins and flavoproteins are a widely investigated and highly versatile group of compounds. Participation of these compounds in photochemistry and photobiology processes are of particular importance in the fields of biology, chemistry and medicine. Written by leading experts in the field each section of the book includes a historical overview of the subject, state of the art developments and future perspectives. Flavins: Photochemistry and Photobiology begins with the properties and applications of flavins, including their photochemistry in aqueous and organic solutions. Subsequent sections discuss riboflavin as a visible light sensitizer in the photo degradation of drugs, antiviral and antibacterial effects, the role of flavins in light induced toxicity and blue light initiated DNA repair by photolyase. Finally there are sections on the flavin based photoreceptors in plants, bacteria and eukaryotic photosynthetic flagelettes. This book brings together leading experts with a unique interdisciplinary emphasis, to provide an authoritative resource on flavins and their role in photochemistry and photobiology.

Bioinorganic Photochemistry Cambridge University Press
Photochemistry and Photobiology of Nucleic Acids, Volume I: Chemistry covers the historical developments in the study of photobiology and photochemistry of nucleic acid components. This volume is divided into 12 chapters that deal with the isolation and characterization of ultraviolet photoproducts of pyrimidines. After briefly covering the concepts of photochemistry of nucleic acids, this volume goes on describing the UV-induced physical and chemical alterations in nucleic acid components, such as pyrimidines, purines, their nucleosides and nucleotides, and related compounds. Significant chap ...

Handbook of Photochemistry, Second Edition CRC Press
Focuses on complex naturally occurring and synthetic supramolecular arrays. The text describes applications of photochemistry in cystalline organic matrices; covers two-component crystals - crystalline molecular compounds, mixed crystals and simple mechanical mixtures - in solid and liquid phases; assesses photoinduced fragmentation of carbon-heteroatom bonds; and more.

Excited States and Photochemistry of Organic Molecules Elsevier
This text develops photochemical and photophysical concepts from a set of familiar principles. Principles of Molecular Photochemistry provides in-depth coverage of electronic spin, the concepts of electronic energy transfer and electron transfer, and the progress made in theoretical and experimental electron transfer.

Photosynergetic Responses in Molecules and Molecular Aggregates BoD – Books on Demand
Photochemistry of Organic Compounds: From Concepts to Practice provides a hands-on guide demonstrating the underlying principles of photochemistry and, by reference to a range of organic reaction types, its effective use in the synthesis of new organic compounds and in various applications. The book presents a complete and methodical approach to the topic, Working from basic principles, discussing key techniques and studies of reactive intermediates, and illustrating synthetic photochemical procedures. Incorporating special topics and case studies covering various applications of photochemistry in chemistry, environmental sciences, biochemistry, physics, medicine, and industry. Providing extensive references to the original literature and to review articles. Concluding with a chapter on retrosynthetic photochemistry, listing key reactions to aid the reader in designing their own synthetic pathways. This book will be a valuable source of information and inspiration for postgraduates as well as professionals from a wide range of chemical and natural sciences.

Modern Molecular Photochemistry CRC Press
Bioinorganic photochemistry is a rapidly evolving field integrating inorganic photochemistry with biological, medical and environmental sciences. The interactions of light with inorganic species in natural systems, and the applications in artificial systems of medical or environmental importance, form the basis of this challenging inter-disciplinary research area. Bioinorganic Photochemistry provides a comprehensive overview of the concepts and reactions fundamental to the field, illustrating important applications in biological, medical and environmental sciences. Topics covered include: Cosmic and environmental photochemistry Photochemistry of biologically relevant nanoassemblies Molecular aspects of photosynthesis Photoinduced electron transfer in biosystems Modern therapeutic strategies in photomedicine The book concludes with an outlook for the future of environmental protection, discussing emerging techniques in the field of pollution abatement, and the potential for bioinorganic photochemistry as a pathway to developing cheap, environmentally friendly sources of energy. Written as an authoritative guide for researchers involved in the development of bioinorganic photochemical processes, Bioinorganic Photochemistry is also accessible to scientists new to the field, and will be a key reference source for advanced courses in inorganic, and bioinorganic chemistry.

Inorganic Photochemistry University Science Books
Computational Photochemistry, Volume 16 provides an overview of general strategies currently used to investigate photochemical processes. Whilst contributing to establishing a branch of computational chemistry that deals with the properties and reactivity of photoexcited molecules, the book also provides insight into the conceptual and methodological research lines in computational photochemistry. Packed with examples of applications of modelling of basic photochemical reactions and the computer-aided development of novel materials in the field of photodegradation (paints), photoprotection (sunscreens), color regulation (photochromic devices) and fluorescent probes, this book is particularly useful to anyone interested in the effect of light on molecules and materials.* Provides an overview of computational photochemistry, dealing with principles and applications* Demonstrates techniques that can be used in the computer-aided design of novel photo responsive materials* Written by experts in computational photochemistry

Supramolecular Photochemistry Wiley-Blackwell
Ein Lehrbuch eines exzellenten Autorenteams mit wissenschaftlicher Erfahrung und der Kompetenz im Schreiben didaktischer Texte zu allen Facetten der Photochemie und Photophysik: Grundlagen sowie ausgewählte Beispielen moderner Anwendungen und aus der heutigen Forschung.

Essentials of Molecular Photochemistry Royal Society of Chemistry
This book offers an introduction to photochemistry for students with a minimal background in physical chemistry and molecular quantum mechanics. The focus is from a theoretical perspective and highlights excited state dynamics. The authors, experienced lecturers, describe the main concepts in photochemical and photophysical processes that are used as a basis to interpret classical steady-state experimental results (essentially product

branching ratios and quantum yields) and the most advanced time-resolved techniques. A significant portion of the content is devoted to the computational techniques present in quantum chemistry and molecular dynamics.With its short summaries, questions and exercises, this book is aimed at graduate students, while its theoretical focus differentiates it from most introductory textbooks on photochemistry.

Principles and Applications of Photochemistry Springer Science & Business Media

This book is based on the George Fisher Baker Lecture given by Jean-Michel Savéant at Cornell University in Fall 2002. * The first book focusing on molecular electrochemistry * Relates to other fields, including photochemistry and biochemistry * Outlines clearly the connection between concepts, experimental illustrations, proofs and supporting methods * Appendixes to provide rigorous demonstrations to prevent an overload of algebra in the main text * Applications-oriented, focused on analyzing the results obtained rather than the methodology

Molecular Reactions and Photochemistry CRC Press

This text is aimed at final year undergraduates, beginning postgraduates, and those requiring a fundamental knowledge of photophysical and photochemical processes. The first two chapters provide an introduction to the more physical and quantitative aspects of the subject. More advanced topics concerned with the interaction between matter and radiation, molecular photophysics, and emission quenching are considered in the following three chapters. Difficult concepts are presented from a qualitative (pictorial) point of view rather than a purely mathematical one and a quantum rather than a classical approach is adopted throughout. The photochemical reactions of organic compounds are classified according to chromophore type (i.e. ethenes, dienes, and ethynes, carbonyl compounds, aromatic compounds, chromophores containing nitrogen, and other organic chromophores). However, in view of the importance of photo-oxygenation processes, this is considered as a separate topic in the final chapter.

Photochemistry Royal Society of Chemistry

A significantly updated translation of Lichtabsorption und Photochemie Organischer Molekule, published by VCH in 1989. 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 by Book News, Inc., Portland, OR

Molecular Photochemistry John Wiley & Sons

During the last two decades the photochemistry of organic molecules has grown into an important and pervasive branch of organic chemistry. In Modern Molecular Photochemistry, the author brings students up to date with the advances in this field - the development of the theory of photoreactions, the utilization of photoreactions in synthetic sequences, and the advancement of powerful laser techniques to study the mechanisms of photoreactions.

Photochemistry and Photobiology of Nucleic Acids IntechOpen

Focusing on complex naturally-occurring and synthetic supramolecular arrays, this work describes the mechanism by which transition metal complexes bind to DNA and how the DNA scaffold modifies the photochemical and photophysical properties to bound complexes. It includes details of photoinduced electron transfer between intercalated molecules, and examines thermally and photochemically induced electron transfer in supramolecular assemblies consisting of inorganic molecular building blocks.

Organic Photochemistry and Photophysics John Wiley & Sons

There have been various comprehensive and stand-alone text books on the introduction to Molecular Photochemistry which provide crystal clear concepts on fundamental issues. This book entitled "Molecular Photochemistry - Various Aspects" presents various advanced topics that inherently utilizes those core concepts/techniques to various advanced fields of photochemistry and are generally not available. The purpose of publication of this book is actually an effort to bring many such important topics clubbed together. The goal of this book is to familiarize both research scholars and post graduate students with recent advancement in various fields related to Photochemistry. The book is broadly divided in five parts: the photochemistry I) in solution, II) of metal oxides, III) in biology, IV) the computational aspects and V) applications. Each part provides unique aspect of photochemistry. These exciting chapters clearly indicate that the future of photochemistry like in any other burgeoning field is more exciting than the past.

Computational Photochemistry Halsted Press

This book compiles the accomplishments of the recent research project on photochemistry “Photosynergetics”, supported by the Ministry of Education, Culture, Sports, Science and Technology of Japan, aiming to develop and elucidate new methods and molecules leading to advanced utilization of photo-energies. Topics include photochemical responses induced by multiple excitation, multiphoton absorption, strong modulation of electronic states, developments of new photofunctional molecules, mesoscopic actuations induced by photoexcitation, and novel photoresponses in molecules and molecular assemblies. The authors stress that these approaches based on the synergetic interaction among many photons and many molecules enable the expansion of the accessibility to specific electronic states. As well, they explain how the development of reaction sequences and molecules/molecular assemblies ensure “additivity” and “integration” without loss of the photon energy, leading to new photoresponsive assemblies in meso- and macroscopic scales.