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Cobalt Catalysis in Organic Synthesis

Methods and Reactions

John Wiley & Sons Provides a much-needed account of the formidable "cobalt rush" in organic synthesis and catalysis Over the past few decades, cobalt has turned into one of the most promising metals for use in catalytic reactions, with important applications in the efficient and selective synthesis of natural products, pharmaceuticals, and new materials. Cobalt Catalysis in Organic Synthesis: Methods and Reactions provides a unique overview of cobalt-catalysed and -mediated reactions applied in modern organic synthesis. It covers a broad range of homogeneous reactions, like cobalt-catalysed hydrogenation, hydrofunctionalization, cycloaddition reactions, C-H functionalization, as well as radical and biomimetic reactions. First comprehensive book on this rapidly evolving research area Covers a broad range of homogeneous reactions, such as C-H activation, cross-coupling, synthesis of heterocyclic compounds (Pauson-Khand), and more Chapters on low-valent cobalt complexes as catalysts in coupling reactions, and enantioselective cobalt-catalyzed transformations are also included Can be used as a supplementary reader in courses of advanced organic synthesis and organometallic chemistry Cobalt Catalysis in Organic Synthesis is an ideal book for graduates and researchers in academia and industry working in the field of synthetic organic chemistry, catalysis, organometallic chemistry, and natural product synthesis.

Electrochemical Aspects of Ionic Liquids

John Wiley & Sons The second edition is based on the original book, which has been revised, updated and expanded in order to cover the latest information on this rapidly growing field. The book begins with a description of general and electrochemical properties of ionic liquids and continues with a discussion of applications in biochemistry, ionic devices, functional design and polymeric ionic liquids. The new edition includes new chapters on Li ion Batteries and Actuators, as well as a revision of existing chapters to include a discussion on purification and the effects of impurities, adsorption of ionic liquids on interfaces and on the electrochemical double layer, among other topics.

Ionic Organic Reactions

Principles of

Ionic Liquids in Synthesis

"The second, completely revised and enlarged edition of what has become the standard reference work in this fascinating field brings together the latest developments, supplemented by numerous practical tips, providing those working in both research and industry with an indispensable source of information. New contributions have been added, to reflect the fact that industrial processes are already established, and ionic liquids are now commercially available. A must for everyone working in the field."--Publisher's description.

Green Industrial Applications of Ionic Liquids

Springer Science & Business Media This book contains the lecture notes for the NATO Advanced Research Workshop on the Green Industrial Applications of Ionic Liquids held April 12th-16, 2000 in Heraklion, Crete, Greece. This was the first international meeting devoted to research in the area of ionic liquids (salts with melting points below 100 °C), and was intended to explore the promise of ionic liquids as well as to set a research agenda for the field. It was the first international meeting dedicated to the study and application of ionic liquids as solvents, and forty-one scientists and engineers from academia, industry, and government research laboratories (as well as six industry observers and four student assistants) met to discuss the current and future status of the application of ionic liquids to new green industrial technologies. It was immediately clear that the number of organic chemists and engineers working

in the field needed to be increased. It was also clear that the declining interest in high temperature molten salts and subsequent increase in low melting ionic liquid solvents had not yet taken hold in Eastern Europe. Participants from NATO Partner Countries contributed significant expertise in high temperature molten salts and were able to take back a new awareness and interest in ionic liquid solvents.

Physical Chemistry of Ionic Materials

Ions and Electrons in Solids

*John Wiley & Sons Defects play an important role in determining the properties of solids. This book provides an introduction to chemical bond, phonons, and thermodynamics; treatment of point defect formation and reaction, equilibria, mechanisms, and kinetics; kinetics chapters on solid state processes; and electrochemical techniques and applications. * Offers a coherent description of fundamental defect chemistry and the most common applications. * Up-to-date trends and developments within this field. * Combines electrochemical concepts with aspects of semiconductor physics.*

Emerging Areas in Bioengineering

*John Wiley & Sons With more than 40 contributions from expert authors, this is an extensive overview of all important research topics in the field of bioengineering, including metabolic engineering, biotransformations and biomedical applications. Alongside several chapters dealing with biotransformations and biocatalysis, a whole section is devoted to biofuels and the utilization of biomass. Current perspectives on synthetic biology and metabolic engineering approaches are presented, involving such example organisms as *Escherichia coli* and *Corynebacterium glutamicum*, while a further section covers topics in biomedical engineering including drug delivery systems and biopharmaceuticals. The book concludes with chapters on computer-aided bioprocess engineering and systems biology. This is a part of the Advanced Biotechnology book series, covering all pertinent aspects of the field with each volume prepared by eminent scientists who are experts on the topic in question. Invaluable reading for biotechnologists and bioengineers, as well as those working in the chemical and pharmaceutical industries.*

Principles of Ionic Organic Reactions

Supported Ionic Liquids Fundamentals and Applications

John Wiley & Sons This unique book gives a timely overview about the fundamentals and applications of supported ionic liquids in modern organic synthesis. It introduces the concept and synthesis of SILP materials and presents important applications in the field of catalysis (e.g. hydroformylation, hydrogenation, coupling reactions, fine chemical synthesis) as well as energy technology and gas separation. Written by pioneers in the field, this book is an invaluable reference book for organic chemists in academia or industry.

Frontier Orbitals and Organic Chemical Reactions

John Wiley & Sons Provides a basic introduction to frontier orbital theory with a review of its applications in organic chemistry. Assuming the reader is familiar with the concept of molecular orbital as a linear combination of atomic orbitals the book is presented in a simple style, without mathematics making it accessible to readers of all levels.

Principles of Ionic Organic Reactions

State Selected and State to State Ion Molecule Reaction Dynamics, Part 1

Experiment

John Wiley & Sons State-Selected and State-to-State Ion-Molecules Reaction Dynamics details the recent experimental and theoretical accomplishments in the field to date by some of its foremost researchers and theorists. Divided into two parts, each of which separately describe the experimental and theoretical aspects of the field, State-Selected and State-to-State Ion-Molecule Reaction Dynamics is an accessible, well organized look at a highly useful and emerging chemical specialty. Part 1, "Experiment," contains eight in-depth studies, which illustrate the key experimental work being done in the field today: Chapter 1 provide a comprehensive

review of the theory and application of inhomogeneous rf fields for the study of the dynamics of low-energy ion-molecules processes Chapter 2 describes the application of multiphoton ionization (MPI) for the preparation of reactant ion states Chapter 3 reviews the application of MPI schemes for state specific cross-section measurements involving transition metal cations Chapter 4 describes the development of the threshold photoelectron secondary ion coincidence (TESICO) method Chapter 5 presents the conceptual and practical aspects of a multicoincidence technique Chapter 6 details the experimental results obtained using the photoionization and differential reactivity methods Chapter 7 reviews the several recent crossed beam studies of charge transfer and collision-induced dissociation systems involving atomic and molecular ions Chapter 8 is a survey of 15 years of high resolution crossed beam scattering of protons with atoms, diatoms, and poly-atomic molecules *State-Selected and State-to-State Ion-Molecule Reaction Dynamics, Part 1: Experiment* offers professionals a true state-of-the-science look at this fascinating and increasingly influential subject.

Ionic and Organometallic-Catalyzed Organosilane Reductions

John Wiley & Sons Ionic and Organometallic-Catalyzed Organosilane Reductions provides an up-to-date, comprehensive review of reductions with organosilanes. Both ionic and catalyst-mediated reaction types are included, with appropriate reference to reaction mechanisms where they have been elucidated. The text also provides a wide variety of organic functional group reductions by organosilicon hydrides, and includes a substantial discussion of asymmetric reductions. All known examples have been compiled in thirty-four easily scanned, comprehensive tables compiled from 809 original articles. This is a must-have reference book for all synthetic organic chemists working in academic and industrial laboratories.

Ionic Liquids in Synthesis

John Wiley & Sons The demand for increasingly clean and efficient chemical syntheses is becoming more urgent from both an economic and an environmental standpoint. Many technologies rely on large quantities of hazardous even toxic solvents. A promising and now established approach is the development of new, ionic solvents that are fluid at room temperature. These solvents not only have the potential to increase chemical reactivity and thus lead to more efficient processes, but are also non-flammable and are less toxic than conventional solvents due to their low vapor pressure. This volume brings together the latest developments in this fascinating field, supplemented by numerous practical tips, and thus provides those working in both research and industry with an indispensable source of information.

Nitrenes and Nitrenium Ions

Wiley-Interscience Featuring contributions respected leaders in the field, Nitrene and Nitrenium Ions is the first comprehensive book to explore the role of reactive intermediate nitrene and nitrenium ions in chemistry and biochemistry. Covering a broad range of topics, including ultrafast studies, computational studies, behavior in aqueous solution, electronic structures, and reactions with aromatic compounds, this valuable resource will empower graduate students and researchers to better understand and expand their synthetic utility.

Ionic Liquid-Based Surfactant Science

Formulation, Characterization, and Applications

John Wiley & Sons This volume will be summarized on the basis of the topics of Ionic Liquids in the form of chapters and sections. It would be emphasized on the synthesis of ILs of different types, and stabilization of amphiphilic self-assemblies in conventional and newly developed ILs to reveal formulation, physicochemical properties, microstructures, internal dynamics, thermodynamics as well as new possible applications. It covers: Topics of ionic liquid assisted micelles and microemulsions in relation to their fundamental characteristics and theories Development bio-ionic liquids or greener, environment-friendly solvents, and manifold interesting and promising applications of ionic liquid based micelles and micremulsions

Ionic Liquids in Biotransformations and Organocatalysis Solvents and Beyond

John Wiley & Sons This book addresses the use of ionic liquids in biotransformation and organocatalysis. Its major parts include: an overview of the fundamentals of ionic liquids and their interactions with proteins and enzymes; the use of ILs in biotransformations; non-solvent applications such as additives, membranes, substrate anchoring, and the use of ILs in organocatalysis (from solvents to co-catalysts and new reactivities, as well as non-solvent applications such as anchoring and immobilization).

Functional Organic Liquids

Wiley-VCH The first book to comprehensively cover the burgeoning new class of soft materials known as functional organic liquids Functional organic liquids, a new concept in soft matter materials science, exhibit favorable properties compared to amorphous polymers and ionic liquids. They are composed of a functional core unit and a side chain, which induces fluidity even at room temperature. Due to their fluidity, functional organic liquids can adopt any shape and geometry and fulfill their function in stretchable and bendable devices for applications in photovoltaics, organic electronics, biomedicine, and biochemistry. Presented in five parts, this book starts with an overview of the design methods and properties of functional organic liquids. The next three parts focus on the applications of this exciting new class of soft materials in the fields of energy conversion, nanotechnology, and biomaterials. They study the liquids for energy conversion, those containing inorganic nanoclusters, and solvent-free soft biomaterials. Functional Organic Liquids concludes with a comparison in terms of properties and application potential between functional organic liquids and more conventional soft matter such as ionic liquids and liquid metals. -Examines the current state of science and technology for functional organic liquids -Focuses on potential and already realized applications such as functional organic liquids for energy conversion -Stimulates researchers to move forward on future development and applications Functional Organic Liquids is an excellent book for materials scientists, polymer chemists, organic chemists, physical chemists, surface chemists, and surface physicists.

Onium Ions

*John Wiley & Sons Comprehensive and up-to-date coverage of onium ions-an indispensable reference for academic and industrial chemists In Onium Ions, Nobel Prize-winning chemist George Olah joins forces with coauthors Kenneth Laali, Qi Wang, and G. K. Surya Prakash to offer an in-depth look at the chemistry and reactions of these important electron-deficient compounds. While other texts have covered various individual types of onium ions, this work addresses the structure and chemistry of numerous different classes of onium ions. Contents include: * Discussions of well-established classes of onium ions, such as azonium, oxonium, sulfonium, selenonium, telluronium, and phosphonium ions. * Coverage of more recent types, from siliconium, halonium, and carbonium to carboxonium, carbosulfonium, and carbazonium ions. * Clear explanations of definition, classification, preparation, and chemistry of each major group of onium ions. * An exploration of superelectrophilic activation of onium ions through contact with superacid media. Enriched with numerous illustrations and a full listing of references for each chapter, Onium Ions should be a staple text in the professional chemist's library.*

Nanocatalysis in Ionic Liquids

John Wiley & Sons Edited and written by renowned experts in the field, this is the first book to reflect the state of the art of nanocatalysis in ionic liquids. Divided into two core areas, the first part of the book describes the different classes of metal nanoparticles as well as their synthesis in ionic liquids, while the second focuses on such emerging issues as the application of such systems to energy and biomass conversion.

Principles of Ionic Reactions

Chemical Reactivity in Confined Systems

Theory, Modelling and Applications

John Wiley & Sons An insightful analysis of confined chemical systems for theoretical and experimental scientists Chemical Reactivity in Confined Systems: Theory and Applications presents a theoretical basis for the molecular phenomena observed in confined spaces. The book highlights state-of-the-art theoretical and computational approaches, with a focus on obtaining physically relevant clarification of the subject to enable the reader to build an appreciation of underlying chemical principles. The book includes real-world examples of confined systems that highlight how the reactivity of atoms and molecules change upon encapsulation. Chapters include discussions on recent developments related to several host-guest systems, including cucurbit[n]uril, ExBox+4, clathrate hydrates, octa acid cavitand, metal organic frameworks (MOFs), covalent organic frameworks (COFs), zeolites, fullerenes, and carbon nanotubes. Readers will learn how to carry out new calculations to understand the physicochemical behavior of confined quantum systems. Topics covered include: A thorough introduction to global reactivity descriptors, including electronegativity, hardness, and electrophilicity An exploration of the Fukui function, as well as dual descriptors, higher order derivatives, and reactivity through information theory A practical discussion of spin dependent reactivity and temperature dependent reactivity Concise treatments of population analysis, reaction force, electron localization functions, and the solvent effect on reactivity Perfect for academic researchers and graduate students in theoretical and computational chemistry and confined chemical systems, Chemical Reactivity in Confined Systems: Theory and Applications will also earn a place in the libraries of professionals working in the areas of catalysis, supramolecular chemistry, and porous materials.

Ionic Compounds

Applications of Chemistry to Mineralogy

John Wiley & Sons A practical introduction to ionic compounds for both mineralogists and chemists, this book bridges the two disciplines. It explains the fundamental principles of the structure and bonding in minerals, and emphasizes the relationship of structure at the atomic level to the symmetry and properties of crystals. This is a great reference for those interested in the chemical and crystallographic properties of minerals.

Reaction Mechanisms in Organic Chemistry

John Wiley & Sons Understanding organic reaction mechanisms is the key for understanding organic chemistry. That is the concept of this unique textbook which supports the students perfectly to understand organic chemistry in a very comprehensive way. Includes a problem & solution section, too.

Ions and Ion Pairs in Organic Reactions

Nuclear Science Abstracts

Modern Nucleophilic Aromatic Substitution

John Wiley & Sons This book provides a comprehensive overview of nucleophilic aromatic substitutions, focusing on the mechanistic and synthetic features that govern these reactions. The first chapter presents a detailed mechanistic analysis of the factors determining the feasibility of S_NAr substitutions, providing decisive information to predict regioselectivity of many reactions and to define the conditions for concerted S_NAr processes. Reflecting the key role played by these species as intermediates in most S_NAr reactions, chapter 2 then discusses the chemistry of anionic sigma-complexes. Chapter 3 describes the concept of superelectrophilicity in S_NAr substitutions, as it has recently emerged from the reactivity of strongly electron-deficient aromatic and heteroaromatic structures. The numerous synthetic

applications are considered in depth in the chapters 4 and 5 that follow on intermolecular and intramolecular nucleophilic aromatic substitutions. Then, chapter 6 focuses on substitutions proceeding formally through displacement of a hydride ion, a hot topic in the field. The final chapter brings together concise yet comprehensive discussions surrounding S_NAr photosubstitutions, radical substitutions, and ANRORC substitutions. Authored by a highly respected chemist who has contributed greatly to the field over the past two decades, this is a valuable information source for all organic chemists working in academia or the pharmaceutical and agrochemical industries.

Progress in Physical Organic Chemistry

John Wiley & Sons Progress in Physical Organic Chemistry is dedicated to reviewing the latest investigations into organic chemistry that use quantitative and mathematical methods. These reviews help readers understand the importance of individual discoveries and what they mean to the field as a whole. Moreover, the authors, leading experts in their fields, offer unique and thought-provoking perspectives on the current state of the science and its future directions. With so many new findings published in a broad range of journals, *Progress in Physical Organic Chemistry* fills the need for a central resource that presents, analyzes, and contextualizes the major advances in the field. The articles published in *Progress in Physical Organic Chemistry* are not only of interest to scientists working in physical organic chemistry, but also scientists working in the many subdisciplines of chemistry in which physical organic chemistry approaches are now applied, such as biochemistry, pharmaceutical chemistry, and materials and polymer science. Among the topics explored in this series are reaction mechanisms; reactive intermediates; combinatorial strategies; novel structures; spectroscopy; chemistry at interfaces; stereochemistry; conformational analysis; quantum chemical studies; structure-reactivity relationships; solvent, isotope and solid-state effects; long-lived charged, sextet or open-shell species; magnetic, non-linear optical and conducting molecules; and molecular recognition.

Wiley's English-Spanish, Spanish-English Chemistry Dictionary

John Wiley & Sons Wiley's English-Spanish, Spanish-English CHEMISTRY DICTIONARY Translates more than 75,000 terms in chemistry and its related disciplines. With more than 35,000 new entries added, the Second Edition of *Wiley's English-Spanish, Spanish-English Chemistry Dictionary* has been completely updated and revised, now translating more than 75,000 terms. You'll find coverage of all areas of chemistry, including chemical biology, biochemistry, biotechnology, and nanochemistry. There's also coverage of relevant terms in related disciplines of science and engineering.

The dictionary's straightforward, intuitive format makes it quick and easy for you to translate terms from either English to Spanish or Spanish to English. Acclaimed lexicographer Steven M. Kaplan has provided Spanish and English language equivalents that are clear and accurate. Moreover, he has reviewed the current chemistry literature in order to include recently coined terms. Wiley's English-Spanish, Spanish-English Chemistry Dictionary features: A wealth of information in one portable volume Entries covering the broad range of subdisciplines within chemistry English and Spanish language equivalents of thousands of chemical compounds Terms and phrases in related areas of science and engineering User-friendly format that takes you directly to the precise term needed Current with all the latest terms and phrases used in contemporary chemistry, this Second Edition remains indispensable for researchers, educators, students, and translators working in the field of chemistry. Este diccionario sirve igualmente bien para las personas que hablan el Inglés como lengua primaria o el Español como lengua primaria.

Atomic-Scale Modelling of Electrochemical Systems

John Wiley & Sons Atomic-Scale Modelling of Electrochemical Systems A comprehensive overview of atomistic computational electrochemistry, discussing methods, implementation, and state-of-the-art applications in the field The first book to review state-of-the-art computational and theoretical methods for modelling, understanding, and predicting the properties of electrochemical interfaces. This book presents a detailed description of the current methods, their background, limitations, and use for addressing the electrochemical interface and reactions. It also highlights several applications in electrocatalysis and electrochemistry. Atomic-Scale Modelling of Electrochemical Systems discusses different ways of including the electrode potential in the computational setup and fixed potential calculations within the framework of grand canonical density functional theory. It examines classical and quantum mechanical models for the solid-liquid interface and formation of an electrochemical double-layer using molecular dynamics and/or continuum descriptions. A thermodynamic description of the interface and reactions taking place at the interface as a function of the electrode potential is provided, as are novel ways to describe rates of heterogeneous electron transfer, proton-coupled electron transfer, and other electrocatalytic reactions. The book also covers multiscale modelling, where atomic level information is used for predicting experimental observables to enable direct comparison with experiments, to rationalize experimental results, and to predict the following electrochemical performance. Uniquely explains how to understand, predict, and optimize the properties and reactivity of electrochemical interfaces starting from the atomic scale Uses an engaging "tutorial style" presentation, highlighting a solid physicochemical background, computational implementation, and applications for different methods, including merits and limitations Bridges the gap between experimental electrochemistry and computational atomistic modelling Written by a team of experts within the field of computational electrochemistry and the wider

computational condensed matter community, this book serves as an introduction to the subject for readers entering the field of atom-level electrochemical modeling, while also serving as an invaluable reference for advanced practitioners already working in the field.

Keynotes in Organic Chemistry

John Wiley & Sons KEYNOTES IN Organic Chemistry KEYNOTES IN Organic Chemistry SECOND EDITION This concise and accessible textbook provides notes for students studying chemistry and related courses at undergraduate level, covering core organic chemistry in a format ideal for learning and rapid revision. The material, with an emphasis on pictorial presentation, is organised to provide an overview of the essentials of functional group chemistry and reactivity, leading the student to a solid understanding of the basics of organic chemistry. This revised and updated second edition of Keynotes in Organic Chemistry includes: new margin notes to emphasise links between different topics, colour diagrams to clarify aspects of reaction mechanisms and illustrate key points, and a new keyword glossary. In addition, the structured presentation provides an invaluable framework to facilitate the rapid learning, understanding and recall of critical concepts, facts and definitions. Worked examples and questions are included at the end of each chapter to test the reader's understanding. Reviews of the First Edition " ...this text provides an outline of what should be known and understood, including fundamental concepts and mechanisms." Journal of Chemical Education, 2004 " Despite the book's small size, each chapter is thorough, with coverage of all important reactions found at first-year level... ideal for the first-year student wishing to revise... and priced and designed appropriately." The Times Higher Education Supplement, 2004

Ionic Liquid Catalyzed Reactions - Green Concepts and Sustainable Applications

VCH

Spin States in Biochemistry and Inorganic Chemistry

Influence on Structure and

Reactivity

John Wiley & Sons It has long been recognized that metal spin states play a central role in the reactivity of important biomolecules, in industrial catalysis and in spin crossover compounds. As the fields of inorganic chemistry and catalysis move towards the use of cheap, non-toxic first row transition metals, it is essential to understand the important role of spin states in influencing molecular structure, bonding and reactivity. *Spin States in Biochemistry and Inorganic Chemistry* provides a complete picture on the importance of spin states for reactivity in biochemistry and inorganic chemistry, presenting both theoretical and experimental perspectives. The successes and pitfalls of theoretical methods such as DFT, ligand-field theory and coupled cluster theory are discussed, and these methods are applied in studies throughout the book. Important spectroscopic techniques to determine spin states in transition metal complexes and proteins are explained, and the use of NMR for the analysis of spin densities is described. Topics covered include: DFT and ab initio wavefunction approaches to spin states Experimental techniques for determining spin states Molecular discovery in spin crossover Multiple spin state scenarios in organometallic reactivity and gas phase reactions Transition-metal complexes involving redox non-innocent ligands Polynuclear iron sulfur clusters Molecular magnetism NMR analysis of spin densities This book is a valuable reference for researchers working in bioinorganic and inorganic chemistry, computational chemistry, organometallic chemistry, catalysis, spin-crossover materials, materials science, biophysics and pharmaceutical chemistry.

Wiley's Remediation Technologies Handbook

Major Contaminant Chemicals and Chemical Groups

John Wiley & Sons Wiley's Remediation Technologies Handbook: Major Contaminant Chemicals and Chemical Groups, extracted from the Enviroglobedatabase, consists of 368 chemicals and chemical groups. This book lists in alphabetical order these chemical and chemical groups along with the numerous technologies, many of which are patented, or trademarked techniques, to remediate them. A short description of each of these technologies is provided along with appropriate references. Wiley's Remediation Technologies Handbook: Major Contaminant Chemicals and Chemical Groups: Covers the most important chemical and chemical groups that are found to pollute the environment, and the ways to remediate them. Gives succinct abstract describing the numerous technologies used to clean-up a wide range of pollutants. Provides the uses and limitations of each technique. Note: CD-ROM/DVD and other supplementary

materials are not included as part of eBook file.

Principles of Ionic Organic Reactions Organic Chemistry

John Wiley & Sons Incorporated Readers will find that this highly acclaimed book offers a balanced approach to functional groups and mechanisms. The presentation of key concepts will help them master basic skills. Throughout the focus is placed on the ideas of organic chemistry and backs them up with illustrations and challenging problems.

Gaseous Molecular Ions

An Introduction to Elementary Processes Induced by Ionization

Springer Science & Business Media Most of the matter in our solar system, and, probably, within the whole universe, exists in the form of ionized particles. On the other hand, in our natural environment, gaseous matter generally consists of neutral atoms and molecules. Only under certain conditions, such as within the path of lightning or in several technical devices (e. g. gas discharges, rocket engines, etc.) will some of the atoms and molecules be ionized. It is also believed that the chemistry of the earth's troposphere predominantly proceeds via reactions between neutral particles. (The complex system of atmospheric chemistry will be treated in one of the forthcoming volumes to this series.) Why, then, are ions considered so important that hundreds of laboratories all over the world (including some of the most prestigious) are involved in research programs on ions, covering many different facets, from biochemistry to physics? One may obtain as many different answers as there are research groups busy in this field. There is, however, one simple, common feature which makes it attractive to work with ions: since they carry one or more net elementary charges, they can easily be guided, focused or separated by appropriate electric and magnetic fields, and, last but not least, they can easily be detected. Apart from these advantages, which are welcome and appreciated by the researcher, the study of molecular ions can provide insight into very fundamental aspects of the general behavior of molecules.

Ion-molecule reactions, by E.W. McDaniel

Molecular Orbitals and Organic Chemical Reactions

Wiley Winner of the PROSE Award for Chemistry & Physics 2010 Acknowledging the very best in professional and scholarly publishing, the annual PROSE Awards recognise publishers' and authors' commitment to pioneering works of research and for contributing to the conception, production, and design of landmark works in their fields. Judged by peer publishers, librarians, and medical professionals, Wiley are pleased to congratulate Professor Ian Fleming, winner of the PROSE Award in Chemistry and Physics for Molecular Orbitals and Organic Chemical Reactions. Molecular orbital theory is used by chemists to describe the arrangement of electrons in chemical structures. It is also a theory capable of giving some insight into the forces involved in the making and breaking of chemical bonds—the chemical reactions that are often the focus of an organic chemist's interest. Organic chemists with a serious interest in understanding and explaining their work usually express their ideas in molecular orbital terms, so much so that it is now an essential component of every organic chemist's skills to have some acquaintance with molecular orbital theory. Molecular Orbitals and Organic Chemical Reactions is both a simplified account of molecular orbital theory and a review of its applications in organic chemistry; it provides a basic introduction to the subject and a wealth of illustrative examples. In this book molecular orbital theory is presented in a much simplified, and entirely non-mathematical language, accessible to every organic chemist, whether student or research worker, whether mathematically competent or not. Topics covered include: Molecular Orbital Theory Molecular Orbitals and the Structures of Organic Molecules Chemical Reactions — How Far and How Fast Ionic Reactions — Reactivity Ionic Reactions — Stereochemistry Pericyclic Reactions Radical Reactions Photochemical Reactions Slides for lectures and presentations are available on the supplementary website: www.wiley.com/go/fleming_student Molecular Orbitals and Organic Chemical Reactions: Student Edition is an invaluable first textbook on this important subject for students of organic, physical organic and computational chemistry. The Reference Edition edition takes the content and the same non-mathematical approach of the Student Edition, and adds extensive extra subject coverage, detail and over 1500 references. The additional material adds a deeper understanding of the models used, and includes a broader range of applications and case studies. Providing a complete in-depth reference for a more advanced audience, this edition will find a place on the bookshelves of researchers and advanced students of organic, physical organic and computational chemistry. Further information can be viewed here. "These books are the result of years of work, which began as an attempt to write a second edition of my 1976 book Frontier Orbitals and Organic Chemical Reactions. I wanted to give a rather more thorough introduction to molecular orbitals, while maintaining my focus on the organic chemist who did not want a mathematical account, but still wanted to understand organic chemistry at a physical level. I'm delighted to win this prize, and hope a new generation of chemists will benefit from these books." -Professor Ian Fleming

Ion Solvation

John Wiley & Sons Chemical reactions generally take place in solution and often involve ions. The behaviour of ions in solution, manifested through ion solvation, is therefore of prime interest in chemistry. This book considers in depth the phenomenology of ion solvation and the models and interpretations that have been proposed as the physical causes for the observed phenomena. It contains a thorough discussion of the statistical thermodynamic background of the solvation process from which a discussion of the actual thermodynamics is developed. This, in turn, serves as a background to the structural and kinetic features of ion solvation.