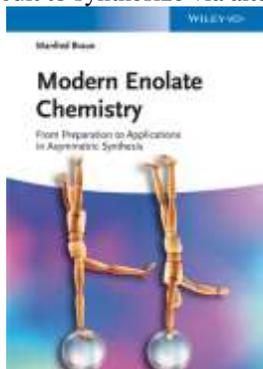


Domino and Intramolecular Rearrangement Reactions as Advanced Synthetic Methods in Glycscience

Edited by Zbigniew J. Witzczak and Roman Bielski
QP702.G577 D66 2016

Each chapter in this book is written by experts in the fields of domino reactions or intramolecular rearrangements and describes their current research. Although many recently isolated carbohydrates fulfill various sophisticated functions, their structures are often very complex. Domino reactions and intramolecular rearrangements offer an elegant and convenient approach to the synthesis of many complex molecules, which are normally difficult to synthesize via alternative routes.



Modern Enolate Chemistry: From Preparation to Applications in Asymmetric Synthesis

By Manfred Braun
QD305.A6 B72 2016

This text presents modern enolate chemistry with an emphasis on metal O-enolates in asymmetric synthesis.

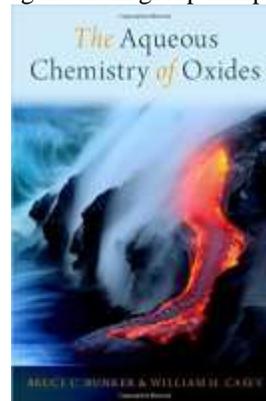
While great care is taken to cover novel, successful concepts, such classical methods as the famous Evans enolates are equally highlighted. Throughout the book representative reaction procedures are presented, thus helping readers to find the best solution for their own synthetic problem.



Organic Redox Systems: Synthesis, Properties, and Applications

Edited by Tohru Nishinaga
QD716.O95 O74 2016

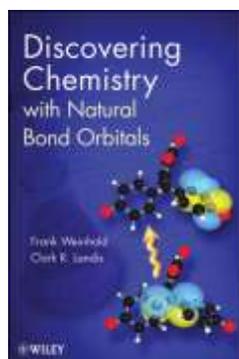
This book describes methods for the preparation and application of redox systems for organic electronic materials such as transistors, photovoltaics, and batteries. It covers bond formation and cleavage, supramolecular systems, molecular design, and synthesis and properties, addresses preparative methods, unique structural features, physical properties, and material applications of redox active p-conjugated systems, and focuses on the transition-metal-free redox systems composed of organic and organo main group compounds.



The Aqueous Chemistry of Oxides

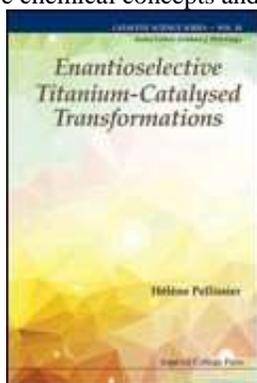
By Bruce C. Bunker and William H. Casey
QD181.O1 B86 2016

This volume is organized into five key sections. Part One features two introductory chapters. Part Two provides the key principles that are critical to understanding most of the major reactions between water and oxides. Part Three deals with the synthesis of oxide materials in aqueous media. Part Four deals with oxide-water reactions and their environmental and technological impacts, and Part Five is devoted to other types of relevant reactions. This book provides a comprehensive summary of all of the critical reactions between oxides and water in a single volume. As such, it ties together a wide range of existing books and literature into a central location that provides a key reference for understanding and accessing a broad range of more specialized topics.



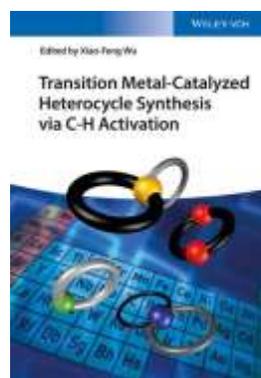
Discovering Chemistry with Natural Bond Orbitals
By Frank Weinhold and Clark R. Landis
QD461.W45 2012

This book explores chemical bonds, their intrinsic energies, and the corresponding dissociation energies. It focuses on conceptual quantum chemistry, a key area for understanding chemical principles and predicting chemical properties. It presents NBO mathematical algorithms embedded in a well-tested and widely used computer program (currently NBO 5.9). While encouraging a "look under the hood" (Appendix A), this book enables students to gain proficiency in using the NBO program to re-express complex wavefunctions in terms of intuitive chemical concepts and orbital imagery.



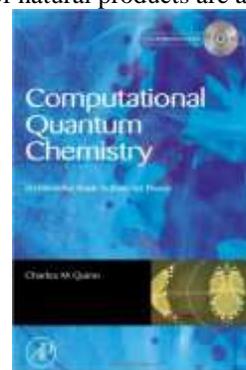
Enantioselective Titanium-Catalysed Transformations
By Hélène Pellissier
QD505.P463 2016

Chiral titanium complexes are low-cost, low-toxicity, and high-efficiency catalysts. Impressive progress on enantioselective titanium-catalysed transformations has been achieved in the past seven years, with exciting new discoveries ranging from basic reactions to novel methodologies. Despite this, the field has not been substantially reviewed since 2008. This book contains up-to-date research and covers all types of enantioselective transformations using chiral titanium catalysts. It illustrates the economic, health, and environmental benefits of chiral titanium catalysts, showing the types of highly enantioselective reactions that they are able to induce are unlimited.



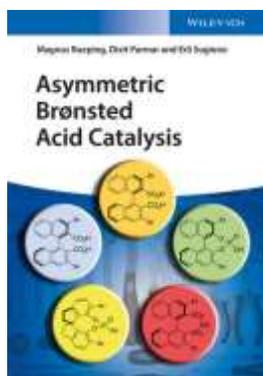
Transition Metal-Catalyzed Heterocycle Synthesis via C-H Activation
Edited by Xiao-Feng Wu
QD400.W9 2016

Reflecting the tremendous growth of this field in recent years, this book covers C-H activation with a focus on heterocycle synthesis. It provides general mechanistic aspects and gives a comprehensive overview of catalytic reactions in the presence of palladium, rhodium, ruthenium, copper, iron, cobalt, and iridium. The chapters are organized according to the transition metal used and sub-divided by type of heterocycle formed to enable quick access to the synthetic route needed. Chapters on carbonylative synthesis of heterocycles and the application of C-H activation methodology to the synthesis of natural products are also included.



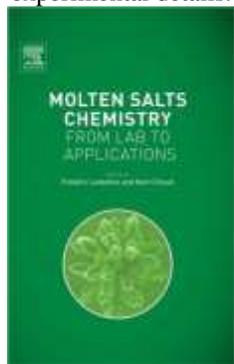
Computational Quantum Chemistry
By Charles M. Quinn
QD462.6.D38 Q35 2002

This text removes much of the mystery of modern computer programs for molecular orbital calculations by showing how to develop Excel spreadsheets to perform model calculations and investigate the properties of basis sets. Using the book together with the CD-ROM provides a unique interactive learning tool. In addition, because of the integration of theory with working examples on the CD-ROM, the reader can apply advanced features available in the spreadsheet to other applications in chemistry, physics, and a variety of disciplines that require the solution of differential equations.



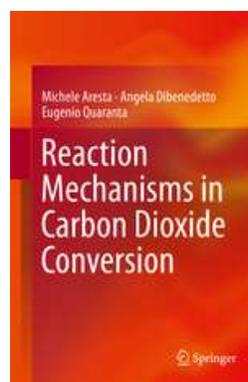
Asymmetric Brønsted Acid Catalysis
By Magnus Rueping, Dixit Parmar, and Erli Sugiono
QD505.R84 2016

A much-needed overview of the synthesis of chiral Brønsted acids and their applications in various organic transformations. The authors summarize the most significant advances in this new and dynamically progressing field, with a special emphasis on BINOL-derived phosphoric acids. They also describe other catalysts, such as C-H, TADDOL-derived Brønsted, and sulfonic acids. For easy navigation, the chapters are organized first by reactive intermediate and then subdivided by reaction type. An appendix contains selected experimental details.



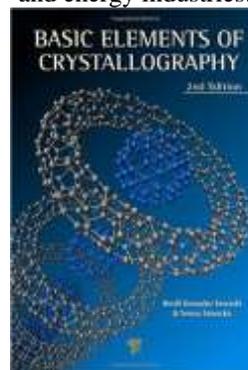
Molten Salts Chemistry: From Lab to Applications
Edited by Frédéric Lantelme and Henri Groult
QD189.M597 2013

This text examines how the electrical and thermal properties of molten salts are well-suited to high temperature chemistry, enabling fast reaction rates. It also explains how their ability to dissolve many inorganic compounds make molten salts ideal as solvents in electrometallurgy, metal coating, treatment of by-products and energy conversion. This book also reviews newer applications of molten salts including materials for energy storage such as carbon nano-particles for efficient super capacitors, high capacity molten salt batteries and for heat transport and storage in solar plants. In addition, they are considered ideal candidates for the development of safer nuclear reactors and for the treatment of nuclear waste, especially to separate actinides from lanthanides by electrorefining.



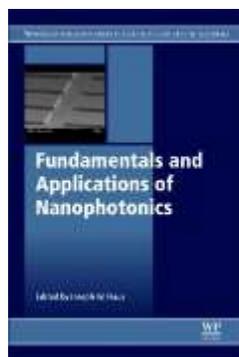
Reaction Mechanisms in Carbon Dioxide Conversion
By Michele Aresta, Angela Dibenedetto, and Eugenio Quaranta
QD181.C1 A74 2016

This book provides an analysis of the reaction mechanisms relevant in the conversion of CO₂ into other products including specialty chemicals and fuels. For each reaction, the mechanism is analyzed in order to highlight the known and obscure reaction steps. Advancing knowledge of the lesser known reactions helps to develop efficient routes for the conversion of CO₂ into valuable products useful in both the chemical and energy industries.



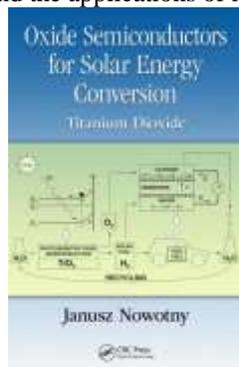
Basic Elements of Crystallography
By Nevill Gonzalez Szwacki and Teresa Szwacka
QD905.2.S99 2016

This textbook is a complete and clear introduction to the field of crystallography. It includes an extensive discussion on the 14 Bravais lattices and their reciprocals, the basic concepts of point- and space-group symmetry, and the crystal structure of elements and binary compounds. The purpose of this textbook is to illustrate rather than describe the structure of materials. Even readers who are completely unfamiliar with the topic, but still interested in learning how the atoms are arranged in crystal structures, will find this book immensely useful. Each chapter is accompanied by exercises designed to encourage students to explore the different crystal structures they are learning about. The solutions to the exercises are also provided at the end of the book.



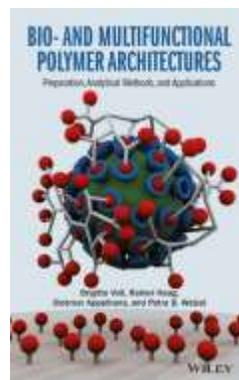
Fundamentals and Applications of Nanophotonics
Edited by Joseph W. Haus
TA1530.F86 2016

This text includes a comprehensive discussion of the field of nanophotonics, including key enabling technologies that have the potential to drive economic growth and impact numerous application domains. It gives readers the theoretical underpinnings needed to understand the latest advances in the field. After an introduction to the area, the text covers the essential topics of electrodynamics, quantum mechanics, and computation as they relate to nanophotonics. The remainder of the text explores materials for nanophotonics, fabrication and characterization techniques, and the applications of nanophotonics.



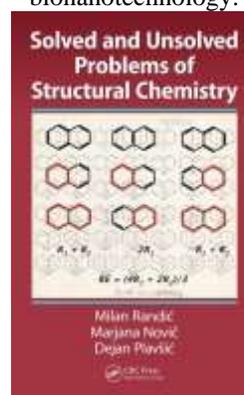
Oxide Semiconductors for Solar Energy Conversion: Titanium Dioxide
By Janusz Nowotny
TJ811.N69 2012

The book provides a general background on oxide semiconductors based on binary oxides and their solid solutions. It covers several aspects of solid-state electrochemistry of oxides including defect chemistry and defect-related properties. The author also takes a pioneering approach in considering bulk versus surface semiconducting properties, showing how they are different due to the effect of segregation. Encompassing the areas of solid-state science, surface chemistry, and photocatalysis, this book reflects the increasing awareness of the importance of structural imperfections, in understanding the properties of metal oxides, specifically TiO₂-based semiconductors.



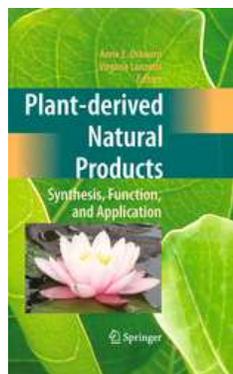
Bio- and Multifunctional Polymer Architectures: Preparation, Analytical Methods, and Applications
By Brigitte Volt, Rainer Haag, Dietmar Appelhans, and Petra B. Welzel
TP248.65.P62 A67 2016

This reference/text addresses concepts and synthetic techniques for the preparation of polymers for state-of-the-art use in biomedicine, synthetic biology, and bionanotechnology.



Solved and Unsolved Problems of Structural Chemistry
By Milan Randić, Marjana Novič, Dejan Plavšić
QD471.R36 2016

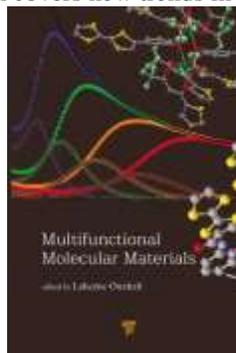
This text introduces new methods and approaches for solving problems related to molecular structure. It includes numerous topics ranging from aromaticity to the graphical and numerical characterization of DNA. It also outlines the construction of novel tools using techniques from discrete mathematics. It discusses a number of important problems in chemistry that have not been fully understood or fully appreciated, including those which have resulted in only partially solved problems and approximated solutions. It collects results that were once scattered in scientific literature into a thoughtful and compact volume that sheds light on numerous problems in chemistry, including those that appeared to have been solved but were actually only partially solved. Most importantly, it shows more complete solutions as well as methods and approaches that can lead to actualization of further solutions to problems in chemistry.



Plant-Derived Natural Products: Synthesis, Function, and Application
Edited by Anne E. Osbourn and Virginia Lanzotti
QK861.P53 2009

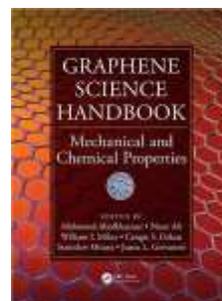
Plants produce a huge array of natural products that serve as sources for drugs, flavouring agents, fragrances and other applications. Rapid progress has been made in recent years in understanding natural product synthesis, regulation and function and the evolution of metabolic diversity. It is timely to bring this information together with contemporary advances in chemistry, plant biology, ecology, agronomy and human health to provide a comprehensive guide to plant-derived natural products.

This text provides an informative and accessible overview of the different facets of the field, ranging from an introduction to the classes of natural products through developments in natural product chemistry and biology to ecological interactions and the significance of plant-derived natural products for humans. The final section of the book covers new trends in the field.



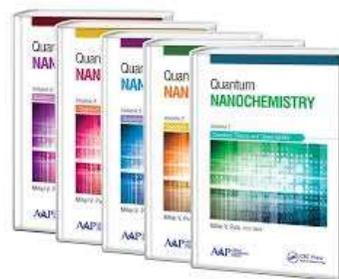
Multifunctional Molecular Materials
Edited by Lahcène Ouahab
TA418.9.N35 M8 2013

This book provides a comprehensive overview of multifunctional molecular materials focusing on electrical conductivity, magnetism, single-molecule magnets behavior, chirality, spin crossover, and luminescence. The book's coverage ranges from transition metals and lanthanide coordination complexes to genuine organic materials. It also discusses some potentialities of applications of these materials in molecule-based devices.



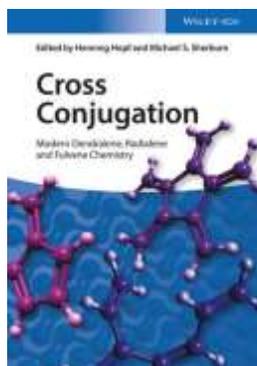
Graphene Science Handbook: Mechanical and Chemical Properties
Edited by Mahmood Aliofkhazraei, et al.
QD341.H9 G686 2016

This book is dedicated to the mechanical and chemical properties of graphene. Topics covered include: the mechanical properties of graphene, results of theoretical investigations of the mechanical properties of graphene structures, mechanical stabilities and properties of graphene under strain, different types of graphene devices for biomolecule and gas sensing, printed graphene-based electrochemical sensor technology, chemical vapor deposition of graphene on copper, graphene modification, graphene in solar cells, and changes at the micrometric and nanometric scales.



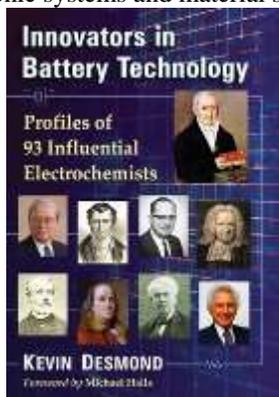
Quantum Nanochemistry
By Mihai V. Putz
QD462.P89 2016

This 5-volume set presents the concepts, principles, and models of quanta, atoms, molecules, solids, and crystal and chemical-biological interaction in cells. It also addresses the first and novel combinations and applications in modeling complex natural or designed phenomena. The author approaches the systematics of atoms-in-molecule progressive modeling, in relation to chemical reactivity indices that are rooted in the electronegativity and chemical hardness prime chemical descriptors, considers the influence of chemical bonding extended to chemical-biological interaction in cells and organisms, and covers the relevant connections with chemistry and atomic/molecular structures for the constituent particles/nodes in crystals and solids, including the propagation of defects on graphenes. The work is rigorously and analytically presented in a flexible physical-chemical style.



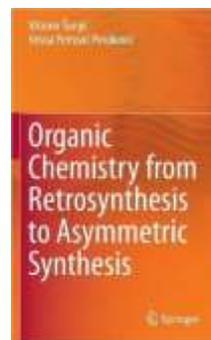
Cross Conjugation: Modern Dendralene, Radialene and Fulvene Chemistry
Edited by Henning Hopf and Michael S. Sherburn
QP517.B49 C67 2016

Filling a gap in the market, this handbook provides a comprehensive overview of the fascinating and expanding field of cross-conjugated molecules, their chemistry, synthesis and properties. The editors have assembled here a team of experts to discuss different classes of molecules, as well as the use of cross-conjugation for organic synthesis and applications in electronic systems and material science.



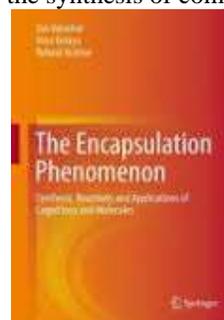
Innovators in Battery Technology: Profiles of 93 Influential Electrochemists
By Kevin Desmond
QD21.D47 2016

This biographical dictionary profiles 95 electrochemists from 19 nations who during the past 270 years have researched and developed ever more efficient batteries and energy cells. Each entry traces the subject's origin, education, discoveries and patents, as well as hobbies and family life. The breakthroughs of early innovators are cataloged, and the work of living scientists and technicians is brought up to date. An appendix provides a cross-referenced timeline of innovation.



Organic Chemistry from Retrosynthesis to Asymmetric Synthesis
By Vitomir Šunjić and Vesna Petrović Peroković
QD262.V58 2016

This book connects a retrosynthetic approach with synthetic methods in the preparation of target molecules from simple, achiral ones to complex, chiral structures in the optically pure form. Retrosynthetic considerations and asymmetric syntheses are presented as closely related topics, underlining the importance of retrosynthetic consideration of target molecules. This approach prepares students in advanced organic chemistry courses, and in particular young scientists working at academic and industrial laboratories, for independently solving synthetic problems and creating proposals for the synthesis of complex structures.



The Encapsulation Phenomenon: Synthesis, Reactivity and Applications of Caged Ions and Molecules
By Yan Voloshin, Irina Belaya, and Roland Krämer
QD471.V656 2016

This book presents a comprehensive summary of the current state of the chemistry of cage compounds. It introduces different ways ions and molecules can be encapsulated by three-dimensional caging ligands to form molecular and polymeric species and discusses their classification, reactivity, and applications. The unique physical and chemical properties of caged ions and molecules open up a range of applications including separation, catalysis, and sensing. The text is structured by the types of caging ligands and then further arranged by ligand class and type of encapsulated species making this a useful reference resource and summary of the current state of research into encapsulated species.