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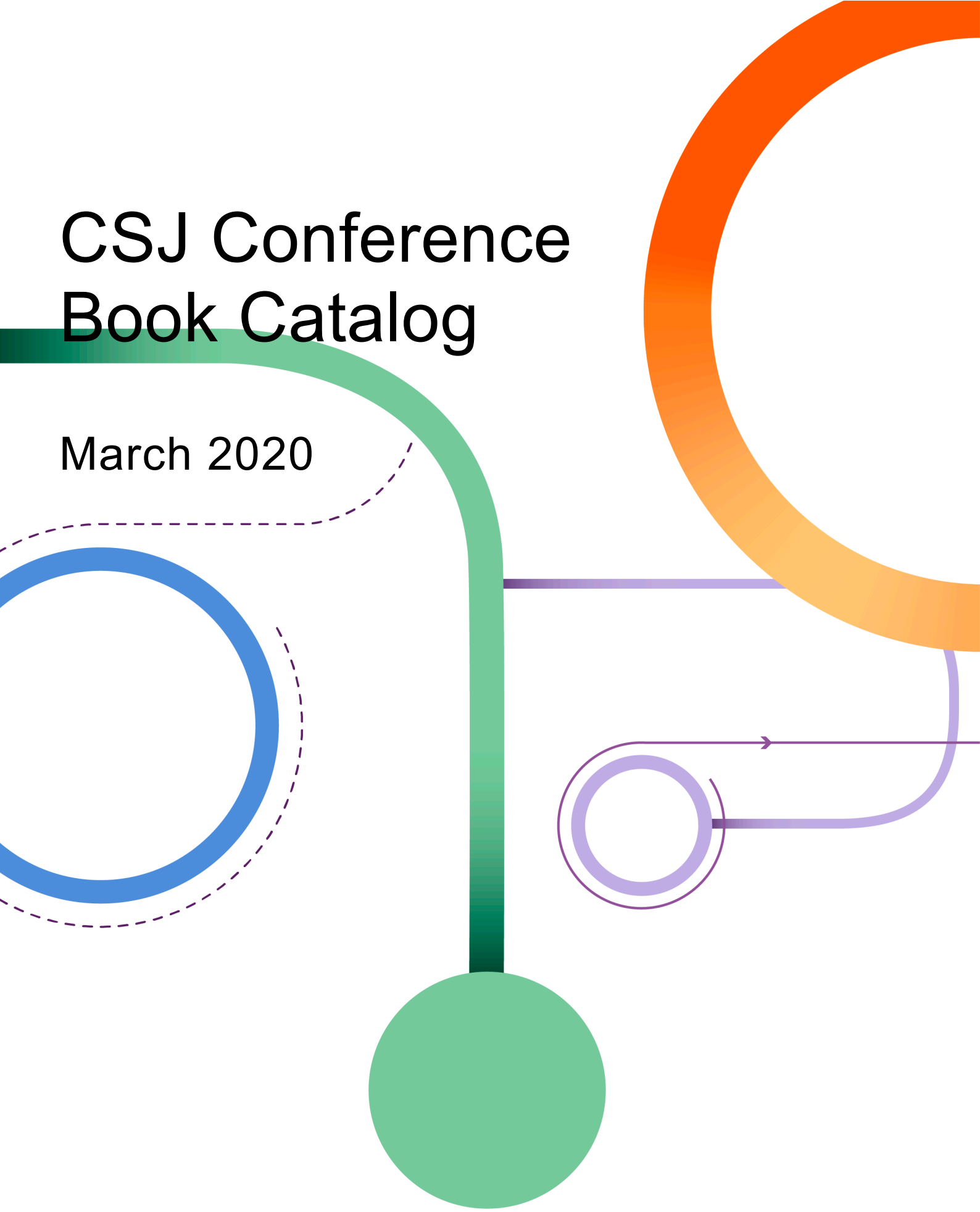
March 2020



WILEY

CONTENTS

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Mathematics for Enzyme Reaction Kinetics and Reactor Performance

F. XAVIER MALCATA

Instituto Superior da Maia

Mathematics for Enzyme Reaction Kinetics and Reactor Performance is the first set in a unique 11 volume-collection on *Enzyme Reactor Engineering*. This two volume-set relates specifically to the wide mathematical background required for systematic and rational simulation of both reaction kinetics and reactor performance; and to fully understand and capitalize on the modelling concepts developed. It accordingly reviews basic and useful concepts of Algebra (first volume), and Calculus and Statistics (second volume). A brief overview of such native algebraic entities as scalars, vectors, matrices and determinants constitutes the starting point of the first volume; the major features of germane functions are then addressed. Vector operations ensue, followed by calculation of determinants. Finally, exact methods for solution of selected algebraic equations -- including sets of linear equations, are considered, as well as numerical methods for utilization at large.

The second volume begins with an introduction to basic concepts in calculus, i.e. limits, derivatives, integrals and differential equations; limits, along with continuity, are further expanded afterwards, covering uni- and multivariate cases, as well as classical theorems. After recovering the concept of differential and applying it to generate (regular and partial) derivatives, the most important rules of differentiation of functions, in explicit, implicit and parametric form, are retrieved -- together with the nuclear theorems supporting simpler manipulation thereof. The book then tackles strategies to optimize uni- and multivariate functions, before addressing integrals in both indefinite and definite forms. Next, the book touches on the methods of solution of differential equations for practical applications, followed by analytical geometry and vector calculus. Brief coverage of statistics--including continuous probability functions, statistical descriptors and statistical hypothesis testing, brings the second volume to a close.

SERIES: ENZYME REACTION ENGINEERING

APRIL 2020 UnknownPP
978-1-119-49028-9 CL $350.00 (Japan) ¥42,000
General & Introductory Chemical Engineering

Essentials of Fluidization

JOHN R. GRACE, XIAOTAO BI & NAOKO ELLIS

A concise and clear introduction to the basics of fluidization, with a view to its applications in the process and energy industries.

APRIL 2020 632PP
978-3-527-34064-4 CL $116.76 (Japan) ¥14,000
Chemical Engineering Fundamentals

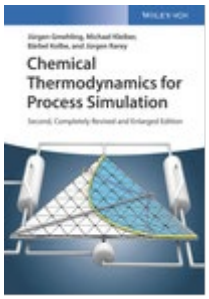
Chemical Thermodynamics for Process Simulation

2nd, Completely Revised and Enlarged Edition

J&UUML;RGEN GMEHLING, MICHAEL KLEIBER, B&AUML;RBEL KOLBE & J&UUML;RGEN RAREY

Universitat Oldenburg, Fachbereich Chemie/Techn; ThyssenKrupp Uhde GmbH; ThyssenKrupp Uhde GmbH; Universitat Oldenburg, Oldenburg, Ge

The only textbook that applies thermodynamics to real-world process engineering problems



This must-read for advanced students and professionals alike is the first book to demonstrate how chemical thermodynamics work in the real world by applying them to actual engineering examples. It also discusses the advantages and disadvantages of the particular models and procedures, and explains the most important models that are applied in process industry. All the topics are illustrated with examples that are closely related to practical process simulation problems. At the end of each chapter, additional calculation examples are given to enable readers to extend their comprehension.

Chemical Thermodynamics for Process Simulation instructs on the behavior of fluids for pure fluids, describing the main types of equations of state and their abilities. It discusses the various quantities of interest in process simulation, their correlation, and prediction in detail. Chapters look at the important terms for the description of the thermodynamics of mixtures; the most important models and routes for phase equilibrium calculation; models which are applicable to a wide variety of non-electrolyte systems; membrane processes; polymer thermodynamics; enthalpy of reaction; chemical equilibria, and more.

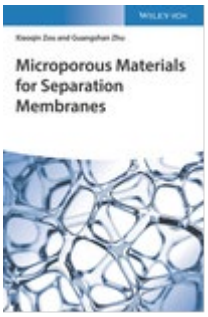
Chemical Thermodynamics for Process Simulation is an ideal resource for those working in the fields of process development, process synthesis, or process optimization, and an excellent book for students in the engineering sciences.

APRIL 2019 808PP
978-3-527-34325-6 PB $122.50 (Japan) ¥14,700
PROCESS ENGINEERING

Microporous Materials for Separation Membranes

XIAOQIN ZOU & GUANGSHAN ZHU

A guide to membrane separation based on a variety of porous materials with promising separation applications



Microporous Materials for Separation Membranes offers an in-depth guide that explores microporous materials? potential for membrane applications. The authors - two experts on the topic - examine a wide range of porous materials that have application potential including: microporous silica, porous carbons, zeolites, metal-organic frameworks (MOFs), and porous organic frameworks (POFs).

Comprehensive in scope, the book covers a broad range of topics on membrane separations such as: hydrogen recovery, carbon dioxide capture, air purification, hydrocarbon separation, pervaporation, and water treatment. In addition, this up-to-date resource explores the most recent materials for preparing microporous membranes and explores the most promising applications for industrial use. This important book:

-Examines the use of microporous materials as membranes to perform with different gases and liquids
-Offers an overview of the basic knowledge of membrane separation and an intense examination of separations
-Describes the state-of-the-art of membrane separation with porous materials
-Highlights the most promising applications of industrial interest

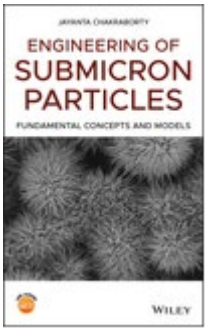
Written for scientists working in the fields of membranes, gas and liquid, Microporous Materials for Separation Membranes offers a valuable guide to the potential of microporous materials for membrane applications.

JULY 2019 472PP
978-3-527-34397-3 CL $213.25 (Japan) ¥25,500
Separations

Engineering of Submicron Particles

Fundamental Concepts and Models

JAYANTA CHAKRABORTY



Brings together in one place the fundamental theory and models, and the practical aspects of submicron particle engineering

This book attempts to resolve the tricky aspects of engineering submicron particles by discussing the fundamental theories of frequently used research tools--both theoretical and experimental. The first part covers the Fundamental Models and includes sections on nucleation, growth, inter-molecular and inter-particle forces, colloidal stability, and kinetics. The second part examines the Modelling of a Suspension and features chapters on fundamental concepts of particulate systems, writing the number balance, modelling systems with particle breakage and aggregation, and Monte Carlo simulation. The book also offers plenty of diagrams, software, examples, brief experimental demonstrations, and exercises with answers.

Engineering of Submicron Particles: Fundamental Concepts and Models offers a lengthy discussion of classical nucleation theory, and introduces other nucleation mechanisms like organizer mechanisms. It also looks at older growth models like diffusion controlled or surface nucleation controlled growth, along with new generation models like connected net analysis. Aggregation models and inter-particle potentials are touched upon in a prelude on intermolecular and surface forces. The book also provides analytical and numerical solutions of population balance models so readers can solve basic population balance equations independently.

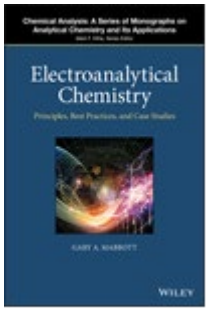
- Presents the fundamental theory, practical aspects, and models of submicron particle engineering
- Teaches readers to write number balances for their own system of interest
- Provides software with open code for solution of population balance model through discretization
- Filled with diagrams, examples, demonstrations, and exercises

AUGUST 2019 240PP
978-1-119-29646-1 CL $145.50 (Japan) ¥17,400
Particle Technology & Product Design

Electroanalytical Chemistry

Principles, Best Practices, and Case Studies

GARY A. MABBOTT



Provides a strong foundation in electrochemical principles and best practices

Written for undergraduate majors in chemistry and chemical engineering, this book teaches the basic principles of electroanalytical chemistry and illustrates best practices through the use of case studies of organic reactions and catalysis using voltammetric methods and of the measurement of clinical and environmental analytes by potentiometric techniques. It provides insight beyond the field of analysis as students address problems arising in many areas of science and technology. The book also emphasizes electrochemical phenomena and conceptual models to help readers understand the influence of experimental conditions and the interpretation of results for common potentiometric and voltammetric methods.

Electroanalytical Chemistry: Principles, Best Practices, and Case Studies begins by introducing some basic concepts in electrical phenomena. It then moves on to a chapter that examines the potentiometry of oxidation-reduction processes, followed by another on the potentiometry of ion selective electrodes. Other sections look at: applications of ion selective electrodes; controlled potential methods; case studies in controlled potential methods; and instrumentation. The book also features several appendixes covering: Ionic Strength, Activity and Activity Coefficients; The Nicolsky-Eisenman Equation; The Henderson Equation for Liquid Junction Potentials; Selected Standard Electrode Potentials; and The Nernst Equation Derivation.

Electroanalytical Chemistry: Principles, Best Practices, and Case Studies is an ideal textbook for undergraduate majors in chemistry and chemical engineering taking instrumental analysis courses. It would also benefit professional chemists who need an introduction to potentiometry or voltammetry.

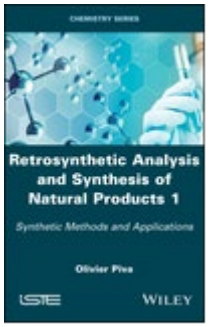
SERIES: CHEMICAL ANALYSIS: A SERIES OF MONOGRAPHS ON ANALYTICAL CHEMISTRY AND ITS APPLICATIONS

MAY 2020 352PP
978-1-119-53859-2 CL $135.00 (Japan) ¥16,200
Analytical Chemistry

Retrosynthetic Analysis and Synthesis of Natural Products 1

Synthetic Methods and Applications

OLIVIER PIVA



For chemists, attempting to mimic nature by synthesizing complex natural products from raw material is a challenge that is fraught with pitfalls. To tackle this unique but potentially rewarding task, researchers can rely on well-established reactions and methods of practice, or apply their own synthesis methods to verify their potential. Whatever the goal and its complexity, there are multiple ways of achieving it. We must now establish a strategic and effective plan that requires the minimum number of steps, but lends itself to widespread use.

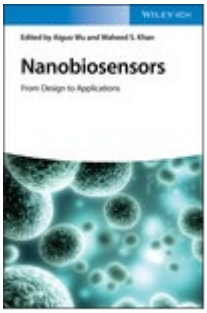
This book is structured around the study of a dozen target products (butyrolactone, macrolide, indole compound, cyclobutanic terpene, spiro- and polycyclic derivatives, etc.). For each product, the different disconnections are presented and the associated syntheses are analyzed step by step. The key reactions are described explicitly, followed by diagrams showing the range of impact of certain transformations. This set of data alone is conducive to understanding syntheses and indulging in this difficult, but worthwhile activity.

OCTOBER 2019 314PP
978-1-78630-349-3 CL $155.00 (Japan) ¥18,600
Analytical Chemistry

Nanobiosensors

From Design to Applications

EDITOR AIGUO WU & EDITOR WAHEED S. KHAN



Containing cutting edge research on the hot topic of nanobiosensor, this book will become highly read

Biosensor research has recently re-emerged as most vibrant area in recent years particularly after the advent of novel nanomaterials of multidimensional features and compositions. Nanomaterials of different types and striking properties have played a positive role in giving the boost and accelerated pace to biosensors development technology.

Nanobiosensors - From Design to Applications covers several aspects of biosensors beginning from the basic concepts to advanced level research. It will help to bridge the gap between various aspects of biosensors development technology and applications. It covers biosensors related material in broad spectrum such as basic concepts, biosensors & their classification, biomarkers & their role in biosensors, nanostructures-based biosensors, applications of biosensors in human diseases, drug detection, toxins, and smart phone based biosensors. *Nanobiosensors - From Design to Applications* will prove a source of inspiration for research on biosensors, their local level development and consequently using for practical application in different industries such as food, biomedical diagnosis, pharmaceutics, agriculture, drug discovery, forensics, etc.

Nanobiosensors - From Design to Applications is a resource for polymer chemists, spectroscopists, materials scientists, physical chemists, surface chemists, and surface physicists.

APRIL 2020 416PP
978-3-527-34510-6 CL $205.00 (Japan) ¥24,600
Analytical Chemistry

International Tables for Crystallography, Volume H International Tables for Crystallography

Powder diffraction, Volume H

EDITOR C.J GILMORE, EDITOR J.A. KADUK & EDITOR H. SCHENK

Powder diffraction is the mostly widely used crystallographic method, with applications spanning all aspects of structural science. This new volume of *International Tables for Crystallography* covers all aspects of the technique with over 50 chapters written by experts in the field.

Consisting of seven parts, this volume:

- Provides an overview of the principles of powder diffraction.
- Discusses the radiation sources used for powder-diffraction studies, instrumentation, the use of different sample environments and methods of sample preparation.
- Covers methodology, including data processing, indexing and reduction, whole-pattern modelling and quantitative analysis. An overview of the relevant crystallographic databases is also provided.
- Focuses on structure determination (including real- and reciprocal-space methods and the maximum-entropy method), structure refinement and structure validation.
- Discusses defects, texture and microstructure, including stress and strain, domain size and thin films.
- Reviews the available software for powder diffraction.
- Describes applications to many areas of industrial and academic importance, including macromolecules, minerals and mining, pharmaceuticals, ceramics, cement, superconductors, pigments, forensic science, archaeology, energy storage, petrochemicals and aluminium production.

Volume H is the key reference for all powder diffractionists from beginners to advanced practitioners and has been designed to be a practical volume without sacrificing rigour. Many examples of the powder-diffraction method are discussed in detail, and in several cases the data used in the examples are available for the reader to download.

SERIES: IUCR SERIES. INTERNATIONAL TABLES FOR CRYSTALLOGRAPHY

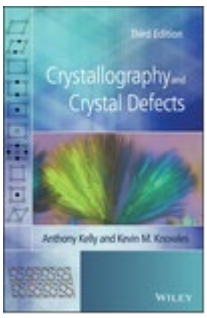
AUGUST 2019 930PP
978-1-118-41628-0 CL $450.00 (Japan) ¥54,000
Crystallography

Crystallography and Crystal Defects

3rd Edition

ANTHONY KELLY & KEVIN M. KNOWLES

University of Cambridge; University of Cambridge



The classic book that presents a unified approach to crystallography and the defects found within crystals, revised and updated

This new edition of *Crystallography and Crystal Defects* explains the modern concepts of crystallography in a clear, succinct manner and shows how to apply these concepts in the analyses of point, line and planar defects in crystalline materials.

Fully revised and updated, this book now includes:

- Original source references to key crystallographic terms familiar to materials scientists
- Expanded discussion on the elasticity of cubic materials
- New content on texture that contains more detail on Euler angles, orientation distribution functions and an expanded discussion on examples of textures in engineering materials
- Additional content on dislocations in materials of symmetry lower than cubic
- An expanded discussion of twinning which includes the description and classification of growth twins
- The inclusion and explanation of results from atomistic modelling of twin boundaries
- Problem sets with new questions, detailed worked solutions, supplementary lecture material and online computer programs for crystallographic calculations.

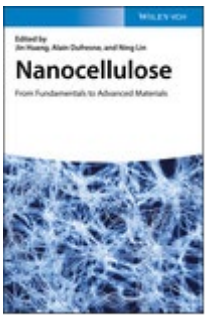
Written by authors with extensive lecturing experience at undergraduate level, *Crystallography and Crystal Defects, Third Edition* continues to take its place as the core text on the topic and provides the essential resource for students and researchers in metallurgy, materials science, physics, chemistry, electrical, civil and mechanical engineering.

APRIL 2020 584PP
978-1-119-42017-0 CL $90.00 (Japan) ¥10,800
CRYSTALLOGRAPHY

Nanocellulose

From Fundamentals to Advanced Materials

EDITOR JIN HUANG, EDITOR ALAIN DUFRESNE & EDITOR NING LIN



Comprehensively introduces readers to the production, modifications, and applications of nanocellulose

This book gives a thorough introduction to the structure, properties, surface modification, theory, mechanism of composites, and functional materials derived from nanocellulose. It also provides in-depth descriptions of plastics, composites, and functional nanomaterials specifically derived from cellulose nanocrystals, cellulose nanofibrils, and bacterial cellulose. It includes the most recent progress in developing a conceptual framework of nanocellulose, as well as its numerous applications in the design and manufacture of nanocomposites and functional nanomaterials. The book also looks at the relationship between structure and properties.

Featuring contributions from many noted experts in the field, Nanocellulose: From Fundamentals to Advanced Materials examines the current status of nanocomposites based on nanocelluloses. It covers surface modification of nanocellulose in the nanocomposites development; reinforcing mechanism of cellulose nanocrystals in nanocomposites; and advanced materials based on self-organization of cellulose nanocrystals. The book studies the role of cellulose nanofibrils in nanocomposites, as well as a potential application based on colloidal properties of cellulose nanocrystals. It also offers strategies to explore biomedical applications of nanocellulose.

-Provides comprehensive knowledge on the topic of nanocellulose, including the preparation, structure, properties, surface modification and strategy
-Covers new reports on the application of nanocellulose
-Summarizes three kinds of nanocellulose (cellulose nanocrystals, cellulose nanofibrils, and bacterial cellulose) and their production, modification, and applications

Nanocellulose: From Fundamentals to Advanced Materials is a useful resource for specialist researchers of chemistry, materials, and nanotechnology science, as well as for researchers and students of the subject.

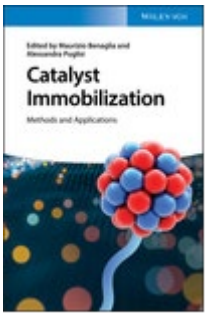
APRIL 2019 504PP
978-3-527-34269-3 CL $159.00 (Japan) ¥19,000
Cellulose/Paper/Textile Chemistry

Catalyst Immobilization

Methods and Applications

EDITOR MAURIZIO BENAGLIA & EDITOR ALESSANDRA PUGLISI

University of Milan



A comprehensive resource on techniques and applications for immobilizing catalysts

Catalyst Immobilization: Methods and Applications covers catalyst immobilization topics including technologies, materials, characterization, chemical activity, and recyclability. The book also presents innovative applications for supported catalysts, such as flow chemistry and machine-assisted organic synthesis.

Written by an international panel of expert contributors, this book outlines the general principles of catalyst immobilization and explores different types of supports employed in catalyst heterogenization. The book's chapters examine the immobilization of chiral organocatalysts, reactions in flow reactors, 3D printed devices for catalytic systems, and more. Catalyst Immobilization offers a modern vision and a broad and critical view of this exciting field. This important book:

-Offers a guide to supported and therefore recyclable catalysts, which is one of the most important tools for developing a highly sustainable chemistry
-Presents various immobilization techniques and applications
-Explores new trends, such as 3D printed devices for catalytic systems
-Contains information from a leading international team of authors

Written for catalytic chemists, organic chemists, process engineers, biochemists, surface chemists, materials scientists, analytical chemists, Catalyst Immobilization: Methods and Applications presents the latest developments and includes a review of the innovative trends such as flow chemistry, reactions in microreactors, and beyond.

JANUARY 2020 496PP
978-3-527-34509-0 CL $215.00 (Japan) ¥25,800
Catalysis

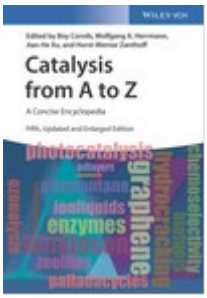
Catalysis from A to Z

A Concise Encyclopedia, 5th Edition

BOY CORNILS, WOLFGANG A. HERRMANN, JIAN-HE XU & HORST-WERNER ZANTHOFF

Hoechst AG, Frankfurt am Main, Germany; Technical University Munich, Garching, Germany; Scripps Res. Inst. La Jolla, California; Evonik Industries AG, Germany

Provides a complete and accessible A to Z collection of information on catalysis



This updated and enlarged must-have edition of a classic book on catalysis explains the important terms of all aspects of the subject - including biocatalysis, homogeneous catalysis, heterogeneous catalysis - as well as the terms associated with it. It also looks at related topics like spectroscopy or analytical methods. Featuring 20% more content than the previous edition, it comprehensively covers the topic in a clear and concise manner, and includes abbreviations, brief biographic entries of important scientists who have worked in catalysis, trade names, important catalytic processes, named reactions, reactions, and other important keywords in the general field of catalysis.

Written by more than 200 top scientists and with more than 15,000 entries on all aspects of catalysis, *Catalysis from A to Z: A Concise Encyclopedia*, 5th Edition is filled with figures, tables, cross-references, and references. It covers acids, ligands, catalytic reactions in organic synthesis, kinetics and thermodynamics of catalytic reactions, and catalyst labeling. The book also looks at theoretical backgrounds of catalytic reactions, industrial catalytic processes, autoclaves, colloids, nanomaterials, spectroscopically methods for catalyst analysis, and more.

Catalysis from A to Z: A Concise Encyclopedia is an ideal resource for every student, chemist, scientist, and engineer involved in catalytic chemistry, chemical engineering, biochemistry, organic chemistry, and more.

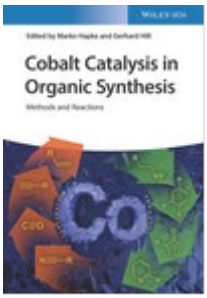
NOVEMBER 2019 2952PP
978-3-527-34311-9 CL $1200.00 (Japan) ¥144,000
CATALYSIS

Cobalt Catalysis in Organic Synthesis

Methods and Reactions

EDITOR MARKO HAPKE & EDITOR GERHARD HILT

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

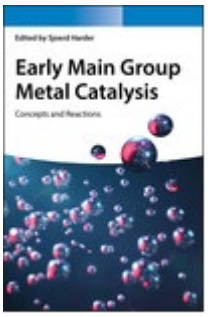
Cobalt Catalysis in Organic Synthesis is an ideal book for graduates and researchers in academia and industry working in the *field* of synthetic organic chemistry, catalysis, organometallic chemistry, and natural product synthesis.

FEBRUARY 2020 480PP
978-3-527-34450-5 CL $205.00 (Japan) ¥24,600
Catalysis

Early Main Group Metal Catalysis

Concepts and Reactions

EDITOR SJOERD HARDER



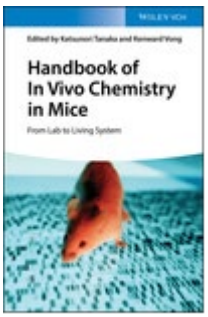
Early Main Group Metal Catalysis gives a comprehensive overview of catalytic reactions in the presence of group 1 and group 2 metals. Chapters are ordered to reaction type, contain educational elements and deal with concepts illustrated by examples that cover the main developments. After a short introduction on polar organometallic chemistry and synthesis of early main group metal complexes, a variety of catalytic reactions are described, e.g. polymerization of alkenes, hydroamination and phosphination reactions, hydrosilylation, hydroboration and hydrogenation catalysis, as well as enantioselective and Lewis-acid catalysis. The book addresses organic chemists and researchers in industry interested in the state-of-the-art and new possibilities of early main group metal catalysis as well as newcomers to the field. Written by a team of leaders in the field, it is a very welcome addition to the area of main group metal chemistry, and to the field of catalysis.

FEBRUARY 2020 400PP
978-3-527-34448-2 CL $205.00 (Japan) ¥24,600
Catalysis

Handbook of In Vivo Chemistry in Mice

From Lab to Living System

EDITOR KATSUNORI TANAKA & EDITOR KENWARD VONG



Provides timely, comprehensive coverage of in vivo chemical reactions within live animals

This handbook summarizes the interdisciplinary expertise of both chemists and biologists performing in vivo chemical reactions within live animals. By comparing and contrasting currently available chemical and biological techniques, it serves not just as a collection of the pioneering work done in animal-based studies, but also as a technical guide to help readers decide which tools are suitable and best for their experimental needs.
The Handbook of In Vivo Chemistry in Mice: From Lab to Living System introduces readers to general information about live animal experiments and detection methods commonly used for these animal models. It focuses on chemistry-based techniques to develop selective in vivo targeting methodologies, as well as strategies for in vivo chemistry and drug release. Topics include: currently available mouse models; biocompatible fluorophores; radionuclides for radiodiagnosis/radiotherapy; live animal imaging techniques such as positron emission tomography (PET) imaging; magnetic resonance imaging (MRI); ultrasound imaging; hybrid imaging; biocompatible chemical reactions; ligand-directed nucleophilic substitution chemistry; biorthogonal prodrug release strategies; and various selective targeting strategies for live animals.
-Completely covers current techniques of in vivo chemistry performed in live animals
-Describes general information about commonly used live animal experiments and detection methods
-Focuses on chemistry-based techniques to develop selective in vivo targeting methodologies, as well as strategies for in vivo chemistry and drug release
-Places emphasis on material properties required for the development of appropriate compounds to be used for imaging and therapeutic purposes in preclinical applications

Handbook of In Vivo Chemistry in Mice: From Lab to Living System will be of great interest to pharmaceutical chemists, life scientists, and organic chemists. It will also appeal to those working in the pharmaceutical and biotechnology industries.

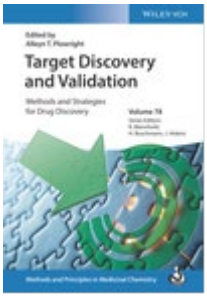
FEBRUARY 2020 560PP
978-3-527-34432-1 CL $230.00 (Japan) ¥27,600
Pharmaceutical & Medicinal Chemistry

Target Discovery and Validation

Methods and Strategies for Drug Discovery

EDITOR ALLEYN T. PLOWRIGHT, SERIES EDITOR RAIMUND MANNHOLD, SERIES EDITOR HELMUT BUSCHMANN & SERIES EDITOR J HOLENZ

University of Dusseldorf, Ge; Aachen, Germany; Laboratorios Dr. Esteve, Barcelona, Spain



The modern drug developers? guide for making informed choices among the diverse target identification methods

Target Discovery and Validation: Methods and Strategies for Drug Discovery offers a hands-on review of the modern technologies for drug target identification and validation. With contributions from noted industry and academic experts, the book addresses the most recent chemical, biological, and computational methods. Additionally, the book highlights techologies that are applicable to ?difficult? targets and drugs directed at multiple targets, including chemoproteomics, activity-based protein profiling, pathway mapping, genome-wide association studies, and array-based profiling. Throughout, the authors highlight a range of diverse approaches, and target validation studies reveal how these methods can support academic and drug discovery scientists in their target discovery and validation research. This resource:
-Offers a guide to identifying and validating targets, a key enabling technology without which no new drug development is possible
-Presents the information needed for choosing the appropriate assay method from the ever-growing range of available options
-Provides practical examples from recent drug development projects, e. g. in kinase inhibitor profiling
Written for medicinal chemists, pharmaceutical professionals, biochemists, biotechnology professionals, and pharmaceutical chemists, Target Discovery and Validation explores the current methods for the identification and validation of drug targets in one comrpehensive volume. It also includes numerous practical examples.

SERIES: METHODS AND PRINCIPLES IN MEDICINAL CHEMISTRY

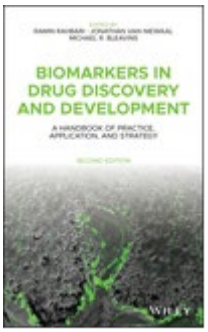
DECEMBER 2019 400PP
978-3-527-34529-8 CL $215.00 (Japan) ¥25,800
Drug Discovery & Development

Biomarkers in Drug Discovery and Development

A Handbook of Practice, Application, and Strategy

2nd Edition

EDITOR RAMIN RAHBARI, EDITOR JONATHAN VAN NIEWAAL & EDITOR MICHAEL R. BLEAVINS



This book continues the legacy of a well-established reference within the pharmaceutical industry -- providing perspective, covering recent developments in technologies that have enabled the expanded use of biomarkers, and discussing biomarker characterization and validation and applications throughout drug discovery and development.

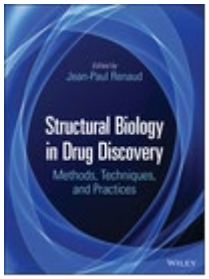
* Explains where proper use of biomarkers can substantively impact drug development timelines and costs, enable selection of better compounds and reduce late stage attrition, and facilitate personalized medicine
* Helps readers get a better understanding of biomarkers and how to use them, for example which are accepted by regulators and which still non-validated and exploratory
* Updates developments in genomic sequencing, and application of large data sets into pre-clinical and clinical testing; and adds new material on data mining, economics, and decision making, personal genetic tools, and wearable monitoring
* Includes case studies of biomarkers that have helped and hindered decision making
* Reviews of the first edition: "If you are interested in biomarkers, and it is difficult to imagine anyone reading this who wouldn't be, then this book is for you." (ISSX) and "...provides a good introduction for those new to the area, and yet it can also serve as a detailed reference manual for those practically involved in biomarker implementation." (ChemMedChem)

MAY 2020 608PP
978-1-119-18750-9 CL $225.00 (Japan) ¥27,000
DRUG DISCOVERY & DEVELOPMENT

Structural Biology in Drug Discovery

Methods, Techniques, and Practices

EDITOR JEAN-PAUL RENAUD



With the most comprehensive and up-to-date overview of structure-based drug discovery covering both experimental and computational approaches, *Structural Biology in Drug Discovery: Methods, Techniques, and Practices* describes principles, methods, applications, and emerging paradigms of structural biology as a tool for more efficient drug development. Coverage includes successful examples, academic and industry insights, novel concepts, and advances in a rapidly evolving field.

The combined chapters, by authors writing from the frontlines of structural biology and drug discovery, give readers a valuable reference and resource that:

- Presents the benefits, limitations, and potentiality of major techniques in the field such as X-ray crystallography, NMR, neutron crystallography, cryo-EM, mass spectrometry and other biophysical techniques, and computational structural biology
- Includes detailed chapters on druggability, allostery, complementary use of thermodynamic and kinetic information, and powerful approaches such as structural chemogenomics and fragment-based drug design
- Emphasizes the need for the in-depth biophysical characterization of protein targets as well as of therapeutic proteins, and for a thorough quality assessment of experimental structures
- Illustrates advances in the field of established therapeutic targets like kinases, serine proteinases, GPCRs, and epigenetic proteins, and of more challenging ones like protein-protein interactions and intrinsically disordered proteins

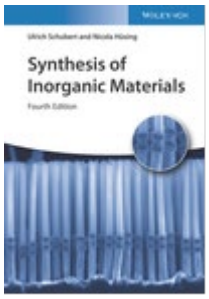
APRIL 2020 688PP
978-1-118-68101-5 CL $295.00 (Japan) ¥35,400
Drug Discovery & Development

Synthesis of Inorganic Materials

4th Edition

ULRICH SCHUBERT & NICOLA HUSING

Technical University Vienna, Austria



Introduces readers to the field of inorganic materials, while emphasizing synthesis and modification techniques

Written from the chemist's point of view, this newly updated and completely revised fourth edition of Synthesis of Inorganic Materials provides a thorough and pedagogical introduction to the exciting and fast developing field of inorganic materials and features all of the latest developments. New to this edition is a chapter on self-assembly and self-organization, as well as all-new content on: demixing of glasses, non-classical crystallization, precursor chemistry, citrate-gel and Pechini liquid mix methods, ice-templating, and materials with hierarchical porosity.

Synthesis of Inorganic Materials, 4th Edition features chapters covering: solid-state reactions; formation of solids from the gas phase; formation of solids from solutions and melts; preparation and modification of inorganic polymers; self-assembly and self-organization; templated materials; and nanostructured materials. There is also an extensive glossary to help bridge the gap between chemistry, solid state physics and materials science. In addition, a selection of books and review articles is provided at the end of each chapter as a starting point for more in-depth reading.

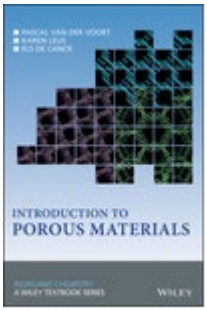
-Gives the students a thorough overview of the fundamentals and the wide variety of different inorganic materials with applications in research as well as in industry
-Every chapter is updated with new content
-Includes a completely new chapter covering self-assembly and self-organization
-Written by well-known and experienced authors who follow an intuitive and pedagogical approach

Synthesis of Inorganic Materials, 4th Edition is a valuable resource for advanced undergraduate students as well as masters and graduate students of inorganic chemistry and materials science.

OCTOBER 2019 424PP
978-3-527-34457-4 PB $110.00 (Japan) ¥13,200
INORGANIC CHEMISTRY

Introduction to Porous Materials

PASCAL VAN DER VOORT, KAREN LEUS & ELS DE CANCK



The first comprehensive textbook on the timely and rapidly developing topic of inorganic porous materials

This is the first textbook to completely cover a broad range of inorganic porous materials. It introduces the reader to the development of functional porous inorganic materials, from the synthetic zeolites in the 50's, to today's hybrid materials such as metal-organic frameworks (MOFs), covalent organic frameworks (COFs) and related networks. It also provides the necessary background to understand how porous materials are organized, characterized, and applied in adsorption, catalysis, and many other domains. Additionally, the book explains characterization and application from the materials scientist viewpoint, giving the reader a practical approach on the characterization and application of the respective materials.

Introduction to Inorganic Porous Materials begins by describing the basic concepts of porosity and the different types of pores, surfaces, and amorphous versus crystalline materials, before introducing readers to nature's porous materials. It then goes on to cover everything from adsorption and catalysis to amorphous materials such as silica to inorganic carbons and Periodic Mesoporous Organosilicas (PMOs). It discusses the synthesis and applications of MOFs and the broad family of COFs. It concludes with a look at future prospects and emerging trends in the field.

- The only complete book of its kind to cover the wide variety of inorganic and hybrid porous materials
- A comprehensive reference and outstanding tool for any course on inorganic porous materials, heterogeneous catalysis, and adsorption
- Gives students and investigators the opportunity to learn about porous materials, how to characterize them, and understand how they can be applied in different fields

Introduction to Inorganic Porous Materials is an excellent book for students and professionals of inorganic chemistry and materials science with an interest in porous materials, functional inorganic materials, heterogeneous catalysis and adsorption, and solid state characterization techniques.

SERIES: INORGANIC CHEMISTRY: A TEXTBOOK SERIES

AUGUST 2019 448PP
978-1-119-42660-8 CL $105.00 (Japan) ¥12,600
Inorganic Chemistry

Inorganic Battery Materials

EDITOR HAILIANG WANG & EDITOR BONIFACE P. T. FOKWA

A guide to the fundamental chemistry and recent advances of battery materials In one comprehensive volume, Inorganic Battery Materials explores the basic chemistry principles, recent advances, and the challenges and opportunities of the current and emerging technologies of battery materials. With contributions from an international panel of experts, this authoritative resource contains information on the fundamental features of battery materials, discussions on material synthesis, structural characterizations and electrochemical reactions.

The book explores a wide range of topics including the state-of-the-art lithium ion battery chemistry to more energy-aggressive chemistries involving lithium metal. The authors also include a review of sulfur and oxygen, aqueous battery chemistry, redox flow battery chemistry, solid state battery chemistry and environmentally beneficial carbon dioxide battery chemistry. In the context of renewable energy utilization and transportation electrification, battery technologies have been under more extensive and intensive development than ever. This important book:

- Provides an understanding of the chemistry of a battery technology
- Explores battery technology's potential as well as the obstacles that hamper the potential from being realized
- Highlights new applications and points out the potential growth areas that can serve as inspirations for future research
- Includes an understanding of the chemistry of battery materials and how they store and convert energy

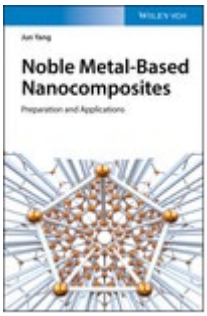
SERIES: EIC BOOKS

SEPTEMBER 416PP
978-1-119-43199-2 CL $200.00 (Japan) ¥24,000
Inorganic Chemistry

Noble Metal-Based Nanocomposites

Preparation and Applications

JUN YANG



Provides a systematic and coherent picture of the solution-based methods for the preparation of noble metal-based composite nanomaterials, their characterization, and potential applications in electrocatalysis

Within the last decade, the development of wet-chemistry methods has led to the blossom of research in composite nanomaterials. However, the design and synthesis of composite nanomaterials with controlled properties remains a significant challenge. This book summarizes the solution-based methods for the preparation of noble metal-based composite nanomaterials. It examines their characterization, as well as their use in electrocatalysis. It also discusses the intrinsic relationship between the catalytic properties and the physical /chemical effects in the composite materials, and offers some perspectives for the future development of metal-based composite nanomaterials. In addition, the book not only provides a systematic and coherent picture of this field, but also inspires rethinking of the current processing technologies.

Noble Metal-Based Nanocomposites: Preparation and Applications offers in-depth chapter coverage of ethanol-mediated phase transfer of metal ions and nanoparticles. It presents the full range of nanocomposites consisting of chalcogenide semiconductors and gold, silver sulfide, or other noble metals. It also examines core-shell structured cadmium selenide-platinum nanocomposites; Pt-containing Ag2S-noble metal nanocomposites for direct methanol fuel cells operated at high fuel concentrations; and nanocomposites consisting of metal oxides and noble metals. In addition, the book looks at scientific issues derived from noble metal-based nanocomposites.

Noble Metal-Based Nanocomposites: Preparation and Applications is an excellent book for inorganic chemists, materials scientists, catalytic chemists, chemical engineers, and those interested in the subject.

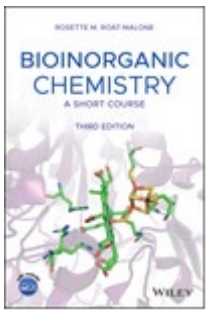
APRIL 2019 456PP
978-3-527-34452-9 CL $152.00 (Japan) ¥18,200
Inorganic Chemistry

Bioinorganic Chemistry

A Short Course, 3rd Edition

ROSETTE M. ROAT-MALONE
Washington College, Chestertown, Maryland, USA

Introduces students to the basics of bioinorganic chemistry



This book provides the fundamentals for inorganic chemistry and biochemistry relevant to understanding bioinorganic topics. It provides essential background material, followed by detailed information on selected topics, to give readers the background, tools, and skills they need to research and study bioinorganic topics of interest to them. To reflect current practices and needs, instrumental methods and techniques are referred to and mixed in throughout the book.

Bioinorganic Chemistry: A Short Course, Third Edition begins with a chapter on Inorganic Chemistry and Biochemistry Essentials. It then continues with chapters on: Computer Hardware, Software, and Computational Chemistry Methods; Important Metal Centers in Proteins; Myoglobins, Hemoglobins, Superoxide Dismutases, Nitrogenases, Hydrogenases, Carbonic Anhydrases, and Nitrogen Cycle Enzymes. The book concludes with chapters on Nanobioinorganic Chemistry and Metals in Medicine. Readers are also offered end-of-section summaries, conclusions, and thought problems.

Appropriate for one-semester bioinorganic chemistry courses, *Bioinorganic Chemistry: A Short Course, Third Edition* is ideal for upper-level undergraduate and beginning graduate students. It is also a valuable reference for practitioners and researchers in need of a general introduction to the subject, as well as chemists requiring an accessible reference.

MAY 2020 352PP
978-1-119-53521-8 PB $99.95 (Japan) ¥11,900
BIOINORGANIC CHEMISTRY

Transition Metal-Dinitrogen Complexes

Preparation and Reactivity

YOSHIAKI NISHIBAYASHI

A comprehensive book that explores nitrogen fixation by using transition metal-dinitrogen complexes

Nitrogen fixation is one of the most prominent fields of research in chemistry. This book puts the focus on the development of catalytic ammonia formation from nitrogen gas under ambient reaction conditions that has been recently repowered by some research groups. With contributions from noted experts in the field, Transition Metal-Dinitrogen Complexes offers an important guide and comprehensive resource to the most recent research and developments on the topic of nitrogen fixation by using transition metal-dinitrogen. The book is filled with the information needed to understand the synthesis of transition metal-dinitrogen complexes and their reactivity. This important book:

-Offers a resource for understanding nitrogen fixation chemistry that is essential for explosives, pharmaceuticals, dyes, and all forms of life
-Includes the information needed for anyone interested in the field of nitrogen fixation by using transition metal-dinitrogen complexes
-Contains state-of-the-art research on synthesis of transition metal-dinitrogen complexes and their reactivity in nitrogen fixation
-Incorporates contributions from well-known specialists and experts with an editor who is an innovator in the field of dinitrogen chemistry

Written for chemists and scientists with an interest in nitrogen fixation, Transition Metal-Dinitrogen Complexes is a must-have resource to the burgeoning field of nitrogen fixation by using transition metal-dinitrogen complexes.

JANUARY 2019 510PP
978-3-527-34425-3 CL $215.00 (Japan) ¥25,800
Coordination Chemistry

Emerging Fluorinated Motifs

Synthesis, Properties and Applications

EDITOR DOMINIQUE CAHARD & EDITOR JUN-AN MA

A must-have resource for all the researchers working in the organofluorine and related fields

This timely two-volume set uniquely focuses on emerging fluorinated motifs beyond R-CF3 and R-F, like R-CF2H, R-OCF3, R-SCF3 and R-SF5. It also offers descriptions of the properties, synthesis, and applications of these emerging fluorinated motifs in order to help readers design new chemical entities, while providing new interest for researchers in organofluorine chemistry and new tools for those in other areas.

Emerging Fluorinated Motifs: Synthesis, Properties and Applications begins with a description of carbon-linked fluorine-containing groups that include monofluoromethyl and difluoromethyl groups. It then details combinations of heteroatoms, Oxygen, Sulfur, Selenium, Nitrogen, and Phosphorus with fluorine-containing groups, outlining subsections of the most popular current motifs. Fluoroalkyl ethers, thioethers, and the recent blossoming of the SF5 unit is covered.

-Focuses on the synthesis, properties, and applications of emerging fluorinated motifs
-Covers carbon-linked fluorine-containing motifs, oxygen-linked fluorine-containing motifs, sulfur-linked fluorine-containing motifs, and more
-Appeals to academic and industrial researchers working in organic chemistry, medicinal chemistry, food chemistry, and materials science
-Edited by world-renowned experts in organofluorine chemistry

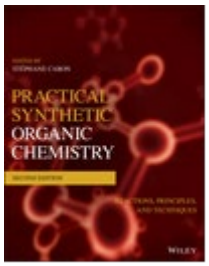
Emerging Fluorinated Motifs is intended for academic research institutes, university libraries, researchers, graduate students, postdoctors, and researchers in the chemical industry.

MAY 2020 760PP
978-3-527-34681-3 CL $190.00 (Japan) ¥22,800
Organic Chemistry

Practical Synthetic Organic Chemistry

Reactions, Principles, and Techniques, 2nd Edition

EDITOR STÉPHANE CARON



This book is a hands-on guide for the organic chemist. Focusing on the most reliable and useful reactions, the chapter authors provide the information necessary for a chemist to strategically plan a synthesis, as well as repeat the procedures in the laboratory.

- Consolidates all the key advances/concepts in one book, covering the most important reactions in organic chemistry, including substitutions, additions, eliminations, rearrangements, oxidations, reductions
- Highlights the most important reactions, addressing basic principles, advantages/disadvantages of the methodology, mechanism, and techniques for achieving laboratory success
- Features new content on recent advances in CH activation, photoredox and electrochemistry, continuous chemistry, and application of biocatalysis in synthesis
- Revamps chapters to include new and additional examples of chemistry that have been demonstrated at a practical scale

MARCH 2020 848PP
978-1-119-44885-3 PB $135.00 (Japan) ¥16,200
ORGANIC CHEMISTRY

Organic Reactions, Volume 100

EDITOR-IN-CHIEF SCOTT E. DENMARK

University of Illinois, Urbana-Champaign

Written by a "who is who" of leading organic chemists, this anniversary volume represent the Organic Reactions editors' choice of the most important, ground-breaking and versatile reactions in current organic synthesis. The 15 reaction types selected for this volume include reactions for carbon-carbon bond formation, cross-coupling reactions, hydro- and halofunctionalizations, among many others.
In line with the successful recipe of the series, each chapter is focused on a single reaction, discussing its mechanism and stereochemistry, scope and limitations, applications to synthesis, comparison with other methods, and experimental procedures. Each chapter concludes with a tabular survey of selected key application examples, complete with reported reaction conditions and yields, to serve as a quick reference guide for synthesis planning.

SERIES: ORGANIC REACTIONS

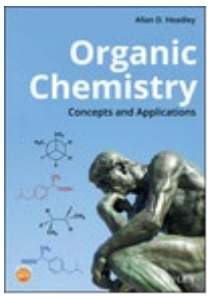
JANUARY 2020 1136PP
978-1-119-45666-7 CL $350.00 (Japan) ¥42,000
Organic Chemistry

Organic Chemistry

Concepts and Applications

ALLAN D. HEADLEY

Provides an in-depth study of organic compounds that bridges the gap between general and organic chemistry



Organic Chemistry: Concepts and Applications presents a comprehensive review of organic compounds that is appropriate for a two-semester sophomore organic chemistry course. The text covers the fundamental concepts needed to understand organic chemistry and clearly shows how to apply the concepts of organic chemistry to problem-solving. In addition, the book highlights the relevance of organic chemistry to the environment, industry, and biological and medical sciences. The author includes multiple-choice questions similar to aptitude exams for professional schools, including the Medical College Admissions Test (MCAT) and Dental Aptitude Test (DAT) to help in the preparation for these important exams.

Rather than categorize content information by functional groups, which often stresses memorization, this textbook instead divides the information into reaction types. This approach bridges the gap between general and organic chemistry and helps students develop a better understanding of the material. A manual of possible solutions for chapter problems for instructors and students is available in the supplementary websites. This important book:

* Provides an in-depth study of organic compounds with division by reaction types that bridges the gap between general and organic chemistry
* Covers the concepts needed to understand organic chemistry and teaches how to apply them for problem-solving
* Puts a focus on the relevance of organic chemistry to the environment, industry, and biological and medical sciences
* Includes multiple choice questions similar to aptitude exams for professional schools

Written for students of organic chemistry, *Organic Chemistry: Concepts and Applications* is the comprehensive text that presents the material in clear terms and shows how to apply the concepts to problem solving.

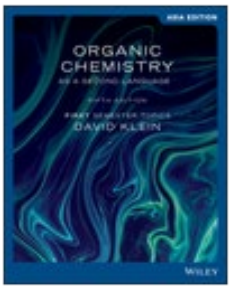
JANUARY 2020 624PP
978-1-119-50458-0 PB $140.00 (Japan) ¥16,800
Organic Chemistry

Organic Chemistry as a Second Language

First Semester Topics, 5th Edition, Asia Edition

DAVID R. KLEIN

Johns Hopkins University



Organic chemistry can be a challenging subject. Most students view organic chemistry as a subject requiring hours upon hours of memorization. Author David Klein's *Second Language* books prove this is not true--organic chemistry is one continuous story that actually makes sense if you pay attention. Offering a unique skill-building approach, these market-leading books teach students how to ask the right questions to solve problems, study more efficiently to avoid wasting time, and learn to speak the language of organic chemistry.

Covering the initial half of the course, *Organic Chemistry as a Second Language: First Semester Topics* reviews critical principles and explains their relevance to the rest of the course. Each section provides hands-on exercises and step-by-step explanations to help students fully comprehend classroom lectures and textbook content. Now in its fifth edition, this valuable study resource covers the characteristics of molecules, the nature of atomic bonds, the relationships between different types of molecules, drawing and naming molecules, and essential molecular reactions.

OCTOBER 2019 408PP
978-1-119-66803-9 PB $60.00 (Japan) ¥7,200
Organic Chemistry

Deep Eutectic Solvents

Synthesis, Properties, and Applications

EDITOR DIEGO J. RAMÓN & EDITOR GABRIELA GUILLENA

A useful guide to the fundamentals and applications of deep eutectic solvents

Deep Eutectic Solvents contains a comprehensive review of the use of deep eutectic solvents (DESs) as an environmentally benign alternative reaction media for chemical transformations and processes. The contributors cover a range of topics including synthesis, structure, properties, toxicity and biodegradability of DESs. The book also explores myriad applications in various disciplines, such as organic synthesis and (bio)catalysis, electrochemistry, extraction, analytical chemistry, polymerizations, (nano)materials preparation, biomass processing, and gas adsorption.

The book is aimed at organic chemists, catalytic chemists, pharmaceutical chemists, biochemists, electrochemists, and others involved in the design of eco-friendly reactions and processes. This important book:

-Explores the promise of DESs as an environmentally benign alternative to hazardous organic solvents
-Covers the synthesis, structure, properties (incl. toxicity) as well as a wide range of applications
-Offers a springboard for stimulating critical discussion and encouraging further advances in the field

Deep Eutectic Solvents is an interdisciplinary resource for researchers in academia and industry interested in the many uses of DESs as an environmentally benign alternative reaction media.

NOVEMBER 2019 384PP
978-3-527-34518-2 CL $205.00 (Japan) ¥24,600
Organic Chemistry

March's Advanced Organic Chemistry

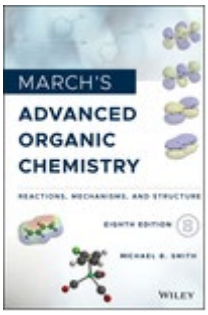
Reactions, Mechanisms, and Structure

8th Edition

MICHAEL B. SMITH

University of Connecticut

The completely revised and updated, definitive resource for students and professionals in organic chemistry



The revised and updated 8th edition of *March's Advanced Organic Chemistry: Reactions, Mechanisms, and Structure* explains the theories of organic chemistry with examples and reactions. This book is the most comprehensive resource about organic chemistry available. Readers are guided on the planning and execution of multi-step synthetic reactions, with detailed descriptions of all the reactions
The opening chapters of *March's Advanced Organic Chemistry, 8th Edition* deal with the structure of organic compounds and discuss important organic chemistry bonds, fundamental principles of conformation, and stereochemistry of organic molecules, and reactive intermediates in organic chemistry. Further coverage concerns general principles of mechanism in organic chemistry, including acids and bases, photochemistry, sonochemistry and microwave irradiation. The relationship between structure and reactivity is also covered. The final chapters cover the nature and scope of organic reactions and their mechanisms.

This edition:

- Provides revised examples and citations that reflect advances in areas of organic chemistry published between 2011 and 2017
- Includes appendices on the literature of organic chemistry and the classification of reactions according to the compounds prepared
- Instructs the reader on preparing and conducting multi-step synthetic reactions, and provides complete descriptions of each reaction

The 8th edition of *March's Advanced Organic Chemistry* proves once again that it is a must-have desktop reference and textbook for every student and professional working in organic chemistry or related fields.

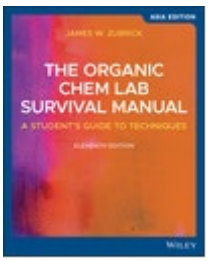
APRIL 2020 2144PP
978-1-119-37180-9 CL $175.00 (Japan) ¥18,000
ORGANIC CHEMISTRY

Organic Chemistry Survival

Learning Manual, 11th Edition, Asia Edition

JAMES W. ZUBRICK

Hudson Valley Community College



Teaches students the basic techniques and equipment of the organic chemistry lab -- the updated new edition of the popular hands-on guide.

The Organic Chem Lab Survival Manual helps students understand the basic techniques, essential safety protocols, and the standard instrumentation necessary for success in the laboratory. Author James W. Zubrick has been assisting students navigate organic chemistry labs for more than three decades, explaining how to set up the laboratory, make accurate measurements, and perform safe and meaningful experiments. This practical guide covers every essential area of lab knowledge, from keeping detailed notes and interpreting handbooks to using equipment for chromatography and infrared spectroscopy.

Now in its eleventh edition, this guide has been thoroughly updated to cover current laboratory practices, instruments, and techniques. Focusing primarily on macroscale equipment and experiments, chapters cover microscale jointware, drying agents, recrystallization, distillation, nuclear magnetic resonance, and much more. This popular textbook:

- Familiarizes students with common lab instruments
- Provides guidance on basic lab skills and procedures
- Includes easy-to-follow diagrams and illustrations of lab experiments
- Features practical exercises and activities at the end of each chapter
- Provides real-world examples of lab notes and instrument manuals

The Organic Chem Lab Survival Manual: A Student's Guide to Techniques, 11th Edition is an essential resource for students new to the laboratory environment, as well as those more experienced seeking to refresh their knowledge.

JANUARY 2020 288PP
978-1-119-67284-5 PB $60.00(Japan) ¥7,200
Organic Chemistry

Comprehensive Organic Transformations

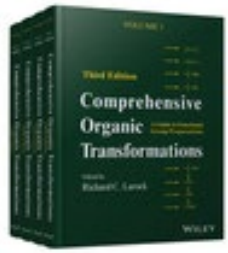
A Guide to Functional Group Preparations

3rd Edition

EDITOR RICHARD C. LAROCK, CONTRIBUTIONS BY ANTON V. DUBROVSKIY, CONTRIBUTIONS BY TANAY KESHARWANI, CONTRIBUTIONS BY NATALIYA A. MARKINA, CONTRIBUTIONS BY ALEXANDRE A. PLETNEV, CONTRIBUTIONS BY CRISTIANO RAMINELLI, CONTRIBUTIONS BY TUANLI YAO, CONTRIBUTIONS BY GILSON ZENI, CONTRIBUTIONS BY LI ZHANG, CONTRIBUTIONS BY XIAOXIA ZHANG, CONTRIBUTIONS BY ROMAN ROZHKOV, CONTRIBUTIONS BY SHILPA A. WORLIKAR, CONTRIBUTIONS BY MAR&IACUTE;A TERESA MOLINA & CONTRIBUTIONS BY CHARLES E. RUSSELL

Iowa State University, Ames

PROSE Award Finalist 2019 - Multivolume Reference/Science



Association of American Publishers Award for Professional and Scholarly Excellence

This greatly-expanded new edition of a best-selling guide offers an encyclopedic and systematic collection of useful synthetic methodology, including tens of thousands of reactions and synthetic transformations.

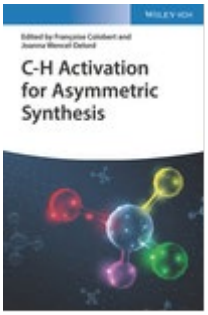
- Covers and cross references so practicing chemists can easily navigate through the book's comprehensive coverage of reagents and reactions
- Updates and expands a best-selling guide through the year 2011

"...the book is undoubtedly still of great value and every chemist working in the area of synthesis should have it within reach in the laboratory."
--***Angewandte Chemie*** **review of the 2nd edition**

FEBRUARY 2018 4056PP
978-0-470-92795-3 CL $1248.00 (Japan) ¥110,000
ORGANIC CHEMISTRY

C-H Activation for Asymmetric Synthesis

EDITOR FRANCOISE COLOBERT & EDITOR JOANNA WENCEL-DELORD



Provides, in one handbook, comprehensive coverage of one of the hottest topics in stereoselective chemistry

Written by leading international authors in the field, this book introduces readers to C-H activation in asymmetric synthesis along with all of its facets. It presents stereoselective C-H functionalization with a broad coverage, from outer-sphere to inner-sphere C-H bond activation, and from the control of olefin geometry to the induction of point, planar and axial chirality. Moreover, methods wherein asymmetry is introduced either during the C-H activation or in a different elementary step are discussed.

Presented in two parts - asymmetric activation of C(sp3)-H bonds and stereoselective synthesis implying activation of C(sp2)-H bonds - CH-Activation for Asymmetric Synthesis showcases the diversity of stereogenic elements, which can now be constructed by C-H activation methods. Chapters in Part 1 cover: C(sp3)-H bond insertion by metal carbenoids and nitrenoids; stereoselective C-C bond and C-N bond forming reactions through C(sp3)-H bond insertion of metal nitrenoids; enantioselective intra- and intermolecular couplings; and more. Part 2 looks at: C-H activation involved in stereodiscriminant step; planar chirality; diastereoselective formation of alkenes through C(sp2)-H bond activation; amongst other methods.

-Covers one of the most rapidly developing fields in organic synthesis and catalysis
-Clearly structured in two parts (activation of sp3- and activation of sp2-H bonds)
-Edited by two leading experts in C-H activation in asymmetric synthesis

CH-Activation for Asymmetric Synthesis will be of high interest to chemists in academia, as well as those in the pharmaceutical and agrochemical industry.

SEPTEMBER 2019 296PP
978-3-527-34340-9 CL $175.00 (Japan) ¥21,000
Methods - Synthesis & Techniques

Organosilicon Chemistry

Novel Approaches and Reactions

EDITOR TAMEJIRO HIYAMA & EDITOR MARTIN OESTREICH

Institut fur Organische Chemie

Provides a unique summary of important catalytic reactions in the presence of silicon

A must-have for all synthetic chemists, this book summarizes all of the important developments in the application of organosilicon compounds in organic synthesis and catalysis. Edited by two world leaders in the field, it describes different approaches and covers a broad range of reactions, e.g. catalytic generation of silicon nucleophiles, Si-H Bond activation, C-H bond silylation, silicon-based cross-coupling reactions, and hydrosilylation in the presence of earth-abundant metals.

In addition to the topics covered above, Organosilicon Chemistry: Novel Approaches and Reactions features chapters that look at Lewis base activation of silicon Lewis acids, silylenes as ligands in catalysis, and chiral silicon molecules.

-The first book about this topic in decades, covering a broad range of reactions
-Covers new approaches and novel catalyst systems that have been developed in recent years
-Written by well-known, international experts in the areas of organometallic silicon chemistry and organosilicon cross-coupling reactions

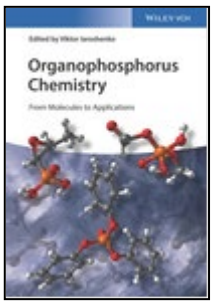
Organosilicon Chemistry: Novel Approaches and Reactions is an indispensable source of information for synthetic chemists in academia and industry, working in the field of organic synthesis, catalysis, and main-group chemistry.

DECEMBER 2019 568PP
978-3-527-34453-6 CL $215.00 (Japan) ¥25,800
Methods - Synthesis & Techniques

Organophosphorus Chemistry

From Molecules to Applications

EDITOR VIKTOR IAROSHENKO

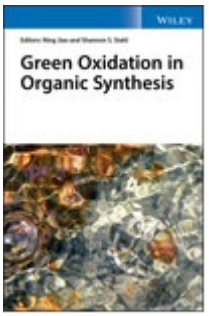


Filling the gap for an up-to-date reference that presents the field of organophosphorus chemistry in a comprehensive and clearly structured way, this one-stop source covers the chemistry, properties, and applications from life science and medicine. Divided into two parts, the first presents the chemistry of various phosphorus-containing compounds and their synthesis, including ylides, acids, and heterocycles. The second part then goes on to look at applications in life science and bioorganic chemistry. Last but not least, such important practical aspects as 31P-NMR and protecting strategies for these compounds are presented.
For organic, bioinorganic, and medicinal chemists, as well as those working on organometallics, and for materials scientists. The book, a contributed work, features a team of renowned scientists from around the world whose expertise spans the many aspects of modern organophosphorus chemistry.

MARCH 2019 592PP
978-3-527-33572-5 CL $230.00 (Japan) ¥27,600
Methods - Synthesis & Techniques

Green Oxidation in Organic Synthesis

EDITOR NING JIAO & EDITOR SHANNON S. STAHL



A valuable introduction to green oxidation for organic chemists interested in discovering new strategies and new reactions for oxidative synthesis

Green Oxidation in Organic Synthesis provides a comprehensive introduction and overview of chemical preparation by green oxidative processes, an entry point to the growing journal literature on green oxidation in organic synthesis. It discusses both experimental and theoretical approaches for the study of new catalysts and methods for catalytic oxidation and selective oxidation.

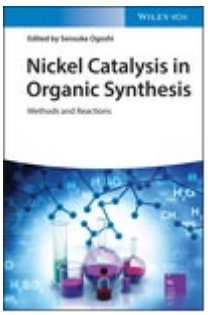
The book highlights the discovery of new reactions and catalysts in recent years, discussing mechanistic insights into the green oxidative processes, as well as applications in organic synthesis with significant potential to have a major impact in academia and industry. Chapters are organized according to the functional groups generated in the reactions, presenting interesting achievements for functional group formation by green oxidative processes with O_2, H_2O_2, photocatalytic oxidation, electrochemical oxidation, and enzymatic oxidation. The mechanisms of these novel transformations clearly illustrated.
Green Oxidation in Organic Synthesis will serve as an excellent reference for organic chemists interested in discovering new strategies for oxidative synthesis which address the priorities of green and sustainable chemistry.

SEPTEMBER 2019 536PP
978-1-119-30416-6 CL $195.00 (Japan) ¥23,400
Methods - Synthesis & Techniques

Nickel Catalysis in Organic Synthesis

Methods and Reactions

EDITOR SENSUKE OGOSHI



A comprehensive reference to nickel chemistry for every scientist working with organometallic catalysts

Written by one of the world's leading reseachers in the field, Nickel Catalysis in Organic Synthesis presents a comprehensive review of the high potential of modern nickel catalysis and its application in synthesis. Structured in a clear and assessible manner, the book offers a collection of various reaction types, such as cross-coupling reactions, reactions for the activation of unreactive bonds, carbon dioxide fixation, and many more.

Nickel has been recognized as one of the most interesting transition metals for homogeneous catalysis. This book offers an overview to the recently developed new ligands, new reaction conditions, and new apparatus to control the reactivity of nickel catalysts, allowing scientists to apply nickel catalysts to a variety of bond-forming reactions. A must-read for anyone working with organometallic compounds and their application in organic synthesis, this important guide:

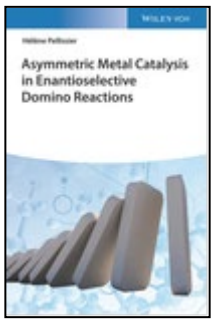
-Reviews the numerous applications of nickel catalysis in synthesis
-Explores the use of nickel as a relatively cheap and earth-abundant metal
-Examines the versatility of nickel catalysis in reactions like cross-coupling reactions and CH activations
-Offers a resource for academics and industry professionals

Written for catalytic chemists, organic chemists, inorganic chemists, structural chemists, and chemists in industry, Nickel Catalysis in Organic Synthesis provides a much-needed overview of the most recent developments in modern nickel catalysis and its application in synthesis.

JANUARY 2020 352PP
978-3-527-34407-9 CL $190.00 (Japan) ¥22,800
Methods - Synthesis & Techniques

Asymmetric Metal Catalysis in Enantioselective Domino Reactions

HELENE PELLISSIER



Introduces an innovative and outstanding tool for the easy synthesis of complex chiral structures in a single step

Covering all of the literature since the beginning of 2006, this must-have book for chemists collects the major progress in the field of enantioselective one-, two-, and multicomponent domino reactions promoted by chiral metal catalysts. It clearly illustrates how enantioselective metal-catalyzed processes constitute outstanding tools for the development of a wide variety of fascinating one-pot asymmetric domino reactions, thereby allowing many complex products to be easily generated from simple materials in one step. The book also strictly follows the definition of domino reactions by Tietze as single-, two-, as well as multicomponent transformations.

Asymmetric Metal Catalysis in Enantioselective Domino Reactions is divided into twelve chapters, dealing with enantioselective copper-, palladium-, rhodium-, scandium-, silver-, nickel-, gold-, magnesium-, cobalt-, zinc-, yttrium and ytterbium-, and other metal-catalyzed domino reactions. Most of the chapters are divided into two parts dealing successively with one- and two-component domino reactions, and three-component processes. Each part is subdivided according to the nature of domino reactions. Each chapter of the book includes selected applications of synthetic methodologies to prepare natural and biologically active products.

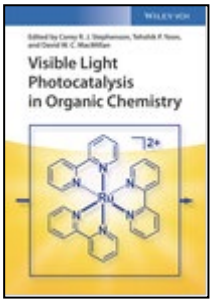
Asymmetric Metal Catalysis in Enantioselective Domino Reactions will be of high interest to synthetic, organic, medicinal, and catalytic chemists in academia and R&D departments.

SEPTEMBER 2019 408PP
978-3-527-34619-6 CL $190.00 (Japan) ¥22,800
Methods - Synthesis & Techniques

Visible Light Photocatalysis in Organic Chemistry

EDITOR COREY R.J. STEPHENSON, EDITOR TEHSHIK P. YOON & EDITOR DAVID W.C. MACMILLAN

Boston University, Boston, USA; University of Wisconsin-Madison, Madison, USA



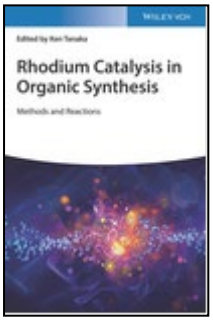
Filling the need for a ready reference that reflects the vast developments in this field, this book presents everything from fundamentals, applications, various reaction types, and technical applications.
Edited by rising stars in the scientific community, the text focuses solely on visible light photocatalysis in the context of organic chemistry. This primarily entails photoinduced electron transfer and energy transfer chemistry sensitized by polypyridyl complexes, yet also includes the use of organic dyes and heterogeneous catalysts.
A valuable resource to the synthetic organic community, polymer and medicinal chemists, as well as industry professionals.

MARCH 2018 456PP
978-3-527-33560-2 CL $215.00 (Japan) ¥25,800
Methods - Synthesis & Techniques

Rhodium Catalysis in Organic Synthesis

Methods and Reactions

KEN TANAKA



An essential reference to the highly effective reactions applied to modern organic synthesis

Rhodium complexes are one of the most important transition metals for organic synthesis due to their ability to catalyze a variety of useful transformations. Rhodium Catalysis in Organic Synthesis explores the most recent progress and new developments in the field of catalytic cyclization reactions using rhodium(I) complexes and catalytic carbon-hydrogen bond activation reactions using rhodium(II) and rhodium(III) complexes.

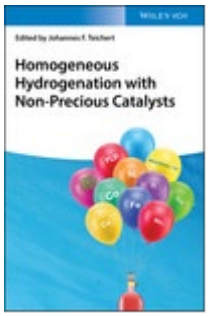
Edited by a noted expert in the field with contributions from a panel of leading international scientists, Rhodium Catalysis in Organic Synthesis presents the essential information in one comprehensive volume. Designed to be an accessible resource, the book is arranged by different reaction types. All the chapters provide insight into each transformation and include information on the history, selectivity, scope, mechanism, and application. In addition, the chapters offer a summary and outlook of each transformation. This important resource:
-Offers a comprehensive review of how rhodium complexes catalyze a variety of highly useful reactions for organic synthesis (e.g. coupling reactions, CH-bond functionalization, hydroformylation, cyclization reactions and others)
-Includes information on the most recent developments that contain a range of new, efficient, elegant, reliable and useful reactions
-Presents a volume edited by one of the international leading scientists working in the field today
-Contains the information that can be applied by researchers in academia and also professionals in pharmaceutical, agrochemical and fine chemical companies

Written for academics and synthetic chemists working with organometallics, Rhodium Catalysis in Organic Synthesis contains the most recent information available on the developments and applications in the field of catalytic cyclization reactions using rhodium complexes.

MARCH 2019 688PP
978-3-527-34364-5 CL $255.00 (Japan) ¥30,600
Methods - Synthesis & Techniques

Homogeneous Hydrogenation with Non-Precious Catalysts

EDITOR JOHANNES F. TEICHERT



A guide and comprehensive review of the most recent advances in homogeneous hydrogenation with non-precious catalysts

In recent years a great deal of research has been applied to homogeneous hydrogenation with non-precious catalysis. Homogeneous Hydrogenation with Non-Precious Catalysts offers a review of the latest developments and advances in the field. In addition, the book explores the transition metal catalysis and the concept of frustrated-lewis-pair (FLP) and enzymatic processes. The editor - a noted expert on the topic - discusses the various catalysts and puts the focus on the synthetic vantage point, highlighting the functional group transformation enabled by the respective catalyst.

Homogeneous Hydrogenation with Non-Precious Catalysts also presents the industrial view of the topic and includes an overview of the various catalysts by functional group transformations. This important book:

-Offers a comprehensive presentation of the newest development in this emerging field
-Highlights the transition metal catalysis, the frustrated-lewis-pair (FLP) concept, and enzymatic processes
-Provides an industrial perspective of the topic
-Includes an overview of the various catalysis by functional group transformations

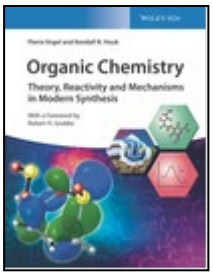
Written for organic chemists, researchers in synthetic chemistry, and industry professionals, Homogeneous Hydrogenation with Non-Precious Catalysts offers a comprehensive and accessible guide to the most recent advances in the field.

DECEMBER 2019 312PP
978-3-527-34439-0 CL $190.00 (Japan) ¥22,800
Methods - Synthesis & Techniques

Organic Chemistry

Theory, Reactivity and Mechanisms in Modern Synthesis

PIERRE VOGEL & KENDALL N. HOUK



Provides the background, tools, and models required to understand organic synthesis and plan chemical reactions more efficiently

Knowledge of physical chemistry is essential for achieving successful chemical reactions in organic chemistry. Chemists must be competent in a range of areas to understand organic synthesis. Organic Chemistry provides the methods, models, and tools necessary to fully comprehend organic reactions. Written by two internationally recognized experts in the field, this much-needed textbook fills a gap in current literature on physical organic chemistry.

Rigorous yet straightforward chapters first examine chemical equilibria, thermodynamics, reaction rates and mechanisms, and molecular orbital theory, providing readers with a strong foundation in physical organic chemistry. Subsequent chapters demonstrate various reactions involving organic, organometallic, and biochemical reactants and catalysts. Throughout the text, numerous questions and exercises, over 800 in total, help readers strengthen their comprehension of the subject and highlight key points of learning. The companion Organic Chemistry Workbook contains complete references and answers to every question in this text. A much-needed resource for students and working chemists alike, this text:

-Presents models that establish if a reaction is possible, estimate how long it will take, and determine its properties
-Describes reactions with broad practical value in synthesis and biology, such as C-C-coupling reactions, pericyclic reactions, and catalytic reactions
-Enables readers to plan chemical reactions more efficiently
-Features clear illustrations, figures, and tables
-With a Foreword by Nobel Prize Laureate Robert H. Grubbs

The book is an ideal textbook for students and instructors of chemistry, and a valuable work of reference for organic chemists, physical chemists, and chemical engineers.

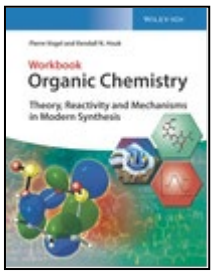
AUGUST 2019 1382PP
978-3-527-34532-8 CL $165.00 (Japan) ¥19,800
Methods - Synthesis & Techniques

Organic Chemistry Workbook

Theory, Reactivity and Mechanisms in Modern Synthesis

PIERRE VOGEL & KENDALL N. HOUK

Provides references and answers to every question presented in the primary Organic Chemistry textbook



Successfully achieving chemical reactions in organic chemistry requires a solid background in physical chemistry. Knowledge of chemical equilibria, thermodynamics, reaction rates, reaction mechanisms, and molecular orbital theory is essential for students, chemists, and chemical engineers. The Organic Chemistry presents the tools and models required to understand organic synthesis and enables the efficient planning of chemical reactions.

This volume, *Organic Chemistry: Theory, Reactivity, and Mechanisms in Modern Synthesis Workbook*, complements the primary textbook--supplying the complete, calculated solutions to more than 800 questions on topics such as thermochemistry, pericyclic reactions, organic photochemistry, catalytic reactions, and more. This companion workbook is indispensable for those seeking clear, in-depth instruction on this challenging subject.

Written by prominent experts in the field of organic chemistry, this book:

- Works side-by-side with the primary Organic Chemistry textbook
- Includes chapter introductions and re-stated questions to enhance efficiency
- Features clear illustrations, tables, and figures
- Strengthens reader's comprehension of key areas of knowledge

Organic Chemistry: Theory, Reactivity, and Mechanisms in Modern Synthesis Workbook is a must-have resource for anyone using the primary textbook.

SEPTEMBER 2019 252PP
978-3-527-34531-1 PB $45.00 (Japan) ¥5,400
Methods - Synthesis & Techniques

Molecular Technology, Volume 4

Synthesis Innovation

EDITOR HISASHI YAMAMOTO & EDITOR TAKASHI KATO

Nagoya University, Japan; University of Tokyo, Japan

Edited by foremost leaders in chemical research together with a number of distinguished international authors, this fourth volume summarizes the most important and promising recent developments in synthesis, polymer chemistry and supramolecular chemisty. Interdisciplinary and application-oriented, this ready reference focuses on innovative methods, covering new developments in catalysis, synthesis, polymers and more. Edited by foremost leaders in chemical research together with a number of distinguished international authors, this fourth volume summarizes the most important and promising recent developments in synthesis, polymer chemistry and supramolecular chemisty. Interdisciplinary and application-oriented, this ready reference focuses on innovative methods, covering new developments in catalysis, synthesis, polymers and more.

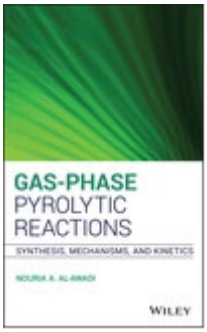
APRIL 2019 432PP
978-3-527-34588-5 CL $190.00 (Japan) ¥22,800
Methods - Synthesis & Techniques

Gas-Phase Pyrolytic Reactions

Synthesis, Mechanisms, and Kinetics

NOURIA A. AL-AWADI

Offers a physical organic chemistry and mechanistic perspective of the chemistry of thermal processes in the gas phase



The book looks at all aspects of the chemical processing technique called gas-phase pyrolysis, including its methodology and reactors, synthesis, reaction mechanisms, structure, kinetics, and applications. It discusses combinations of pyrolytic reactors with physiochemical techniques, routes for and reactions for the synthesis of organic compounds, and the control of reaction rates.

Gas-Phase Pyrolytic Reactions: Synthesis, Mechanisms, and Kinetics starts with in-depth chapter coverage of static pyrolysis, dynamic flow pyrolysis, and analytical pyrolysis. It then examines synthesis and applications, including flash vacuum pyrolysis in organic synthesis, elimination of HX, elimination of CO and CO_2, pyrolysis of Meldrum's acid derivatives, and elimination of N_2. A chapter on reaction mechanism comes next and includes coverage of retero-ene reaction and reactive intermediates. Following that are sections covering: structure/reactivity correlation, functional group & structural frame interconversions; gas-phase pyrolysis of hydrazones and phosphorus Ylides; and more.

Gas-Phase Pyrolytic Reactions: Synthesis, Mechanisms, and Kinetics will appeal to organic chemists, physical organic chemists, chemical engineers and anyone interested in green/sustainable chemistry, chemical synthesis, or process chemistry.

MARCH 2020 304PP
978-1-118-05747-6 CL $140.00 (Japan) ¥16,800
Physical Organic Chemistry

Electron Transfer

Mechanisms and Applications

SHUNICHI FUKUZUMI

Osaka University, Japan

- The author is an international expert in the field. Reviewers: "one of the top scientists in this field", "world-known top chemist"
- A systematic overview of the fundamental concepts and the powerful applications
- The key process in many green energy applications, such as solar cells and hydrogen fuel

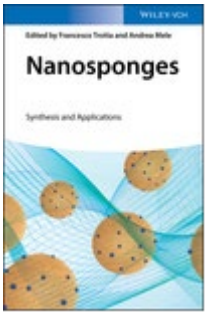
READERSHIP: Organic chemists, inorganic chemists, biochemists, electrochemists, environmental chemists and libraries.

MARCH 2020 240PP
978-3-527-32666-2 CL $170.00 (Japan) ¥20,400
Physical Organic Chemistry

Nanosponges

Synthesis and Applications

EDITOR FRANCESCO TROTTA & EDITOR ANDREA MELE



An excellent overview of the field, covering in detail a wide range of different types of constituent materials, such as polymers, metals and metal oxides. It discusses their production and synthetic routes, as well as applications in several areas, including catalysis, drug delivery and environmental science.
A must-have for scientists in academia and industry, as well as a valuable resource for both newcomers and more established researchers working in the field.

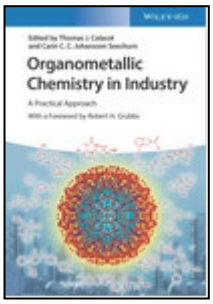
APRIL 2019 336PP
978-3-527-34099-6 CL $190.00 (Japan) ¥22,800
Supramolecular Chemistry

Organometallic Chemistry in Industry

A Practical Approach

EDITOR THOMAS J. COLACOT, EDITOR CARIN C.C. JOHANSSON SEECHURN & FOREWORD BY ROBERT H. GRUBBS

California Institute of Technology, Pasadena, USA



Showcases the important role of organometallic chemistry in industrial applications and includes practical examples and case studies

This comprehensive book takes a practical approach to how organometallic chemistry is being used in industrial applications. It uniquely offers numerous, real-world examples and case studies that aid working R&D researchers as well as Ph.D. and postdoc students preparing to ace interviews in order to enter the workforce. Edited by two world-leading and established industrial chemists, the book covers flow chemistry (catalytic and non-catalytic organometallic chemistry), various cross-coupling reactions (C-C, C-N, and C-B) in classical batch chemistry, conjugate addition reactions, metathesis, and C-H arylation and achiral hydrogenation reactions.

Beginning with an overview of the many industrial milestones within the field over the years, Organometallic Chemistry in Industry: A Practical Approach provides chapters covering: the design, development, and execution of a continuous flow enabled API manufacturing route; continuous manufacturing as an enabling technology for low temperature organometallic chemistry; the development of a nickel-catalyzed enantioselective Mizoroki-Heck coupling; and the development of iron-catalyzed Kumada cross-coupling for the large scale production of Aliskiren intermediates. The book also examines aspects of homogeneous hydrogenation from industrial research; the latest industrial uses of olefin metathesis; and more.

Organometallic Chemistry in Industry: A Practical Approach is an excellent resource for all chemists, including those working in the pharmaceutical industry and organometallics.

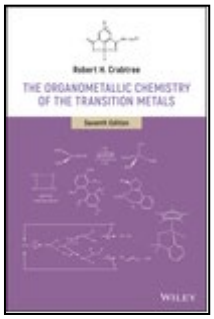
MARCH 2020 336PP
978-3-527-34517-5 CL $135.00 (Japan) ¥16,200
Organometallic Chemistry

The Organometallic Chemistry of the Transition Metals

7th Edition

ROBERT H. CRABTREE

Yale University



Provides vital information on organometallic compounds, their preparation, and use in synthesis, and explores the fundamentals of the field and its modern applications

Fully updated and expanded to reflect recent advances, the new, seventh edition of this bestselling text presents students and professional chemists with a comprehensive introduction to the principles and general properties of organometallic compounds, as well as including practical information on reaction mechanisms and detailed descriptions of contemporary applications. Increased focus is given to organic synthesis applications, nanoparticle science, and green chemistry. This edition features up-to-date examples of fundamental reaction steps and greater emphasis on key topics like oxidation catalysis, CH functionalization, nanoclusters and nanoparticles, and green chemistry. New coverage is added for computational chemistry, energy production, and biochemical aspects of organometallic chemistry.

The Organometallic Chemistry of the Transition Metals, Seventh Edition provides new/enhanced chapter coverage of ligand-assisted additions and eliminations; proton-coupled electron transfer; surface, supported, and cooperative catalysis; green, energy, and materials applications; and photoredox catalysis. It covers coordination chemistry; alkyls and hydrides; Pi-complexes; and oxidative addition and reductive elimination. The book also features sections on insertion and elimination; spectroscopy; metathesis polymerization and bond activation; and more.

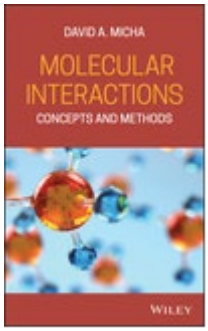
The Organometallic Chemistry of the Transition Metals, Seventh Edition is an insightful book that will appeal to all advanced undergraduate and graduate students in organic chemistry, organometallic chemistry, inorganic chemistry, and bioinorganic chemistry, as well as any practicing chemist in those fields.

SEPTEMBER 2019 464PP
978-1-119-46588-1 CL $115.00 (Japan) ¥13,800
ORGANOMETALLIC CHEMISTRY

Molecular Interactions

Concepts and Methods

DAVID A. MICHA



- A modern, comprehensive text/reference describing intermolecular forces; it begins at atomic structure and advances through molecular and systemic structures.
- Proceeds from introductory material to advanced modern treatments
- Contains applications to many physical systems and worked examples
- Concepts, models, theoretical and computational tools are included to describe specific physical systems such as excited states in photoinduced phenomena, forces at catalyst surfaces as well as applications in photovoltaicsand photoelectrochemistry.
- Relevant to technologies for new materials, biologicalphenomena, and energy and fuels production

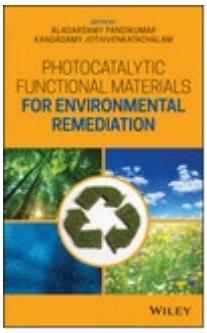
READERSHIP: Advanced undergraduate, graduate students, researchers in the molecular sciences, computational chemists, and mechanical engineers. Professional engineers and biologists in energy, fuels and pharmaceutical industry.

JANUARY 2020 400PP
978-0-470-29074-3 CL $175.00 (Japan) ¥21,000
Physical Chemistry

Photocatalytic Functional Materials for Environmental Remediation

EDITOR ALAGARSAMY PANDIKUMAR & EDITOR KANDASAMY JOTHIVENKATACHALAM

A comprehensive volume on photocatalytic functional materials for environmental remediation



As the need for removing large amounts of pollution and contamination in air, soil, and water grows, emerging technologies in the field of environmental remediation are of increasing importance. The use of photocatalysis--a green technology with enormous potential to resolve the issues related to environmental pollution--breaks down toxic organic compounds to mineralized products such as carbon dioxide and water. Due to their high performance, ease of fabrication, long-term stability, and low manufacturing costs, photofunctional materials constructed from nanocomposite materials hold great potential for environmental remediation.

Photocatalytic Functional Materials for Environmental Remediation examines the development of high performance photofunctional materials for the treatment of environmental pollutants.

This timely volume assembles and reviews a broad range of ideas from leading experts in fields of chemistry, physics, nanotechnology, materials science, and engineering. Precise, up-to-date chapters cover both the fundamentals and applications of photocatalytic functional materials. Semiconductor-metal nanocomposites, layered double hydroxides, metal-organic frameworks, polymer nanocomposites, and other photofunctional materials are examined in applications such as carbon dioxide reduction and organic pollutant degradation.

Photocatalytic Functional Materials for Environmental Remediation is a vital resource for researchers, engineers, and graduate students in the multi-disciplinary areas of chemistry, physics, nanotechnology, environmental science, materials science, and engineering related to photocatalytic environmental remediation.

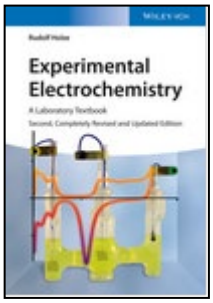
AUGUST 2019 400PP
978-1-119-52984-2 CL $175.00 (Japan) ¥21,000
Photochemistry

Experimental Electrochemistry

A Laboratory Textbook, 2nd Edition

RUDOLF HOLZE

Technical University, Chemnitz



Showing how to apply the theoretical knowledge in practice, the one and only compilation of electrochemical experiments on the market now in a new edition. Maintaining its didactic approach, this successful textbook provides clear and easy-to-follow instructions for carrying out the experiments, illustrating the most important principles and applications in modern electrochemistry, while pointing out the potential dangers and risks involved.
This second edition contains 84 experiments, many of which cover electrochemical energy conversion and storage as well as electrochemical equilibrium.

OCTOBER 2019 288PP
978-3-527-33524-4 PB $65.00 (Japan) ¥7,800
ELECTROCHEMISTRY

Bioelectrochemical Interface Engineering

EDITOR R. NAVANIETHA KRISHNARAJ & EDITOR RAJESH K. SANI

An introduction to the fundamental concepts and rules in bioelectrochemistry and explores latest advancements in the field

Bioelectrochemical Interface Engineering offers a guide to this burgeoning interdisciplinary field. The authors--noted experts on the topic--present a detailed explanation of the field's basic concepts, provide a fundamental understanding of the principle of electrocatalysis, electrochemical activity of the electroactive microorganisms, and mechanisms of electron transfer at electrode-electrolyte interfaces. They also explore the design and development of bioelectrochemical systems.

The authors review recent advances in the field including: the development of new bioelectrochemical configurations, new electrode materials, electrode functionalization strategies, and extremophilic electroactive microorganisms. These current developments hold the promise of powering the systems in remote locations such as deep sea and extra-terrestrial space as well as powering implantable energy devices and controlled drug delivery. This important book:

* Explores the fundamental concepts and rules in bioelectrochemistry and details the latest advancements
* Presents principles of electrocatalysis, electroactive microorganisms, types and mechanisms of electron transfer at electrode-electrolyte interfaces, electron transfer kinetics in bioelectrocatalysis, and more
* Covers microbial electrochemical systems and discusses bioelectrosynthesis and biosensors, and bioelectrochemical wastewater treatment
* Reviews microbial biosensor, microfluidic and lab-on-chip devices, flexible electronics, and paper and stretchable electrodes

Written for researchers, technicians, and students in chemistry, biology, energy and environmental science, *Bioelectrochemical Interface Engineering* provides a strong foundation to this advanced field by presenting the core concepts, basic principles, and newest advances.

NOVEMBER 2019 560PP
978-1-119-53854-7 CL $250.00 (Japan) ¥30,000
Electrochemistry

Electrochemical Systems

4th Edition

JOHN NEWMAN & NITASH P. BALSARA

University of California, Berkley

Provides a comprehensive understanding of a wide range of systems and topics in electrochemistry

This book offers complete coverage of electrochemical theories as they pertain to the understanding of electrochemical systems. It describes the foundations of thermodynamics, chemical kinetics, and transport phenomena--including the electrical potential and charged species. It also shows how to apply electrochemical principles to systems analysis and mathematical modeling. Using these tools, the reader will be able to model mathematically any system of interest and realize quantitative descriptions of the processes involved.

This brand new edition of *Electrochemical Systems* updates all chapters while adding content on lithium battery electrolyte characterization and polymer electrolytes. It also includes a new chapter on impedance spectroscopy. Presented in 4 sections, the book covers: Thermodynamics of Electrochemical Cells, Electrode Kinetics and Other Interfacial Phenomena, Transport Processes in Electrolytic Solutions, and Current Distribution and Mass Transfer in Electrochemical Systems. It also features three appendixes containing information on: Partial Molar Volumes, Vectors and Tensors, and Numerical Solution of Coupled, Ordinary Differential Equations.

Electrochemical Systems, Fourth Edition is an excellent resource for students, scientists, and researchers involved in electrochemical engineering.

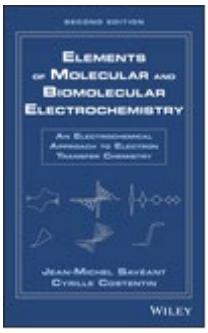
SERIES: THE ECS SERIES OF TEXTS AND MONOGRAPHS

JUNE 2020 704PP
978-1-119-51460-2 CL $175.00 (Japan) ¥21,000
ELECTROCHEMISTRY

Elements of Molecular and Biomolecular Electrochemistry

An Electrochemical Approach to Electron Transfer Chemistry, 2nd Edition

JEAN-MICHEL SAVÉANT & CYRILLE COSTENTIN



Written by two of the world's leading authorities in the field of electrochemistry, this book comprehensively addresses workhorse electrochemical reactions that serve as the basis of modern research for alternative energy solutions.

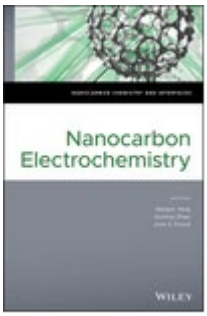
- Provides an accessible and readable summary on the use of electrochemical techniques and the applications of electrochemical concepts to functional molecular-level systems
- Includes a new chapter on proton coupled electron transfer, a completely revamped chapter on molecular catalysis of electrochemical reactions, and added sections throughout the book
- Bridges a gap and strengthens the relationship between electrochemists, molecular and biomolecular chemists--showing a variety of functions that may be obtained by multi-component systems designed using the paradigms of both chemistries

JULY 2019 640PP
978-1-119-29233-3 CL $225.00 (Japan) ¥27,000
ELECTROCHEMISTRY

Nanocarbon Electrochemistry

EDITOR NIANJUN YANG, EDITOR GUOHUA ZHAO & EDITOR JOHN S. FOORD

University of Oxford, UK



Provides a comprehensive introduction to the field of nanocarbon electrochemistry

The discoveries of new carbon materials such as fullerene, graphene, carbon nanotubes, graphene nanoribbon, carbon dots, and graphdiyne have triggered numerous research advances in the field of electrochemistry. This book brings together up-to-date accounts of the recent progress, developments, and achievements in the electrochemistry of different carbon materials, focusing on their unique properties and various applications.

Nanocarbon Electrochemistry begins by looking at the studies of heterogeneous electron transfer at various carbon electrodes when redox-active molecules are reversibly and specifically adsorbed on the carbon electrode surface. It then covers electrochemical energy storage applications of various carbon materials, particularly the construction and performance of supercapacitors and batteries by use of graphene and related materials. Next, it concentrates on electrochemical energy conversion applications where electrocatalysis at 0D, 1D, 2D, and 3D carbon materials nanocarbon materials is highlighted. The book finishes with an examination of the contents of electrogenerated chemiluminescence and photoelectrochemical pollutant degradation by use of diamond and related carbon materials.

Nanocarbon Electrochemistry is an ideal book for students, researchers, and industrial partners working on many diverse fields of electrochemistry, whether they already make frequent use of carbon electrodes in one form of another or are looking at electrodes for new applications.

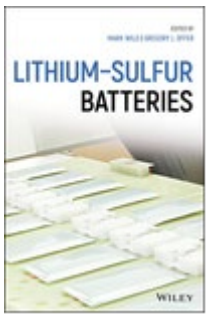
SERIES: NANOCARBON CHEMISTRY AND INTERFACES

JANUARY 2020 384PP
978-1-119-46823-3 CL $195.00 (Japan) ¥23,400
Electrochemistry

Lithium-Sulfur Batteries

EDITOR MARK WILD & EDITOR GREGORY J. OFFER

A guide to lithium sulfur batteries that explores their materials, electrochemical mechanisms and modelling and includes recent scientific developments



Lithium Sulfur Batteries (Li-S) offers a comprehensive examination of Li-S batteries from the viewpoint of the materials used in their construction, the underlying electrochemical mechanisms and how this translates into the characteristics of Li-S batteries. The authors -- noted experts in the field -- outline the approaches and techniques required to model Li-S batteries.

Lithium Sulfur Batteries reviews the application of Li-S batteries for commercial use and explores many broader issues including the development of battery management systems to control the unique characteristics of Li-S batteries. The authors include information onsulfur cathodes, electrolytes and other components used in making Li-S batteries and examine the role of lithium sulfide, the shuttle mechanism and its effects, and degradation mechanisms. The book contains a review of battery design and:

- Discusses electrochemistry of Li-S batteries and the analytical techniques used to study Li-S batteries
- Offers information on the application of Li-S batteries for commercial use
- Distills years of research on Li-S batteries into one comprehensive volume
- Includes contributions from many leading scientists in the field of Li-S batteries
- Explores the potential of Li-S batteries to power larger battery applications such as automobiles, aviation and space vehicles

Written for academic researchers, industrial scientists and engineers with an interest in the research, development, manufacture and application of next generation battery technologies, *Lithium Sulfur Batteries* is an essential resource for accessing information on the construction and application of Li-S batteries.

MARCH 2019 336PP
978-1-119-29786-4 CL $160.00 (Japan) ¥19,200
Batteries & Fuel Cells

Multi-component Reactions in Molecular Diversity

EDITOR JEAN-PHILIPPE GODDARD, EDITOR MAX MALACRIA & EDITOR CYRIL OLLIVIER

While very useful for studying syntheses of molecular diversity, multi-component reactions also offer rapid access to a variety of complex molecules that are relevant for biological applications. Multi-component Reactions in Molecular Diversity analyzes these reactions, whether they are realized by organometallic, ionic or even radical processes. It highlights popular methods based on monotype reactions (cascade, tandem, domino) and their efficiency and academic industrial domain are illustrated. This book also investigates the most efficient ways to prepare complex molecules. Multi-component reactions are in tune with the concepts of atom and steps economy, which are of prior importance in all the reported processes ? from the laboratory to the pilot scale. The essential criteria for green chemistry are also examined in the book in detail.

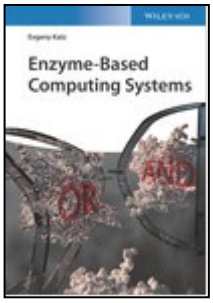
FEBRUARY 2020 198PP
978-1-78630-511-4 CL $120.00 (Japan) ¥14,400
Biochemistry (Chemical Biology)

Enzyme-Based Computing Systems

EVGENY KATZ

Clarkson University, Potsdam, N.Y., USA

This systematic and comprehensive overview of enzyme-based biocomputing is an excellent resource for scientists and engineers working on the design, study and applications of enzyme-logic systems.



AUGUST 2019 424PP
978-3-527-34570-0 CL $223.50 (Japan) ¥26,800
Biomolecules (DNA, RNA, Peptides, etc.)

Biphasic Chemistry and The Solvent Case

EDITOR JEAN-PHILIPPE GODDARD, EDITOR MAX MALACRIA & EDITOR CYRIL OLLIVIER

Biphasic Chemistry and The Solvent Case examines recent improvements in reaction conditions, in order to affirm the role of chemistry in the sustainable field.

This book shows that those who work within the chemistry industry support limits for the use of toxic or flammable solvents, since it reduces the purifications to simple filtrations. Thanks to commercial scavengers, solid phase syntheses are now available to all. Fluorine biphasic catalysis enables extremely efficient catalyst recycling and has a high applicability potential at the industrial level.

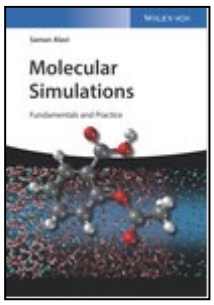
This book also reviews the many studies that have shown that water is a solvent of choice for most synthetic reactions. Particular traits can be obtained and the effects on thermodynamics make it possible to operate at lower temperatures, thereby achieving energy savings. Finally the great diversity of application of the reactions without solvents is illustrated.

FEBRUARY 2020 230PP
978-1-78630-509-1 CL $135.00 (Japan) ¥16,200
Sustainable Chemistry & Green Chemistry

Molecular Simulations

Fundamentals and Practice

SAMAN ALAVI



Provides hands-on knowledge enabling students of and researchers in chemistry, biology, and engineering to perform molecular simulations

This book introduces the fundamentals of molecular simulations for a broad, practice-oriented audience and presents a thorough overview of the underlying concepts. It covers classical mechanics for many-molecule systems as well as force-field models in classical molecular dynamics; introduces probability concepts and statistical mechanics; and analyzes numerous simulation methods, techniques, and applications.

Molecular Simulations: Fundamentals and Practice starts by covering Newton's equations, which form the basis of classical mechanics, then continues on to force-field methods for modelling potential energy surfaces. It gives an account of probability concepts before subsequently introducing readers to statistical and quantum mechanics. In addition to Monte-Carlo methods, which are based on random sampling, the core of the book covers molecular dynamics simulations in detail and shows how to derive critical physical parameters. It finishes by presenting advanced techniques, and gives invaluable advice on how to set up simulations for a diverse range of applications.

Molecular Simulations: Fundamentals and Practice is an excellent book benefitting chemist, biologists, engineers as well as materials scientists and those involved in biotechnology.

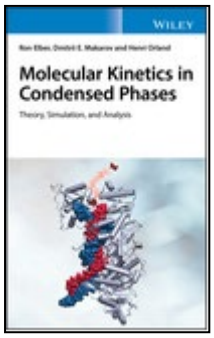
JUNE 2020 352PP
978-3-527-34105-4 PB $120.00 (Japan) ¥14,400
Computational Chemistry & Molecular Modeling

Molecular Kinetics in Condensed Phases

Theory, Simulation, and Analysis

RON ELBER, DMITRII E. MAKAROV & HENRI ORLAND

University of Illinois at Urbana-Champaign



A guide to the theoretical and computational toolkits for the modern study of molecular kinetics in condensed phases

Molecular Kinetics in Condensed Phases: Theory, Simulation and Analysis puts the focus on the theory, algorithms, simulations methods and analysis of molecular kinetics in condensed phases. The authors -- noted experts on the topic -- offer a detailed and thorough description of modern theories and simulation methods to model molecular events. They highlight the rigorous stochastic modelling of molecular processes and the use of mathematical models to reproduce experimental observations, such as rate coefficients, mean first passage times and transition path times.

The book's exploration of simulations examines atomically detailed modelling of molecules in action and the connections of these simulations to theory and experiment. The authors also explore the applications that range from simple intuitive examples of one- and two-dimensional systems to complex solvated macromolecules.

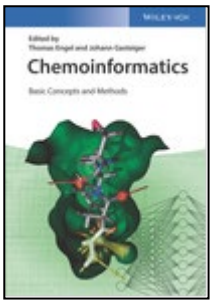
Written for students and academic researchers in the fields of chemical kinetics, chemistry, computational statistical mechanics, biophysics and computational biology, *Molecular Kinetics in Condensed Phases* is the authoritative guide to the theoretical and computational toolkits for the study of molecular kinetics in condensed phases.

FEBRUARY 2020 288PP
978-1-119-17677-0 CL $95.00 (Japan) ¥11,400
Computational Chemistry & Molecular Modeling

Chemoinformatics

Basic Concepts and Methods

EDITOR THOMAS ENGEL & EDITOR JOHANN GASTEIGER



This essential guide to the knowledge and tools in the field includes everything from the basic concepts to modern methods, while also forming a bridge to bioinformatics. The textbook offers a very clear and didactical structure, starting from the basics and the theory, before going on to provide an overview of the methods. Learning is now even easier thanks to exercises at the end of each section or chapter. Software tools are explained in detail, so that the students not only learn the necessary theoretical background, but also how to use the different software packages available. The wide range of applications is presented in the corresponding book Applied Chemoinformatics - Achievements and Future Opportunities (ISBN 9783527342013). For Master and PhD students in chemistry, biochemistry and computer science, as well as providing an excellent introduction for other newcomers to the field.

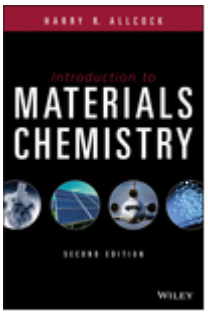
AUGUST 2018 608PP
978-3-527-33109-3 PB $120.00 (Japan) ¥14,400
Chemical Informatics

Introduction to Materials Chemistry

2nd Edition

HARRY R. ALLCOCK

The Pennsylvania State University, University Park, Pennsylvania



This textbook introduces the reader to the elementary chemistry on which materials science depends by discussing the different classes of materials and their applications. It shows the reader how different types of materials are produced, why they possess specific properties, and how they are used in technology. Each chapter contains study questions to enable discussions and consolidation of the acquired knowledge.

The new edition of this textbook is completely revised and updated to reflect the significant expansion of the field of materials chemistry over the last years, covering now also topics such as graphene, nanotubes, light emitting diodes, extreme photolithography, biomedical materials, and metal organic frameworks.

From the reviews of the first edition:

"This book is not only informative and comprehensive for a novice reader, but also a valuable resource for a scientist and/or an industrialist for new and novel challenges." (Materials and Manufacturing Process, June 2009)

"Allcock provides a clear path by first describing basic chemical principles, then distinguishing between the various major materials groups, and finally enriching the student by offering a variety of special examples." (CHOICE, April 2009)

"Proceeding logically from the basics to materials in advanced technology, it covers the fundamentals of materials chemistry, including principles of materials synthesis and materials characterization methods." (Internationale Fachzeitschrift Metall, January 2009)

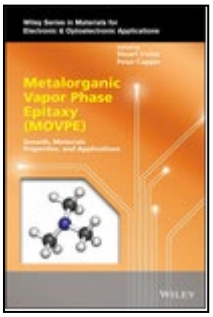
NOVEMBER 2019 512PP
978-1-119-34119-2 CL $125.00 (Japan) ¥15,000
GENERAL & INTRODUCTORY MATERIALS SCIENCE

Metalorganic Vapor Phase Epitaxy (MOVPE)

Growth, Materials Properties, and Applications

EDITOR STUART IRVINE & EDITOR PETER CAPPER

BAE Systems Ltd, UK



Systematically discusses the growth method, material properties, and applications for key semiconductor materials

MOVPE is a chemical vapor deposition technique that produces single or polycrystalline thin films. As one of the key epitaxial growth technologies, it produces layers that form the basis of many optoelectronic components including mobile phone components (GaAs), semiconductor lasers and LEDs (III-Vs, nitrides), optical communications (oxides), infrared detectors, photovoltaics (II-IV materials), etc. Featuring contributions by an international group of academics and industrialists, this book looks at the fundamentals of MOVPE and the key areas of equipment/safety, precursor chemicals, and growth monitoring. It covers the most important materials from III-V and II-VI compounds to quantum dots and nanowires, including sulfides and selenides and oxides/ceramics.

Sections in every chapter of *Metalorganic Vapor Phase Epitaxy (MOVPE): Growth, Materials Properties and Applications* cover the growth of the particular materials system, the properties of the resultant material, and its applications. The book offers information on arsenides, phosphides, and antimonides; nitrides; lattice-mismatched growth; CdTe, MCT (mercury cadmium telluride); ZnO and related materials; equipment and safety; and more. It also offers a chapter that looks at the future of the technique.

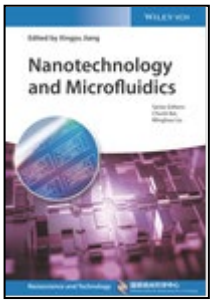
Metalorganic Vapor Phase Epitaxy (MOVPE): Growth, Materials Properties and Applications is an excellent book for graduate students, researchers in academia and industry, as well as specialist courses at undergraduate/postgraduate level in the area of epitaxial growth (MOVPE/ MOCVD/ MBE).

SERIES: WILEY SERIES IN MATERIALS FOR ELECTRONIC & OPTOELECTRONIC APPLICATIONS

OCTOBER 2019 584PP
978-1-119-31301-4 CL $225.00 (Japan) ¥27,000
Optical and Non-Linear Optical Materials

Nanotechnology for Microfluidics

EDITOR XINGYU JIANG, SERIES EDITOR CHUNLI BAI & SERIES EDITOR MINGHUA LIU



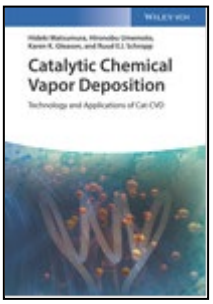
The book focuses on microfluidics with applications in nanotechnology. The first part summarizes the recent advances and achievements in the field of microfluidic technology, with emphasize on the the influence of nanotechnology. The second part introduces various applications of microfluidics in nanotechnology, such as drug delivery, tissue engineering and biomedical diagnosis.

FEBRUARY 2020 448PP
978-3-527-34533-5 CL $190.00 (Japan) ¥22,800
Thin Films, Surfaces & Interfaces

Catalytic Chemical Vapor Deposition

Technology and Applications of Cat-CVD

HIDEKI MATSUMURA, HIRONOBU UMEMOTO, KAREN K. GLEASON & RUUD E.I. SCHROPP



The authoritative reference on catalytic chemical vapor deposition, written by the inventor of the technology.

This comprehensive book covers a wide scope of Cat-CVD and related technologies from the fundamentals to the many applications, including the design of a Cat-CVD apparatus. Featuring contributions from four senior leaders in the field, including the father of catalytic chemical vapor deposition, it also introduces some of the techniques used in the observation of Cat-CVD related phenomena so that readers can understand the concepts of such techniques.

Catalytic Chemical Vapor Deposition: Technology and Applications of Cat-CVD begins by reviewing the analytical tools for elucidating the chemical reactions in Cat-CVD, such as laser-induced fluorescence and deep ultra-violet absorption, and explains in detail the underlying physics and chemistry of the Cat-CVD technology. Subsequently it provides an overview of the synthesis and properties of Cat-CVD-prepared inorganic and organic thin films. The last parts of this unique book are devoted to the design and operation of Cat-CVD apparatuses and the applications.

- Provides coherent coverage of the fundamentals and applications of catalytic chemical vapor deposition (Cat-CVD)
- Assembles in one place the state of the art of this rapidly growing field, allowing new researchers to get an overview that is difficult to obtain solely from journal articles
- Presents comparisons of different Cat-CVD methods which are usually not found in research papers
- Bridges academic and industrial research, showing how CVD can be scaled up from the lab to large-scale industrial utilization in the high-tech industry.

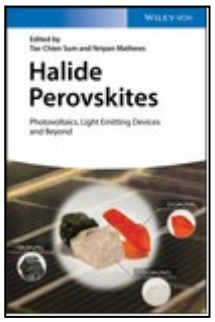
Catalytic Chemical Vapor Deposition: Technology and Applications is an excellent one-stop resource for researchers and engineers working on or entering the field of Cat-CVD, Hot-Wire CVD, iCVD, and related technologies.

APRIL 2019 440PP
978-3-527-34523-6 CL $215.00 (Japan) ¥25,800
Thin Films, Surfaces & Interfaces

Halide Perovskites

Photovoltaics, Light Emitting Devices, and Beyond

EDITOR TZE-CHIEN SUM & EDITOR NRIPAN MATHEWS



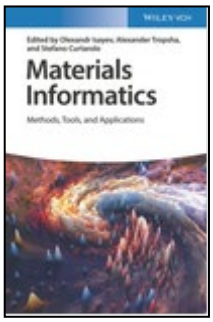
Real insight from leading experts in the field into the causes of the unique photovoltaic performance of perovskite solar cells, describing the fundamentals of perovskite materials and device architectures.
The authors cover materials research and development, device fabrication and engineering methodologies, as well as current knowledge extending beyond perovskite photovoltaics, such as the novel spin physics and multiferroic properties of this family of materials. Aimed at a better and clearer understanding of the latest developments in the hybrid perovskite field, this is a must-have for material scientists, chemists, physicists and engineers entering or already working in this booming field.

JANUARY 2019 312PP
978-3-527-34111-5 CL $190.00 (Japan) ¥22,800
Thin Films, Surfaces & Interfaces

Materials Informatics

Methods, Tools, and Applications

EDITOR OLEXANDR ISAYEV, EDITOR ALEXANDER TROPSHA & EDITOR STEFANO CURTAROLO



Provides everything readers need to know for applying the power of informatics to materials science

There is a tremendous interest in materials informatics and application of data mining to materials science. This book is a one-stop guide to the latest advances in these emerging fields. Bridging the gap between materials science and informatics, it introduces readers to up-to-date data mining and machine learning methods. It also provides an overview of state-of-the-art software and tools. Case studies illustrate the power of materials informatics in guiding the experimental discovery of new materials.

Materials Informatics: Methods, Tools and Applications is presented in two parts - Methodological Aspects of Materials Informatics and Practical Aspects and Applications. The first part focuses on developments in software, databases, and high-throughput computational activities. Chapter topics include open quantum materials databases; the ICSD database; open crystallography databases; and more. The second addresses the latest developments in data mining and machine learning for materials science. Its chapters cover genetic algorithms and crystal structure prediction; MQSPR modeling in materials informatics; prediction of materials properties; amongst others.

-Bridges the gap between materials science and informatics
-Covers all the known methodologies and applications of materials informatics
-Presents case studies that illustrate the power of materials informatics in guiding the experimental quest for new materials
-Examines the state-of-the-art software and tools being used today

Materials Informatics: Methods, Tools and Applications is a must-have resource for materials scientists, chemists, and engineers interested in the methods of materials informatics.

OCTOBER 2019 304PP
978-3-527-34121-4 CL $150.00 (Japan) ¥18,000
Theory, Modeling & Simulation

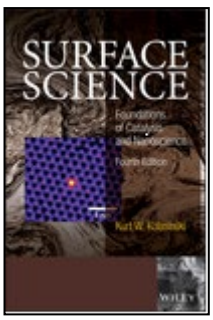
Surface Science

Foundations of Catalysis and Nanoscience

4th Edition

KURT W. KOLASINSKI

Queen Mary, University of London, UK



An updated fourth edition of the text that provides an understanding of chemical transformations and the formation of structures at surfaces

The revised and enhanced fourth edition of *Surface Science* covers all the essential techniques and phenomena that are relevant to the field. The text elucidates the structural, dynamical, thermodynamic and kinetic principles concentrating on gas/solid and liquid/solid interfaces. These principles allow for an understanding of how and why chemical transformations occur at surfaces. The author (a noted expert on in the field) combines the required chemistry, physics and mathematics to create a text that is accessible and comprehensive.

The fourth edition incorporates new end-of-chapter exercises, the solutions to which are available on-line to demonstrate how problem solving that is relevant to surface science should be performed. Each chapter begins with simple principles and builds to more advanced ones. The advanced topics provide material beyond the introductory level and highlight some frontier areas of study.

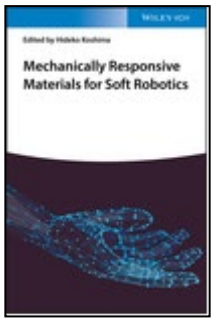
Written for students, researchers and professionals, the fourth edition of *Surface Science* offers a revitalized text that contains the tools and a set of principles for understanding the field.

Instructor support material, solutions and PPTs of figures, are available at http://booksupport.wiley.com

JANUARY 2020 528PP
978-1-119-54663-4 CL $90.00 (Japan) ¥10,800
MATERIALS CHARACTERIZATION

Mechanically Responsive Materials for Soft Robotics

EDITOR HIDEKO KOSHIMA



Offers a comprehensive review of the research and development of mechanically responsive materials and their applications in soft robots

Mechanically Responsive Materials for Soft Robotics offers an authoritative guide to the current state of mechanically responsive materials for the development of soft robotics. With contributions from an international panel of experts, the book examines existing mechanically responsive materials such as crystals, polymers, gels, and composites that are stimulated by light and heat. The book also explores the application of mechanical materials to soft robotics. The authors describe the many excellent mechanical crystals developed in recent years that show the ability to bend, twist, rotate, jump, self-heal, and shape memory. Mechanical polymer materials are described for evolution into artificial muscles, photomobile materials, bioinspired soft actuators, inorganic-organic hybrid materials, multi-responsive composite materials, and strain sensor materials.

The application of mechanical materials to soft robots is just the beginning. This book reviews the many challenging and versatile applications, such as soft microrobots made from photoresponsive elastomers, four-dimensional printing for assembling soft robots, self-growing of soft robots like plants, and biohybrid robots using muscle tissue.

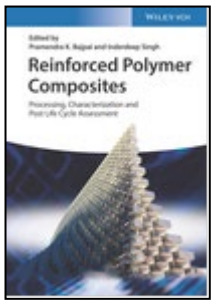
Written for materials scientists, polymer chemists, photochemists, physical chemists, solid state chemists, inorganic chemists, and robotics engineers, Mechanically Responsive Materials for Soft Robotics offers a comprehensive and timely review of the most recent research on mechanically responsive materials and the manufacture of soft robotics.

DECEMBER 2019 448PP
978-3-527-34620-2 CL $215.00 (Japan) ¥25,800
Biomaterials

Reinforced Polymer Composites

Processing, Characterization and Post Life Cycle Assessment

EDITOR PRAMENDRA K. BAJPAI & EDITOR INDERDEEP SINGH



Presents state-of-the-art processing techniques and readily applicable knowledge on processing of polymer composites

The book presents the advancement in the field of reinforced polymer composites with emphasis on manufacturing techniques, including processing of different reinforced polymer composites, secondary processing of green composites, and post life cycle processing. It discusses the advantages and limitations of each processing method and the effect of processing parameters on the overall performance of the composites. Characterization and applications of reinforced polymer composites are also introduced.

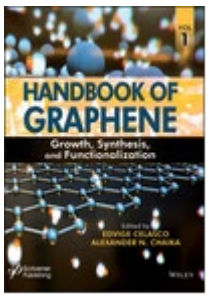
Reinforced Polymer Composites: Processing, Characterization and Post Life Cycle Assessment starts off by providing readers with a comprehensive overview of the field. It then introduces them to the fabrication of both short fiber/filler reinforced polymer composites and laminated reinforced polymer composites. Next, it takes them through the processing of polymer-based nanocomposites; the many advances in curing methods of reinforced polymer composites; and post life cycle processing, re-processing, and disposal mechanisms of reinforced polymer composites. Numerous other chapters cover: synthetic versus natural fiber reinforced plastics; characterization techniques of reinforced plastics; friction and wear analysis of reinforced plastics; secondary processing of reinforced plastics; and applications of reinforced plastics.

Reinforced Polymer Composites: Processing, Characterization and Post Life Cycle Assessment is an important book for materials scientists, polymer chemists, chemical engineers, process engineers, and anyone involved in the chemical or plastics technology industry.

OCTOBER 2019 288PP
978-3-527-34599-1 CL $175.00 (Japan) ¥21,000
Composites

Handbook of Graphene Set, 8 Volumes

SCRIVENER PUBLISHING (EDITOR)



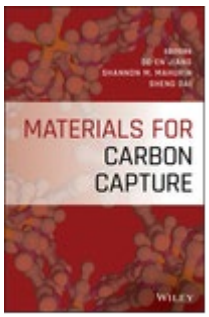
An eight-volume set of handbooks on graphene research and applications

This set features Volumes 1, 2, 3, 4, 5, 6, 7, and 8 of the Handbook of Graphene. Each volume is dedicated to specific topics within the subject area, such as Physics, Chemistry, and Biology; Biomaterials; and Composites. The handbooks offer an overview of graphene research and its role in emerging applications. Graphene, a a valuable nanomaterial, is used in leading edge technological development, including sensing and biosensing. Topics covered in detail within the handbooks include: graphene composites; the synthesis and functionalization of graphene on various substrates; modeling methods in graphene research; and graphene-based materials for biological applications.

JUNE 2019 4746 PP
978-1-119-45990-3 CL $2,199.95 (Japan) ¥263,900
Carbon Materials

Materials for Carbon Capture

EDITOR DE-EN JIANG, EDITOR SHANNON M. MAHURIN & EDITOR SHENG DAI



Covers a wide range of advanced materials and technologies for CO2 capture

As a frontier research area, carbon capture has been a major driving force behind many materials technologies. This book highlights the current state-of-the-art in materials for carbon capture, providing a comprehensive understanding of separations ranging from solid sorbents to liquid sorbents and membranes. Filled with diverse and unconventional topics throughout, it seeks to inspire students, as well as experts, to go beyond the novel materials highlighted and develop new materials with enhanced separations properties.

Edited by leading authorities in the field, *Materials for Carbon Capture* offers in-depth chapters covering: CO2 Capture and Separation of Metal-Organic Frameworks; Porous Carbon Materials: Designed Synthesis and CO2 Capture; Porous Aromatic Frameworks for Carbon Dioxide Capture; and Virtual Screening of Materials for Carbon Capture. Other chapters look at Ultrathin Membranes for Gas Separation; Polymeric Membranes; Carbon Membranes for CO2 Separation; and Composite Materials for Carbon Captures. The book finishes with sections on Poly(amidoamine) Dendrimers for Carbon Capture and Ionic Liquids for Chemisorption of CO2 and Ionic Liquid-Based Membranes.

- A comprehensive overview and survey of the present status of materials and technologies for carbon capture
- Covers materials synthesis, gas separations, membrane fabrication, and CO2 removal to highlight recent progress in the materials and chemistry aspects of carbon capture
- Allows the reader to better understand the challenges and opportunities in carbon capture

Materials for Carbon Capture is an excellent book for advanced students of chemistry, materials science, chemical and energy engineering, and early career scientists who are interested in carbon capture. It will also be of great benefit to researchers in academia, national labs, research institutes, and industry working in the field of gas separations and carbon capture.

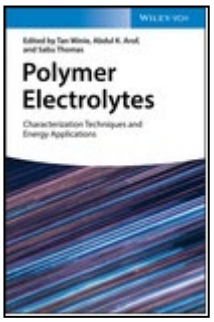
DECEMBER 2019 376PP
978-1-119-09117-2 CL $165.00 (Japan) ¥19,800
Porous Materials

Polymer Electrolytes

Characterization Techniques and Energy Applications

EDITOR TAN WINIE, EDITOR ABDUL K. AROF & EDITOR SABU THOMAS

Mahatma Gandhi University



A comprehensive overview of the main characterization techniques of polymer electrolytes and their applications in electrochemical devices

Polymer Electrolytes is a comprehensive and up-to-date guide to the characterization and applications of polymer electrolytes. The authors ? noted experts on the topic ? discuss the various characterization methods, including impedance spectroscopy and thermal characterization. The authors also provide information on the myriad applications of polymer electrolytes in electrochemical devices, lithium ion batteries, supercapacitors, solar cells and electrochromic windows.

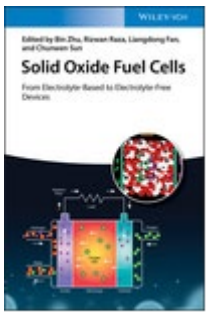
Over the past three decades, researchers have been developing new polymer electrolytes and assessed their application potential in electrochemical and electrical power generation, storage, and conversion systems. As a result, many new polymer electrolytes have been found, characterized, and applied in electrochemical and electrical devices. This important book:
-Reviews polymer electrolytes, a key component in electrochemical power sources, and thus benefits scientists in both academia and industry
-Provides an interdisciplinary resource spanning electrochemistry, physical chemistry, and energy applications
-Contains detailed and comprehensive information on characterization and applications of polymer electrolytes
Written for materials scientists, physical chemists, solid state chemists, electrochemists, and chemists in industry professions, Polymer Electrolytes is an essential resource that explores the key characterization techniques of polymer electrolytes and reveals how they are applied in electrochemical devices.

DECEMBER 2019 416PP
978-3-527-34200-6 CL $205.00 (Japan) ¥24,600
Materials for Energy Systems

Solid Oxide Fuel Cells

From Electrolyte-Based to Electrolyte-Free Devices

EDITOR BIN ZHU, EDITOR RIZWAN RAZA, EDITOR LIANGDONG FAN & EDITOR CHUNWEN SUN



Presents innovative approaches towards affordable, highly efficient, and reliable sustainable energy systems

Written by leading experts on the subject, this book provides not only a basic introduction and understanding of conventional fuel cell principle, but also an updated view of the most recent developments in this field. It focuses on the new energy conversion technologies based on both electrolyte and electrolyte-free fuel cells - from advanced novel ceria-based composite electrolyte low temperature solid oxide fuel cells to non-electrolyte fuel cells as advanced fuel-to-electricity conversion technology.

Solid Oxide Fuel Cells: From Electrolyte-Based to Electrolyte-Free Devices is divided into three parts. Part I covers the latest developments of anode, electrolyte, and cathode materials as well as the SOFC technologies. Part II discusses the non-electrolyte or semiconductor-based membrane fuel cells. Part III focuses on engineering efforts on materials, technology, devices and stack developments, and looks at various applications and new opportunities of SOFC using both the electrolyte and non-electrolyte principles, including integrated fuel cell systems with electrolysis, solar energy, and more.

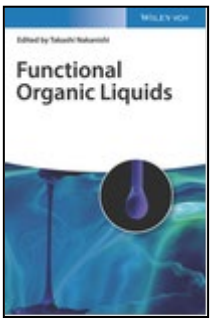
-Offers knowledge on how to realize highly efficient fuel cells with novel device structures
-Shows the opportunity to transform the future fuel cell markets and the possibility to commercialize fuel cells in an extended range of applications
-Presents a unique collection of contributions on the development of solid oxide fuel cells from electrolyte based to non-electrolyte-based technology

Solid Oxide Fuel Cells: From Electrolyte-Based to Electrolyte-Free Devices will serve as an important reference work to students, scientists, engineers, researchers, and technology developers in the fuel cell field.

APRIL 2020 488PP
978-3-527-34411-6 CL $230.00 (Japan) ¥27,600
Materials for Energy Systems

Functional Organic Liquids

EDITOR TAKASHI NAKANISHI



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

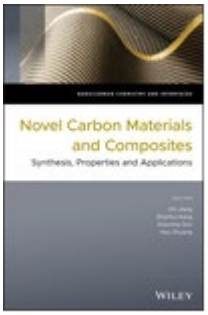
Functional Organic Liquids is an excellent book for materials scientists, polymer chemists, organic chemists, physical chemists, surface chemists, and surface physicists.

MARCH 2019 296PP
978-3-527-34190-0 CL $124.00 (Japan) ¥14,800
Nanomaterials

Novel Carbon Materials and Composites

Synthesis, Properties and Applications

EDITOR XIN JIANG, EDITOR ZHENHUI KANG, EDITOR XIAONING GUO & EDITOR HAO ZHUANG



Connects knowledge about synthesis, properties, and applications of novel carbon materials and carbon-based composites

This book provides readers with new knowledge on the synthesis, properties, and applications of novel carbon materials and carbon-based composites, including thin films of silicon carbide, carbon nitrite, and their related composites. It examines the direct bottom-up synthesis of the carbon-based composite systems and their potential applications, and discusses the growth mechanism of the composite structures. It features applications that range from mechanical, electronic, chemical, biochemical, medical, and environmental to functional devices.

Novel Carbon Materials and Composites: Synthesis, Properties and Applications covers an overview of the synthesis, properties, and applications of novel carbon materials and composites. Especially, it covers everything from chemical vapor deposition of silicon carbide films and their electrochemical applications to applications of various novel carbon materials for the construction of supercapacitors to chemical vapor deposition of diamond/silicon carbide composite films to the covering and fabrication processes of nanodot composites.

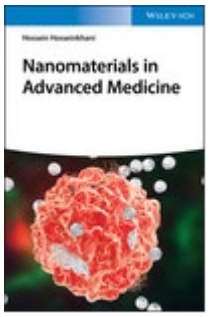
Novel Carbon Materials and Composites: Synthesis, Properties and Applications is an important book for academic researchers and industrial scientists working in the fabrication and application of carbon materials and carbon-based composite materials and related fields.

SERIES: NANOCARBON CHEMISTRY AND INTERFACES

APRIL 2019 304PP
978-1-119-31339-7 CL $160.00 (Japan) ¥19,200
Nanochemistry

Nanomaterials in Advanced Medicine

HOSSEIN HOSSEINKHANI



A comprehensive and multidisciplinary review of the fundamental concepts and medical applications of nanomaterials development technology

Nanomedicine offers a range of multi-interdisciplinary approaches and brings together the field of chemistry, pharmaceutical science, biology, and clinical medicines by focusing on design and preparation of biodegradable or non-biodegradable biomaterials for their biological, medical, and pharmaceutical applications. Nanomaterials in Advanced Medicine reviews the concepts and applications of the combination of the technology of biology and engineering that are emerging as an integral aspect of today's advanced medicine. Nanomedicine provides the technology for imaging, cancer treatment, medical tools, bone treatment, drug delivery, diagnostic tests, drug development, angiogenesis and aims to exploit the improved and often novel physical, chemical, and biological properties of materials at the nanometer scale.

Designed to provide a broad survey of the field, Nanomaterials in Advanced Medicine is divided into three main sections: Nanophysics, Nanochemistry, and Nanomedicine. Each chapter describes in detail the most current and valuable methods available and contains numerous references to the primary literature. This important book:
-Offers a field guide for biologists and physicians who want to explore the fascinating world of nanotechnology
-Contains a comprehensive review of the topic from a noted expert in the field
-Includes an introduction to nanotechnology and explores the synthesis, structure and properties of various types of nanobiomaterials
-Bridges the gap between various aspects of nanomaterials? development technology and their applications

Written for pharmaceutical chemists, biotechnologists, life scientists, materials scientists, polymer chemists, and biochemists, Nanomaterials in Advanced Medicine provides a must-have guide to the fundamental concepts and current applications of nanomaterials in the medical field.

APRIL 2019 224PP
978-3-527-34549-6 CL $124.00 (Japan) ¥14,800
Nanomedicine

Surface and Interface Science, Volumes 7 and 8

Volume 7 - Solid-Liquid and Biological Interfaces;
Volume 8 - Applications of Surface

EDITOR KLAUS WANDELT

University of Bonn, Germany

In ten volumes, this unique handbook covers all fundamental aspects of surface and interface science and offers a comprehensive overview of this research area for scientists working in the field, as well as an introduction for newcomers.

Volume 1: Concepts and Methods
Volume 2: Properties of Elemental Surfaces
Volume 3: Properties of Composite Surfaces: Alloys, Compounds, Semiconductors
Volume 4: Solid-Solid Interfaces and Thin Films
Volume 5: Solid-Gas Interfaces I
Volume 6: Solid-Gas Interfaces II
Volume 7: Liquid and Biological Interfaces
Volume 8: Interfacial Electrochemistry
Volume 9: Applications of Surface Science I
Volume 10: Applications of Surface Science II

Content of Volumes 7 & 8:
* Probing Liquid/Solid Interfaces at the Molecular Level
* Structure and Dynamics of Liquid-Solid Interfaces
* Adsorption of Biomolecules
* Liquid Surfaces
* Surfaces of Ionic Liquids
* Superhydrophobicity
* Cell Penetrating Peptides Targeting and Distorting Biological Membranes
* Theory of Solid/Electrolyte Interfaces
* Metal/Electrolyte Interfaces: An Atomic View
* X-Ray Spectroscopy at Electro-Catalytic Interfaces
* Fundamental Aspects of Electro-Catalysis
* Non-Linear Processes at Solid/Liquid Interfaces

SERIES: WANDELT HDBK SURFACE AND INTERFACE SCIENCE

JANUARY 2020 1008PP
978-3-527-41159-7 CL $500.00 (Japan) ¥60,000
Condensed Matter

Surface and Interface Science, Volumes 9 and 10

Volume 9 - Applications I; Volume 10 - Applications II

EDITOR KLAUS WANDELT

University of Bonn, Germany

In ten volumes, this unique handbook covers all fundamental aspects of surface and interface science and offers a comprehensive overview of this research area for scientists working in the field, as well as an introduction for newcomers.

Content of Volumes 8 & 9:
* Surface Analytics with X-Ray Photoelectron and Auger Electron Spectroscopy on Coated Steel Sheets
* Applications of Graphene
* Industrial Heterogeneous Catalysis
* Automotive Catalysis
* High-Throughput Heterogeneous Catalyst Research, Development, Scale-Up, and Production Support
* Industrial Separation of Insulating Particles: Triboelectric Charging
* Friction: Friend and Foe
* Surface Science and Flotation
* Application of Surface Science to Corrosion
* Electrons, Electrodes, and the Transformation of Organic Molecules
* Self-Cleaning Surfaces: From Fundamental Aspect to Real Technical Applications
* Thin Films: Sputtering, PVD Methods and Applications
* Wafer Bonding
* Superconformal Deposition
* Spintronics: Surface and Interface Aspects
* Device Efficiency of Organic Light-Emitting Diodes
* Dye-Sensitized Solar Cells
* Electronic Nose: Current Status and Future Trends
* Surface Science in Batteries
* Surface and Interface Science in Fuel Cells Research

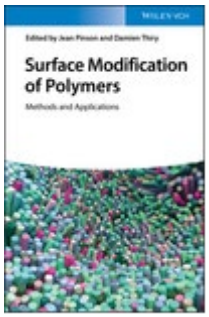
SERIES: WANDELT HDBK SURFACE AND INTERFACE SCIENCE

JANUARY 2020 1000PP
978-3-527-41381-2 CL $500.00 (Japan) ¥60,000
Condensed Matter

Surface Modification of Polymers

Methods and Applications

EDITOR JEAN PINSON & EDITOR DAMIEN THIRY



A guide to modifying and functionalizing the surfaces of polymers

Surface Modification of Polymers is an essential guide to the myriad methods that can be employed to modify and functionalize the surfaces of polymers. The functionalization of polymer surfaces is often required for applications in sensors, membranes, medicinal devices, and others. The contributors - noted experts on the topic - describe the polymer surface in detail and discuss the internal and external factors that influence surface properties.

This comprehensive guide to the most important methods for the introduction of new functionalities is an authoritative resource for everyone working in the field. This book explores many applications, including the plasma polymerization technique, organic surface functionalization by initiated chemical vapor deposition, photoinduced functionalization on polymer surfaces, functionalization of polymers by hydrolysis, aminolysis, reduction, oxidation, surface modification of nanoparticles, and many more. Inside, readers will find information on various applications in the biomedical field, food science, and membrane science. This important book:

-Offers a range of polymer functionalization methods for biomedical applications, water filtration membranes, and food science
-Contains discussions of the key surface modification methods, including plasma and chemical techniques, as well as applications for nanotechnology, environmental filtration, food science, and biomedicine
-Includes contributions from a team of international renowned experts

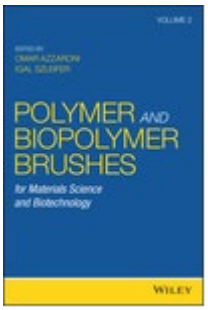
Written for polymer chemists, materials scientists, plasma physicists, analytical chemists, surface physicists, and surface chemists, Surface Modification of Polymers offers a comprehensive and application-oriented review of the important functionalization methods with a special focus on biomedical applications, membrane science, and food science.

DECEMBER 2019 460PP
978-3-527-34541-0 CL $205.00 (Japan) ¥24,600
Polymer processing

Polymer and Biopolymer Brushes

for Materials Science and Biotechnology
Volume 2

OMAR AZZARONI & IGAL SZLEIFER



Serves as a guide for seasoned researchers and students alike, who wish to learn about the cross-fertilization between biology and materials that is driving this emerging area of science

This book covers the most relevant topics in basic research and those having potential technological applications for the field of biopolymer brushes. This area has experienced remarkable increase in development of practical applications in nanotechnology and biotechnology over the past decade. In view of the rapidly growing activity and interest in the field, this book covers the introductory features of polymer brushes and presents a unifying and stimulating overview of the theoretical aspects and emerging applications. It immerses readers in the historical perspective and the frontiers of research where our knowledge is increasing steadily--providing them with a feeling of the enormous potential, the multiple applications, and the many up-and-coming trends behind the development of macromolecular interfaces based on the use of polymer brushes.

Polymer and Biopolymer Brushes: Fundamentals and Applications in Materials offers chapters on: Functionalization of Surfaces Using Polymer Brushes; Polymer Brushes by ATRP and Surface-Mediated RAFT Polymerization for Biological Functions; Electro-Induced Copper Catalyzed Surface Modification with Monolayer and Polymer Brush; Polymer Brushes on Flat and Curved Substrates; Biomimetic Anchors for Antifouling Polymer Brush Coating; Glycopolymer Brushes Presenting Sugars in Their Natural Form; Smart Surfaces Modified with Phenylboronic Acid-Containing Polymer Brushes; DNA Brushes; Polymer Brushes as Interfacial Materials for Soft Metal Conductors and Electronics; and more.

The book is aimed at both graduate students and researchers new to this subject as well as scientists already engaged in the study and development of polymer brushes.

MARCH 2020 448PP
978-1-119-45498-4 CL $205.50 (Japan) ¥24,600
Biopolymers

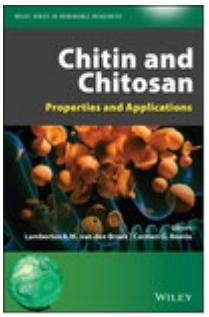
Chitin and Chitosan

Properties and Applications

EDITOR LAMBERTUS A. M. VAN DEN BROEK, EDITOR CARMEN G. BOERIU & SERIES EDITOR CHRISTIAN V. STEVENS

Faculty of Bioscience Engineering, Ghent University, Belgium

Offers a comprehensive guide to the isolation, properties and applications of chitin and chitosan



Chitin and Chitosan: Properties and Applications presents a comprehensive review of the isolation, properties and applications of chitin and chitosan. These promising biomaterials have the potential to be broadly applied and there is a growing market for these biopolymers in areas such as medical and pharmaceutical, packaging, agricultural, textile, cosmetics, nanoparticles and more.

The authors -- noted experts in the field -- explore the isolation, characterization and the physical and chemical properties of chitin and chitosan. They also examine their properties such as hydrogels, immunomodulation and biotechnology, antimicrobial activity and chemical enzymatic modifications. The book offers an analysis of the myriad medical and pharmaceutical applications as well as a review of applications in other areas. In addition, the authors discuss regulations, markets and perspectives for the use of chitin and chitosan. This important book:

- Offers a thorough review of the isolation, properties and applications of chitin and chitosan.
- Contains information on the wide-ranging applications and growing market demand for chitin and chitosan
- Includes a discussion of current regulations and the outlook for the future

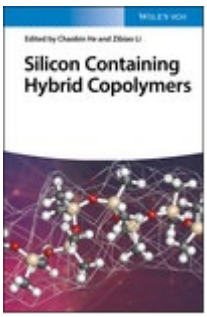
Written for Researchers in academia and industry who are working in the fields of chitin and chitosan, *Chitin and Chitosan: Properties and Applications* offers a review of these promising biomaterials that have great potential due to their material properties and biological functionalities.

SERIES: WILEY SERIES IN RENEWABLE RESOURCE

JANUARY 2020 536PP
978-1-119-45043-6 CL $200.00 (Japan) ¥24,000
Biopolymers

Silicon Containing Hybrid Copolymers

EDITOR CHAOBIN HE & EDITOR ZIBIAO LI



Combines chemistry and material science in order to provide a complete overview of the design, synthesis, and applications of organo-silica

This book offers comprehensive and systematic coverage of the latest developments in functional hybrid silicon copolymers, their applications, and how they were developed in relation to previous works in the preparation of various functional groups terminated silicone materials.

Silicon Containing Hybrid Copolymers begins with a chapter that introduces readers to organo-silicon materials. It then presents a chapter on reactive functionally terminated polyorganosiloxanes, and contains a section on the methods and advances of functionalized polyhedral oligomeric silsesquioxanes (POSS) and copolymers. Nanostructured self-assemblies from silicon containing hybrid copolymers are discussed - as are superhydrophobic materials derived from hybrid silicon. Other chapters examine silicone copolymers for healthcare and personal care applications; construction of organic optoelectronic materials by using polyhedral oligomeric silsesquioxanes (POSS); and 3D printing silicone materials and devices. The book also includes an overview of material toughening and fire retardancy in regards to hybrid POSS nanocomposites. This title:

-Focuses on design and synthesis strategies, providing a valuable resource for researchers in academia and industry
-Presents recent applications, with emphasis on the underlying strategies and the influence from previous designs, in fields such as healthcare and consumer care
-Combines synthetic pathways with design specific considerations to provide the reader with greater control over the design process

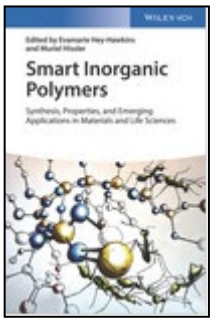
Silicon Containing Hybrid Copolymers is an ideal book for materials scientists, polymer chemists, and bioinorganic chemists.

MARCH 2020 280PP
978-3-527-34664-6 CL $185.00 (Japan) ¥22,200
Polymer Synthesis

Smart Inorganic Polymers

Synthesis, Properties, and Emerging Applications in Materials and Life Sciences

EDITOR EVAMARIE HEY-HAWKINS & EDITOR MURIEL HISSLER



Provides complete and undiluted knowledge on making inorganic polymers functional.

This comprehensive book reflects the state of the art in the field of inorganic polymers, based on research conducted by a number of internationally leading research groups working in this area. It covers the synthesis aspects of synthetic inorganic polymers and looks at multiple inorganic monomers as building blocks, which exhibit unprecedented electronic, redox, photo-emissive, magnetic, self-healing and catalytic properties. It also looks at the applications of inorganic polymers in areas such as optoelectronics, energy storage, industrial chemistry, and biology.

Beginning with an overview of the use of smart inorganic polymers in daily life, Smart Inorganic Polymers: Synthesis, Properties and Emerging Applications in Materials and Life Sciences goes on to study the synthesis, properties, and applications of polymers incorporating different heteroelements such as boron, phosphorus, silicon, germanium, and tin. The book also examines inorganic polymers in flame-retardants, as functional materials, and in biology.

- An excellent addition to the polymer scientists' and synthetic chemists' toolbox
- Summarizes the state of the art on how to make and use functional inorganic polymers, from synthesis to applications
- Edited by the coordinator of a highly funded European community research program (COST action) that focuses specifically on the exploration of inorganic polymers
- Features contributions from top experts in the field

Aimed at academics and industrial researchers in this field, *Smart Inorganic Polymers: Synthesis, Properties and Emerging Applications in Materials and Life Sciences* will also benefit scientists who want to get a better overview on the state-of-the-art of this rapidly advancing area.

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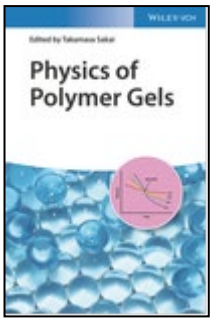
Polymer Synthesis

Physics of Polymer Gels

EDITOR TAKAMASA SAKAI



Explains the correlation between the physical properties and structure of polymer gels

This book elucidates in detail the physics of polymer gels and reviews their unique properties that make them attractive for innumerable applications. Geared towards experienced researchers and entrants to the field, it covers rubber elasticity, swelling and shrinking, deformation and fracture of as well as mass transport in polymer gels, enabling the readers to purposefully design polymer gels fit for specific purposes.

Divided into two parts, *Physics of Polymer Gels* starts by explaining the statistical mechanics and scaling of a polymer chains, and that of polymer solutions. It then introduces the structure of polymer gels and explains the rubber elasticity, which predicts the solid-like nature of polymer gels. Next, it describes swelling/deswelling, which can be understood by combining the rubber elasticity and the osmotic pressure of a polymer solution. Large deformation and fracture, and the diffusion of substances in polymer gels, which are essential for practical applications, are also introduced. The last half of the book contains the authors' experimental results using Tetra-PEG gels and provides readers with the opportunity to examine and compare it with the first half in order to understand how to utilize the models to experiments. This title:

- Is the first book dedicated to the physics of polymer gels
- Describes in detail the properties of polymer gels and their underlying physics, facilitating the development of novel, polymer gel-based applications
- Serves as a reference for all relevant polymer gel properties and their underlying physics
- Provides a unified treatment of the subject, explaining the physical properties of polymer gels within a common nomenclature framework

Physics of Polymer Gels is a must-have book for experienced researchers, such as polymer chemists, materials scientists, organic chemists, physical chemists, and solid-state physicists, as well as for newcomers to the field.

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