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Adsortive Removal of Heavy Metals from Groundwater by Iron Oxide Based Adsorbents

Valentine Uwamariya, UNESCO-IHE Institute for Water Education, Delft, The Netherlands

This book describes the adsorption method in the removal of selected heavy metals present as cations (Cd, Cu and Pb) or oxyanions (Cr(VI) and As(V)) using iron oxide coated sand (IOCS) and granular ferric hydroxide (GFH). The effects of pH, natural organic matter (fulvic acid (FA)) and interfering ions (phosphate and calcium) on the adsorption efficiency were also assessed. The sorption reactions that take place at the surface of the adsorbent were also described through the surface complexation modeling for Cd, Cu and Pb cation adsorption. Batch adsorption tests and rapid small scale column tests (RSST) were used as laboratory methods.

Analytical Chemistry from Laboratory to Process Line

Edited by Gennady E. Zaikov, Kazan National Research Technological University, Russia and A. K. Haghi, University of Ottawa, Canada

Analytical Chemistry from Laboratory to Process Line highlights many of the latest developments and trends in engineering chemistry research and describes the respective tools to characterize and predict properties and behavior of materials. The book provides original, theoretical, and important experimental results that use non-routine methodologies, and presents chapters on novel applications of more familiar experimental techniques and analyses of composite problems that indicate the need for new experimental approaches presented.

Analytical Chemistry of Uranium

Environmental, Forensic, Nuclear, and Toxicological Applications

Zeev Karpas, Nuclear Research Center (Retired), Negev, Israel

Accurate uranium analysis, and particularly for isotope measurements, is essential in many fields, including environmental studies, geology, hydrogeology, the nuclear industry, health physics and, homeland security. This volume covers the fascinating advances in the field of analytical chemistry of uranium. Exploring a broad range of topics, the book focuses on industrial processes that involve uranium, its presence in the environment, health and biological implications of exposure to uranium compounds, and nuclear forensics. Each chapter includes an overview of the topic and several examples to demonstrate the analytical procedures. Separation and purification techniques are included where necessary.

Advances in Chromatography, Volume 53

Edited by Eli Grushka, Hebrew University of Jerusalem, Israel and Nelu Grinberg, Boehringer-Ingeleim Pharmaceuticals Inc., Ridgefield, Connecticut, USA
Series: Advances in Chromatography

For more than four decades, scientists and researchers have relied on the Advances in Chromatography series for the most up-to-date information on a wide range of developments in chromatographic methods and applications. For Volume 53, the series editors have invited established, well-known chemists to offer cutting-edge reviews of developments in chromatographic methods with applications in the life sciences. The clear presentation of topics and vivid illustrations for which this series has become known makes the material accessible and engaging to analytical, biochemical, organic, polymer, and pharmaceutical chemists at all levels of technical skill.

Electrochemical Biosensors

Edited by Serge Cosnier, Université Joseph Fourier, Grenoble Cedex, France
Series: Pan Stanford Series on the High-Tech of Biotechnology

This book provides an overview of biosensors based on amperometry, conductometry, potentiometry, square-wave voltammetry, impedance, and electrochemiluminescence and describes the use of ultramicroelectrodes for the real-time monitoring and understanding of exocytosis. Areas of particular interest are the use of silver and gold nanoparticles for signal amplification, photocurrent transduction, and aptamer design. Moreover, advanced insights in the innovative concept of self-powered biosensors derived from biofuel cells are also discussed.

Handbook of Terahertz Technologies

Devices and Applications

Edited by Ho-Jin Song, NTT Microsystem Integration Laboratories, Kanagawa, Japan and Tadato Nagatsuma, Osaka University, Japan

The book covers some of the technical breakthroughs in terms of device technologies. It discusses not only the theoretical details and typical features of the technology described, but also some issues and challenges related to it. In addition, it is shown what can actually be done with the terahertz-wave technologies by introducing several successful demonstrations, such as wireless communications, industrial uses, remote sensing, chemical analysis, and 2D/3D imaging.
High Performance Liquid Chromatography in Pesticide Residue Analysis
Edited by Tomasz Tuzimski, Medical University of Lublin, Poland and Joseph Sherma, Lafayette College, Easton, Pennsylvania, USA
Series: Chromatographic Science Series
HPLC is the principal separation technique for identification of the pesticides in environmental samples and for quantitative analysis of analytes. At each stage of the HPLC procedure the chromatographer should possess basic skills that substantially help in accomplishing HPLC experiments correctly, to obtain reliable, repeatable, and reproducible results. This book serves as a comprehensive source of information and training on the state-of-the-art pesticide residues methods performed with aid of HPLC and aids the readers in avoiding the many pitfalls that are possible during work with the HPLC mode.
CRC Press
Market: Environmental Science
May 2015: 6 x 10: 582pp
Hb: 978-1-466-56881-5: $159.95
ebook: 978-1-466-56882-2
* For full contents and more information, visit: www.crcpress.com/9781466568815

An Integrated Approach to Analytical Instrument Qualification and Computerised System Validation in Analytical Laboratories
R.D. McDowall, McDowall Consulting, Bromley, Kent, UK and C. Burgess, Barnard Castle, UK
Analytical instrumentation used within regulated analytical laboratories is computerized either via firmware inside the instrument or via a PC workstation with control and application software installed on it. Qualification and validation are typically considered as separate activities with little if any interaction between the two disciplines. The major problem is that you cannot validate the computer system without qualifying the instrument and vice versa. This book is based upon a successful two part workshop given by the authors that will address these concerns.
CRC Press
Market: Environmental Science
September 2016: 7 x 10: 600pp
Hb: 978-1-439-83029-1: $279.95
ebook: 978-1-439-83030-7
* For full contents and more information, visit: www.crcpress.com/9781439830291

Nanomaterials for Water Management
Signal Amplification for Biosensing from Nanostructures
Edited by Robert S. Marks and Ibrahim Abdulhalim
Series: Pan Stanford Series on the High-Tech of Biotechnology
The interest in finding reliable and highly sensitive sensors for water quality control has grown recently empowered by the explosion of cutting-edge technologies such as nanotechnologies, optoelectronics, and computing on one hand and by the increasing need for more secure control of water quality on the other hand. This book highlights a number of modern topics in the field of biosensing particularly for water sensing in which the signal is enhanced, starting from surface enhanced spectroscopies using plasmonic structures such as Raman scattering (SERS), infrared enhanced absorption (SEIRA), and surface enhanced fluorescence (SEF).
Pan Stanford
Market: Environmental Science & Technology
August 2015: 6 x 9: 238pp
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* For full contents and more information, visit: www.crcpress.com/97898146653478

Liposomes in Analytical Methodologies
Edited by Katie A. Edwards, Cornell University, Ithaca, New York, USA
Liposomes in Analytical Methodologies provides up-to-date consideration of actively researched techniques, written by expert investigators in their respective fields from a perspective not readily available in the primary literature. The introductory chapter serves as a primer for readers entering the area as well as a refresher for those with existing background to understand the fundamentals and broad application of liposomes for analytical purposes. With topics ranging from liposome arrays that exhibit environment-dependent color changes to exquisite fluorescent imaging, readers will gain an appreciation for the versatile utility that liposomes can add to the analytical toolbox.
Pan Stanford
Market: Analytical Chemistry
December 2015: 6 x 9: 450pp
Hb: 978-9-814-66926-9: $179.95
ebook: 978-9-814-66927-6
* For full contents and more information, visit: www.crcpress.com/9789814669269

Microfluidic Chip-Capillary Electrophoresis Devices
Edited by Ying Seng Fung, Qidan Chen, Fuying Du, Wenpeng Guo, Tongmei Ma, Zhou Nie, Hui Sun, Ruige Wu and Wenfeng Zhao
Capillary electrophoresis (CE) and microfluidic chip (MC) devices are relatively mature technologies, but this book demonstrates how they can be integrated into a single, revolutionary device that can provide on-site analysis of samples when laboratory services are unavailable. By introducing the combination of CE and MC technology, Microfluidic Chip-Capillary Electrophoresis Devices broadens the scope of chemical analysis, particularly in the biomedical, food, and environmental sciences.
CRC Press
Market: Chemistry
August 2015: 6-1/8 x 9-1/4: 382pp
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ebook: 978-1-482-25165-4
* For full contents and more information, visit: www.crcpress.com/9781482251647
Pharmaceutical Industry Practices on Genotoxic Impurities

Edited by Heewon Lee, Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Connecticut, USA
Series: Chromatographic Science Series
A great deal of confusion and uncertainty over genotoxic impurity (GTI) identification, assessment, and control exists. This book strives to facilitate scientific and systematic consensus on GTI management by presenting rationales, strategies, practices, and case studies from the pharmaceutical industry. Exploring the safety, quality, and regulatory aspects of GTIs, the text explains the how and why of various GTI control tactics and practices, including GTI control examples in drug substance and drug product development processes from large and small pharmaceutical firms in multiple geographical regions.

Planar Chromatography - Mass Spectrometry

Edited by Teresa Kowalska, Mieczyslaw Sajewicz and Joseph Sherma, Lafayette College, Easton, PA (emeritus)
Series: Chromatographic Science Series
This book focuses on a relatively new approach to chemical analysis in general, and to separation science in particular. It is the first book to systematically cover the theoretical background, techniques, instrumentation, and practical applications of planar chromatography–mass spectrometry as a hyphenated tool of analytical chemistry. It also examines the high and as-yet unexploited potential of planar chromatography–mass spectrometry for analytical use in scientific investigations and promotes its expanded use in academia and industry.

Supercritical Fluid Chromatography

Advances and Applications in Pharmaceutical Analysis

Edited by Gregory K. Webster, AbbVie, Inc, North Chicago, Illinois, USA
This book reviews the use of supercritical fluid chromatography (SFC) in drug discovery and describes its application in mass spectrometric and polarographic detection. The book also sheds light on the role of SFC in drug development from natural products, its use in pilot-scale operations as a chromatographic technique, and the advancement of SFC with new technologies.
Biomass and Biofuels
Advanced Biorefineries for Sustainable Production and Distribution
Edited by Shibu Jose, University of Missouri, Columbia, USA and Thallada Bhaskar
Focusing on the key challenges that still impede the realization of the billion-ton renewable fuels and energy products vision, this book provides comprehensive information on sustainable production of biomass feedstock, supply chain management of feedstocks to the biorefinery site, advanced conversion processes, and catalysts/biocatalysts for production of fuels and chemicals using conventional and integrated technologies. It also presents detailed coverage of downstream/recovery operations, for a refinery processing lignocellulosic and algal biomass resources.

 CRC Press
Market: Agricultural Science
April 2015: 7 x 10: 392pp
Hb: 978-1-466-59531-6: $119.95
ebook: 978-1-466-59532-3
* For full contents and more information, visit: www.crcpress.com/9781466595316

Biomass Power for the World
Edited by Wim P. M. van Swaaij, University of Twente, Enschede, Netherlands, Sascha R. A. Kersten, University of Twente, Enschede, Netherlands and Wolfgang Palz, World Council for Renewable Energy, Brussels, Belgium
Series: Pan Stanford Series on Renewable Energy
This book explores the development of biomass, the largest renewable energy source at present, to efficient applications in modern and developing society. Accessible to non-experts and detailed enough for experts, the book reveals the true challenges that lie ahead in this extremely broad area. It focuses on specific technologies, both biological and thermo-chemical, from the simple to the extremely complex, and provides clear, concise explanations that include future prospects. Written by experts, the book highlights the role of bio-energy in the future of renewable energy.

Pan Stanford
Market: Clean Energy
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ebook: 978-9-814-61388-0
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Chemistry of Sustainable Energy
Nancy E. Carpenter
Understanding the chemistry underlying sustainable energy is central to any long-term solution. This text introduces a broad array of advanced chemistry topics relevant to sustainable energy research and elucidates the application of these topics with examples from the primary literature. It examines promising areas of energy conversion, namely, wind power, fuel cells, solar photovoltaics, and biomass conversion processes, as well as next-generation nuclear power. This book also covers topics tied to understanding the chemistry of sustainable energy, including fossil fuels, thermodynamics, polymers, hydrogen generation and storage, and carbon capture.

Chapman and Hall/CRC
Market: Renewable Energy
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ebook: 978-1-466-57533-2
* For full contents and more information, visit: www.crcpress.com/9781466575325

Microwave-Mediated Biofuel Production
Veera G. Gude, Mississippi State University, USA
This book focuses on chemical syntheses and processes for biofuel production mediated by microwave energy. This is the first contribution in this area serving as a resource and guidance manual for understanding the principles, mechanisms, design, and applications of microwaves in biofuel process chemistry. Green chemistry of microwave-mediated biofuel reactions and thermodynamic potentials for the process biochemistry will be the focus of this book. Microwave generation, wave propagation, process design, development and configurations, and biofuel applications will be discussed in detail.

CRC Press
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Sugarcane as Biofuel Feedstock
Advances Toward a Sustainable Energy Solution
Edited by Barnabas Gikonyo, State University of New York (SUNY), Geneseo, New York, USA
As the world’s energy hunger grows ever larger, fossil fuel reserves are diminishing—and concerns about climate change remind us that our love affair with fossil fuels cannot continue much longer. This has inspired intense research into sustainable energy sources. Biofuels seemed initially promising, but the world soon realized that food-based biofuel has its own dangers. Second-generation biofuels, however, use biomass from crops’ inedible parts—such as the stalks and leaves of sugarcane—offering a far more viable solution. In this book, researchers from around the world review some of the most important and timely topics related to using sugarcane feedstock for biofuel.

Apple Academic Press
Market: Environmental Engineering
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* For full contents and more information, visit: www.crcpress.com/9781771881296
Aptamers
Tools for Nanotherapy and Molecular Imaging
Edited by Rakesh N. Veedu, Murdoch University, Perth, Australia
Aptamers, often termed as ‘chemical antibodies,’ are an emerging class of synthetic ligands for efficient target-specific molecular recognition. The objective of this book is to highlight recent advances and potential of aptamers in various disease conditions. This book focuses on the applications of aptamers in targeted nanotherapy, detection, and in molecular imaging in various disease conditions such as cancer, neurological diseases and infectious diseases.

Basics of Molecular Recognition
Dipankar Chatterji, Molecular Biophysics Unit, Indian Institute of Science, Malleswaram, Bangalore, 560012, India
This book describes the major governing rules for biological recognition, self-assembly and the methods that follow. The book concludes with the problem of dimensionality in biological recognition process, and shows how biological recognition can be followed on a surface explaining the effect it has on molecular crowding.

Biocalorimetry
Foundations and Contemporary Approaches
Edited by Margarida Bastos, Department of Chemistry & Biochemistry, Faculty of Sciences, University of Porto
This book provides a current and comprehensive overview of state-of-the-art approaches in biocalorimetry. Starting with a brief historical introduction to calorimetry, the book goes on to discuss prospects for calorimeter development in the near future. Thereafter, a number of unique up-to-date applications of calorimetry in the study of biological systems are provided. Chapters have been contributed by a wide range of experts in the field, many of whom personally pioneered key developments in biocalorimetry.

Bioluminescent Microbial Biosensors
Design, Construction, and Implementation
Edited by Gerald Thouand, University of Nantes, La Roche-sur-Yon, France and Robert S. Marks
Series: Pan Stanford Series on the High-Tech of Biotechnology
This book describes the design and the use of bioluminescent biosensors. It introduces beginners and experienced researchers starting in the microbiological biosensor domain to the practical aspects of building a luminescent microbial biosensor. It is also a source of information about other applications that use microbial cells. Each chapter focuses as far as possible on the technological conception of the presented biosensor with a clear demonstration of the issues in the design and how to reach the proof of concept. The book is divided into three practical sections facilitating the reader to easily access the information.

Cancer-Causing Viruses and Their Inhibitors
Edited by Satya Prakash Gupta, National Institute of Technical Teachers’ Training and Research (NITTTR), Bhopal, India
Cancer-causing viruses, also called oncoviruses, play a key role in the development of certain cancers by contributing to genetic changes. This volume presents a plethora of research from internationally reputed contributors who discuss different types of oncoviruses, their mechanisms of invasion and growth, and their life cycles. The book begins with an overview of the oncoviruses discovered to date and includes a brief description of their structure, genotypes, replication, and mechanisms of infection leading to cancers. It then explores several of these viruses in detail, including HCV, EBV, HPV, and HIV.

Cell Membrane Nanodomains
From Biochemistry to Nanoscopy
Edited by Alessandra Cambi, Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands and Diane S. Lidke, University of New Mexico, Albuquerque, USA
This book furthers the readers’ understanding of the fundamental molecular mechanisms that govern nanostructures and protein function relationships at the cell membrane and explains the ins and outs of this rapidly developing high- or super-resolution microscopy field. Contributing writers include experts from the optical nanoscopy and microscopy fields, biophysicists, biochemists, and cell biologists. Since superresolution optical techniques helped advance the understanding of cellular structure and protein behavior, there is a special emphasis on technologies that are enabling the visualization of lipids, proteins, and other molecular components at unprecedented spatiotemporal resolution.

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Edited by David Schiraldi, Case Western Reserve University, Cleveland, Ohio, USA and Gennady E. Zaikov, Kazan National Research Technological University, Russia

Written by highly regarded experts in the field, this book covers many of the major themes of chemical and biochemical physics, addressing important issues, from concept to technology to implementation. It provides new research and updates on a variety of issues in physical chemistry and biochemistry. Many chapters include case studies and supporting technologies and explain the conceptual thinking behind current uses and potential uses not yet implemented. By providing an applied and modern approach, this volume presents a wide-ranging view of current developments in applied methodologies in chemical and biochemical physics research.

Apple Academic Press
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**Developability of Biotherapeutics**

Computational Approaches

Edited by Sandeep Kumar, Pfizer, Chesterfield, Missouri, USA and Satish Kumar Singh, Pfizer, Chesterfield, Missouri, USA

This reference describes applications of computational and molecular modeling techniques toward more efficient and affordable biopharmaceutical drug development at the pre-clinical stages that could positively impact clinical outcomes. With a primary focus on the developability of monoclonal antibody candidates, it addresses many contributions that computation can make towards biopharmaceutical drug development in general. It is a rich source of information on current principles and practices and provides a starting point for finding innovative applications of computation in biotherapeutics.

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**Chemical Reagents for Protein Modification, Fourth Edition**

Chemistry for Protein Modification, Fourth Edition

Roger L. Lundblad, Lundblad Biotechnology, Chapel Hill, North Carolina, USA

A comprehensive review of reagents used for the chemical modification of proteins, the fourth edition represents a major revision. The completely updated text is substantially larger and includes five new chapters: Alkylating Agents, Acylating Agents, Nitration and Nitrosylation, Oxidation, and Modification of Proteins with Reducing Agents. The format has been markedly revised, presenting information based on the chemical nature of the modifying material and on the amino acid residue modified. Much of the information is in tabular form to enable the rapid location of cited material.

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**Diversity of Selenium Functions in Health and Disease**

Edited by Regina Brigielus-Flohe, German Institute of Human Nutrition, Neubetal and Helmut Sies

Series: Oxidative Stress and Disease

This book brings together the accumulated evidence regarding selenium biochemistry and trace element caused carcinogenesis. After the introduction to be written by Gerry Combs, five sections are planned. The first section is devoted to how selenium is integrated into selenoproteins. Next is a section on selenium compounds with individual functions. Dual functions are dealt with next followed by a section devoted to unexpected links to selenium such as with diabetes. The final section deals with polymorphisms and mutations in gene of selenoproteins. The book should appeal to biochemists, physiologists, nutritionists, and clinical researchers, especially those planning clinical trials.

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**Chemistry and Chemical Biology**

Methodologies and Applications

Edited by Roman Joswik, Military Institute of Chemistry and Radiometry, Warsaw, Poland and Andrei A. Dalinkevich, Institute of Physical Chemistry at the Russian Academy of Sciences, Moscow

Series: AAP Research Notes on Chemistry

This important volume highlights the latest developments and trends in chemistry, biochemistry, and biology. It presents the developments of advanced materials and respective tools to characterize and predict the material properties and behavior. The book provides original, theoretical, and important experimental results that use non-routine methodologies often unfamiliar to the usual readers. The papers on novel applications of more familiar experimental techniques and analyses of chemical, biochemical, and biological programs indicate the need for new experimental approaches.

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**Glutamine**

Biochemistry, Physiology, and Clinical Applications

Edited by Dominique Meynial-Denis, Unité de Nutrition Humaine, St Genès Champanelle, France

Glutamine is a non-essential amino acid that fulfills many key roles in metabolism and cell/tissue function. This book examines recent advances in our understanding of the biochemistry of glutamine as well as molecular and cellular aspects of glutamine metabolism and action. It also reviews the various functions of this amino acid other than its function as an energy substrate. Finally, the importance of glutamine in critical illness and its role in the aging process and exercise is also emphasized.

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Glycobiology and Human Diseases
Edited by Gherman Wiederschain, Boston College, Chestnut Hill, Massachusetts, USA
This book discusses glycobiology and various forms of human diseases. Topics covered include immunoglobulins, inflammation and glycosylation, the role and therapeutic significance of natural anti-glycan antibodies in malignancies and in normal and aberrant pregnancy, identifying urinary glycans as a possible method for the diagnosis of lysosomal storage diseases, glycochemistry of human milk (biological roles and diseases) and pectins as biological modulators of human physiological reactions. The book includes analysis of comprehensive data and some productive conclusions and perspectives.

How Enzymes Work
From Structure to Function
Edited by Haruo Suzuki, Kitasato University, Kanagawa-ken, Japan
This book starts with an introduction to various enzymes to show how interesting enzymes are. It is followed by historical kinetic studies on enzymes and the overall rapid reaction kinetics. The subsequent topics describe the basics of protein structure, the control of enzyme activity, and the purification of enzymes. A case on the kinetic and structural studies of L-phenylalanine oxidase is also presented. There are many good books on enzyme kinetics, but only a few books describe their kinetic and structural aspects. This book deals with both and contains many references that can be good sources for further readings. The book is handy and is especially helpful for beginners.

Human Longevity
Omega-3 Fatty Acids, Bioenergetics, Molecular Biology, and Evolution
Raymond C. Valentine, Professor Emeritus, University of California at Davis, USA and David L. Valentine
Human cells are protected from the ravages of aging by defensive systems including novel mechanisms against membrane oxidation introduced in this book. The book proposes a unified concept in which aging cells faced with declining energy production by mitochondria and the relatively high cost of protecting membranes against oxidation are triggered by energy stress to activate programmed cellular death. It includes case histories illustrating the duality of polysaturated membranes in aging and longevity. It also explains the relationship between membrane unsaturation and longevity leading to a unified concept of aging.

3rd Edition - TEXTBOOK - NEW EDITION
Insect Physiology and Biochemistry, Third Edition
James L. Nation, Sr.
Following the tradition of its bestselling predecessors, this edition provides working scientists and students with an engaging and authoritative guide to the most current findings in the dynamic field of insect physiology. Expanded and updated, this third edition challenges conventional entomological wisdom with the latest research and analytical interpretations. Encouraging independent evaluation of the data and allowing for the extrapolation of major concepts across species, this indispensable text establishes a thorough understanding of the physiological and biochemical functions and adaptations that have made insects one of the most successful groups of living organisms on the planet.

TEXTBOOK
Introduction to Experimental Biophysics - A Laboratory Guide
Jay L. Nadeau, McGill University, Montreal, Canada
A companion to the author’s highly praised textbook, this manual presents wet lab methods for courses in biophysics or molecular biology. Tested in a pedagogical setting, the experiments follow a logical progression beginning with a DNA construct. The book starts with the basics of molecular cloning: amplifying and purifying plasmid, plasmid mapping, and using restriction enzymes. Later experiments deal with more advanced techniques, such as the synthesis and characterization of quantum dots and gold nanoparticles, protein crystallization, and spectroscopic techniques.

TEXTBOOK
Introduction to Experimental Biophysics (Set)
Textbook and Lab Manual
Jay Nadeau, McGill University, Montreal, Quebec, Canada
A practical companion for physical scientists seeking to move into wet laboratory experiments and biological research areas, this set provides a firm footing in basic terminology and concepts. The test begins with the simpler, essential methods and then builds gradually to more advanced techniques. Written at a level that assumes no previous background in biology, the book is organized to follow a logical experimental progression. This structure allows readers to follow the steps involved in the production of nucleic acids and proteins and the different levels of purification required for each type of analysis.
5th Edition - TEXTBOOK

**Introduction to Nutrition and Metabolism, Fifth Edition**

David A. Bender, Emeritus Professor, University College London, UK

Extensively revised and updated to reflect our current understanding of nutritional and dietary requirements, the Fifth Edition presents principles of nutrition and metabolism, biochemistry, and interactions between health and diet, and examines the role of nutrition in common chronic diseases. The author continues to use concise, authoritative language to emphasize and describe the underlying biochemistry that is essential to an understanding of nutrient function and the ability to evaluate and interpret future advances in nutrition science. The text is enhanced with full-color newly drawn diagrams and figures.

**Market:** Food Science and Nutrition

**Pb:** 978-1-466-57224-9 $79.95

**ebook:** 978-1-466-57225-6

Prev Ed Pb: 978-1-420-04311-9

*For full contents and more information, visit: www.crcpress.com/9781466572249

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2nd Edition - NEW EDITION

**An Introduction to Polysaccharide Biotechnology, Second Edition**

Stephen E. Harding, Gary G. Adams, University of Nottingham, United Kingdom, Michael P. Tombs, Berit Smestad Pauslen and Hilde Barsett

This second edition offers an up-to-date account of the production and uses of polysaccharides. New chapters focus on vaccines, encapsulation, and bioactivity. The volume explains and illustrates how recent developments in polysaccharides may lead to major future progress in this field. Compact yet comprehensive material highlights the rapidly growing biotechnology of polysaccharides.

**Market:** Chemistry

**June 2016:** 7 x 10: 280pp

**Hb:** 978-1-482-24697-1 $129.95

**ebook:** 978-1-482-24832-6

**Prev. Ed Hb:** 978-1-420-04312-9

*For full contents and more information, visit: www.crcpress.com/9781482246971

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**Life Chemistry Research**

**Biological Systems**

Edited by Roman Joswik, Military Institute of Chemistry and Radiometry, Warsaw, Poland, Gennady E. Zaikov, Kazan National Research Technological University, Russia and A. K. Haghj, University of Ottawa, Canada

This volume contains a collection of topical chapters that promote interdisciplinary approaches to biological systems, focusing on fundamental and relevant connections between chemistry and life. Included are studies and experiments as well as invited lectures and notes by prominent leaders on a wide variety of topics in biology and biochemistry. By describing the complementary nature of chemistry and biology, the book presents the biological processes in detailed chemical terms, providing a fascinating look into the emerging field of chemical biology.

**Market:** Life Sciences

**May 2015:** 6-1/8 x 9-1/4: 350pp

**Hb:** 978-1-771-88068-8 $149.95

**ebook:** 978-1-498-70000-9

*For full contents and more information, visit: www.crcpress.com/9781771880688

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**Lipids**

**Nutrition and Health**

Claude Leray

Lipids (fats and oils) are essential cellular components in animals, plants, and bacteria, and they play an important role in human nutrition. This book presents a detailed account of the nutritional aspects of all types of lipid—fatty acids, triacylglycerols, phospholipids, sphingolipids, sterols, and fat-soluble vitamins (A, D, E, K). The importance of the omega-3/omega-6 fatty acid ratio in cardiovascular health is well known, but the nutritional balance of lipids also impacts the immune system, the central nervous system, and cancer processes.

**Market:** Nutrition

**November 2014:** 6-1/8 x 9-1/4: 322pp

**Pb:** 978-1-482-24231-7 $99.95

**ebook:** 978-1-482-24232-4

*For full contents and more information, visit: www.crcpress.com/9781482242317

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**Liposomes, Lipid Bilayers and Model Membranes**

From Basic Research to Application

Edited by Georg Pabst, University of Graz, Austria, Norbert Kučerka, National Research Council of Canada, Chalk River, Mu-Ping Nieh, University of Connecticut, Storrs, USA and John Katsaras, Oak Ridge National Laboratory, Tennessee, USA

With contributions from leading researchers in their fields, this book describes state-of-the-art lipid/model membrane research, and industrial and medical applications, all in one volume. The book is divided into two sections. The first section covers a range of basic research topics, from theory and computational simulations to current experimental research. The second part describes applications of lipid systems used in the pharmaceutical, textile, and food industries. Covering basic and applied research, this book serves as a useful reference for both the novice and the expert.

**Market:** Biochemistry/Biophysics

**March 2014:** 7 x 10: 478pp

**Hb:** 978-1-466-50709-8 $187.95

**ebook:** 978-1-466-50711-1

*For full contents and more information, visit: www.crcpress.com/9781466507098

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**Mapping of Nervous System Diseases via MicroRNAs**

Edited by Christian Barbato and Francesca Ruberti

Series: Frontiers in Neurotherapeutics Series

This book reviews the function of miRNA in neurological diseases and the advancement of the technology for therapeutic modulation of miRNA activity. Due to the ever-expanding knowledge of miRNAs as fine-tuners of gene expression in all aspects of biology and medicine, and to the emerging impact of sequence-specific post-transcriptional gene silencing mediated by miRNA as a potential therapeutic approach directed to the nervous system, this book will be of great interest to a broad scientific audience.

**Market:** Biomedical Science

**January 2016:** 6-1/8 x 9-1/4: 278pp

**Hb:** 978-1-482-26352-7 $149.95

**ebook:** 978-1-482-26353-4

*For full contents and more information, visit: www.crcpress.com/9781482263527

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Mass Spectrometry-Based Metabolomics: A Practical Guide

Edited by Sastia Prama Putri, Osaka University, Suita, Japan and Eiichiro Fukusaki

This book is a simple, step-by-step reference for profiling metabolites in a target organism. It discusses optimization of sample preparation for urine, serum, blood, tissue, food, and plant and animal cell samples. The book summarizes all steps in metabolomics research, from experimental design to sample preparation, analytical procedures, and data analysis. Case studies are presented for easy understanding of the metabolomics workflow and its practical applications in different research fields. It includes an in-house library and built-in software so readers can analyze real data samples.

Neurobiology of Chemical Communication

Edited by Carla Mucignat-Caretta, University of Padova, Italy

Series: Frontiers in Neuroscience

Exploring the role of the chemical senses in mediating intra- and interspecific communication, this volume examines the structure, anatomy, electrophysiology, and molecular biology of pheromones. It discusses how chemical signals work on different mammalian and non-mammalian species and includes chapters on insects, Drosophila honey bees, amphibians, mice, cats, and cattle. It also explores the controversial topic of human pheromones. An essential reference for students and researchers in the field of pheromones, this is also an ideal resource for those working on behavioral phenotyping of animal models and persons interested in the biology/ecology of the different species.

Motor Proteins and Molecular Motors

Anatoly B. Kolomeisky

This accessible book explores the mechanisms of cellular functioning associated with several specific enzymatic molecules called motor proteins. It presents established results, theoretical methods, and experimental observations related to biological molecular motors. The author uses fundamental physical-chemical concepts and methods to develop a systematic theoretical framework for understanding motor protein dynamics. He introduces the main ideas using simple arguments that avoid heavy mathematical derivations in favor of more intuitive physical understanding.

Redox Proteins in Supercomplexes and Signalosomes

Edited by Ricardo O. Louro, Instituto de Tecnología Química e Biológica Antonio Xavier, Universidade Nova de Lisboa, Portugal and Irene Diaz-Moreno, Instituto de Bioquímica Vegetal y Fotosíntesis, cccCartuja, Universidad de Sevilla - CSIC

This book is one of the first to explore the key role played by redox proteins and their interaction network in a wide range of essential cellular processes in all domains of life. The book explains how the mitochondrial respiratory chain is dynamically organized in supercomplexes even under physiological conditions. It also addresses the impact of supercomplex assembly on mitochondrial morphology, physiology, and biogenesis to shed light on the molecular mechanisms of pathological situations, including aging.

Natural Biomarkers for Cellular Metabolism: Biology, Techniques, and Applications

Edited by Vladimir V. Ghukasyan, University of North Carolina, Chapel Hill, USA and Ahmed A. Heikal, University of Minnesota, Duluth, USA

Series: Series in Cellular and Clinical Imaging

This guide covers the current state of knowledge on intrinsic fluorescent biomarkers and highlights advances in using these biomarkers for the metabolic mapping and clinical diagnosis of healthy and diseased cells and tissues. The book’s first section introduces the fundamentals of cellular energy metabolic pathways as well as natural biomarkers within the context of their biological functions. The second section outlines the theoretical and technical background of quantitative, noninvasive, autofluorescence microscopy and spectroscopy methods. The last two sections explore applications in biochemistry, cell biology, and medicine.

Reversibility of Chronic Disease and Hypersensitivity, Volume 3: Clinical Environmental Manifestations of the Neurocardiovascular Systems

Edited by William J. Rea, Environmental Health Center, Dallas, Texas, USA and Kalpana Patel, Allergy and Environmental Health Center WNY, Buffalo, New York, USA

The third volume of an encyclopedic four-volume set, this book focuses on laboratory data and treatment. Distinguishing itself from previous works on chemical sensitivity, this set explains newly understood mechanisms of chronic disease and hypersensitivity involving core molecular function. It discusses new information on ground regulation system, genetics, the autonomic nervous system, and immune and non-immune functions. It includes sophisticated diagnostic technology and cutting-edge treatment techniques as well as numerous color figures and supporting research.

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Role of Oxidative Stress in Chronic Diseases

Edited by Isaías Dichi, University of Londrina, Brazil, José Wander Breganó, University of Londrina, Brazil, Andréa Name Colado Simão, University of Londrina, Brazil and Rubens Cecchini

This book presents recent findings on the role of oxidative stress in chronic diseases. Understanding the mechanisms by which oxidative stress acts on chronic diseases enables readers to comprehend the rationale which underlies intervention in such conditions. This book gives readers a broad view in relation to an important issue related to oxidative stress, that is, genetic polymorphism. It covers the role of oxidative stress in transmissible diseases as well as non-transmissible chronic diseases. It discusses three types of non-transmissible chronic diseases: oxidative stress in metabolic diseases, in autoimmune and neurodegenerative diseases, and in cancer and cachexia. Each chapter covers a different disorder and the efficacy of interventional procedures.

CRC Press
Market: Infectious Diseases
March 2014: 6-1/8 x 9-1/4: 220pp
Hb: 978-1-482-21682-0: $199.95
eBook: 978-1-482-21681-3
* For full contents and more information, visit: www.crcpress.com/9781482216813

Skin Bioscience
A Molecular Approach

Edited by Toyoko Imae, National Taiwan University of Science & Technology, Taipei

This book introduces skin bioscience with a specific focus on the molecular approach. Following the description of the fundamental structure and unique functionality of the skin, it examines the response of the skin to exterior stimulation. It also focuses on the beautification and regeneration of the skin. This book provides readers with the molecular knowledge of the skin and stimulates their interest in further investigation and development of skin bioscience.

Pan Stanford
Market: Dermatology
February 2014: 6 x 9: 240pp
Hb: 978-9-814-36495-9: $149.95
eBook: 978-9-814-36496-6
* For full contents and more information, visit: www.crcpress.com/9789814364959

Structural and Mediator Lipidomics

Michel Lagarde, Nathalie Bernoud-Hubac, Celine Costaz, Frederic Carriere and Michel Guichardant

In this book, the authors present lipid molecular species, which have been well defined for their biological activities, whatever the biological system involves, with reference to the closely related structural lipids. The emphasize bioactive lipids issued from membrane lipids, especially polyunsaturated fatty acid derivatives produced through various oxygenation processes. They also cover enzymes associated with the production of these bioactive lipids and receptor proteins relating to their action.

EPFL Press
Market: Molecular Biology
December 2015: 6 x 9: 120pp
Hb: 978-2-940-22292-6: $69.95
ebook: 978-1-482-21682-0
* For full contents and more information, visit: www.crcpress.com/9782940222926

Vitamin B12
Advances and Insights

Edited by Rima Obeid, University Hospital of the Saarland, Homburg, Germany

Cobalamin (Vitamin B12) was discovered in the first half of the 20th century. Recently, the fast pace of development in research technologies has changed our understanding of the closely related structural lipids. The emphasize bioactive lipids issued from membrane lipids, especially polyunsaturated fatty acid derivatives produced through various oxygenation processes. They also cover enzymes associated with the production of these bioactive lipids and receptor proteins relating to their action.

EPFL Press
Market: Nutrition
May 2016: 6 x 9: 448pp
Hb: 978-1-482-21681-3: $199.95
ebook: 978-1-482-21681-3
* For full contents and more information, visit: www.crcpress.com/9781482216813

The Toxicology and Biochemistry of Insecticides, Second Edition

Simon J. Yu, University of Florida, Gainesville, USA

Continuing as the sole book in more than two decades to address this multifaceted field, the second edition of this highly praised review on insecticide toxicology has been expanded and updated to present the latest information on insecticide classification, formulation, bioassay, mode of action, resistance, metabolism, selective toxicity, environmental fate, and regulatory legislation. Incorporating references for further reading, this valuable resource discusses newly developed insecticides, newly discovered modes of action, new labeling requirements, and more. It provides essential insecticide knowledge required for effective insect pest management.

CRC Press
Market: Environmental Science
November 2014: 7 x 10: 380pp
Hb: 978-1-482-21060-6: $99.95
ebook: 978-1-482-21061-3
* For full contents and more information, visit: www.crcpress.com/9781482210606

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**Cell and Matrix Mechanics**

*Edited by Roland Kaunas, Texas A&M University, College Station, USA and Assaf Zemel, The Hebrew University of Jerusalem, Israel*

This book covers several key areas of cell and tissue mechanics, providing the data and modeling framework for a multiscale analysis. The first section introduces basic concepts and outlines popular approaches used to study the mechanical properties of cells and matrix. The following two sections focus on molecular-scale studies of subcellular and matrix protein mechanics. The third section focuses on cell-cell and cell-matrix interactions. The final section deals with studies at the tissue scale.

**Controlled Release Systems**

*Advances in Nanobottles and Active Nanoparticles*  
*Edited by Alex van Herk, Institute of Chemical and Engineering Sciences, Singapore, Jacqueline Forcada and Giorgia Pastorin*

This book focuses on responsive nanoparticles and brings together two interesting areas: nanoparticles and responsive polymers. The concept of the book is that of a systematic approach from nanoparticles synthesis via responsive polymers to nanobottles. The second part of the book presents contributions from experts in the field and provides a state-of-the-art overview of the field.

**DNA Engineering**

*Properties and Applications*  
*Kenji Mizoguchi, Tokyo Metropolitan University, Hachioji, Japan and Hirokazu Sakamoto, Tokyo Metropolitan University, Hachioji, Japan*

This book presents basic information about DNA, along with comprehensive theoretical introduction to DNA. It discusses recent developments in divalent-metal-ion inserted M-DNA complex, which gives rise to the possibility of DNA application to electronic functionality. Further, the book describes three examples of applications: optical and electrical materials, electronic devices such as bioTFT memory and color-tunable light-emitting diodes, and biofuel cell application with use of proton conduction in DNA.

**Elastic Fiber Matrices**

*Biomimetic Approaches to Regeneration and Repair*  
*Edited by Anand Ramamurthi, Cleveland Clinic Lerner Research Institute, Cleveland, OH, USA and Chandrasekhar Kothapalli, Cleveland State University, Cleveland, OH, USA*

Soft connective tissues, such as skin, blood vessels, and lung and urogenital tissues, exhibit architecturally complex extracellular matrices (ECM) of which the elastic matrix forms a major structural component. This book is the first comprehensive resource on the subject, detailing state-of-the-art approaches to elastic matrix regeneration and repair. It presents a critical analysis of the merits and limitations of available technologies and provides perspectives on future technological needs and advances as well as clinical translation and commercialization of these technologies.

**Microfluidics and Nanotechnology**

*Biosensing to the Single Molecule Limit*  
*Edited by Eric Lagally, Western Governors University, Salt Lake City, UT, USA*

Series: Devices, Circuits, and Systems

While similar books concentrate only on microfluidics or nanotechnology, this book describes integrated approaches for the detection of single cells and molecules. Focusing exclusively on biological and chemical targets, it explores state-of-the-art physical, chemical, contact, and noncontact detection methods, explaining the theory behind the different techniques. By highlighting a variety of technologies, the text allows for a comparison of the fundamental advantages and challenges of each, as well as an appreciation of the power of leveraging scalability and integration to achieve sensitivity at low cost.

**Molecular and Cellular Biomechanics**

*Edited by Bradley Layton, University of Montana, Missoula, USA*

This book bridges the gap between life sciences and physical sciences by providing several perspectives on cellular and molecular mechanics on a fundamental level. It begins with a general introduction to the scales and terms that are used in the field of cellular and molecular biomechanics and then moves from the molecular scale to the tissue scale. It discusses various tissues or cellular systems through the chapters written by prominent engineers and physicists working in various fields of biomechanics.
Nanomaterials for Electrochemical Sensing and Biosensing

Edited by Martin Pumera

Nanotechnology brings new possibilities for the development of sensors, biosensors, and novel electrochemical bioassays. Nanoscale materials have been extensively used in a wide variety of configurations—as electrode surfaces to promote electrochemical reaction, as “wires” to enzymes connecting their redox centers to electrode surface, as nanobarcodes for biomolecules, or as tags to amplify the signal of a biorecognition event. Nanomaterial-based electrochemical sensors have been used in many areas, including cancer diagnostics and the detection of infectious organisms. This book reviews important achievements in the field of nanomaterial-based electrochemical sensors and biosensors.

Pan Stanford
May 2014: 6 x 9: 292pp
Hb: 978-9-814-36490-4: $149.95
ebook: 978-9-814-36491-1
* For full contents and more information, visit: www.crcpress.com/9789814364904

Patient Specific Stem Cells

Edited by Deepak Lamba, Buck Institute for Research on Aging, Novato, CA, USA

An in-depth overview, this book covers the generation of Pluripotent stem cells (iPSCs)and the current research in various labs on how the technology is being used to study the diseases and identify novel treatments. It addresses three main areas: (a) various methods of reprogramming somatic cells to derive patients specific IPS Cells, (b) Generation and differentiation of various patient specific stem cells into different tissues including neurons, retinal cells, and cardiac cells, and (c) Applications of the patient derived cells including toxicity testing, and drug discovery.

CRC Press
August 2016: 6-1/8 x 9-1/4: 500pp
Hb: 978-1-466-58026-8: $159.95
ebook: 978-1-466-58029-9
* For full contents and more information, visit: www.crcpress.com/9781466580268

Synthetic Biology Handbook

Edited by Darren N. Nesbeth, University College London, UK

This book provides the reader with an explanation of the major goals of synthetic biology: (i) making biological tools that are understood as well as the silicon tools developed by the computer industry, (ii) using these tools to do useful things within the biology we are already familiar with, such as yeast or stem cells, and iii) using these tools to make entirely new biological entities that previously did not exist in nature. The book also provides technical details of current advances toward these goals.

CRC Press
Market: Biomedical Science
March 2016: 7 x 10: 318pp
Hb: 978-1-466-56847-1: $159.95
ebook: 978-1-466-56848-8
* For full contents and more information, visit: www.crcpress.com/9781466568471
the development of inhibitors of aquaporin function. The second section discusses the physiological and pathophysiological roles of aquaporins in humans and microbes. The final section covers the development of inhibitors of aquaporin function.

Aquaporins in Health and Disease
New Molecular Targets for Drug Discovery

Edited by Graca Soveral, Research Institute for Medicines, Faculty of Pharmacy, University of Lisbon, Portugal, Soren Nielsen, Department of Health Science and Technology, Aalborg University, Denmark and Angela Casini, School of Chemistry, Cardiff University, UK

This book presents the latest research advances in aquaporins and other major intrinsic protein (MIP) channels. The first section of the book describes the general concepts of aquaporin channel function, genomic research, structure-function analysis of aquaporins and glycerol facilitators, and regulation by gating and trafficking, including yeast aquaporin regulation and function. The second section discusses the physiological and pathophysiological roles of aquaporins in humans and microbes. The final section covers the development of inhibitors of aquaporin function.

Basic Principles of Analytical Ultracentrifugation

Peter Schuck, National Institute of Biomedical Imaging and Bioengineering, National Institutes of Health, Bethesda, Maryland, USA, Huaying Zhao, National Institute of Biomedical Imaging and Bioengineering, National Institutes of Health, Bethesda, Maryland, USA, Chad A. Brautigam, Department of Biophysics, The University of Texas Southwestern Medical Center, Dallas, USA and Rodolfo Ghirlanda, National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, Bethesda, Maryland, USA

Filling a gap in the literature of biophysics, this book explains the fundamentals in the theory and practice of AUC. It introduces the basic principles and technical setup of an AUC experiment and describes the optical systems used for detection. It explores the ultracentrifugation experiment from a macromolecular standpoint, offering a detailed physical picture of the sedimentation process and relevant macromolecular parameters. The authors present important practical aspects for conducting an experiment and cover instrument calibration and quality-control experiments.

Bioreactors
Animal Cell Culture Control for Bioprocess Engineering

Goutam Saha, North-Eastern Hill University, Shillong, Meghalaya, India, Alok Barua, Indian Institute of Technology Kharagpur, West Bengal, India and Satyabroto Sinha, Indian Institute of Technology Kharagpur, Department of Electrical Engineering, West Bengal, India

This book presents the design, fabrication, and control of a new type of bioreactor meant especially for animal cell line culture. The new bioreactor, called the “see-saw bioreactor,” is ideal for the growth of cells with a sensitive membrane. The authors describe the principle of operation of the see-saw bioreactor and how to automatically control the bioprocess. They also discuss the thorough experimental research they conducted on this prototype bioreactor and define the future scope of work in terms of design, control, and software sensors.

Biosimilar and Interchangeable Biologics
From Cell Line to Commercial Launch, Two Volume Set

Sarfraz K. Niazi, Therapeutic Proteins International, LLC, Chicago, Illinois, USA

The field of biosimilar drugs is one of the hottest subjects in the field of new drug development, with scores of companies offering seminar and training programs for prospective manufacturers and stakeholders. This book is a modern comprehensive overview of the entire biosimilar manufacturing and distribution process, covering concepts introduced by the FDA, litigation strategies, analytical methods, pharmokinetic studies, and the future and current status of biosimilar product approvals.

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Biosimilars and Interchangeable Biologics

Strategic Elements

Safaraz K. Niazi, Therapeutic Proteins International, LLC, Chicago, Illinois, USA

Even very established companies have made mistakes when developing biosimilar products. For example, not appreciating future threats to intellectual property caused a biosimilar product development plan to fail after millions have been spent. Additional pitfalls include not anticipating the next line of improved products, better formulations, delivery systems, and the possibility that the dosing and indications can themselves be patented. This two-volume set examines how to choose the right product to develop and how to maneuver around the legal fireworks and secure a viable commercial presence.

CRC Press

Market: Biopharmaceutical Technology
January 2016: 8-1/2 x 11: 599pp
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* For full contents and more information, visit: www.crcpress.com/9781498743471

Biosimilars and Interchangeable Biologics

Tactical Elements

Safaraz K. Niazi, Therapeutic Proteins International, LLC, Chicago, Illinois, USA

Even very established companies have made mistakes when developing biosimilar products. For example, not appreciating future threats to intellectual property caused a biosimilar product development plan to fail after millions have been spent. Additional pitfalls include not anticipating the next line of improved products, better formulations, delivery systems, and the possibility that the dosing and indications can themselves be patented. This two-volume set examines how to choose the right product to develop and how to maneuver around the legal fireworks and secure a viable commercial presence.

CRC Press

Market: Biopharmaceutical Technology
January 2016: 8-1/2 x 11: 575pp
Hb: 978-1-498-74349-5: $189.95
ebook: 978-1-498-74348-8

* For full contents and more information, visit: www.crcpress.com/9781498743495

Enzyme Nanocarriers

Edited by Daniela Cardinale, UMR BFP, Villenave d’Ormon, France and Thierry Michon, INRA-University Bordeaux, Villenave d’Ormon, France

Enzyme immobilization on solid supports has been considered for a long time as an attractive solution to perform sophisticated organic synthesis, as required in the preparation of fine pharmaceutical chemicals. But in the late 1990s, the tremendous progress in molecular biology fundamentals opened up the possibilities to feed a tool box for building new bio-inspired nanotechnologies. The research presented in this book was selected among the most impressive achievements in the fields of enzyme bio-conjugation and bio-inspired nanosupports. It opens up potential applications in nanocatalysis and for lab-on-a-chip and biosensor devices, drug delivery vectors, and nanometrology.

Pan Stanford

Market: Nanoscience
October 2015: 6 x 9: 266pp
Hb: 978-9-814-61342-2: $149.95
ebook: 978-9-814-61343-9

* For full contents and more information, visit: www.crcpress.com/9789814613422

Handbook of Encapsulation and Controlled Release

Edited by Munmaya Mishra, c/o Altra Research Center, Richmond, Virginia, USA, Editor in Chief, International Journal of Polymeric Materials and Polymeric Biomaterials, Taylor & Francis, Philadelphia, Pennsylvania, USA

Written at a level comprehensible to non-experts, this handbook covers the current state of encapsulation and controlled released technologies, presenting the fundamental processes involved and exploring how to use those processes for different applications in various industries. It is a comprehensive source of technical information and current practices of encapsulation in research and industry, providing a much-needed authoritative reference for continued research and development in encapsulation and controlled release technologies.

CRC Press

Market: Materials Science
November 2015: 7 x 10: 1512pp
Hb: 978-1-482-23232-5: $399.95
ebook: 978-1-482-23234-9

* For full contents and more information, visit: www.crcpress.com/9781482232325

Marine Glycobiology

Principles and Applications

Edited by Se-Kwon Kim

Marine glycobiology is an emerging and exciting area in the field of science and medicine. Glycobiology, the study of the structure and function of carbohydrates and carbohydrate-containing molecules, is fundamental to all biological systems and represents a developing field of science that has made huge advances in the last half-century. This book revolutilizes the concept of marine glycobiology, focusing on the latest principles and applications of marine glycobiology and their relationships.

CRC Press

Market: Biomedical Science
May 2016: 7 x 10: 504pp
Hb: 978-1-482-23233-2: $209.95
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2nd Edition · TEXTBOOK · NEW EDITION

Biotechnology Fundamentals, Second Edition

Firdos Alam Khan, Manipal University, Dubai, United Arab Emirates

This is a substantial revision of a successful book designed to be used for an introductory course in biotechnology. Each chapter has been updated with better illustrations and an enhanced pedagogy. This second edition includes new problem sets, key words, better alignment with figures/text, additional solutions with problems contained in the text, and an additional test bank.

CRC Press

Market: Biomedical Science
January 2016: 7 x 10: 667pp
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**Marine OMICS**

**Principles and Applications**

Edited by Se-Kwon Kim, Pukyong National University, Busan, South Korea

This book provides comprehensive coverage on current trends in marine omics of various relevant topics such as genomics, lipidomics, proteomics, foodomics, transcriptomics, metabolomics, nutrigenomics, pharmacogenomics and toxigenomics as related to and applied to marine biotechnology, molecular biology, marine biology, marine microbiology, environmental biotechnology, environmental science, aquaculture, pharmaceutical science and bioprocess engineering.

CRC Press

**Market:** Biomedical Science

**May 2016:** 7 x 10: 500pp

**Hb:** 978-1-482-25820-2: $229.95

**eBook:** 978-1-482-25821-9

*For full contents and more information, visit: [www.crcpress.com/9781482258202](http://www.crcpress.com/9781482258202)*

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**Microbial Biotechnology**

**Progress and Trends**

Edited by Farshad Darvishi Harzevili, University of Maragheh, Iran and Hongzhang Chen, Institute of Process Imaging, Chinese Academy of Sciences, Beijing

Microbial biotechnology is defined as “any technological application that uses microbiological systems, microbial organisms, or derivatives thereof, to make or modify products or processes for specific use.” This book presents an overview of all of the latest developments and innovations taking place in the highly interdisciplinary field. Many of the contributors are world-class researchers in a numbers of key subfields. The text also incorporates relevant case studies throughout the book.

CRC Press

**Market:** Biotechnology

**November 2014:** 7 x 10: 379pp

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**eBook:** 978-1-482-24521-9

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**Tapping Molecular Wilderness**

**Drugs from Chemistry–Biology–Biodiversity Interface**

Yongyuth Yuthavong, National S&T Development Agency, Pathumthani, Thailand

This book is for readers with some background in science, concerning the search for drugs, starting from molecular diversity in nature or molecular wilderness. It differs from those available on the subject of natural products and drugs derived therefrom in that it looks at the broad picture on how materials and organisms from nature affect our health and how we have combined our knowledge in chemistry, biology, and biodiversity to promote our wellness from resources in the “molecular wilderness,” with caveats on sustainable utilization of these resources.

Pan Stanford

**Market:** Biotechnology

**September 2015:** 6 x 9: 156pp

**Hb:** 978-9-814-66932-0: $179.95

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**Understanding Enzymes**

**Function, Design, Engineering and Analysis**

Edited by Allan Svendsen, Novozymes A/S, Bagsvaerd, Denmark

This book focuses on new understanding of enzyme function and optimization, past enzyme function analysis, enzyme engineering, and growing insights from the simulation work as well as nanotechnology measurement of enzymes in action in vitro or in silico. It presents insights into the mechanistic function and understanding of enzyme reactions and covers novel structure analysis technologies in conjunction with x-ray and NMR structural methods. The text discusses topics including single molecules, molecular dynamic simulations of different conformers of enzymes, surface enzyme kinetics, metagenomics and bioinformatics sequence handling, and coupled reactions in nanodevices.

Pan Stanford

**Market:** Biomedical Science

**January 2016:** 6 x 9: 700pp

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**eBook:** 978-9-814-66934-4

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**TEXTBOOK**

**Principles of Membrane Bioreactors for Wastewater Treatment**

Hee-Deung Park, In-Soung Chang and Kwang-Jin Lee

Membrane bioreactor (MBR) technology is a wastewater treatment method combining biological pollutant treatment with physical membrane separation. It has gained increasing commercial significance over the last decade, with applications in municipal and industrial wastewater treatment becoming increasingly widespread. This book covers a wide variety of MBR topics, including filtration theory, membrane materials and geometry, fouling phenomena and properties, and strategies for minimizing fouling. Also covered are practical aspects such as operation, maintenance, design, and application.

CRC Press

**Market:** Biotechnology

**April 2015:** 6-1/8 x 9-1/4: 445pp

**Hb:** 978-1-466-59037-3: $129.95

**eBook:** 978-1-466-59038-0

*For full contents and more information, visit: [www.crcpress.com/9781466590373](http://www.crcpress.com/9781466590373)*
Solids that possess acidic properties on their surfaces function as catalysts just like liquid acids, such as sulfuric acid and hydrochloric acid. By using solid acid catalysts, chemical processes become more productive and more environmentally friendly. In fact, solid acids are being used in many industrial chemical processes from the largest chemical process of catalytic cracking in petroleum refining to the synthesis of various fine chemicals. This book covers the fundamentals of solid acid catalysis, including its history and characterization, and discusses different types of catalysts and solid acid-catalyzed reactions as well as their industrial applications.
Coarse-Grained Modeling of Biomolecules
Edited by Garegin A. Papoian
Series: Series in Computational Biophysics
Many researchers are choosing computational modeling of biomolecules to analyze data at a level of mechanistic detail that would otherwise prove difficult to achieve. This book reflects on the tremendous impact of computational modeling, focusing on coarse-grained simulations for biomolecules, such as proteins and nucleic acids, for which systems may be too large and the processes too slow for atomistic or quantum simulations. Coverage includes fundamentals as well as applications in state-of-the-art coarse-grained force fields of proteins and nucleic acids.
CRC Press
June 2016: 7 x 10: 448pp
Hb: 978-1-466-56157-1 $219.95
ebook: 978-1-466-57617-9
* For full contents and more information, visit: www.crcpress.com/9781466576063

Graph-Theoretical Matrices in Chemistry
Dusanka Janezic, University of Primorska, Koper, Slovenia, Ante Milicevic, The Institute of Medical Research and Occupational Health, Zagreb, Croatia, Sonja Nikolic, The Rugjer Boškovic Institute, Zagreb, Croatia and Nestad Trinarjic, The Rugjer Boškovic Institute, Zagreb, Croatia
Divided into five sections, this book offers 200 graph-theoretical matrices covering adjacency and related matrices, distance and related matrices, incidence matrices, and special and graphical matrices. It provides insight into the properties and potential usefulness of many novel graph-theoretical matrices in chemistry. Most of the graph-theoretical matrices presented have been used as sources of molecular descriptors usually referred to as topological indices. They are concerned with a special class of graphs that represent molecules.
CRC Press
Market: Chemistry
April 2015: 6-1/8 x 9-1/4: 160pp
Hb: 978-1-498-70115-0 $139.95
ebook: 978-1-498-70122-8
* For full contents and more information, visit: www.crcpress.com/9781498701150

Computational and Experimental Analysis of Functional Materials
Edited by Oleksandr Reshetnyak, Ivan Franko National University, Lviv, Ukraine and Gennady E. Zaikov, Kazan National Research Technological University, Russia
Series: AAP Research Notes on Polymer Engineering Science and Technology
This book looks at the synthesis of polyaniline by different methods, under different conditions, for various applications, and presents studies of its properties by a wide range of the modern physic-chemical methods. The book provides a comprehensive analysis of experimental results from the point of view of the correlations in the triad synthesis conditions–structure-physico-chemical properties. It combines the results of experimental investigations and original methodology of the description of physical–chemical and electrochemical phenomena at interface surfaces, showing an influence of such phenomena on the applied aspects of the polyaniline and nanocomposites on its basis applications.
Apple Academic Press
Market: Chemistry
February 2016: 6-1/8 x 9-1/4: 350pp
Hb: 978-1-771-88342-9 $149.95
ebook: 978-1-466-57617-9
* For full contents and more information, visit: www.crcpress.com/9781771883429

In Silico Bees
Edited by James Devillers, CTIS, Rillieux La Pape, France
Bees are critically important for ecosystem function and biodiversity maintenance through their pollinating activity. This book provides a collection of computational methods to those primarily interested in the study of the ecology, ethology, and entomology of bees. It presents numerous case studies to enable readers to understand the appropriateness but also the limitations of models in theoretical and applied bee research. Written by an international team of experts, this book covers the main types of modeling approaches that can be used in terrestrial ecology and applied ecotoxicology.
CRC Press
Market: Entomology
January 2014: 6-1/8 x 9-1/4: 314pp
Hb: 978-1-466-51788-2 $129.95
ebook: 978-1-466-51788-2
* For full contents and more information, visit: www.crcpress.com/9781466517875

Computational Approaches to Protein Dynamics
From Quantum to Coarse-Grained Methods
Edited by Monika Fuxreiter, University of Debrecen, Hungary
Series: Series in Computational Biophysics
This book presents modern biomolecular computational techniques that address protein flexibility/dynamics at all levels of theory. It shows how these advanced methods provide insights into dynamic aspects of biochemical processes. The book covers a wide spectrum of dynamics, from electronic structure-based to coarse-grained techniques via multiscaling at different levels. It describes the methods and results of enzyme catalysis, examines computational techniques to tackle biological problems involving intrinsically disordered proteins (IDPs), and discusses computational issues related to experimental characterization of IDPs.
CRC Press
Market: Biochemistry & Biophysics
December 2014: 6-1/8 x 9-1/4: 479pp
Hb: 978-1-466-56157-1 $162.95
ebook: 978-1-482-29786-7
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Living Matter
Algebra of Molecules
Valery V. Stcherbic and Leonid P. Buchatsky
This book provides a review of biochemistry as an algebra of molecules of living matter and utilizes Clifford algebras to discuss the basic biochemical processes of DNA replication, DNA transcription, RNA splicing and translation. Vital carcinogenesis is discussed in depth, specific attention is paid to the structural features of biomolecules that define a particular Clifford algebra, and useful examples of genetic information being transformed into Clifford algebras are provided.
CRC Press
Market: Computer Science & Engineering
December 2015: 6-1/8 x 9-1/4: 160pp
Hb: 978-1-498-74137-8 $129.95
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Many-Body Effects and Electrostatics in Biomolecules

Edited by Qiang Cui, University of Wisconsin-Madison, USA, Markus Meuwly and Pengyu Ren, University of Texas at Austin, USA

An important challenge that the field faces is to develop the next generation of computational models that strike the proper balance of computational efficiency and accuracy, so that problems of increasing complexity can be tackled in a systematic, robust manner. With contributions by leading experts in the area of biomolecular simulations, this book discusses cutting-edge ideas regarding effective strategies to describe many-body effects and electrostatics at quantum, classical, and coarse-grained levels. It not only provides an up-to-date snapshot of the current simulation field but also stimulates exchange of ideas across different sub-fields of modern computational (bio)chemistry.

Pan Stanford
Market: Chemistry
December 2015: 6 x 9: 450pp
Hb: 978-9-814-61345-3: $149.95
eBook: 978-9-814-61346-0
* For full contents and more information, visit: www.crcpress.com/9789814613453

Molecular Modeling at the Atomic Scale

Methods and Applications in Quantitative Biology

Edited by Ruhong Zhou, IBM T.J. Watson Research Center, Yorktown Heights, New York, USA

Series: Series in Computational Biophysics

Developments in molecular modeling from experimental and computational techniques have enabled a wide range of biological applications. This timely summary reflects the recent advances in bridging novel algorithms and high performance computing with characterization of important biological processes, such as folding dynamics of key proteins. It encompasses the perspectives of leading experts on this transformation in molecular biology, illustrating with state of the art examples how molecular modeling approaches are being applied to critical questions in modern quantitative biology.

CRC Press
Market: Computational Biology/Biophysics & Biochemistry
August 2014: 6-1/8 x 9-1/4: 388pp
Hb: 978-1-466-56295-0: $124.95
eBook: 978-1-466-56296-7
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Metalloproteins

Theory, Calculations, and Experiments

Edited by Art E. Cho, Korea University, Korea and William A. Goddard III, California Institute of Technology, Pasadena, USA

Metal ions in metalloproteins are critical to the protein’s function, structure, and stability. Because numerous essential biological functions require metal ions and most of these functions involve metalloproteins, understanding metalloproteins and how to manipulate them is of great importance in the biological and medical fields. This book examines current research on metalloproteins and the interplay between theory and experiment, detailing the role of theoretical modeling in the field and explaining how it aids experiments. The text also presents the current state of computational protein modeling, enabling researchers to adopt computation as an integral component of their studies.

CRC Press
Market: Chemistry
April 2015: 6-1/8 x 9-1/4: 294pp
Hb: 978-1-439-83138-8: $129.95
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Metal-Organic Frameworks

Materials Modeling towards Engineering Applications

Edited by Jianwen Jiang, National University of Singapore

Metal-organic frameworks (MOFs) have emerged as a new family of nanomaterials. With an enormous choice of inorganic/organic building blocks, MOFs possess a wide range of surface area, pore size, and functionality and, thus, have been considered versatile materials for many potential applications. This book presents a broad collection of recent modeling studies in the field of MOF’s toward potential engineering applications, such as gas storage/separation, carbon capture, catalysis, water purification, and drug delivery.

Pan Stanford
Market: Materials Science
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Quantum Nanochemistry, Volume Five

Quantum Structure-Activity Relationships (Qu-SAR)

Edited by Mihai V. Putz, West University of Timisoara, Romania

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Apple Academic Press
Market: Chemistry
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Quantum Nanochemistry, Volume Four
Quantum Solids and Orderability
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Research Methodology in Chemical Sciences
Experimental and Theoretical Approach
Edited by Tanmoy Chakraborty, Manipal University, Jaipur, India and Lalita Ledwani, Manipal University, Jaipur, India
Recent Methodology in Chemical Sciences provides an eclectic survey of contemporary problems in experimental, theoretical, and applied chemistry. This book covers recent trends in research with the different domain of the chemical sciences. The chapters, written by knowledgeable researchers, provide different insights to the modern-day research in the domain of spectroscopy, plasma modification, and theoretical and computational analysis of chemical problems. It covers descriptions of experimental techniques, discussions on theoretical modeling, and much more.

Apple Academic Press
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Gustavo Adolfo Aucar, Northeastern University of Argentina and Rodolfo H. Romero

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Market: Physics
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Hb: 978-1-439-86923-9: $179.95
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Milan Randić, Drake University, Des Moines, IA, Marjana Nović and Dejan Plavsic

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CRC Press
Market: Chemistry
January 2016: 6-1/8 x 9-1/4: 466pp
Hb: 978-1-498-71151-7: $129.95
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Edited by Nazmul Islam, Techno Global Balurghat (TBG), India

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Market: Mathematics
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Pravin P. Deshpande and Dimitra Sazou

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Market: Materials Science/Corrosion
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Electroanalytical Chemistry

Edited by Allen J. Bard, University of Texas, Austin, USA and Cynthia G. Zoski, New Mexico State University, Las Cruces, USA

Series: Electroanalytical Chemistry: A Series of Advances

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Pan Stanford
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May 2016: 6 x 9: 400pp
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Electrochemical Reduction of Carbon Dioxide

Fundamentals and Technologies

Edited by Jinli Qiao, Donghua University, Shanghai, China, Yuyu Liu and Jiujun Zhang, National Research Council, Vancouver, British Columbia, Canada

Series: Electrochemical Energy Storage and Conversion

This book gives a comprehensive overview of the electrochemical reduction of carbon dioxide. It covers fundamentals and technologies, including the latest materials and newest developments. The authors address a variety of topics that include electrochemical processes, materials, components, manufacturing, and degradation mechanisms, as well as challenges and strategies. With contributions from researchers who are at the top of their fields and on the cutting edge of technology, the book includes in-depth discussions ranging from engineering of components to applied devices.

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Edited by Kwong-Yu Chan and Chi-Ying Vanessa Li

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Market: Energy and Fuels
June 2014: 6-1/8 x 9-1/4: 519pp
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Textbook

Introduction to Electrochemical Science and Engineering

Serguei N. Lvov, The Pennsylvania State University, University Park, USA

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Edited by Yixuan Wang, Albany State University, Georgia, USA

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Multisensor Systems for Chemical Analysis

Edited by Larisa Lvova, University of Rome Tor Vergata, Italy, Dmitry Kirsanov, St. Petersburg State University, Russia, Corrado Di Natale, University of Rome Tor Vergata, Italy and Audrey Legin, St. Petersburg State University, Russia

This book explores recent advances in the development of artificial sensory systems, widely known as electronic tongues and noses. Each chapter can be read independently, providing not only experimentalists but also computational chemists with a variety of research directions. The book will inspire fruitful new ideas and significant practical advances.

Manganese Oxides for Energy Storage and Conversion

Edited by Scott W. Donne, University of Newcastle, Callaghan, Australia

This book concentrates on the various roles that manganese oxides have played in energy storage and conversion applications. It presents a review of structures and synthesis methods, setting the scene to begin discussing the cathode active behavior of manganese oxides in both aqueous and non-aqueous, primary and rechargeable battery systems. It also discusses the use of manganese oxides in supercapacitors, a relatively new field. The book then describes and analyzes the range of manganese oxide based materials that have been used as catalysts in fuel cells.

Nanochemistry in Advanced Electrochemical Power Sources

Edited by S. R. S. Prabaharan, Manipal International University, Selangor Darul Ehsan, Malaysia and M. Silvai Michael, Chemical sciences Research Centre, Chennai, India

This book reflects a state-of-the-art understanding of electrochemical power sources employing positive and negative electrode materials at nanoscale, including Lithium-ion batteries, microbatteries, and electrochemical supercapacitors. Featuring contributions based on the recent research outcomes of leading experts in the field, the text focuses on the fundamental aspects of energy storage device performance, with a special emphasis on nanoscale advantages. The editors include current processing techniques as well as the synthesis, characterization, physical and electrochemical properties, and applications of nanoscale materials related to advanced electrochemical power sources.

Nanotechnology in Advanced Electrochemical Power Sources

Edited by S. R. S. Prabaharan, Manipal International University, Selangor Darul Ehsan, Malaysia and M. Silvai Michael, Chemical sciences Research Centre, Chennai, India

This book reflects a state-of-the-art understanding of electrochemical power sources employing positive and negative electrode materials at nanoscale, including Lithium-ion batteries, microbatteries, and electrochemical supercapacitors. Featuring contributions based on the recent research outcomes of leading experts in the field, the text focuses on the fundamental aspects of energy storage device performance, with a special emphasis on nanoscale advantages. The editors include current processing techniques as well as the synthesis, characterization, physical and electrochemical properties, and applications of nanoscale materials related to advanced electrochemical power sources.

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Revised and Expanded

Edited by Ole Hammerich, University of Copenhagen, Denmark and Bernd Speiser, Institut Fur Organische Chemie

Completely revised and updated, Organic Electrochemistry, Fifth Edition explains distinguishing fundamental characteristics that separate organic electrochemistry from classical organic compounds. It includes descriptions of the most important variants of the process of electron transfers between organic molecules and emphasizes the importance of electron transfers in initiating various electrochemical reactions. The sweeping changes and lengthy additions in the fifth edition testify to the field’s continued and rapid growth in research, practice, and application, and make it a valuable addition to your collection.
PEM Electrolysis for Hydrogen Production
Principles and Applications
Edited by Dmitri Bessarabov, Haijiang Wang, National Research Council Canada, Vancouver, Canada, Hui Li, National Research Council of Canada, Institute for Fuel Cell Innovation, Vancouver, BC, Canada and Nana Zhao
There is increasing research interest in producing hydrogen through polymer electrolyte membrane (PEM) electrolysis as a way of converting renewable energy to hydrogen fuel. This book provides comprehensive coverage of the fundamentals and applications of PEM electrolysis and reviews state-of-the-art technologies and challenges related to each of the components. In addition, the text addresses failure analysis and describes available failure diagnostic tools while providing future research directions to assist scientists and technology developers in bringing commercially viable PEM electrolysis systems to fruition.

CRC Press
Market: Energy Engineering/Chemical Engineering
October 2015: 8-1/2 x 11: 389pp
Hb: 978-1-482-25229-3: $189.95
ebook: 978-1-482-25232-3
* For full contents and more information, visit: www.crcpress.com/9781482252293

Proton-Conducting Ceramics
From Fundamentals to Applied Research
Mathieu Marrony, European Institute for Energy Research (EIFER), Kalsruhe, Germany
This book proposes a wide overview of the research and development of proton-conducting solid oxide materials. It is the first to approach the topic on proton-conducting ceramics and presents analysis studies from the fundamental to the most promising applied domains. It describes theoretical studies to enhance understanding of proton-transport mechanisms through materials and focuses on the main families of materials referred in the literature, highlighting their structure and their electrical and physicochemical properties.

Pan Stanford
Market: Chemistry
October 2015: 6 x 9: 442pp
Hb: 978-9-814-61384-2: $149.95
ebook: 978-9-814-61385-9
* For full contents and more information, visit: www.crcpress.com/9789814613842
Ecotoxicology and Chemistry Applications in Environmental Management

Sven Erik Jorgensen, Copenhagen University, Denmark

This book explains how to apply environmental chemistry and ecotoxicology in environmental management. It answers questions like "Why is it necessary to apply an integrated approach?" and "How does one apply an integrated environmental management approach?". This novel book provides a holistic view related to environmental problems in eco-toxicological fields and the translation of scientific knowledge and research results into effective measures, especially in the field of environmental policy, one of the most difficult tasks today.

CRC Press
Market: Environmental Science
May 2016: 6-1/8 x 9-1/4: 312pp
Hb: 978-1-498-71652-9: $119.95
ebook: 978-1-498-71653-6
* For full contents and more information, visit: www.crcpress.com/9781498716529

Environmental Problems in Marine Biology

Methodological Aspects and Applications
Edited by Tamara Garcia Barrera and Jose Luis Gomez Ariza

Marine environment can be affected by several pollution problems, such as the presence of elements and their chemical species, pharmaceuticals, and nanoparticles. Assessment strategies include proteomics, genomics, chemical speculation analysis, metabolomics, and metabolomics. This book serves as a useful methodological tool for researchers and specialists in the fields of analytical chemistry, environmental sciences, biochemistry, genomics, and toxicology. It includes, for the first time, the methodological aspects and applications related to chemical speciation and -omics strategies applied to the marine environment.

CRC Press
Market: Life Science
September 2016: 6 x 9: 300pp
Hb: 978-1-482-26450-0: $189.95
ebook: 978-1-482-26451-7
* For full contents and more information, visit: www.crcpress.com/9781482264500

Groundwater Geochemistry and Isotopes

Ian Clark, University of Ottawa, Ontario, Canada

There remains a lack of understanding of environmental isotopes and their use; students and practitioners typically find the concepts of isotope concentrations and partitioning to be more complicated than for geochemistry. However, this need not be so, if the basics are presented together with geochemistry, using case studies and examples to make the point. This new book presents the basics of environmental isotopes and geochemistry together, with case studies and simple examples that build a real understanding of their use in natural and contaminated groundwater.

CRC Press
Market: Water Science and Engineering
April 2015: 6-1/8 x 9-1/4: 456pp
Hb: 978-1-466-59173-8: $119.95
ebook: 978-1-466-59174-5
* For full contents and more information, visit: www.crcpress.com/9781466591738

Handbook of Chemical Regulations
Benchmarking, Implementation, and Engineering Concepts

Edited by Martha J. Boss, AECOM, Omaha, Nebraska, USA, Brad Boss, AECOM, Omaha, Nebraska, USA, Cybil Boss, AECOM, Omaha, Nebraska, USA and Dennis W. Day, AECOM, Omaha, Nebraska, USA

This book is the first of its kind to provide a compendium of environmental, health and safety, and engineering concepts for global harmonization, based on a framework of regulatory standards. Understanding the scientific concepts that are inherent in chemical usage and their interplay globally is essential for chemical manufacturers, processors, distributors, importers, exporters, and other users. An easy to read guide to navigating global harmonization, this book offers reasons behind major requirements for chemical production, distribution, importation, and usage.

CRC Press
Market: Occupational Health & Safety
August 2015: 6-1/8 x 9-1/4: 616pp
Hb: 978-1-498-71779-3: $139.95
ebook: 978-1-498-71780-9
* For full contents and more information, visit: www.crcpress.com/9781498717793

Impact of Oil Spill Disasters on Marine Habitats and Fisheries in North America

Edited by J. Brian Alford, The University of Tennessee, Knoxville, USA, Mark S. Peterson, University of Southern Mississippi, Ocean Springs, USA and Christopher C. Green, Louisiana State University Agricultural Center, Baton Rouge, USA
Series: CRC Marine Biology Series

This book contains scientific findings and reviews from experts researching impacts of the Exxon Valdez, Argo’, and Deepwater Horizon oil spills on coastal fishery resources. It describes physiological effects of oil-derived compounds on fishes, presenting results from field and laboratory investigations. It addresses the science of assessing oil spill impacts on coastal habitats, with an emphasis on salt-marsh ecosystems in the Gulf of Mexico. It also explores quantified and potential impacts of oil spills on population and community dynamics of commercial and recreational fishery species.

CRC Press
Market: Environmental Science
October 2014: 7 x 10: 495pp
Hb: 978-1-466-55721-5: $139.95
ebook: 978-1-466-55720-8
* For full contents and more information, visit: www.crcpress.com/9781466557208

Humic Matter in Soil and the Environment
Principles and Controversies, Second Edition

Kim H. Tan, Professor Emeritus, University of Georgia, Athens, USA
Series: Books in Soils, Plants, and the Environment

The field of humic matter research has undergone drastic changes in concepts and principles, and a second edition is now warranted to communicate these advances. This revised and updated edition continues the tradition of providing comprehensive coverage of the genesis, extraction, properties, and impacts of humic matter on agriculture, industry, and the environment. Chapters examine organic matter; present concepts of humus versus humic matter; and explore the nature and distribution, chemical composition, characterization, electrochemical properties, agronomic and industrial applications, and medicinal and pharmaceutical applications of humic substances.

CRC Press
Market: Agricultural Science
June 2014: 7 x 10: 495pp
Hb: 978-1-482-23446-6: $139.95
ebook: 978-1-482-23445-9
* For full contents and more information, visit: www.crcpress.com/9781482234459

Handbook of Chemical Regulations
Exportation, Importation, and Engineering Concepts

CRC Press
Market: Occupational Health & Safety
August 2015: 6-1/8 x 9-1/4: 616pp
Hb: 978-1-498-71778-6: $139.95
ebook: 978-1-498-71780-9
* For full contents and more information, visit: www.crcpress.com/9781498717786

Complimentary Exam Copy e-Inspection New in Paperback Companion Website
Soil Phosphorus
Edited by Rattan Lal, The Ohio State University, Columbus, USA and B. A. Stewart, West Texas A&M University, Canyon, USA

Series: Advances in Soil Science

Because inappropriate use of phosphorus can lead to non-point source pollution and eutrophication of natural waters, effective systems for managing its use are needed to minimize environmental risks. This book focuses on the availability and recycling of phosphorus, regulatory and policy issues of sustainable phosphorus use, and water quality management in agroecosystems pertaining to phosphorus. Sections are dedicated to global phosphorus reserves, cycling and pathways of phosphorus, phosphorus in agriculture, human dimensions and policy intervention, and research and development priorities.

CRC Press
Market: Agricultural Science
August 2016: 7 x 10: 350pp
Hb: 978-1-482-25784-7 $139.95
ebook: 978-1-466-55794-9
* For full contents and more information, visit: www.crcpress.com/9781482257847

Trace Elements in Waterlogged Soils and Sediments
Edited by Jorg Rinklebe
Series: Advances in Trace Elements in the Environment

This book fills a need for studying the fate of trace elements in wetland ecosystems and the linked chemical, physical and biological processes. It addresses the fundamental processes governing the behavior and fate of the trace elements as well as issues relating to remediation and management of contaminations in such environments. Treatment of the subject is quite comprehensive, including a discussion of the factors controlling the dynamics and release kinetics of the trace elements and their underlying biogeochemical processes.

CRC Press
May 2016: 7 x 10: 400pp
Hb: 978-1-482-24051-1 $189.95
ebook: 978-1-420-24052-8
* For full contents and more information, visit: www.crcpress.com/9781482240511

Transport & Fate of Chemicals in Soils
Principles & Applications

H. Magdi Selim, Louisiana State University, Baton Rouge, USA

This book provides the fundamentals for the understanding of reactive chemicals retention and their transport in soils and aquifers. The book offers the first comprehensive treatment with supporting examples of mathematical models that describe contaminants reactivity and transport in soils and aquifers. It is also a practical guide for designing experiments and collecting data that focuses on characterizing retention as well as release kinetic reactions in soils and contaminant transport experiments in the laboratory, greenhouse (column) and in the field.

CRC Press
Market: Environmental Engineering
September 2014: 6-1/8 x 9-1/4: 352pp
Hb: 978-1-466-55794-9 $174.95
ebook: 978-1-466-55795-6
* For full contents and more information, visit: www.crcpress.com/9781466557949

Trace Elements in Abiotic and Biotic Environments

Alina Kabata-Pendias, Institute of Soil Science and Plant Cultivation, Pulawy, Poland and Barbara Szteke

This book helps readers understand the fundamental principles and phenomena that control the transfer of trace elements. It describes the occurrence and behavior of trace elements in rocks, soil, water, air, and plants, and also discusses the anthropogenic impact to the environment. In addition, the book covers the presence of trace elements in feeds, as either contaminants or as nutritional or zootechnical additives, and their transfer across the food chain to humans. All trace elements are covered—from aluminum to lanthanides as well as rare Earth elements (actinides and lanthanides).

CRC Press
Market: Agricultural Science
April 2015: 6-1/8 x 9-1/4: 468pp
Hb: 978-1-482-21279-2 $159.95
ebook: 978-1-466-55795-6
* For full contents and more information, visit: www.crcpress.com/9781482212792

Soil and Water Chemistry
An Integrative Approach, Second Edition

Michael E. Essington, University of Tennessee, Knoxville, USA

The discipline of soil chemistry examines the chemical and mineralogical characteristics of the soil environment and the chemical processes that distribute matter between the soil solid, solution, and gaseous phases. This book provides a comprehensive treatment of the composition and chemical properties of soils and the processes that govern their fate in the environment. It covers a variety of topics including soil chemical environment, soil minerals, soil organic matter, cation exchange, oxidation-reduction, mineral weathering and solubility, surface chemistry and adsorption reaction, and acidity and salinity in soil materials. The book has been thoroughly revised and all chapters have been updated.

CRC Press
Market: Agriculture
April 2015: 7 x 10: 656pp
Hb: 978-1-466-55794-9 $79.95
ebook: 978-1-466-55795-6
* For full contents and more information, visit: www.crcpress.com/9781466557914

2nd Edition • TEXTBOOK
**Air Pollution and Freshwater Ecosystems**

**Sampling, Analysis, and Quality Assurance**

*Timothy J. Sullivan*, E&G Environmental Chemistry, Corvallis, Oregon, USA, *Alan T. Herlihy*, Oregon State University, Corvallis, USA and *James R. Webb*, University of Virginia, Charlottesville, USA

A practical book for professionals who rely on water quality data for decision making, this book is based on three decades of experience of three highly published water and watershed resource professionals. It focuses on the analysis of air pollution sensitive waters and the consequent effects associated with soil and water acidification, nutrient-N enrichment, or the effects of atmospherically deposited toxic substances. It also covers lake zooplankton and/or stream macroinvertebrate biomonitor.

Explanations of the reasons behind various recommendations provide readers with the tools needed to alter recommended protocols to match particular study needs and budget.

**CRC Press**

**Market:** Environmental Science

November 2014: 6-1/8 x 9-1/4: 346pp

Hb: 978-1-482-22713-0: $129.95

ebook: 978-1-482-22714-7

* For full contents and more information, visit: [www.crcpress.com/9781482227130](http://www.crcpress.com/9781482227130)

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**Analysis of Oceanic Waters and Sediments**

*Thomas Roy Crompton*

Until fairly recently, the analysis of seawater was limited to a number of major constituents such as chloride and alkalinity. Insufficient attention had been given to the analysis of sediments and one of the objects of this book is to draw the attention of analysts and others concerned to the methods available as well as their sensitivity and limitations. This book covers all aspects of the analysis of seawater using both classical and the most advanced, recently introduced physical techniques.

**CRC Press**

**Market:** Environmental Science

January 2016: 6-1/8 x 9-1/4: 294pp

Hb: 978-1-498-70152-5: $189.95
ebook: 978-1-498-70153-2

* For full contents and more information, visit: [www.crcpress.com/9781498701525](http://www.crcpress.com/9781498701525)

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**Environmental Applications of Instrumental Chemical Analysis**

Edited by *Mahmood Barbooti*, Montclair State University, New Jersey, USA

This book is a comprehensive review of the instrumental analytical methods and their use in environmental monitoring, site assessment and remediation follow-up operations. The increased concern about environmental issues necessitate the precise determination of various types of chemicals in environmental samples. In general, all stages of environmental work start with the evaluation of organic and inorganic environmental samples. This important book furnishes the fundamentals of instrumental chemical analysis methods to various environmental applications and also covers recent developments in instrumental chemical methods.

**Apple Academic Press**

**Market:** Environmental Engineering

April 2015: 6-1/8 x 9-1/4: 604pp

Hb: 978-1-7718-8801-9: $149.95
ebook: 978-1-482-62664-3

* For full contents and more information, visit: [www.crcpress.com/9781771888019](http://www.crcpress.com/9781771888019)

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**Innovative Materials and Methods for Water Treatment**

**Solutions for Arsenic and Chromium Removal**

Edited by *Marek Bryjak*, Wrocław University of Technology, Poland, *Nalan Kabay*, Ege University, İzmir, Turkey, *Bernabe L. Rivas* and *Jochen Bindschuh*, University of Southern Queensland, Toowoomba, Australia

*Series:* Sustainable Water Developments - Resources, Management, Treatment, Efficiency and Reuse

Due to increasing demand for water potable and irrigation, water suppliers have to use alternative resources. They either have to regenerate wastewater or deal with contaminated surface water. This book brings together the experiences of various experts in preparing innovative materials selective for arsenic and chromium and performing innovative processes for removal of these two elements from water and will be of interest to engineers and decision makers responsible for safe water production and delivery. Part 1 preparation of innovative materials with improved affinity towards arsenic as well as chromium. Part 2: innovative methods for removal of these toxic elements.

**CRC Press**

**Market:** Water Science, Technology and Engineering

December 2015: 438pp

Hb: 978-1-138-02749-7: $119.95
ebook: 978-1-315-68260-0

* For full contents and more information, visit: [www.crcpress.com/9781138027497](http://www.crcpress.com/9781138027497)

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**Quantification of Measurement Uncertainty in Analytical Chemistry**

**Practical Tools and Applications**

Edited by *Thomas W. Vetter*, Nat’l Inst of Standards & Technology, Gaithersburg, Maryland and *William F. Guthrie*, Nat’l Inst of Standards & Technology, Gaithersburg, Maryland

Increasing requirements to conform to international standards for quality assurance, such as ISO 17025, are driving a need for appropriate methods for the estimation of measurement uncertainty throughout the chemical industry. This volume provides specific insights on measurement uncertainty causal factors and how they are addressed for chemical measurement systems. It includes practical examples that illustrate uncertainty estimation in a manner compliant with the Guide to the Expression of Uncertainty in Measurement (GUM). Chapters on the uncertainty of sampling and interpreting uncertainties in a compliance situation are included.

**CRC Press**

**Market:** Analytical Chemistry

October 2016: 6-1/8 x 9-1/4: 300pp

Hb: 978-1-420-09505-0: $189.95
ebook: 978-1-420-09506-7

* For full contents and more information, visit: [www.crcpress.com/9781420095050](http://www.crcpress.com/9781420095050)

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**Real-Time Environmental Monitoring**

**Sensors and Systems**

*Miguel F. Acevedo*, University of North Texas Department of Geography, Denton, TX

This book introduces the fundamentals of environmental monitoring, based on electronic sensors, instruments, and systems that allow real-time and long-term data acquisition, data-logging, and telemetry. This is an emerging area that is very important to some aspects of environmental assessment and compliance monitoring. Real-time monitoring approaches can facilitate the cost effective collection of data over time and, to some extent, negate the need for sample, collection, handling and transport to a laboratory, either on-site or off-site.

**CRC Press**

**Market:** Environmental Science

November 2015: 6-1/8 x 9-1/4: 356pp

Hb: 978-1-482-24020-7: $139.95
ebook: 978-1-482-24034-4

* For full contents and more information, visit: [www.crcpress.com/9781482240207](http://www.crcpress.com/9781482240207)
Advanced Nutrition
Macronutrients, Micronutrients, and Metabolism, Second Edition

Carolyn D. Berdanier, Professor Emerita, University of Georgia, Athens, USA and Lynnette A. Berdanier, University of North Georgia, Gainesville, USA

Expanded and updated, this new edition continues in the tradition of its predecessor, serving as an essential textbook for advanced undergraduate and first-year graduate students studying human nutrition. The book incorporates fundamental concepts in nutrition science and provides comprehensive coverage of both macro and micronutrients, emphasizing each nutrient’s description, absorption, use, and excretion. Highlighted topics include exercise, obesity, starvation, trauma, nutrigenomics and nutrient-gene interactions, the effects of aging, and nutrition requirement comparisons among different species. The book includes chapter summaries, case studies, problem-solving activities, and critical thinking questions.

CRC Press
Market: Nutrition
February 2015: 7 x 10: 608pp
PB: 978-1-482-20517-6: $139.95
eBook: 978-1-482-20518-3

Authenticity of Foods of Animal Origin

Joannis Sotirios Arvanitoyannis, University of Thessalia, Volos, Greece
Series: Food Biology Series
The first in a two-volume set on the authenticity of foods, this volume focuses on techniques and methods for assessing food authenticity and traceability and their application to foods of animal origin. Dedicated chapters include meats, poultry, fish and seafood, milk and dairy, and honey. The book addresses current legislation in the United States, Canada, and Europe regarding traceability, authenticity, and the genetic modification of foods. The final section offers conclusions, discusses future trends, and provides suggestions for improving food authenticity and traceability.

CRC Press
Market: Food & Culinary Science
December 2015: 6-1/8 x 9-1/4: 334pp
PB: 978-1-498-70641-4: $239.95
eBook: 978-1-498-70764-1

Bread and Its Fortification
Nutrition and Health Benefits

Edited by Cristina M. Rosell, Institute of Agrochemistry & Food Technology - IATA-CSIC, Paterna, Spain, Joanna Bajerska, Poznan University, Poland and Aly F. El Sheikha, Al-Baha University, Al-Aqeeq, Saudi Arabia
Series: Food Biology Series
Bread supplies over half of the caloric intake of the world’s population, including a high proportion of the intake of vitamins B and E, making it a major food of the world. It is an important part of the human diet, and is mainly influenced by nature of substrate and microorganisms involved in its fermentation. This book provides updated information on bread and its fortification for health benefits. It presents advances in areas of fermentation technology, bread microbiology, bread biotechnology, and bread biochemistry.

CRC Press
Market: Food & Culinary Science
October 2015: 6-1/8 x 9-1/4: 417pp
PB: 978-1-498-70156-3: $139.95
eBook: 978-1-498-70157-0

A Chef’s Guide to Gelling, Thickening, and Emulsifying Agents

Alicia Foundation
The use of food texturizing agents has been steadily increasing in the culinary industry. Understanding how to use these texturizing agents is important for chefs of all levels, from professionals to culinary students and amateur cooks. This new work from famed chef Ferran Adrià’s Alicia Foundation provides a clear and practical guide for any chef who wants to work with these texturizing agents. The book discusses more than 20 carefully tested gelling, thickening, foaming, and emulsifying agents.

CRC Press
Market: Food Science
October 2014: 6 x 9: 360pp
HB: 978-1-466-56507-4: $49.95
eBook: 978-1-482-29787-4

Chinese Dates
A Traditional Functional Food

Edited by Dong-Hong Liu, Zhejiang University, Hangzhou, PR of China, Xingqian Ye, College of Biosystems and Food Science, Zhejiang University, Zhejiang, P. R. China and Yueming Jiang, University of North Georgia, Athens, USA and Lynnette A. Berdanier, Professor Emerita, University of North Georgia, Gainesville, USA
Series: Functional Foods and Nutraceuticals
The jujube fruit, or Chinese date, is generally recognized as an outstanding source of biologically active compounds related to both nutritional and nutraceutical values. Chinese dates contain various constituents, including triterpenic acids, flavonoids, cerebrosides, amino acids, phenolic acids, and polysaccharides. They also contain mineral constituents, including magnesium, potassium, copper, niacin, calcium, manganese, phosphorus, and iron. This book provides information on the jujube fruit’s origin, distribution, varieties, biochemical properties, traditional products and technology, innovative processing technology, food use, and health benefits.

CRC Press
Market: Food & Culinary Science
May 2016: 7 x 10: 432pp
HB: 978-1-498-70358-1: $239.95
eBook: 978-1-498-70359-8

Cooking as a Chemical Reaction
Culinary Science with Experiments

Z. Sibel Ozilgen, Yeditepe University, Istanbul, Turkey
This unique textbook provides experiments geared for students in culinary arts, nutrition, dietetics, and gastronomy programs. It is intended for students with limited scientific background who are studying different aspects of food preparation and processing. The text uses experiments and experiences from the kitchen, rather than theory, as the basic means of explaining the scientific facts and principles behind food preparation and processing. An instructor’s manual providing the expected outcomes of the experiments and figure slides for teaching are available with qualifying course adoption.

CRC Press
Market: Food & Culinary Science
September 2014: 7 x 10: 298pp
PB: 978-1-466-55480-1: $49.95
eBook: 978-1-466-55481-8

For more information, visit: www.crcpress.com/9781466554801
Differential Scanning Calorimetry
Applications in Fat and Oil Technology
Edited by Emma Chiavaro
This book discusses differential scanning calorimetry (DSC), one of the main thermo-analytical techniques, and its main applications in the field of lipid technology. The authors also describe other thermal and physical techniques frequently coupled with DSC the related applications. The book is divided into three parts covering the main applications of DSC on different lipid sources as well as some more theoretical aspects of the technique.

CRC Press
Market: Food & Culinary Science
December 2016: 6-1/8 x 9-1/4: 320pp
Hb: 978-1-466-59153-0: $212.95
ebook: 978-1-498-72669-6
* For full contents and more information, visit: www.crcpress.com/9781466591532

Flow Injection Analysis of Food Additives
Edited by Claudia Ruiz-Capillas, CSIC, Madrid, Spain and Leo M. L. Nollet, University College Ghent, Belgium (Retired)
Series: Food Analysis & Properties
Flow Injection Analysis of Food Additives gives you the tools you need to analyze food and beverage additives using FIA. This sets it apart from other books that simply focus on the theoretical basis and principles of FIA or on the design of equipment, instrumentation, manifold, and setting mechanism. Truly unprecedented in its scope, this book represents the work of 80 authors from 14 countries who combine efforts to give you the first review on measurements of additives and other substances by FIA in relation to the use of additives in food.

CRC Press
Market: Food & Culinary Science
December 2015: 7 x 10: 736pp
Hb: 978-1-498-74173-6: $199.95
ebook: 978-1-498-72668-9
* For full contents and more information, visit: www.crcpress.com/9781498741736

Food Composition and Analysis
Methods and Strategies
Edited by A. K. Haghi, University of Guilan, Rasht, Iran and Elizabeth Carvajal-Millan, Research Center for Food and Development (CIAD), Hermosillo, Mexico
This book covers methods and strategies related to food composition and analysis. Topics include antioxidant activity of maize bran arabinoxylan microspheres, active packaging based on the release of carvacrol and thymol for fresh food; enzymes for the flavor, dairy, and baking industries; membrane technology in food processing; tenderization of meat and meat products; biological properties of mushrooms; polyacrylamide-grafted gelatin; irradiation of fruits, vegetables, and spices for better preservation and quality; oilsides as a sustainable source of oil and protein for aquaculture feed.

Apple Academic Press
Market: Food Science
May 2016: 6-1/8 x 9-1/4: 448pp
Hb: 978-1-466-59794-5: $169.95
ebook: 978-1-498-71719-2
* For full contents and more information, visit: www.crcpress.com/9781498717192

Food Emulsions
Edited by David Julian McClements
Continuing the mission of the first two editions, this third edition covers the fundamentals of emulsion science and demonstrates how this knowledge can be applied to control the appearance, stability and texture of many common emulsion-based foods. With two new chapters, this edition provides the most comprehensive and contemporary discussion of the field of food emulsions currently available. The new chapters cover the behavior of food emulsions within the gastrointestinal tract after ingestion and the application of emulsion-based delivery systems.

CRC Press
Market: Food & Culinary Science
August 2015: 7 x 10: 690pp
Hb: 978-1-498-74172-9: $212.95
ebook: 978-1-498-72668-9
* For full contents and more information, visit: www.crcpress.com/9781498741729

Food Forensics
Stable Isotopes as a Guide to Authenticity and Origin
Edited by James F. Carter, Queensland Health Forensic and Scientific Services, Coopers Plains, Australia and Lesley A. Chesson, IsoForensics, Inc., Salt Lake City, Utah, USA
We’ve all heard the saying, “You are what you eat,” but what if you didn’t really know what you were consuming on a daily basis? Verifying the authenticity and quality of foodstuffs can be tricky, but it’s necessary to protect consumers from fraudulent food products. This book focuses on the applications of stable isotope analysis and allied techniques for food authentication and geolocation, and will cover the entire gamut of foodstuffs from beverages to seasonings to produce and meats. In addition to basic analysis and case examples, the book will cover data QA/QC, statistical treatment, and interpretation.

CRC Press
Market: Food & Culinary Science
May 2016: 6-1/8 x 9-1/4: 448pp
Hb: 978-1-498-74172-9: $212.95
ebook: 978-1-498-72668-9
* For full contents and more information, visit: www.crcpress.com/9781498741729

Food Safety Chemistry
Toxicant Occurrence, Analysis and Mitigation
Edited by Liangli (Lucy) Yu, Institute of Food and Nutraceutical Science, School of Agriculture and Biology, Shanghai Jiao Tong University, Shuo Wang and Bao-Guo Sun
This edited book is a comprehensive guide to the chemistry of food toxicants produced during processing, formulation, and storage of food. Each major food chemical contaminant will be discussed for toxic effects and the biological mechanisms behind their toxicity. Their absorption and distribution profiles and the factors influencing their levels in foods will be discussed. In addition, a listing of commonly used analytical techniques in food safety chemistry will make the book useful for food scientists and nutritionists.

CRC Press
Market: Food Science and Technology
October 2014: 6-1/8 x 9-1/4: 344pp
Hb: 978-1-466-59794-5: $169.95
ebook: 978-1-466-59795-2
* For full contents and more information, visit: www.crcpress.com/9781466597945
TEXTBOOK

Food Science and Technology
An Introduction
George L. Baker, IV, Ph.D.
This textbook provides a broad overview of food science and technology topics such as food laws and regulations, food chemistry, food analysis, food microbiology, food safety, food processing, and food product development. Case studies provide the reader with 50 different real-life scenarios as they apply to many topics in the book, and a sample test bank of questions is included at the end of each chapter. Throughout the text, markers help readers better grasp the significance of a particular topic.
CRC Press
Market: Food & Culinary Science
June 2016: 6-1/8 x 9-1/4: 500pp
Hb: 978-1-482-24899-9: $79.95
ebook: 978-1-482-24900-2
* For full contents and more information, visit: www.crcpress.com/9781482248999

Fresh-cut Fruits and Vegetables
Physiology, Technology and Safety
Edited by Sunil Pareek, Maharana Pratap University of Agriculture & Technology, Udaipur, India
Series: Innovations in Postharvest Technology Series
Ready-to-use fruits and vegetables are having increasing success in the market. However, fresh-cut produce deteriorates faster than intact produce. This is a substantial problem, considering that fresh-cut fruits and vegetables are living and breathing during and after processing, and therefore they are subject to constant and irreversible deterioration. This work covers the basics of the subject of fresh-cuts through quality preservation, nutritional losses, physiology, and safety to industry oriented advancements in sanitization, coatings, packaging, set up of industry and hurdle technology.
CRC Press
Market: Food & Culinary Science
June 2016: 6-1/8 x 9-1/4: 568pp
Hb: 978-1-482-72994-0: $179.95
ebook: 978-1-482-72995-7
* For full contents and more information, visit: www.crcpress.com/9781482729940

Functional Food Ingredients and Nutraceuticals
Processing Technologies, Second Edition
Edited by John Shi, Guelph Food Research Center, Canada
Series: Functional Foods and Nutraceuticals
This book introduces the “green” separation processes and stabilization technologies that been developed to address consumer’s concerns on quality and safety issues. It emphasizes the role of nanotechnology in packaging processes and how nano- and micro-encapsulation technologies are used to protect and stabilize the bioactivity of health-promoting components.
CRC Press
Market: Food & Culinary Science
October 2015: 6-1/8 x 9-1/4: 659pp
Hb: 978-1-482-24064-1: $189.95
ebook: 978-1-482-24065-8
* For full contents and more information, visit: www.crcpress.com/9781482240641

Handbook of Food Analysis, Third Edition - Two Volume Set
Edited by Leo M.L. Nollet, University College Ghent, Belgium (Retired) and Fidel Toldra, Instituto de Agroquimica y Tecnologia de Alimentos (CSIC), Department of Food Science, Paterna (Valencia), Spain
This two-volume reference delineates the physical and chemical properties of nutrients and other food components. It provides step-by-step descriptions of preparation, detection, separation, derivatization, and clean-up techniques; it also assesses the relative advantage, accuracy, and reliability of each procedure. Sixteen new chapters have been added to this two-volume reference. They discuss hand analysis techniques of rheological, thermal, and flavor properties of food as well as various methods and techniques in food analysis. Chapters on amines, flavorings, and food traceability are also included.
CRC Press
Market: Food & Culinary Science
June 2015: 8-1/2 x 11: 1568pp
Hb: 978-1-466-51247-4: $69.95
ebook: 978-1-466-51248-1
* For full contents and more information, visit: www.crcpress.com/9781466512474

Introduction to Food Chemistry, Second Edition
Richard Owusu-Apenten, University of Ulster, Coleraine, Northern Ireland
This new edition provides a simple, yet comprehensive, treatment of food chemistry suited to undergraduate courses. This fully referenced text contains hundreds of examples and cases studies illustrating the chemical changes observed in foods due to processing. It presents six new chapters on the chemistry of food components and six new chapters introducing concepts and principles of food chemistry. It also contains a new chapter introducing food phase and physical transformations. The author provides web support for teachers including teaching resources, useful experiments, illustrative demonstrations, and study questions.
CRC Press
Market: Food & Culinary Science
June 2016: 7 x 10: 544pp
Hb: 978-1-466-51247-4: $69.95
ebook: 978-1-466-51248-1
Prev. Ed Hb: 978-0-849-31724-6
* For full contents and more information, visit: www.crcpress.com/9781466512474

The Maillard Reaction Reconsidered
Cooking and Eating for Health
Jack N. Losso, Louisiana State University, Baton Rouge, USA
Cooking involves chemical reactions that can make food smell and taste better. However, the same process that is responsible for grilled and seared foods has also been linked to chronic degenerative diseases such as diabetes, obesity, chronic inflammation, erectile dysfunction, cardiovascular disease, cancer, and Alzheimer’s. This book explores the Maillard reaction, which produces advanced glycation end products (AGEs), and its link to chronic degenerative diseases. It also covers dietary factors that can help prevent those diseases.
CRC Press
Market: Food & Culinary Science
December 2015: 7 x 10: 438pp
Hb: 978-1-482-24821-0: $79.95
ebook: 978-1-482-24822-7
* For full contents and more information, visit: www.crcpress.com/9781482248210

For more information, visit: www.crcpress.com
Meat Quality
Genetic and Environments Factors
Edited by Wieslaw Przybylski, PhD, Warsaw University of Life Science, Poland and David Hopkins, PhD, NSW Department of Primary Industries, Australia
Series: Chemical & Functional Properties of Food Components
This book covers factors affecting meat quality from the growth of animals to the final product. It discusses specific aspects of meat quality for beef, pork, and sheep. This comprehensive book covers key topics such as animal welfare, nutrition, pre-slaughter handling, slaughter technology, breeding strategies, and the influence of common genetic factors on meat quality. It also discusses the latest meat production systems designed to ensure high-quality meat and the role of transgenic animal technology in meat quality.

CRC Press
Market: Food & Culinary Science
October 2014: 6-1/8 x 9-1/4: 472pp
Hb: 978-1-482-22031-5: $189.95
ebook: 978-1-482-22032-2
* For full contents and more information, visit: www.crcpress.com/9781482220315

Methods in Food Analysis
Edited by Rui M. S. Cruz, ISE-University of Algarve, Faro, Portugal, Igor Khmelinskii and Margarida Vieira, Universidade do Algarve, Faro, Portugal
This book reviews methods of analysis and detection in the area of food science and technology. Each chapter deals with determination/quantification analyses of quality parameters in food, covering topics such as lipids, color, texture, and rheological properties in different food products. The book focuses on the most common methods of analysis, presenting methodologies for specific work conditions. It provides a reference for food engineers and researchers working in the area of food science and technology as well as undergraduate and postgraduate students.

CRC Press
Market: Food Chemistry
June 2014: 6-1/8 x 9-1/4: 256pp
Hb: 978-1-482-23195-3: $216.95
ebook: 978-1-482-23196-0
* For full contents and more information, visit: www.crcpress.com/9781482231953

Nanoparticle- and Microparticle-based Delivery Systems
Encapsulation, Protection and Release of Active Compounds
David Julian McClements, University of Massachusetts, Amherst, USA
This book covers the formation, properties, characterization, and application of different kinds of colloidal delivery systems that can be utilized within the food industry, including surfactant-based, emulsion-based, and biopolymer-based systems. The book takes a traditional colloid science approach to the subject with particular emphasis on the practical aspects of formulation of particulate and emulsion-based delivery systems for pharmaceutical and food applications. It covers active ingredients drawn from proteins, carbohydrates, and lipids as well as mineral-based active ingredients. The book describes particle characteristics and explains mechanical particle fabrication methods.

CRC Press
Market: Food & Culinary Science
August 2014: 6-1/8 x 9-1/4: 572pp
Hb: 978-1-482-23315-5: $224.95
ebook: 978-1-482-23316-2
* For full contents and more information, visit: www.crcpress.com/9781482233155

Postharvest Ripening Physiology of Crops
Edited by Sunilk Pareek
Series: Innovations in Postharvest Technology Series
This book describes postharvest physiology, biochemistry, and molecular biology of ripening. Quality, physiology, and molecular biology of flower senescence are discussed. It includes detailed information on advances in respiration measurement, stomatal relations in postharvest, and factors controlling postharvest water loss. In addition, it addresses lysophospholipids research, which is gaining popularity and provides information on ripening and extending the shelf life of horticultural products.

CRC Press
Market: Fruit & Vegetable Products
January 2016: 6-1/8 x 9-1/4: 672pp
Hb: 978-1-498-70380-2: $249.95
ebook: 978-1-498-70381-9
* For full contents and more information, visit: www.crcpress.com/9781498703802

Seafood Science
Advances in Chemistry, Technology and Applications
Edited by Se-Kwon Kim, Pukyong National University, Busan, South Korea
This book provides current trends in seafood science of various relevant topics including isolation aspects, different methodologies involved in seafood production, detailed explanations about marine species such as fish, seaweed, and crustaceans and their health benefits as well as health risk. These topics provide a platform to develop various aquaculture/biotechnology industries. The book is essential reading for the novice and experts marine-related fields, such as aquaculture, biotechnology, chemical sciences, natural products, materials science, pharmaceutical science, and nutraceutical science.

CRC Press
Market: Food & Culinary Science
September 2014: 6-1/8 x 9-1/4: 606pp
Hb: 978-1-466-59583-5: $199.95
ebook: 978-1-466-59583-5
* For full contents and more information, visit: www.crcpress.com/9781466595828

Ultra Performance Liquid Chromatography Mass Spectrometry
Evaluation and Applications in Food Analysis
Edited by Mu Naushad and Mohammad Rizwan Khan
This book provides a unique collection of up-to-date UPLC-MS/MS (ultra-performance liquid chromatography-tandem mass spectrometric) methods for the separation and quantitative determination of pesticides, caspiacins, heterocyclic amines, aflatoxin, perfluorochemicals, acrylamide, procyandins and alkaloids, lactose content, phenolic compounds, vitamins, and aroma and flavor compounds in a wide variety of foods and food products. With contributions by experts in interdisciplinary fields, this reference offers practical information for readers in research and development, production, and routine analysis of foods and food products.

CRC Press
Market: Food Chemistry
March 2014: 6-1/8 x 9-1/4: 490pp
Hb: 978-1-466-59154-7: $199.95
ebook: 978-1-466-59155-4
* For full contents and more information, visit: www.crcpress.com/9781466591547
Advances in Technologies for Producing Food-relevant Polyphenols
Edited by Jose Cuevas Valenzuela, Jose Rodrigo Vergara-Salinas and Jose Ricardo Perez-Correa
Series: Contemporary Food Engineering
This book serves as a reference to develop and optimize processes to obtain polyphenols and produce polyphenol-rich foods. It covers the identification and characterization of several classes of polyphenols and analyzes their food-relevant bioactive properties (e.g. antioxidant, antibacterial, antiviral, anticancer properties) and bioavailability. It then covers the main technologies used to obtain polyphenol extracts from different sources such as solvent extraction, pressurized liquid extraction and supercritical extraction and discusses the techniques and processes used to add polyphenols to food matrices.

CRC Press
Market: Food & Culinary Science
June 2016: 6-1/8 x 9-1/4: 306pp
Hb: 978-1-498-71497-6: $179.95
ebook: 978-1-482-29956-4
* For full contents and more information, visit: www.crcpress.com/9781498714976

Experimental Design and Process Optimization
Maria Isabel Rodrigues, University of Campinas, Brazil and Antonio Francisco Iemma, University of Sao Paulo, Brazil
This book is an excellent educational aid for teaching the methodology of experimental design and response surface analysis. It is also a valuable resource for use in R&D as well as for the development or improvement of both analytical methodologies and industrial processes. The authors describe the benefits of the sequential strategy of factorial design, explore the screening design technique developed by Plackett and Burman as an alternative to preliminary selection, and review statistical science essentials to aid readers in understanding and applying the concepts presented.

CRC Press
Market: Food Engineering
December 2014: 7 x 10: 336pp
Hb: 978-1-482-29955-7: $187.95
ebook: 978-1-482-29956-4
* For full contents and more information, visit: www.crcpress.com/9781482299557

Engineering Aspects of Food Emulsification and Homogenization
Edited by Marilyn Rayner and Petr Dejmek
Series: Contemporary Food Engineering
This book describes the state-of-the-art technology and brings together aspects from physical chemistry, fluid mechanics, and chemical engineering. These aspects are the foundation needed for understanding emulsification at more than a rudimentary level. This is the first comprehensive treatment of emulsification including state-of-the art developments and integration of all aspects available in English. The book’s perspective is that of the unit emulsification process, using fundamental theory from different fields to discuss design and function of different emulsification techniques.

CRC Press
Market: Food & Culinary Science
April 2015: 6-1/8 x 9-1/4: 331pp
Hb: 978-1-466-58043-5: $179.95
ebook: 978-1-466-58044-2
* For full contents and more information, visit: www.crcpress.com/9781466580435

4th Edition
Engineering Properties of Foods, Fourth Edition
Through three editions, this has been the must-have resource on food properties and their variations. The book defines food properties and the necessary theoretical background for each. It also evaluates the usefulness of each property in the design and operation of important food processing equipment. This new edition addresses advanced knowledge of food properties by providing the latest developments in the field. It offers three new chapters covering glass transition temperature pertaining to food, kinetics related to non-thermal processing, and micro-structural properties of foods

CRC Press
Market: Food & Culinary Science
April 2014: 7 x 10: 812pp
Hb: 978-1-466-55642-3: $249.95
ebook: 978-1-466-55643-0
Prev. Ed Hb: 978-0-824-75328-3
* For full contents and more information, visit: www.crcpress.com/9781466556423

3rd Edition - NEW EDITION
Handbook of Food Engineering, Third Edition
Edited by Dennis R. Heldman, Heldman Associates, Mason, Ohio, USA, Daryl B. Lund, University of Wisconsin, Madison, USA and Christina Sabillov, Louisiana State University, Baton Rouge, USA
The primary mission of the third edition of Handbook of Food Engineering is to provide the information needed for efficient design and development of processes used in the manufacturing of food products, along with supplying the traditional background on these processes. The new edition focuses on the thermophysical properties of food and the rate constants of change in food components during processing. It highlights the use of these properties and constants in process design. In addition to chapters on the properties of food and food ingredients, the book has a new chapter on nano-scale science in food processing. An additional chapter focuses on basic concepts of mass transfer in foods.

CRC Press
August 2016: 7 x 10: 968pp
Hb: 978-1-466-56312-4: $279.95
ebook: 978-1-466-56313-1
* For full contents and more information, visit: www.crcpress.com/9781466563124

4th Edition
Introduction to Food Process Engineering
Albert Ibarz, University of Lleida, Spain and Gustavo V. Barbosa-Canovas, Washington State University, Pullman, USA
Series: Food Preservation Technology
This text introduces the basic principles of food engineering, providing readers with a good understanding of what food process engineering encompasses. The text begins with an overview of basic concepts of unit operations, familiarizing readers with fundamental ideas regarding processes. It then reviews key topics in food process engineering, covering the physical properties of food, traditional fluid mechanics, and heat transfer. The text examines transport phenomena, momentum, energy, and mass balances, as well as macroscopic balances. It also discusses food processing and food preservation technologies and food packaging.

CRC Press
April 2014: 7 x 10: 722pp
Hb: 978-1-439-80918-1: $89.95
ebook: 978-1-482-21966-1
* For full contents and more information, visit: www.crcpress.com/9781439809181
Light Scattering Technology for Food Property, Quality and Safety Assessment
Edited by Renfu Lu, USDA, ARS, East Lansing, Michigan, USA
Series: Contemporary Food Engineering
Recently, considerable research activities have been reported on the development and application of various light scattering technologies for assessing structural, rheological and sensory properties, quality attributes, and safety of a wide range of food and agricultural products. This book is the first to provide readers with an overview of the principles and theory of light transfer in food and biological materials. It also includes a comprehensive review of the latest advances in light scattering technology in food and agricultural applications.

Mediterranean Food
Composition & Processing
Edited by Rui M. S. da Cruz, ISE-University of Algarve, Faro, Portugal and Maria M. C. Vieira, ISE-University of Algarve, Faro, Portugal
The Mediterranean region is well known around the world for its rich culinary history. While most books tend to only focus on the nutritional, culinary, and/or health aspects of Mediterranean cuisine, this book presents a more scientific approach and discusses the composition of specific foods from the Mediterranean basin as well as specific processing methodologies applied to produce food in this area of the world.

Nutritional Biochemistry
Current Topics in Nutrition Research
Edited by Chad Cox, California State University, Sacramento, USA
Collected in this research compendium are recent studies within each of these topics. Each chapter contributes to a well-rounded and up-to-date picture of nutritional biochemistry. Appropriate for graduate-level and post-doctorate students, this book will stimulate further study into this important field of research.
Forensic Analysis of Biological Evidence

A Laboratory Guide for Serological and DNA Typing

J. Thomas McClintock, DNA Diagnostics, Inc., Crofton, Maryland, USA

Focusing on the basic techniques used in forensic DNA laboratories, this textbook introduces readers to serological analysis and DNA typing methods and provides a thorough background of the molecular techniques used to determine identity or parental lineage. Originally published as Forensic DNA Analysis: A Laboratory Manual, this revised work offers updated exercises and protocols for all kinds of DNA and serological analyses with delineated objectives, step-by-step procedures, and required laboratory supplies. Exercises provide an overview of forensic DNA analysis, explain sources or types of biological material, supply background principles and practical methodology, and simulate human forensic testing.

CRC Press
Market: Forensic Science
February 2014: 6-1/2 x 9-1/4: 364pp
Pb: 978-1-466-50456-1: $59.95
ebook: 978-1-466-50458-5
* For full contents and more information, visit: www.crcpress.com/9781466504561

Forensic Analysis of Tattoos and Tattoo Inks

Michelle D. Miranda

This book provides an analysis of tattoo inks and uses of tattoos as a tool in forensic investigations and criminalistics. It covers the history of tattoos and tattoo inks, including the use of tattoos as aids in identification of individuals. This includes cases of charred, decomposed, mummified or otherwise unidentified remains. It explains the process of tattooing and the roles of tattoos in criminalological inquiry and legal matters. It also scientifically evaluates the physical properties of tattoo inks in macroscopic, microscopic, and spectroscopic terms, identifying the optical and chemical properties of the various pigments found in these inks.

CRC Press
Market: Forensic Science
September 2015: 6-1/2 x 9-1/4: 364pp
Hb: 978-1-482-22214-6: $129.95
ebook: 978-1-482-22215-3
* For full contents and more information, visit: www.crcpress.com/9781482221466

Forensic Science

An Introduction to Scientific and Investigative Techniques, Fourth Edition

Edited by Stuart H. James, James & Associates Forensic Consultants, Inc., Fort Lauderdale, Florida, USA, Jon J. Nordby, Final Analysis Forensics, University Place, Washington, USA and Suzanne Bell, West Virginia University, Morgantown, USA

Designed for a single-term course at the lower undergraduate level, this book covers a range of fundamental topics essential to modern forensic investigation. Going beyond theory to application, this text incorporates the wisdom of forensic practitioners who discuss the real cases they have investigated. Sidebars in each chapter provide historical notes, discuss practical information and current events, and offer advice for career advancement. Case studies help students visualize concepts, and each chapter concludes with a summary, key terms, review questions, and references for further reading. Appropriate for any sensibility, more than 300 photos from real cases give students a true-to-life learning experience.

CRC Press
January 2014: 8-1/2 x 11: 614pp
ebook: 978-1-439-85386-3
* For full contents and more information, visit: www.crcpress.com/9781439853832

Human Scent Evidence

Paola A. Prada, Florida International University, Miami, USA, Allison M. Curran, Florida International University, Miami, Florida, USA and Kenneth G. Furton, Florida International University, Miami, USA

During the last decade, scientific studies have supported using human scent as a biometric tool and indicator of the presence or absence of an individual at a crime scene. This book focuses on some of these recent advances in the use of human scent as forensic evidence: It examines theories of human odor production, the legal significance of results, and canine scent work from multiple search categories as described in the Scientific Working Group on Dog and Orthogonal detector Guidelines (SWGDOG). It also explores current trends in scent collection techniques, including devices, materials, and storage protocols.

CRC Press
Market: Forensics and Criminal Justice
October 2014: 6-1/8 x 9-1/4: 228pp
Hb: 978-1-466-58395-5: $129.95
ebook: 978-1-466-58396-2
* For full contents and more information, visit: www.crcpress.com/9781466583955

Nuclear Forensic Analysis, Second Edition

Kenton J. Moody, Lawrence Livermore National Laboratory, California, USA, Patrick M. Grant, Lawrence Livermore National Laboratory, California, USA and Ian D. Hutchence, Lawrence Livermore National Laboratory, California, USA

Now in its second edition, this book provides a multidisciplinary reference for forensic scientists, analytical and nuclear chemists, and nuclear physicists. The authors focus particularly on the chemical, physical, and nuclear aspects associated with the production or interrogation of a radioactive sample. They consolidate fundamental principles of nuclear forensic analysis, all pertinent protocols and procedures, computer modeling development, interpretational insights, and attribution considerations. The principles are then detailed in application to real-world investigations and casework. This edition includes a new section on sample analysis considerations and interpretation following a post-detonation nuclear forensic collection, new case studies, and expanded treatments of radiologic dispersal devices (RDDs) and statistical analysis methodologies.

CRC Press
Market: Forensic Chemistry
December 2014: 6-1/8 x 9-1/4: 524pp
Hb: 978-1-439-88061-6: $169.95
ebook: 978-1-439-88062-3
* For full contents and more information, visit: www.crcpress.com/9781439880616

The Basics of Investigating Forensic Science

A Laboratory Manual

Kathy Mirakovits, Portage Northern High School, Michigan, USA and Gina Londino

This book is designed for the beginning forensic science student and for instructors who wish to teach a solid foundation in basic forensic science topics and laboratory techniques. It covers a wide range of subjects, including fingerprinting, shoeprint analysis, firearms, pathology, anthropology, forensic biology, drugs, trace evidence, and much more. It can be used alongside any introductory forensic textbook or as a stand-alone manual. It provides lab exercises of various levels and experiments that are basic and affordable, requiring minimal access to advanced instruments.

CRC Press
Market: Forensic Science
September 2015: 7 x 10: 188pp
Pb: 978-1-482-22315-6: $49.95
ebook: 978-1-482-22317-0
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The Chemical Century
Molecular Manipulation and Its Impact on the 20th Century
Richard J. Sundberg, University of Virginia, Charlottesville, USA
This fascinating new volume provides a comprehensive yet concise overview of the chemical aspects of some of the major innovations and changes that occurred during the twentieth century, relating chemical structures and properties to real-life applications. The author covers the important and consequential developments in chemistry and explains their everyday, real-life applications. The section Molecular Biology and Its Applications includes examples of the application of biotechnology and genetic engineering.

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Market: General Chemistry
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* For full contents and more information, visit: www.crcpress.com/9781482260960

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Edited by William M. Haynes, National Institute of Standards and Technology, Boulder, Colorado, USA
The CRC Handbook of Chemistry & Physics 97th Edition is an update of a classic reference. Several new tables will be added and others updated. Building on the new feature first introduced in the 94th edition, four historical figures in science will be honoured on the end plates.
CRC Press
June 2016: 8-1/2 x 11: 2600pp
Hb: 978-1-498-75429-3 $199.95
* For full contents and more information, visit: www.crcpress.com/9781498754286

3rd Edition
Dekker Encyclopedia of Nanoscience and Nanotechnology, Third Edition, Seven Volume Set
Edited by Sergey Edward Lyshevski, Rochester Institute of Technology, New York, USA
With its original publication, the Dekker Encyclopedia of Nanoscience and Nanotechnology immediately became the reference against which all other nano references are measured. Continuing to cover the field as no other resource, the seven-volume Third Edition crosses disciplines to examine essential paradigms, principles, theories, and methodologies, as well as the latest information on nanotechnologies. Featuring 61 new, 34 revised, and 352 revised entries, it covers advances in nanoscale engineering, simulation tools, and computational methods to assist readers in mastering biological, engineering, physical, and technological facets.
CRC Press
Market: Nanoscience
March 2016: 8-1/2 x 11: 6200pp
Hb: 978-1-439-89134-6: $455.00
* For full contents and more information, visit: www.crcpress.com/9781439891346

Educating Scientists and Engineers for Academic and Non-Academic Career Success
James Speight, CD&W Inc., Laramie, Wyoming, USA
Series: Chemical Industries
This text focuses on the structure of the current educational system and describes the transformations needed to ensure the adequate education of future science and engineering students. It describes how university faculty can make the necessary changes to teach a broader range of skills, technical proficiency, teamwork, adaptability, and versatility within the undergraduate and postgraduate curriculum. Also covered are approaches to provide a broader exposure to experiences desired by both academic and non-university employers to prepare students for an increasingly interdisciplinary, collaborative, and global job market.
CRC Press
Market: General Engineering & Technology
December 2014: 6-1/8 x 9-1/4: 193pp
Pb: 978-1-466-55356-9 $49.95
ebook: 978-1-466-55357-6
* For full contents and more information, visit: www.crcpress.com/9781466553569

Entrepreneurship in Chemistry and the Life Sciences
Cedric Pearce, Chapel Hill, North Carolina, USA
Scientists typically are not trained to think of discoveries as potential business opportunities and many are lost even though they might have a significant impact on society. This book is designed to help chemistry and life scientists start their own businesses. For graduates, this book provides a background of new companies and how they operate. Full of examples, it is an excellent introduction to the process of successfully identifying new scientific discoveries with commercial potential and establishing businesses based on new technology.
CRC Press
April 2016: 6-1/8 x 9-1/4: 300pp
Hb: 978-1-466-55476-4: $39.95
* For full contents and more information, visit: www.crcpress.com/9781466554764

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experimental methods.

CRC Press
Market: Chemistry
March 2015: 6 1/8 x 9 1/4: 384 pp
Pb: 978-1-482-23380-3: $139.95
ebook: 978-1-482-23381-0
* For full contents and more information, visit: www.crcpress.com/9781482233803

Nanoscale Flow
Advances, Modeling, and Applications
Edited by Sarhan M. Musa, Prairie View A&M University, Houston, Texas, USA
This book presents the latest research in the multidisciplinary area of nanoscale flow. It contains contributions from top inventors in industry, academia, and government on topics including the boiling heat transfer and critical heat flux phenomena of nanofluids; modeling for heat transfer of nanofluids using a fractal approach; thermal conductivity enhancement in nanofluids measured with a hot-wire calorimeter; two-phase laminar mixed convection AL...—water nanofluid in an elliptic duct; molecular imaging, omics, and nanoscale flow-mediated medicine tumors strategies; and nanoscale flow applications in medicine.

CRC Press
Market: Nanoscience & Technology
December 2014: 6 1/8 x 9 1/4: 261 pp
Hb: 978-1-482-23380-3: $139.95
ebook: 978-1-482-23381-0
* For full contents and more information, visit: www.crcpress.com/9781482233803

Problem-Solving Exercises in Green and Sustainable Chemistry
Albert S. Matlack, University of Delaware, Newark, USA and Andrew P. Dicks, University of Toronto, Ontario, Canada
This book teaches students how to analyze and solve real-world problems that occur in green and sustainable chemistry. It describes situations based on events that have actually taken place and encourages creativity in finding solutions to problems that have multiple “correct” answers. The exercises and commentaries from the experienced author emphasize the reality that green chemistry is about making practical decisions and weighing multiple factors that are often conflicting, thus making it difficult or impossible to apply one perfect solution to a given problem.

CRC Press
Market: Chemistry
October 2015: 6 1/8 x 9 1/4: 175 pp
Pb: 978-1-482-25257-6: $39.95
ebook: 978-1-482-25258-3
* For full contents and more information, visit: www.crcpress.com/9781482252576

Reversibility of Chronic Disease and Hypersensitivity, Volume 2
The Effects of Environmental Pollutants on the Organ System
William J. Rea, Environmental Health Center, Dallas, Texas, USA and Kalpana D. Patel, Allergy and Environmental Health Center WNY, Buffalo, New York, USA
Encyclopedic in scope, the multi-volume set, Reversibility of Chronic Degenerative Disease and Hypersensitivity, draws deeply on the clinical histories of thousands of profoundly ill patients to describe the physiology and chemical sensitivity of chronic degenerative diseases, their different manifestations, how to diagnose them, and how to reverse the dysfunction. This second volume describes clinical syndromes within each of the body’s systems: musculoskeletal, cardiovascular, gastrointestinal, and respiratory.

CRC Press
August 2014: 7 x 10: 723 pp
Hb: 978-1-439-81343-0: $237.95
ebook: 978-1-439-81344-7
* For full contents and more information, visit: www.crcpress.com/9781439813430

Understanding Chemistry through Cars
Geoffrey M. Bowers, Alfred University, New York, USA and Ruth A. Bowers
There is almost nothing in a car that cannot be described from a chemical perspective, thereby making cars an untapped pedagogical resource for the study of chemistry. This book is suitable as an introductory course or capstone project and provides a thorough, although not exhaustive, presentation of chemistry in relation to cars. Topics include the ideal gas law, materials chemistry, thermochemistry, solution chemistry, mass transport, polymerization, light/matter interactions, and oxidation/reduction. A Twitter account and a blog allow readers to interact directly with authors and other experts.

CRC Press
Market: Chemistry
November 2014: 6 1/8 x 9 1/4: 261 pp
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Ehrlich’s Geomicrobiology, Sixth Edition

Edited by Henry Lutz Ehrlich, Rensselaer Polytechnic Institute, Troy, New York, USA, Dianne K. Newman, California Institute of Technology, Pasadena, USA and Andreas Kappler, Eberhard-Karls-University Tübingen, Center for Applied Geosciences (ZAG), Germany

This new edition surveys various aspects of geomicrobiology, including the microbial role in elemental cycling and in the formation and degradation of minerals and fossil fuels. Unlike the previous edition, many expert contributors besides the editors have been included, providing added depth to topics and broadening the overall insights. The new breadth of scope and possible applications in agriculture, forestry, aquaculture, marine science, the metals industry, and more that this book presents make it a must-have source in geomicrobiology.

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One Century of the Discovery of Arsenicosis in Latin America (1914-2014) As2014

Edited by Marta I. Litter, National University of General San Martin, Prov. de Buenos Aires, Argentina, Hugo B. Nicolli, National University of General San Martin, Prov. de Buenos Aires, Argentina, Martin Meichtry, National University of General San Martin, Prov. de Buenos Aires, Argentina, Natalia Quici, Jochen Bundschuh, University of Southern Queensland (USQ), Toowoomba, QLD, Australia & Royal Institute of Technology (KTH), Stockholm, Sweden, Prosun Bhattacharya, Royal Institute of Technology, Stockholm, Sweden and Ravi Naidu, University of South Australia, Mawson Lakes, Australia

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Edited by Sergeï D. Varfolomeev, Moscow State University, Russia
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A Practitioner’s Guide
J. Robert Taylor, Consultant, Alleroed, Denmark
The book basically shows you how to analyze operator, maintenance, and management error for oil, gas, and chemical plants. The book describes practical approaches to human error analysis in process plant operations, including estimated error and accident frequencies. Based on the well-known SRK model of human error it represents a practical collection of examples and statistics from over 30 years of study, with many examples of the practical application of methods.

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Innovations for Process Intensification
Edited by K. V. Raghavan, Indian Institute of Chemical Technology, India and B. M. Reddy, Indian Institute of Chemical Technology, India
With contributions from experts from both the industry and academia, this book presents the latest developments in the identified areas. In addition, a thorough and updated coverage of the traditional aspects of heterogeneous catalysis such as preparation, characterization and use in well-established technologies such as nitration, ammoxidation and hydrofluorination is included. This book incorporates appropriate case studies, explanatory notes, and schematics for more clarity and better understanding.

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Edited by Peter Grunwald, University of Hamburg, Germany
Modern biocatalysis relies on the tremendous advances in omics techniques and the structural elucidation of biomolecules, which have led to synthetic biology and metabolic engineering as new research fields with high application potential for the rational design of enzymes and microbial production strains. In this book, renowned scientists discuss the actual developments in these research fields together with a variety of application-oriented topics.

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Introduction to Crystal Growth
Principles and Practice
H.L. Bhat, Indian Institute of Science, Bangalore
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An Introduction to High-Pressure Science and Technology
Edited by Jose Manuel Recio, Malta Consolider Team and University of Oviedo, Spain, Jose Manuel Menendez, Malta Consolider Team and University of Edinburgh, Scotland and Alberto Otero de la Roza, Malta Consolider Team and National Institute for Nanotechnology, Edmonton, Alberta, Canada
Suitable for newcomers to the field, this book guides readers through the process of learning why pressure is considered a powerful scientific and technological tool, how pressure can be introduced into the laboratory, and which problems can be solved using this thermodynamic variable. The book presents basic thermodynamic equations, state-of-the-art computational tools, and many experimental techniques. It also addresses the responses of microorganisms, Earth constituents, and icy planets to pressure.

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Don M. Pirro, ExxonMobil, Fairfax, Virginia, USA, Martin Webster and Ekkehard Daschner

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Micro- and Nanobubbles

Fundamentals and Applications

Edited by Hideki Tsuge, Keio University, Tokyo, Japan

The field of micro- and nanobubbles has shown a strong potential for growth and is frequently highlighted in the news. Micro- and nanobubbles have many applications in a variety of fields including engineering, agriculture, environment, food, and medicine. This book is divided into three parts for the convenience of the reader: fundamentals, applications of microbubbles, and applications of nanobubbles. The book comprehensively discusses these topics and presents the possibility of micro- and nanobubbles as a new technology that can be utilized globally.

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Tribocorrosion for Materials Engineers

Margaret Stack, University of Strathclyde, Glasgow, England, UK

This book describes various tribocorrosion processes including wear phenomena, the Pourbaix diagram for aqueous corrosion, and the thermodynamic stability diagram for high temperature oxidation. It highlights the work done during the past 20 years on tribocorrosion maps where both tribology and corrosion mapping approaches are combined. The author addresses erosion, abrasion (and microscale-abrasion), fretting, and sliding wear interactions with corrosion. Best practices in testing tribocorrosion over a multi-parameter space, enabling the production of such maps, are discussed with respect to current international standards in the subject.

CRC Press

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Cavitation
A Novel Energy-Efficient Technique for the Generation of Nanomaterials
Edited by Sivakumar Manickam, The University of Nottingham Malaysia Campus, Semenyih and Muthupandian Ashokkumar, University of Melbourne, Parkville, Australia
The past decade has witnessed the development of a wide range of nanomaterials using cavitation. While a few currently available books deal with the fundamental aspects of cavitation and sonochemistry, there is no book devoted specifically to the technologically important nanomaterials obtained by cavitation. This was the stimulus behind the development of this book. Leading researchers working on utilizing cavitation for the generation of nanomaterials have made their contributions to this book.
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Nanostructural Bioceramics
Advances in Chemically Bonded Ceramics
Edited by Leif Hermansson, Doxa AB, Uppsala, Sweden
Biomaterials are produced in situ and in vivo in the body using mainly hydration reactions, that is, reactions between phosphates, silicates or aluminates, and water. The nanostructural integration of these biomaterials in the body is controlled by six mechanisms. This book describes the new biomaterials based on nanostructural chemically bonded bioceramics and discusses their general and specific properties. It presents an overview of the nanostructural chemically bonded bioceramics, including their processing aspects, properties, integration with tissues, relation to other bioceramics and biomaterials, and nanostructural integration in different dental and orthopaedic applications.
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**Active Plasmonic Nanomaterials**

Edited by Luciano De Sio, University of Calabria, Arcavacata di Rende, Italy

Plasmonic nanoparticles (NPs) represent an outstanding class of nanomaterials that have the capability to localize light at the nanoscale by exploiting a phenomenon called “localized plasmon resonance.” This book reviews recent efforts devoted to the utilization of NPs in many research fields, such as photonics, optics, and plasmonics. In this framework, a particular interest is devoted to “active plasmonics,” a quite broad concept that indicates those applications in which NPs play an “active” role, such as the realization of gain-assisted means, utilization of NPs embedded in liquid crystalline and flexible materials, and exploitation of renewable solar energy.

**Metal-Induced Crystallization**

Fundamentals and Applications

Edited by Zumin Wang, Max Planck Institute for Intelligent Systems, Stuttgart, Germany, Lars P. H. Jeurgens, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland and Eric J. Mittemeijer, Max Planck Institute for Intelligent Systems and University of Stuttgart, Germany

This book provides the first comprehensive and in-depth overview of the current fundamental understanding of metal-induced crystallization and further elucidates how to employ this process in various technologies, including thin-film solar cells and display technologies. It aims to give the reader a thorough perspective of metal-induced crystallization and thereby stimulate the development of novel crystalline-semiconductor-based technologies.

**Bent-core Liquid Crystals**

Edited by Hideo Takezoe, Tokyo Institute of Technology, Japan and Alexey Eremin

This book provides insight into the latest developments in the research on liquid crystals formed by bent-core mesogens. After a short historical introduction, the authors discuss different kinds of mesophase structures formed by bent-core molecules. A majority of this book is devoted to physical properties such as elasticity, optics and non-linear optics, and behavior in restricted geometries. As chemistry is often relevant to the emergence of new phases, particularly with chiral symmetry breaking, chemistry viewpoints are broadly involved in this book.

**Dancing with Light**

Advances in Photofunctional Liquid-Crystalline Materials

Haifeng Yu

Recent progress in this field indicates that integrating photochromic molecules into LC materials enables one to photo-manipulate unique features such as photoinduced phase transition, photocollated alignment and phototiggered molecular cooperative motion, leading to novel applications beyond displays. This book introduces readers to this field, from the primary to the advanced level in photoreponsive LC materials. The subject is introduced step-by-step, including the basic knowledge of LCs, photoreponsive properties of LCs, and their detailed performances in the form of low-molecular-weight compound, polymer, cross-linked elastomer, and block copolymer.
Advanced Materials for Clean Energy

Edited by Qiang Xu, National Institute of Advanced Industrial Science and Technology (AIST), Osaka, Japan and Tetsuhiro Kobayashi, National Institute of Advanced Industrial Science and Technology (AIST), Osaka, Japan

This book surveys the key developments in the science and engineering of the state-of-the-art materials for clean energy. The book provides a broad overview of materials for photovoltaics, solar energy conversion, thermoelectrics, piezoelectrics, supercapacitors, rechargeable batteries, fuel cells, and hydrogen production and storage. Each of these topics is covered by an experienced international group of contributors, all of whom are experts in their respective fields. This is a valuable resource for readers wanting to delve into research for maximizing the efficiency of alternative energy approaches.

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Alkali-Aggregate Reaction in Concrete
A World Review

Edited by Alan B. Poole, Retired Consulting Engineer, Oxford, UK and Ian Sims, RSK Environment Ltd, UK

This book is unique in providing authoritative and up to date expert information on the causes and effects of Alkali-Aggregate Reaction (AAR) in concrete structures worldwide. It provides a ‘state of the art’ review and deals authoritatively with the mechanisms of AAR, its diagnosis and the methods of treatment of this problem where it develops in concrete. It provides accurate information on the most recent research results concerning AAR as it affects concrete structures and covers the practical approaches of dealing with the problem. The book has been compiled from the expert contributions provided by senior engineers and scientists from many parts of the world.

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Analysis and Performance of Engineering Materials
Key Research and Development

Edited by Gennady E. Zaikov, Kazan National Research Technological University, Russia

This new book facilitates the study of problematic chemicals in such applications as chemical fate modeling, chemical process design, and experimental design. It provides a valuable overview of current chemical processes, products, and practices and analyzes theories to formulate and prove physicochemical principles. It addresses the production and application of polymers, including chemical, physicochemical, and purely physical methods of examination. The research found in this book will aid scientists and researchers in developing improved engineering materials. The book’s coverage of key developments can be applied in industrial chemistry, biochemistry, and materials science.

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Biomineralization Sourcebook
Characterization of Biominerals and Biomimetic Materials

Edited by Elaine DiMasi, National Synchrotron Light Source, Upton, New York, USA and Laurie B. Gower, University of Florida, Gainesville, USA

This handbook provides a comprehensive account of materials science approaches to characterization of biominerals and biomimetic model systems. It covers state-of-the-art in the characterization of atomic and molecular structure, including the latest in diffraction, scattering, and spectroscopy, in addition to methods for imaging morphology and interfaces. It also looks at computational approaches and probes for examining energetic and forces in assembly. The final section focuses on mechanical function and measurement methodology as well as studies of live cells and whole organs.

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Carbonated Hydroxyapatite
Materials, Synthesis, and Applications

Michael E. Fleet, University of Western Ontario, London, Canada

This book introduces recent advances in understanding the crystal structure of carbonate hydroxyapatite (also known as bone mineral), which forms the hard tissue of bones and teeth. The book includes chapters on apatite mineralogy and geochemistry, synthesis methods, X-ray structure, infrared spectroscopy, crystal chemistry of carbonate hydroxyapatite, and biological apatites. There are 75 illustrations, 25 tables of data, and 3 appendices. Discussion of the new research is supported by an outline of the theory behind the methods of investigation and reviews of previous research on hydroxyapatite materials, for the benefit of non-specialist students and researchers.

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Chemical and Applied Engineering Materials
Interdisciplinary Research and Methodologies

Edited by Maria Rajkiewicz, Institute for Engineering of Polymer Materials and Dyes, Piastow, Poland

This new research book explores and discusses a range of topics on the physical and mechanical properties of chemical engineering materials. Chapters from prominent researchers in the fields of physics, chemistry, and engineering science present new research on composite materials, blends, carbon nanotubes, and nanocomposites along with their applications in technology. Discussing the processing, morphology, structure, properties, performance, and applications, the book highlights the diverse and multidisciplinary nature of the field.

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Edited by Bohdana Marvalova, Technical University of Liberec, Czech Republic and Iva Petrikova, Technical University of Liberec, Czech Republic
Constitutive Models for Rubber IX offers engineers, scientists and postgraduate students an overview of recent theoretical and experimental research on the behaviour, properties and modelling of rubber.

Chemical Functionalization of Carbon Nanomaterials
Chemistry and Applications
Edited by Vijay Kumar Thakur and Manju Kumari Thakur
This book provides a thorough examination of the rapidly developing field of carbon-based nanomaterials. It covers important up-to-date research on carbon nanomaterials, including descriptions of their variants and how they can be chemically functionalized. It also gives an overview of current advanced applications of functionalized carbon nanomaterials, including their use in critical areas such as chemical analysis, drug delivery, and water treatment. It is a significant collection of findings that give an in-depth look at current achievements in the field while looking ahead to new possibilities in research and practice.

The Chemistry and Physics of Engineering Materials, Volume One
Modern Analytical Methodologies
Edited by Alexandr A. Berlin, Russian Academy of Sciences, Moscow, Russia, Roman Joswik, Military Institute of Chemistry and Radiometry, Warsaw, Poland and Vatin Nikolai Ivanovich, Saint-Petersburg State Polytechnical University, Russia
This new volume focuses on modern analytic methodologies in the chemistry and physics of engineering materials that have potential for applications in several disciplines of engineering and science. Contributions range from new methods to novel applications of existing methods. The collection of topics in this volume reflects the diversity of recent advances in chemistry and physics of engineering materials with a broad perspective that will be useful for scientists as well as for graduate students and engineers. This new book presents leading-edge research from around the world.

Durability of Geosynthetics, Second Edition
John H. Greenwood, Hartmut F. Schroeder and Wim Voskamp
This book provides a state-of-the-art review of the life-limiting mechanisms of geosynthetics, the methods available to test and assess lifetime, and the means by which durability can be improved. It provides engineers with the information they need on the durability lifetime, bridging the knowledge gap between them and polymer scientists.

The Chemistry and Physics of Engineering Materials, Volume Two
Limitations, Properties, and Models
Edited by Alexandr A. Berlin, Russian Academy of Sciences, Moscow, Russia, Roman Joswik, Military Institute of Chemistry and Radiometry, Warsaw, Poland and Vatin Nikolai Ivanovich, Saint-Petersburg State Polytechnical University, Russia
This new volume focuses on the limitations, properties, and models in the chemistry and physics of engineering materials that have potential for applications in several disciplines of engineering and science. Contributions range from new methods to novel applications of existing methods. The collection of topics in this volume reflects the diversity of recent advances in chemistry and physics of engineering materials with a broad perspective that will be useful for scientists as well as for graduate students and engineers. This new book presents leading-edge research from around the world.

Eco-Friendly Nano-Hybrid Materials for Advanced Engineering Applications
Edited by S. Ananda Kumar, Anna University, Chennai, India
This new book focuses on eco-friendly nanohybrid. It clearly summarizes the fundamentals and established techniques of synthesis and processing of eco-friendly nanohybrid materials to provide a systematic and coherent picture of synthesis and the processing of nanomaterials. The research on nanotechnology is evolving and expanding very rapidly. Nanotechnology represents an emerging technology that has the potential to have an impact on an incredibly wide number of industries, such as the medical, environmental, and pharmaceutical industries.
The Chemistry and Physics of Engineering Materials - Two Volume Set

Edited by Alexandr A. Berlin, Russian Academy of Sciences, Moscow, Russia, Roman Joswik, Military Institute of Chemistry and Radiometery, Warsaw, Poland and Vatin Nikolai Ivanovich, Saint-Petersburg State Polytechnical University, Russia

This new two-volume set focuses on the chemistry and physics of engineering materials that have potential for applications in several disciplines of engineering and science. Contributions range from new methods to novel applications of existing methods. Volume I addresses modern analytic methodologies while Volume 2 focuses on the limitations, properties, and models of materials. The collection of topics in these volumes reflect the diversity of recent advances in chemistry and physics of engineering materials with a broad perspective that will be useful for scientists as well as graduate students and engineers. This new two-volume set presents leading-edge research from around the world.

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CRC Concise Encyclopedia of Nanotechnology

Edited by Boris Ildusovich Kharisov, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Mexico, Oxana Vasilievna Kharissova, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Mexico and Ubaldo Ortiz-Mendez, Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Mexico

The book examines the design, application, and utilization of devices, techniques, and technologies critical to research at the atomic, molecular, and macromolecular levels ranging from 1 to 100 nanometers. More than three dozen specific topics are examined, including nanomaterials, nanocatalysts, nanoceramics, nanocrystalline carbon nanotubes, drug delivery, nanopolymer, nanoparticles, nanocoatings, and nanomedicine. The material is presented in a concise manner and has been updated to reflect the latest applications and research findings. Entries are organized alphabetically, making information easy to find.

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Endohedral Metallofullerenes Basics and Applications

Edited by Xing Lu, Huazhong University of Science and Technology, Wuhan, Hubei Province, China, Luis Echegoyen, The University of Texas, El Paso, USA, Alan L. Balch, University of California, Davis, USA, Shigeru Nagase, Fukui Institute for Fundamental Chemistry, Kyoto University, Japan and Takeshi Akasaka, University of Tsukuba, TARA Center, Ibaraki, Japan

Endohedral metallofullerenes (EMFs) stand as a novel type of newly emerged metal-carbon hybrid molecules and occupy an important position in the family of nanocarbon materials. Research on EMFs has increased dramatically during the last 10-15 years. This area is now ready for a systematic and up-to-date summary. This book presents the most advanced review on all aspects of EMFs, including the generation, extraction, isolation, structural issues, theories, intrinsic properties, chemical behaviors, and potential applications, ending with a perspective on the field’s future directions.

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Engineering Materials Applied Research and Evaluation Methods

Edited by Ali Pourhashemi, Christian Brothers University, Memphis, Tennessee, USA

This book covers many important aspects of applied research and evaluation methods in chemical engineering and materials science that are important in chemical technology and in the design of chemical and polymeric products. This book gives readers a deeper understanding of physical and chemical phenomena that occur at surfaces and interfaces. The link between interfacial behavior and the performance of products and chemical processes is important. Helping to fill the gap between theory and practice, this book explains the major concepts of new advances in high-performance materials and their applications.

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Extractive Metallurgy of Rare Earths, Second Edition

Nagaiyar Krishnamurthy, Bhabha Research Centre, Mumbai, Maharashtra, India and Chiranjib Kumar Gupta, Bhabha Research Centre, Mumbai, Maharashtra, India

This book describes the properties, characteristics, and uses of rare earth elements. It explains where, in what quantities, and how these elements occur in nature, as well as how they are processed from ores into marketable end materials. Retaining its status as a comprehensive monograph for academic, industry, and regulatory professionals, the Second Edition includes a new chapter on the recycling of rare earth elements from devices such as unused batteries and electronics, and is updated throughout with important developments from the past ten years.

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High Performance Elastomer Materials
An Engineering Approach

Edited by Dariusz M. Bielinski, Lodz University of Technology, Poland, Ryszard Kozlowski, Institute for Engineering of Polymer Materials and Dyes, Piastow, Poland and Gennady E. Zaikov, Kazan National Research Technological University, Russia

This book presents selected papers on various aspects of rubber engineering, technology, and exploitation. The contributions range from new methods of the modification of filler surface and crosslinks structure of rubber vulcanizates, through modern functional elastomer composites, to aspects of their thermal stability, flammability, and ozone degradation.

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Functional Materials
Properties, Performance and Evaluation

Edited by Ewa Klodzinska, Institute for Engineering of Polymer Materials and Dyes, Torun, Poland
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This book presents selected papers on various aspects of rubber engineering, technology, and exploitation. The contributions range from new methods of the modification of filler surface and crosslinks structure of rubber vulcanizates, through modern functional elastomer composites, to aspects of their thermal stability, flammability, and ozone degradation.

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Hydrogenation with Low-Cost Transition Metals

Edited by Jacinto Sa, Uppsala University, Sweden, and Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw and Anna Srebrowata, Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw

This book describes recent developments in the preparation of catalysts and their catalytic abilities in chemoselective hydrogenation for the production of fine chemicals and pharmaceutical compounds. Emphasizing the use of low-cost metals (Cu, Ni, Fe, and Ag) that are often present in the form of nanoparticles, the text provides valuable reaction mechanism schemes, engineering solutions, and perspective for the field.

CRC Press
Market: Materials Science
December 2015: 6-1/8 x 9-1/4: 203pp
Hb: 978-1-498-73053-2: $169.95
ebook: 978-1-498-73054-9
* For full contents and more information, visit: www.crcpress.com/9781498730532

Industrial Chemistry of Oxides for Emerging Applications

Lech Pawlowski, Ecole Nationale Supérieure de Chimie de Lille, Villeneuve d’Ascq, France

Industrial chemistry of important oxides has developed very rapidly, and the new technologies are being introduced in all stages of oxide transformation, such as the metallurgy of ores (which includes aspects of recycling and environmentally friendly practices); the synthesis of fine powders (allowing the production of very pure and fine oxide powders useful for nano-structured materials with improved properties); and the functionalization of products in 2-D and 3-D, including the processing of film and coating deposition and methods of sintering.

EPFL Press
Market: Materials Chemistry
March 2016: 6 x 9: 250pp
Hb: 978-1-466-58712-0: $119.95
ebook: 978-1-466-58713-7
* For full contents and more information, visit: www.crcpress.com/9781466587120

Companion Website
Inorganic-Whisker-Reinforced Polymer Composites
Synthesis, Properties and Applications
QiJu Sun and Wu Li, Qinghai Institute of Salt Lakes, Xining, P.R. of China
This book gives a comprehensive presentation of inorganic microcrystalline fibers, or whiskers. It covers whisker synthesis, surface modification, applications for reinforcing polymer-matrix composites, and analysis of resulting filled polymer composites. It focuses on calcium carbonate whiskers as a primary case study, introducing surface treatment methods for calcium carbonate whiskers and factors that influence them. It also considers possible challenges and solutions in synthesis and applications of polymers filled with inorganic whiskers and summarizes the latest practices and research progress in China and elsewhere.

TEXTBOOK
Kinetics in Materials Science and Engineering
Dennis W. Readey, Colorado School of Mines, Golden, USA
This book introduces the kinetics of materials, emphasizing reactions and phase transformations of importance in industrial applications and reflecting the full breadth of the field, from metals, ceramics, and electronic materials to polymers, biomaterials, and composites. The author explicitly avoids “black box” equations, providing derivations with clear explanations. The contents begin with a discussion of classical chemical kinetics, followed by surface energy and its effects, nucleation, and growth phase transitions. Coverage concludes with an exploration of diffusion in ideal systems, non-ideal diffusion, and more information, visit: www.crcpress.com/9781498700672

Mechanical and Physico-Chemical Characteristics of Modified Materials
Performance Evaluation and Selection
Edited by Seghir Maamir, University of Boumerdes, Algeria and A. K. Haghi, University of Ottawa, Canada
Understanding chemical and solid materials and their properties and behavior is fundamental to chemical and engineering design. With some of the world’s leading experts describing their most recent research, this book describes the procedures for material selection and design to ensure that the most suitable materials for a given application are identified from the full range of materials, chemicals, and section shapes available. Several case studies have been developed to further illustrate procedures and to add to the practical implementation of the text.

Materials Chemistry
A Multidisciplinary Approach to Innovative Methods
Edited by Klaus Friedrich, Gennady E. Zaikov, Kazan National Research Technological University, Russia and A. K. Haghi, University of Ottawa, Canada
This book focuses on important aspects of materials chemistry by providing an overview of the theoretical aspects of materials chemistry, by describing the characterization and analysis methods for materials, and by explaining physical transport mechanisms in various materials. This book is designed to provide important information for scientists and engineers on experimental research in materials chemistry using modern methods. The methods and instrumentation described represent modern analytical techniques useful to researchers, product development specialists, and quality control experts in polymer synthesis and manufacturing.

Multifunctional Materials and Modeling
Edited by M. A. Korepanov, Udmurt State University, Izhevsk, Russia, A. M. Lipanov, M. I. Kalashnikov Izhevsk State Technical University, Izhevsk, Russia, Gennady E. Zaikov, Kazan National Research Technological University, Russia and A. K. Haghi, University of Ottawa, Canada
Series: Innovations in Chemical Physics and Mesoscopy
This important book presents a valuable collection of new research and new trends in nanomaterials, mesoscopy, quantum chemistry, and chemical physics processes. It highlights the development of nanomaterials as well as investigation of combustion and explosion processes. It highlights new trends in processes and methods of the treatment of polymeric materials and also covers material modification, including super small quantities of metal/carbon nanocomposites as well as new information on the modeling of processes and quantum calculations. Nonlinear kinetic appearances and their applications are highlighted as well.

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Multinary Alloys Based on II-VI Semiconductors

Vasyi Tomashyk, V.Ye. Lashkaryov Institute for Semiconductor Physics of the National Academy of Sciences of Ukraine, Kiev

This book provides up-to-date experimental and theoretical information on phase relations based on II-VI semiconductor systems with five or more components. It delves into practical applications of nanocrystalline silicon and explores the methods used for studying and controlling the structure and properties of nanocrystalline semiconductors. The book covers material synthesis, processing, structure characterization, and properties, earning it an ideal resource for researchers from industry, academia, government, and private research institutions.

CRC Press
Market: Materials Science
September 2015: 6-1/8 x 9-1/4: 670pp
Hb: 978-1-482-23651-4: $249.95
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* For full contents and more information, visit: www.crcpress.com/9781482236514

Nanocomposite Materials
Synthesis, Properties and Applications

Edited by Jyotishkumar Parameswaranpillai, Nishar Hameed, Deakin University, Geelong, Australia, Thomas Kurian, and Pingfeng Yu, Fudan University, Shanghai, China

This book provides a comprehensive collection of the latest information on nanomaterials and nanocomposites. It covers material synthesis, processing, structure characterization, properties, and applications. It presents a coherent treatment of how composite properties depend on nanostructure, and covers cutting-edge topics like bionanocomposites for sustainable development. This book summarizes many developments in the field making it an ideal resource for researchers from industry, academia, government, and private research institutions.

CRC Press
July 2016: 7 x 10: 480pp
Hb: 978-1-482-25807-3: $239.95
ebook: 978-1-482-25818-9

* For full contents and more information, visit: www.crcpress.com/9781482258073

Nanosilicon
Properties, Synthesis, Applications, Methods of Analysis and Control

Anatoly A. Ischenko, Professor and Head of the Department of Analytical Chemistry, Moscow Lomonosov State University of Fine Chemical Technologies, Gennady V. Fetisov, Professor of Chemistry, Moscow Lomonosov State University, and Leonid A. Aslalnov, Professor and Head of the Laboratory of Structural Chemistry, Moscow Lomonosov State University

This book focuses on methods for producing nanosilicon, its electronic and optical properties, research methods to characterize its spectral and structural properties, and its possible applications. The book covers the basic properties of semiconductors, gives special attention to the photoluminescence of silicon nanoparticles, and describes methods used for studying and controlling the structure and properties of nanocrystalline silicon. It also explores the practical applications of nanocrystalline silicon, including the use of nanoparticles in sunscreens.

CRC Press
Hb: 978-1-466-59422-7: $199.95
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* For full contents and more information, visit: www.crcpress.com/9781466594227

Nanostructured Ceramic Oxides for Supercapacitor Applications

Edited by Avinash Balakrishnan and K.R.V. Subramanian

When developing a high performance supercapacitor, it is generally desirable to design the geometry and morphology of supercapacitor electrodes with fully utilized surface area and well-defined pore structures, which can lead to faster charge and discharge movement contacting the electroactive materials and promote faradic redox reactions. This book proposes preparation methodology of various one-dimensional metal oxide nanomaterials used as electrode overlays and methods by which the conductivity of the stoichiometric metal oxide can be increased.

CRC Press
February 2014: 6-1/8 x 9-1/4: 209pp
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ebook: 978-1-466-57619-9

* For full contents and more information, visit: www.crcpress.com/9781466576192

Natural Mineral Nanotubes
Properties and Applications

Edited by Pooria Pasbakhsh, Monash University, Selangor, Malaysia, and G. Jock Churchman, University of Adelaide, Australia

The book provides a wide introduction on history, mineralogy, geology, and the characteristics and application of different natural nanotubes. It is the first comprehensive book to discuss natural nanotubes, particularly halloysite nanotubes. The book will be useful mainly for postgraduate students and researchers working on the application of natural nanotubes. It will also be useful for those companies or researchers that focus on the design of materials and composites for sustainability.

Apple Academic Press
Market: General Chemistry
February 2015: 6-1/8 x 9-1/4: 498pp
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ebook: 978-1-482-26225-4

* For full contents and more information, visit: www.crcpress.com/9781771880565

A Novel Green Treatment for Textiles
Plasma Treatment as a Sustainable Technology

Chi-wai Kan, The Hong Kong Polytechnic University

Focusing on green chemistry and sustainability, this book discusses how plasma treatment has been used to modify textile properties. The book highlights the benefits of generating plasma and the reaction mechanisms between the surface of a textile and plasma species. The text addresses factors such as the nature of plasma gas, flow rate, system pressure, and discharge power that affect the final results of plasma treatments. An opening chapter presents current "brown" methods of treating textiles, exploring the environmental, economic, and social costs of these methods. Throughout the book, the author presents the twelve principles of green chemistry and how they can be applied to the textile industry.

CRC Press
Market: Materials Chemistry
September 2014: 6-1/8 x 9-1/4: 311pp
Hb: 978-1-439-83944-7: $187.95
ebook: 978-1-439-83945-4

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Porous Silicon: From Formation to Application: Formulation, Properties, and Applications, Volume One

Edited by Ghenadii Korotcenkov

Filling a gap in the literature of the field, this handbook is an up-to-date reference on the formulation, processing, and properties of porous silicon. It covers the qualities of porous silicon, including its electrical, luminescent, optical, and thermal properties, and includes extensive references to recently published literature in the field. It also analyzes present and potential applications of porous silicon in various technologies and fields, including optoelectronics, microelectronics, photonics, medicine, chemistry, biosensing, and energy.

CRC Press

Market: Material Science

November 2015: 8-1/2 x 11: 423pp

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Porous Silicon: From Formation to Application: Optoelectronics, Microelectronics, and Energy Technology Applications, Volume Three

Edited by Ghenadii Korotcenkov

Porous silicon is rapidly attracting increasing interest in various fields, including optoelectronics, microelectronics, photonics, medicine, chemical and biosensing. This nanostructured and biodegradable material has a range of properties, making it ideal for indicated applications. This volume highlights porous silicon applications in optoelectronics, microelectronics, photonics, and micromachining. Features of fabrication and performances of photonic crystals, fuel cells, elements of integral optoelectronics, solar cells, LED batteries, cold cathodes, hydrogen generation and storage, PSI-based composites and so on are being analyzed in this part.

CRC Press

January 2016: 8-1/2 x 11: 430pp

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* For full contents and more information, visit: www.crcpress.com/9781482264586

Physics and Chemistry of Classical Materials

Applied Research and Concepts

Edited by Ewa Klodzinska, Institute for Engineering of Polymer Materials and Dyes, Torun, Poland

This book provides a comprehensive presentation of the concepts, properties, and applications of classical materials. It also provides the first unified treatment for the broad subject of classical materials. The authors use a fundamental approach to define the structure and properties of a wide range of solids on the basis of the local chemical bonding and atomic order present in the material. Emphasizing the physical and chemical origins of different material properties, this important volume focuses on the most technologically important materials being utilized and developed by scientists and engineers.

Apple Academic Press

Market: Materials Science

November 2014: 6 x 9: 310pp

Hb: 978-1-771-88045-9: $139.95

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Porous Silicon: From Formation to Application: Biomedical and Sensor Applications, Volume Two

Edited by Ghenadii Korotcenkov

This second volume of a three-book series discusses applications of porous silicon in bioengineering and in various sensors, including gas sensors, biosensors, pressure sensors, electrochemical sensors, mechanical sensors, and optical sensors. It also reviews the fabrication, parameters, and applications of devices that use porous silicon. It guides readers through practical implementations that span environmental control, chemistry, spectroscopy, gas chromatography, microelectronics, micromachining, microfluidics, the car industry, medicine, and biotechnology. It is an indispensable reference for those involved in research, development, and applications of porous silicon.

CRC Press

January 2016: 8-1/2 x 11: 410pp

Hb: 978-1-482-26452-4: $139.95

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* For full contents and more information, visit: www.crcpress.com/9781482264524

Oxide Nanostructures

Growth, Microstructures, and Properties

Edited by Avanish Kumar Srivastava, CSIR - National Physical Laboratory, New Delhi, India

From green power issues like photovoltaic cells to rechargeable batteries, from drug delivery agents to antimicrobial and cosmetic products, from semiconductor materials to semiconductors and insulators, metal oxides have been omnipresent in terms of both commercial prerogatives and research highlights. This book is solely devoted towards this special section of nanomaterials with an aim to partially access the science pertaining to the oxides of metals.

Pan Stanford

Market: Materials Chemistry

April 2016: 6 x 9: 424pp

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A Practical Guide to Microstructural Analysis of Cementitious Materials

Edited by Karen Scrivener, Ecole Polytechnique Fédérale de Lausanne, Switzerland, Ruben Snellings, VITO, Mol, Belgium and Barbara Lothenbach, EMPA, Dübendorf, Switzerland

This edited volume provides the cement science community with a state-of-the-art overview of analytical techniques used in cement chemistry to study the hydration and microstructure of cements. Each chapter focuses on a specific technique, not only describing the basic principles behind the technique, but also providing essential, practical details on its application to the study of cement hydration. Each chapter sets out present best practice, and draws attention to the limitations and potential experimental pitfalls of the technique.

Companion Website

Research Methodology on Interfaces of Physics and Chemistry in Micro and Nanoscale Materials

Edited by Nekane Guaratzena, Institute of Polymer Science and Technology (ICTP), Madrid, Spain

This book covers a selection of recent research studies and new developments in physics and chemistry in micro and nanoscale materials. It brings together research contributions from eminent experts in the field from both academic and industry, providing the latest developments in advanced materials chemical domains.

Companion Website

Quaternary Alloys Based on II - VI Semiconductors

Vasyl Tomashyk, V.I.e. Lashkaryov Institute for Semiconductor Physics of the National Academy of Sciences of Ukraine, Kiev

This book collects data pertaining to diagrams of quaternary systems based on II–VI semiconductor compounds. It illustrates up-to-date experimental and theoretical information about phase relations based on II–VI semiconductor systems with four components. It critically evaluates many industrially significant systems presented in two-dimensional sections for the condensed phases. Each quaternary database description includes the diagram type, possible phase transformations and physical–chemical interactions of the components, thermodynamic characteristics, and methods for equilibrium investigation and sample preparation.

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Safety of Nanomaterials along Their Lifecycle

Release, Exposure, and Human Hazards

Edited by Wendel Wohlleben, Thomas A.J. Kuhlbusch, Jürgen Schnekenburger and Claus-Michael Lehr

The incorporation of nanomaterials into products can improve performance, efficiency and durability both in industrial applications and in consumer articles. This book presents the state of the art in nanosafety research from a lifecycle perspective. It is divided into four parts: characterization, hazard, release & exposure, and real-life case studies. To improve coherence throughout the book, various chapters review the same suite of well-characterized, judiciously chosen, and identical industrial nanomaterials.

For full contents and more information, visit: www.crcpress.com/9781466567863

Companion Website

Rare Earth Materials

Properties and Applications

A.R. Jha, Private Consultant, Cerritos, California, USA

Bringing together information previously available only from disparate journal articles and databases, this book describes the unique characteristics and applications of 17 rare earth materials (REMs). It defines their chemical, electrical, thermal, and optical characteristics. Maintaining a focus on physical and chemical properties, the book addresses the history and critical issues pertaining to mining and processing of rare earth materials. Coverage includes extraction, recycling, refinement, visual inspection, identification of spectroscopic parameters, quality control, element separation, pricing control, and environmental & geo-political considerations.

For full contents and more information, visit: www.crcpress.com/9781466564022

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Structural Characterization Techniques

Advances and Applications in Clean Energy

Edited by Lorenzo Malavasi, University of Pavia, Italy

The book presents state-of-the-art contributions related to advanced structural characterization techniques in the field of clean energy materials with particular emphasis on solid oxide fuel cells and hydrogen storage materials. It describes several diffraction and spectroscopic techniques for investigation of both the average and local structures with several examples related to the most recent clean energy materials. It is the first authoritative collection of contributions showing the importance of applying the most advanced structural techniques to shed light on the properties and mechanism of materials currently investigated for the use in alternative energy devices.

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Superfluid States of Matter

Boris V. Svistunov, University of Massachusetts, MA, USA, Egor S. Babaev, Dept of Theoretical Physics, KTH Royal Institute of Technology, Stockholm, Sweden and Nikolay V. Prokof’ev

Discussing changes over the last two decades, this book represents an up-to-date treatment of superfluidity. It covers new superfluid materials such as high-temperature and multicomponent superconductors, ultra-cold atomic bosons and fermions, and helium superfluids. It begins by explaining the general physical principles behind the superfluid phenomenon as a framework for the discussion of realistic systems. The authors present superfluidity as a phenomenon of emergent topological order and show that all superproperties of the system are explained by the appearance of a new constant of motion.

CRC Press
Market: Physics
April 2015: 7 x 10 581pp
Hb: 978-1-466-59502-6: $187.95
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Synergy in Supramolecular Chemistry

Edited by Tatsuya Nabeshima

Cooperative and synergistic chemical events have attracted significant attention from many researchers engaged in organic chemistry, inorganic chemistry, biological chemistry, polymer chemistry, medicinal chemistry, and other related materials sciences. Synergistic supramolecular systems could be developed to amplify the functions and integration of molecular devices in ways that cannot be achieved by conventional single molecules. This book introduces basic concepts and examples of supramolecular chemistry in terms of cooperation and synergy, and it surveys recent progress in this field.

CRC Press
Market: Chemistry
December 2014: 6-1/8 x 9-1/4: 394pp
Hb: 978-1-466-59502-6: $187.95
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Upconverting Nanomaterials

Perspectives, Synthesis, and Applications

Edited by Claudia Altavilla, IMCB-CNR Institute for Composites and Biomedical Materials, Italy

Series: Nanomaterials and their Applications

Rare earth (RE)-doped upconversion of nano-phosphors can efficiently convert near-infrared light into visible or ultraviolet luminescence using a stepwise multiphoton process in a system of real energy levels of Ln(III) ions which are embedded in an appropriate host lattice. This book provides a fundamental understanding of the mechanics and materials, with particular attention to the design, synthesis and functionalization of upconverting nanoparticles and their applications in different fields of research in one self-contained textbook.

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Market: Nanoscience & Technology
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Myeongkyu Lee, Yonsei University, Korea

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Chemometrics Applications and Research

QSAR in Medicinal Chemistry

Edited by Andrew G. Mercader, Research Institute of Theoretical and Applied Physical-Chemistry (INIFTA), Argentina, Pablo R. Duchowicz, Theoretical and Applied Research Institute at La Plata National University (INIFTA), Argentina and P. M. Sivakumar, Foreign Postdoctoral Researcher (FPR), RIKEN, Wako Campus, Japan

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Margaret Ashton-Key, University of Southampton, Southampton, UK, Penny Wright, Cambridge University Hospitals, Cambridge, UK and Dennis Wright, University of Southampton, Southampton, UK

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May 2016: 8-1/2 x 11: 280pp
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Dimethyl Sulfoxide (DMSO) in Trauma and Disease

Stanley W. Jacob, Gerlinger Professor, Department of Surgery, Oregon Health Sciences University, Portland, Oregon and Jack C. de la Torre, Professor of Psychology (Adjunct), University of Texas, Austin

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CRC Press
Market: Chemistry
April 2015: 6-1/8 x 9-1/4: 270pp
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Charles Dickson, Hickory, North Carolina, USA

Written by an author with more than 40 years of teaching experience in the field, this book responds to a critical classroom need for material on directed laboratory investigations in biological and pharmaceutical chemistry. This manual supplies 75 experiments in 22 major subject areas. This includes biochemical groups, for example, carbohydrates, lipids, proteins, enzymes, and nucleic acids. Investigations also cover numerous botanical classes important to pharmacy, including balsams, glycosides, alkaloids, and tannins. Finally, there are experiments dealing with major drug classifications, such as analgesics, antibiotics, psychotropics, sulfonamides, and antacids.

CRC Press
Market: Pharmaceutical Science & Regulation
February 2014: 6-1/8 x 9-1/4: 160pp
Pb: 978-1-466-59483-8: $139.95
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Heterogeneous Catalysis

A Versatile Tool for the Synthesis of Bioactive Heterocycles

K.L. Ameta, Ph.D., Mody University of Science and Technology, Rajastan, India and Andrea Penoni, Università degli Studi dell’Insubria, Como, Italy

For more than a century, bioactive heterocycles have formed one of the largest areas of research in organic chemistry. They are important from a biological and industrial point of view as well as to the understanding of life processes and efforts to improve the quality of life. This book highlights the recent methodologies used in the synthesis of such bioactive systems and focuses on the role of heterogeneous catalysis in the design and synthesis of various biologically active heterocyclic compounds of pharmacological interest. It also examines anticancer, antifungal, antibacterial, anti-HIV, anti-inflammatory, antioxidant, and many more biological activities of heterocyclic compounds.

CRC Press
Market: Chemistry
September 2014: 6-1/8 x 9-1/4: 355pp
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Kratom and Other Mitragynines

The Chemistry and Pharmacology of Opioids from a Non-Opium Source

Edited by Robert B. Raffa, Temple University School of Pharmacy, Philadelphia, Pennsylvania, USA

This book presents an introduction to the chemical and biological properties of alkaloids isolated from M. speciosa as well as their synthetic analogs. It covers various topics from phytochemistry, medicinal chemistry, and pharmacology perspectives. Current research, analgesic effects, and addiction potential are also discussed. As the first extensive text on the basic science and clinical use of Kratom, the book provides readers with a concise yet comprehensive introduction to the world of Kratom’s “other opioid.”

CRC Press
Market: Pharmaceutical Science
October 2014: 6 x 9: 360pp
Pb: 978-1-482-22518-1: $139.95
ebook: 978-1-482-22519-8: $139.95
* For full contents and more information, visit: www.crcpress.com/9781482225181
Natural Products Chemistry
Sources, Separations and Structures

Raymond Cooper, The Hong Kong Polytechnic University and George Nicola, UCSD, San Diego, California, USA
Compounds isolated from nature may possess biological profiles and pharmaceutical potential far greater than anything made by man. However, they are notoriously cumbersome to isolate and challenging to synthesize, and the path of natural products to viable drugs is an arduous journey. This book presents a practical guide to gathering, isolating, and discovering new pharmaceuticals from nature. It emphasizes the challenges and advantages of products acquired from nature over traditional compounds such as those arising from combinatorial chemistry.

2nd Edition
Phage Display In Biotechnology and Drug Discovery, Second Edition

Edited by Sachdev S. Sidhu, University of Toronto, Ontario, Canada and Clarence Ronald Geyer, University of Saskatchewan, Saskatoon, Canada
The book provides a comprehensive view of the impact and promise of phage display in drug discovery and biotechnology. Building on the success of its previous edition, the book discusses current theories, principles, and methods in the field and demonstrates applications for peptide phage display, protein phage display, and the development of novel antibodies. Also covered are applications of phage display for protein characterization and drug discovery. The book provides readers with an overview of the amazing breadth of the impact that phage display technology has had on the study of proteins in general as well as the development of proteins.

CRC Press
Market: Natural Products Chemistry
July 2014: 6-1/8 x 9-1/4: 206pp
Pb: 978-1-466-56761-0: $99.95
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Rational Basis for Clinical Translation in Stroke Therapy

Edited by Giuseppe Micelli, Director of the Department of Emergency Neurology, IRCCS, Pavia, Italy and Diana Amantea, Department of Pharmacobiology, University of Calabria, Rende, Italy
During the last decades, numerous promising drugs that provided neuroprotection in the laboratory setting failed to translate into the clinic because of their toxicity or lack of efficacy. However, these apparently disappointing results have provided valuable lessons to improve research strategies and enhance their clinical translation. In this scenario, by bringing together the experience developed by stroke researchers and clinicians, this book provides a precious tool for improving stroke patients’ treatment and management.

CRC Press
Market: Biomedical Science
August 2014: 6-1/8 x 9-1/4: 538pp
Hb: 978-1-466-59497-5: $187.95
ebook: 978-1-466-59498-2
* For full contents and more information, visit: www.crcpress.com/9781466594975

Radiosensitizers and Radiochemotherapy in the Treatment of Cancer

Shirley Lehnert, McGill University, Montreal, Quebec, Canada
This book gathers into a single volume the most up-to-date information on radiosensitizing drugs, the mechanisms of radiosensitization, and the clinical applications of this treatment modality. Written for radiation oncologists, medical oncologists, graduate students and residents in various branches of oncology, the text details a range of agents and treatment pathways. Intuitively organized by topic and application, it includes the latest clinical trials, extensive illustrations, and a wealth of references.

CRC Press
Market: Physics
December 2014: 6-1/8 x 9-1/4: 548pp
Hb: 978-1-439-82903-5: $167.95
ebook: 978-1-439-82902-8
* For full contents and more information, visit: www.crcpress.com/9781439829028
Active Phytochemicals from Chinese Herbal Medicines
Anti-Cancer Activities and Mechanisms

Wing Shing Ho
This book analyzes the pharmacology of active phytochemicals derived from traditional Chinese herbs used for the management of cancer and other diseases. The book bridges the gap between modern medicine and herbal medicines and provides useful information to medical doctors and scientists on how integrated medicines will work better towards cancer therapy.

CRC Press
Market: Biomedical Science
September 2015: 6-1/8 x 9-1/4: 178pp
Hb: 978-1-482-21986-9 $139.95
ebook: 978-1-482-21987-6
* For full contents and more information, visit: www.crcpress.com/9781482219869

Ayurvedic Pharmacopoeial Plant Drugs
Expanded Therapeutics

C. P. Khare, Society for New Age Herbas, New Delhi, India
This book is the first review of all therapeutic sections of 456 plant drugs in the Ayurvedic Pharmacopoeia of India. It covers the various plant chemicals, therapeutic uses, and doses of Ayurvedic plant drugs on the basis of contemporary scientific literature. Provides evidence-based information on the various aspects of the medicinal plants, such as their botanic identifications, phytochemical characteristics, and their pharmacological properties.

CRC Press
Market: Alternative & Complementary Medicine
November 2015: 7 x 10: 627pp
Hb: 978-1-466-58999-5 $169.95
ebook: 978-1-466-59000-7
* For full contents and more information, visit: www.crcpress.com/9781466589995

Antimicrobials
Synthetic and Natural Compounds

Edited by Dharumadurai Dhanasekaran, Bharathidasan University, Tiruchirapalli, Tamil Nadu, India, Nooruddin Thajuddin, Bharathidasan University, Tiruchirapalli, Tamil Nadu, and A. Panneerselvam, A.V.V.M. Sri Pushpam college, Poondi, Tamil Nadu, India
This book explores an important topic: finding and applying alternative means of pathogenic control and treatment via natural sources in the face of increasing numbers of drug-resistant bacteria. It summarizes latest research regarding natural antimicrobial compounds derived from various plant, sponge, and other microbial sources. With collected contributions from international subject experts, it focuses primarily on natural products as a source of bioactive compounds that may be active against multidrug-resistant pathogens, providing an alternative to established antibiotics in controlling infectious diseases.

CRC Press
Market: Life Science
December 2015: 7 x 10: 524pp
Hb: 978-1-498-71562-1 $159.95
ebook: 978-1-498-71563-8
* For full contents and more information, visit: www.crcpress.com/9781498715621

Ayurvedic Pharmacopoeial Plant Drugs
Expanded Therapeutics

C. P. Khare, Society for New Age Herbas, New Delhi, India
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CRC Press
Market: Alternative & Complementary Medicine
November 2015: 7 x 10: 627pp
Hb: 978-1-466-58999-5 $169.95
ebook: 978-1-466-59000-7
* For full contents and more information, visit: www.crcpress.com/9781466589995

Aromatherapy
Basic Mechanisms and Evidence Based Clinical Use

Edited by Giacinto Bagetta, Marco Cosentino and Tsukasa Sakurada
Series: Clinical Pharmacognosy Series
This reference provides an up-to-date compilation of background scientific information that advocates the application of currently developed clinical studies of the effects of aromatherapy to the treatment of human diseases such as mild, stress-induced mood disorders, infectious diseases, and age-related disturbances. It presents a rational basis for clinical translations of aromatherapy for treating human diseases in need of safer or more effective therapies and discusses the need for further clinical development in areas where therapy is lacking.

CRC Press
Market: Chemistry
December 2015: 6-1/8 x 9-1/4: 461pp
Hb: 978-1-466-59842-3 $169.95
ebook: 978-1-466-59843-0
* For full contents and more information, visit: www.crcpress.com/9781466598430

Botanical Miracles
Chemistry of Plants That Changed the World

Raymond Cooper, The Hong Kong Polytechnic University
Jeffrey John Deakin, FRSC
As the shortcomings of purely synthetic approaches to biochemical discovery and development are becoming more apparent, interest persists in the intriguing chemistry of natural products as sources of inspiration for unusual new compounds. Uniquely, this book relates the application of extracts from plants to their influence upon human health, and, ultimately, the development of modern marvels in medicinal compounds, nutrition products, beverages, perfumes, cosmetics, and organic pigments. Moreover, this up-to-date scientific work provides a fascinating point of entry to the chemistry of important natural products explored through the key functional groups of organic chemistry.

CRC Press
Market: Chemistry
February 2016: 6-1/8 x 9-1/4: 252pp
Hb: 978-1-498-70428-1 $119.95
ebook: 978-1-498-70430-4
* For full contents and more information, visit: www.crcpress.com/9781498704281

Botanicals
Methods and Techniques for Quality & Authenticity

Edited by Kurt Reynertson, Johnson & Johnson Consumer Products, Skillman, New Jersey, USA
Khalid Mahmood, Society for New Age Herbas, New Delhi, India
This book relates the application of extracts from plants to their influence upon human health, and, ultimately, the development of modern marvels in medicinal compounds, nutrition products, beverages, perfumes, cosmetics, and organic pigments. Moreover, this up-to-date scientific work provides a fascinating point of entry to the chemistry of important natural products explored through the key functional groups of organic chemistry.

CRC Press
Market: Chemistry
January 2015: 6-1/8 x 9-1/4: 332pp
Hb: 978-1-466-59841-6 $139.95
ebook: 978-1-466-59842-3
* For full contents and more information, visit: www.crcpress.com/9781466598416
Chamomile
Medicinal, Biochemical, and Agricultural Aspects

Moumita Das, Indira Gandhi National Open University, New Delhi, India
Series: Traditional Herbal Medicines for Modern Times
This book is a ready reference on German Chamomile (henceforth called Chamomile), a medicinal and aromatic plant of European origin, which is extensively used for its medicinal properties worldwide. The flowers of chamomile contain valuable blue coloured oil which is used in medicines. In addition, it is used in shampoos, soaps and cosmetics. The main themes of the book are taxonomy, pharmacology, genetics, biochemistry, breeding and cultivation. It will include the latest information on the medicinal, aromatic and cultivation aspects of Chamomile.

CRC Press
Market: Life Science
July 2014: 6-1/8 x 9-1/4: 316pp
Hb: 978-1-466-57759-6: $199.95
* For full contents and more information, visit: www.crcpress.com/9781466577596

Chemical Ecology
The Ecological Impacts of Marine Natural Products
Edited by Melany P. Puglisi-Weening, Ph.D., Mikel A. Becerro and Valerie Paul
During the past 20 years marine chemical ecology emerged as a respected field of study providing a better understanding of the role natural products play in organisms and their environments. Ample data in this book advocates the conservation of marine environments for future drug discovery efforts while sustaining the health of marine environments. Marine chemical ecology has expanded to include research in the areas of predator-prey interactions, marine microbial chemical ecology, and seasonal and geographical distribution of marine natural products.

CRC Press
Market: Environmental Science
July 2016: 6-1/8 x 9-1/4: 400pp
Hb: 978-1-482-24488-0: $199.95
* For full contents and more information, visit: www.crcpress.com/9781482244880

Dictionary of Flavonoids with CD-ROM

John Buckingham, Consultant Editor, Dictionary of Natural Products, London, UK and V. Ranjit N. Munasinghe, Greenford, UK
Research into flavonoids, a large and important group of natural products, and their effects on human health continues unabated. This single volume lists all known flavonoids (circa 13,000), detailing chemical structures, physical properties, biological source and a concise bibliography. Derived from the well-respected Dictionary of Natural Products, it is presented in a compact dictionary format, and is an invaluable reference source for all those working in this area. The book is accompanied by a CD-ROM fully searchable by chemical structure as well as by physical properties and chemical names.

CRC Press
Market: Plant Science
March 2015: 8-1/2 x 11: 1199pp
Hb: 978-1-466-55434-6: $759.00
ebook: 978-1-482-28250-4
* For full contents and more information, visit: www.crcpress.com/9781466554344

Green Biorenewable Biocomposites
From Knowledge to Industrial Applications
Edited by Vijay Kumar Thakur, Washington State University, Pullman, USA and Michael R. Kessler, Washington State University, Pullman, USA
Keeping in mind the advantages of bio-based materials, this book focuses on the potential efficacy of different biocomposites procured from diverse natural resources and the preparation and processing of the biocomposites to be used for a variety of applications. Each chapter gives an overview on a particular biocomposite material and its processing and successful utilization for selected applications.

Apple Academic Press
Market: Materials Science
January 2015: 6-1/8 x 9-1/4: 568pp
Hb: 978-1-77188-032-9: $149.95
ebook: 978-1-482-25267-5
* For full contents and more information, visit: www.crcpress.com/9781771880329

Essential Oils
Contact Allergy and Chemical Composition
Anton C. de Groot and Erich Schmidt
This book provides a full review of contact allergy to essential oils, along with detailed analyses of their chemical composition. The authors include an alphabetical list of all ingredients found in the essential oils discussed, specifying in which oils they may be present (in tabular format). The book also provides a list of all currently known contact allergens in essential oils, with chemical structures, synonyms, and specification in which oils and at which maximum concentrations they can be present.

CRC Press
Market: Chemistry
April 2016: 992pp
Hb: 978-1-482-24640-7: $199.95
* For full contents and more information, visit: www.crcpress.com/9781482246407

Handbook of African Medicinal Plants, Second Edition

Maurice M. Iwu, Bioresources Development Group, Abuja, Nigeria, and Bioresources Development and Conservation Program, Maryland, USA
A comprehensive review of over 2,000 species of plants employed in indigenous African medicine, this book provides a concise description of the materia medica of an enormous and extensively varied continent. It includes a detailed pharmacognostical profile of 170 of the major herbs, including the common name, synonyms, African names, habitat and distribution, medicinal uses, chemical constituents, and published pharmacologic activity. The profiles are presented in both alphabetic order and according to family. The book also provides an introduction to African traditional medicine.

CRC Press
Market: Complementary and Alternative Medicine
February 2014: 7 x 10: 506pp
Hb: 978-1-466-57197-6: $149.95
ebook: 978-1-466-57198-3
* For full contents and more information, visit: www.crcpress.com/9781466571976

Browse and order online: www.crcpress.com
Medicinal Plants and Malaria
Applications, Trends, and Prospects

Woon-Chien Teng, National University of Singapore, Ho Han Kiat, Rosarin Suwanarusk and Hwee-Ling Koh
Series: Traditional Herbal Medicines for Modern Times

Malaria is a potentially life-threatening disease that affects millions worldwide with a huge global disease burden, especially in Africa. More recently, the emergence and spread of multi-drug resistance in parts of Southeast Asia prompts the urgent need for novel and effective therapy against the disease. This work aims to give an up-to-date and comprehensive review of botanical medicine used for malaria to track the progress of research. It serves as a guide and starting platform for research, as well as stimulating general interest and awareness of the potential of medicinal plants in the prophylaxis and treatment of malaria.

CRC Press
Market: Life Science
January 2016: 6-1/8 x 9-1/4: 410pp
Hb: 978-1-498-74467-6: $89.95
eBook: 978-1-498-74469-0

* For full contents and more information, visit: www.crcpress.com/9781498744676

Natural Products Interactions on Genomes

Edited by Siva Somasundaram
Series: Clinical Pharmacognosy Series

This book focuses on recent developments in understanding human genome interactions with various natural products. It includes studies on the interaction of natural products with genes involved in diseases such as breast and prostate cancer, as well as the effects of natural products on microbial growth. It also presents a unique real-time approach by providing hyperlinks to websites with updated literature on natural products and interactions with genes involved in metabolic pathways.

CRC Press
Market: Natural Products Chemistry
October 2015: 6-1/8 x 9-1/4: 216pp
Hb: 978-1-439-87361-8: $129.95
eBook: 978-1-439-88841-4

* For full contents and more information, visit: www.crcpress.com/9781439873618

Rhodiola rosea
Edited by Alain Cuverrier, Montreal Botanical Garden, Quebec, Canada and Kwesi Ampomg-Nyarko, Alberta Agriculture and Rural Development, Canada
Series: Traditional Herbal Medicines for Modern Times

Recent interest in the species *Rhodiola rosea* (rose-root) in the West arose from the use of the rhizome as an adaptogen for the treatment of stress, but in the last few years, studies have confirmed other valuable medicinal properties. Written by well-known researchers, this volume examines important aspects of this increasingly important medicinal plant, including its botany, taxonomy, ethnobotany, classification, chemistry, phytochemistry, agronomy, and biotechnology. The contributors also describe experimentation with *R. rosea* in clinical practice for treating depression and anxiety disorders, to improve systemic functions, to augment cancer treatment, and in aerospace medicine.

CRC Press
Market: Biological Science
December 2015: 6-1/8 x 9-1/4: 304pp
Hb: 978-1-439-88840-7: $129.95
eBook: 978-1-439-88841-4

* For full contents and more information, visit: www.crcpress.com/9781439888407

Therapeutic Medicinal Plants
From Lab to the Market

Edited by Marta C.T. Duarte and Mahendra Rai, SGB Amravati University, Maharashtra, India

Medicinal plants have been used in the prevention, diagnosis, and elimination of diseases based on the practical experience of thousands of years. There is a pressing need to initiate and transform laboratory research into fruitful formulations leading to the development of newer products for the cure of diseases such as AIDS, cancer, and hepatitis, as well as coping with multi-drug resistance problems. This book presents recent developments in the research on medicinal plants for different diseases, formulation of products, and market strategy.

CRC Press
Market: Life Science
November 2015: 7 x 10: 421pp
Hb: 978-1-482-25403-7: $139.95
eBook: 978-1-482-25404-4

* For full contents and more information, visit: www.crcpress.com/9781482254037
Market: Chemistry

Carbohydrate Chemistry
Proven Synthetic Methods, Volume 2
Edited by Gijsbert van der Marel and Jeroen Codee. Leiden University, The Netherlands
Series: Carbohydrate Chemistry
This second volume in a series offers a collection of synthetic procedures valuable to the practice of synthetic carbohydrate chemistry, both for specific synthetic transformations and the preparation of common synthetic intermediates. Each chapter presents in-depth experimental descriptions for the reported procedures, including reaction setup, reaction conditions, work-up procedures, and purification protocols. All described procedures have been independently verified as reliable and reproducible. With editors and contributors who are highly respected scientists in the field, this book provides a widely useful reference for both researchers and students.
CRC Press
Market: Organic Chemistry
March 2014: 6-1/8 x 9-1/4: 333pp
Hb: 978-1-439-87594-0 $187.95
ebook: 978-1-439-87595-7
* For full contents and more information, visit: www.crcpress.com/9781439875940

C-H Bond Activation in Organic Synthesis
Edited by Jie Jack Li, University of San Francisco, California, USA
C-H Activation involves any of a wide range of techniques, often using catalysts in which a carbon to hydrogen covalent bond of an organic compound is cleaved to replace the hydrogen with a functional group. C-H Activation for functionalization is the state of the art in organic chemistry. It enables chemists to carry out reactions in the most environmentally friendly fashion with the least contamination of by-products. Written by an author experienced in this rapidly developing field, this book covers C-H activation by a variety of catalysts.
CRC Press
Market: Chemistry
April 2015: 6-1/8 x 9-1/4: 327pp
Hb: 978-1-482-23310-0 $139.95
ebook: 978-1-482-23311-7
* For full contents and more information, visit: www.crcpress.com/9781482233100

Antioxidants
Advances in Chemistry and Biology
Edited by Ana Paula Rocha Duarte, Instituto Superior Técnico, Lisboa, Portugal, Amelia Pilar Rauter, Universidade de Lisboa, Portugal and Joao Carlos Moura Bordado, Instituto de Materiais, Manutenção, Ambiente e Segurança
This volume provides a detailed description of the main types of antioxidants, their action mechanisms, extraction or production processes, most common characterization techniques, and their most promising applications. The book covers the fast growing area of polyphenols, including their general stability and pH sensitivity. Also covered are the effects of antioxidants in relation to cardiovascular health, which are being measured in terms of oxidative stress. As the current role of the antioxidants in the health, food, packaging, and chemical industries is high, an update of the most recent advances is timely.
CRC Press
Market: Chemistry
June 2016: 6-1/8 x 9-1/4: 250pp
Hb: 978-1-482-24496-0 $59.95
ebook: 978-1-482-24497-7
* For full contents and more information, visit: www.crcpress.com/9781482244960

C60: Buckminsterfullerene
Some Inside Stories
Edited by Harold W. Kroto, Florida State University, Tallahassee, USA
Series: Pan Stanford Series on Nanomaterials and Nanotechnology
This compendium of accounts reveals the unique perspectives of many scientists who made major contributions to the Nobel Prize-winning discovery of C60 buckminsterfullerene but who have not previously published personal accounts. The introduction attempts to provide a rational framework for understanding how this discovery came about and how firmly it rested on earlier technical breakthroughs and how important the contributions of researchers who were young students at the time were. In addition to these accounts, most of the key publications are also reprinted.
Pan Stanford
Market: Nanoscience & Nanotechnology
November 2015: 6 x 9: 196pp
Hb: 978-9-814-46371-3 $34.95
ebook: 978-9-814-46372-0
* For full contents and more information, visit: www.crcpress.com/9789814463713

Advanced Organic Synthesis
A Laboratory Manual
Dmitry V. Liskin, Christopher Newport University, Virginia, USA and Penny Chaloner, Imperial College London, UK
This book is designed for students aspiring to gain knowledge and techniques in organic synthesis. It focuses on a mechanistic background of key reactions in organic chemistry, gives insight into well-established trends, and introduces new developments in the field. Featuring experiments that were performed by the author as a graduate student as well as some of his recently published experiments, it provides undergraduates with theoretical knowledge and practical experience needed to succeed in graduate school or industry.
CRC Press
Market: Chemistry
December 2015: 6-1/8 x 9-1/4: 107pp
Hb: 978-1-482-24496-0 $59.95
ebook: 978-1-482-24497-7
* For full contents and more information, visit: www.crcpress.com/9781482244960

C-H Bond Activation in Organic Synthesis
Edited by Jie Jack Li, University of San Francisco, California, USA
C-H Activation involves any of a wide range of techniques, often using catalysts in which a carbon to hydrogen covalent bond of an organic compound is cleaved to replace the hydrogen with a functional group. C-H Activation for functionalization is the state of the art in organic chemistry. It enables chemists to carry out reactions in the most environmentally friendly fashion with the least contamination of by-products. Written by an author experienced in this rapidly developing field, this book covers C-H activation by a variety of catalysts.
CRC Press
Market: Chemistry
April 2015: 6-1/8 x 9-1/4: 327pp
Hb: 978-1-482-23310-0 $139.95
ebook: 978-1-482-23311-7
* For full contents and more information, visit: www.crcpress.com/9781482233100

Carbohydrate Chemistry
Proven Synthetic Methods, Volume 3
Edited by René Roy, Université du Québec à Montréal, Canada and Sébastien Vidal, University of Lyon, Villeurbanne, France
Series: Carbohydrate Chemistry
Featuring contributions from world-renowned experts and overseen by a highly respected series editor, Carbohydrate Chemistry: Proven Synthetic Methods, Volume 3 compiles reliable protocols for the preparation of intermediates for carbohydrate synthesis or other uses in the glycosciences. Exploring carbohydrate chemistry from both the academic and industrial points of view, this unique resource brings together useful information into one convenient reference. To ensure reproducibility, an independent checker has verified the experimental parts involved by repeating the protocols or using the methods.
CRC Press
Market: Chemistry
April 2015: 6-1/8 x 9-1/4: 329pp
Hb: 978-1-466-58357-3 $149.95
ebook: 978-1-466-58358-0
* For full contents and more information, visit: www.crcpress.com/9781466583573

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Some Inside Stories
Edited by Harold W. Kroto, Florida State University, Tallahassee, USA
Series: Pan Stanford Series on Nanomaterials and Nanotechnology
This compendium of accounts reveals the unique perspectives of many scientists who made major contributions to the Nobel Prize-winning discovery of C60 buckminsterfullerene but who have not previously published personal accounts. The introduction attempts to provide a rational framework for understanding how this discovery came about and how firmly it rested on earlier technical breakthroughs and how important the contributions of researchers who were young students at the time were. In addition to these accounts, most of the key publications are also reprinted.
Pan Stanford
Market: Nanoscience & Nanotechnology
November 2015: 6 x 9: 196pp
Hb: 978-9-814-46371-3 $34.95
ebook: 978-9-814-46372-0
* For full contents and more information, visit: www.crcpress.com/9789814463713
Chemistry of Heterocyclic Compounds
Rakesh Kumar Parashar, University of Delhi, India
This book discusses the structure, synthesis, and reactivity of heterocyclic compounds. It covers nomenclature, conformational aspects, aromatic stabilization and biological activity of heterocyclic compounds. The book also includes discussions of biochemical processes involving destruction of heterocyclic rings. It includes problem sets that help readers to understand and apply the principles of heterocyclic reactivity and synthesis. The inclusion of more advanced material and references make the book a valuable reference text for postgraduate taught courses, postgraduate researchers, and chemists at all levels working with heterocyclic compounds in industry, particularly in the pharmaceutical and agrochemical industries.

Chemistry of Pyrroles
Boris A. Trofimov, Al’tina I. Milkhalova, Elena Yu Schmidt and Lyubov N. Sobenina, A.E. Favorskii Irkutsk Institute of Chemistry, Russia
Pyrrole is a heterocyclic aromatic organic compound. The book is devoted to the latest achievements of the chemistry of pyrrole, a fundamental structural unit with vital importance. Molecules of pyrrole are present in many biologically active compounds such as antibiotics, pigments, and pheromones. The book provides condensed, clear-cut information on novel syntheses of substituted pyrroles as key structural units of living matter (chlorophyll and hemoglobin), pharmaceuticals, and monomers for optoelectronic materials.

Environmentally Friendly Syntheses Using Ionic Liquids
Edited by Jaiton Dupont, Toshiyuki Itô, Tottori University, Japan, Pedro Lozano and Sanjay Malhotra, Frederick National Laboratory for Cancer Research, Maryland, USA
Series: Sustainability: Contributions through Science and Technology
Increased environmental consciousness within the scientific community has spurred the search for environmentally friendly processes as alternatives to conventional organic solvents. Numerous advances—including the use of ionic liquids—have made it possible to develop substitutes for some toxic solvents. The book presents the latest developments in the field. It also reviews the latest applications in a wide range of fields including biotechnology, nuclear science, medicine, pharmaceuticals, environmental science, and organic and inorganic chemistry—all from the standpoint of green sustainable chemistry.

Fundamentals of Asymmetric Synthesis
G. L. David Krupadanam
Asymmetric synthesis is an integral part of synthetic organic chemistry. Some of the reactions in this book were known prior to 1980, while several new ones, particularly catalytic asymmetric reactions, have been discovered in the recent years. The impact of this new class of reactions has been impressively extensive—both on organic and medicinal chemistry. These reactions have been accepted wholeheartedly by synthetic organic chemists in developing shorter routes for complex natural targets as well as in the manufacture of a wide range of drug intermediates.

Green Organic Chemistry and its Interdisciplinary Applications
Vera M. Kolb, University of Wisconsin-Parkside, Kenosha, USA
This book covers key developments in green chemistry and demonstrates to students that the developments were most often the result of innovative thinking. Using a set of selected experiments, all of which have been performed in the laboratory with undergraduate students, students are taught how to optimize and develop green experiments. By focusing on both the interdisciplinary applications of green chemistry and the innovative thinking that produced the new developments, the two key messages of the book reinforce each other.

Green Syntheses, Volume 1
Edited by Pietro Tundo, University Ca' Foscari, Venice, Italy and John Andraos, CareerChem, Toronto, Ontario, Canada
Series: Green Syntheses Series
This book, the first volume in the new Green Syntheses series, presents reaction pathways that include a single reaction or a multi-step sequence to a known product. A unique feature of this series is to include green metrics as a key component of submissions of original works in order to substantiate the level of “greenness” of new chemical processes. It helps fill an expressed need by both academia and industry to incorporate, together with accurate synthetic protocols, metrics analysis as a means to rigorously define efficiency and sustainability of chemical syntheses.
Materials for Sustainable Energy Applications
Conversion, Storage, Transmission and Consumption
David Munoz-Rojas, Laboratoire des Materiaux et du Genie Physique, Grenoble, France and Xavier Moya, University of Cambridge, UK
The impending energy crisis brought on by the running out of finite and non-homogeneously distributed fossil fuel reserves and the worldwide increase in energy demand has prompted vast research in the development of sustainable energy technologies in the last few decades. The purpose of this book is to give a unified and comprehensive presentation of the fundamentals and the use and design of novel materials for efficient sustainable energy applications, such as conversion, storage, transmission, and consumption. The book presents general coverage of the use and design of advanced materials for sustainable energy applications.
Pan Stanford
Market: Clean Tech
April 2016: 6-1/8 x 9-1/4: 363pp
Hb: 978-9-814-41181-3: $149.95
* For full contents and more information, visit: www.crcpress.com/9789814411813

Modern Electrolysatic Methods in Organic Chemistry
Edited by Frank Marken and Mahito Atobe
Series: New Directions in Organic & Biological Chemistry
This book covers new ways of making materials and compounds in low waste processes employing energy from electricity rather than chemical reagents. Electro organic synthesis offers clean synthesis tools as well as unusual reaction intermediates and reaction types. Applications have remained niche, but continuing interest in this field is evident in industry and academia with the advent of microfluidic reactors. This book targets some areas of recent progress and development with high novelty and potential.
CRC Press
Market: Chemistry
September 2016: 6-1/8 x 9-1/4: 320pp
Hb: 978-1-482-24916-2: $199.95
ebook: 978-1-482-24917-0
* For full contents and more information, visit: www.crcpress.com/9781482249163

Modern NMR Techniques for Synthetic Chemistry
Edited by Julie Fisher, University of Leeds, UK
Series: New Directions in Organic & Biological Chemistry
This book illustrates how the key analytical technique, NMR spectroscopy, may be used to determine the abundance, size, shape, and function of organic molecules. It provides the reader with a physical picture for the NMR technique used (pictorial rather than mathematical), indicating the most common pulse sequences, some practical information as appropriate, followed by illustrative examples. This format is followed for each chapter so that the reader may go straight to practical and theoretical details as appropriate.
CRC Press
Market: Chemistry
October 2014: 6-1/8 x 9-1/4: 363pp
Hb: 978-1-466-59224-7: $199.95
ebook: 978-1-466-59225-4
* For full contents and more information, visit: www.crcpress.com/9781466592247

Molecules That Amaze Us
Paul May, University of Bristol, UK and Simon Cotton, University of Birmingham, UK
This book presents an interesting, informative, and fun description of the molecules that make up modern life, and how they impact upon all of us. It contains approximately 100 sections, each describing a different molecule and typically what it does, how it’s made, and what’s so interesting about it. Examples include capsaicin (the molecule responsible for the spicy heat of chillis), DEET (the insect repellent), Kevlar (the material for bullet-proof vests), taurine (an excitatory amino acid in the human brain), Kevlar (the material for bullet-proof vests), and many others.
CRC Press
Market: Chemistry
October 2014: 6-1/8 x 9-1/4: 742pp
Hb: 978-1-466-58960-5: $59.95
ebook: 978-1-466-58961-2
* For full contents and more information, visit: www.crcpress.com/9781466589605

Multicomponent Reactions
Synthesis of Bioactive Heterocycles
Edited by K.L. Ameta, Ph.D., Mody University of Science and Technology, Rajasthan, India and Anshu Dandia
This timely book will provide a succinct summary of methods for the synthesis of bioactive heterocycles using a multicomponent reaction (MCR) approach. The majority of pharmaceuticals and biologically active agrochemicals are heterocyclic while countless additives and modifiers used in industrial applications are heterocyclic in nature. With the recent introduction of high-throughput biological evaluation, the importance of MCRs for drug discovery has been recognized and considerable efforts have been focused especially on the design and development of multi-component procedures for the generation of various bioactive heterocycles due to their significant therapeutic potential.
CRC Press
Market: Chemistry
June 2016: 6-1/8 x 9-1/4: 352pp
Hb: 978-1-498-73417-2: $199.95
ebook: 978-1-498-73419-6
* For full contents and more information, visit: www.crcpress.com/9781498734127

Non-nitrogenous Organocatalysis
Edited by Andrew Harned, Texas State University, Lubbock, USA
Series: Organocatalysis Series
A growing interest in organocatalysts, catalytic reactions employing entirely organic catalysts, has made organocatalysis indispensable. However, there can be a misconception that organocatalysts are based only on nitrogen-containing functional groups and are useful only for asymmetric reactions. This book shows that the umbrella of organocatalysis covers other main group elements besides nitrogen and is not limited to asymmetric methods. Many of the catalysts and mechanisms discussed may not have a viable asymmetric variant or cannot be rendered asymmetric at all.
CRC Press
Market: Chemistry
June 2016: 6-1/8 x 9-1/4: 288pp
Hb: 978-1-498-71505-8: $189.95
ebook: 978-1-498-71503-4
* For full contents and more information, visit: www.crcpress.com/9781498715034
TEXTBOOK

Organic Chemistry
A Mechanistic Approach

Penny Chaloner, Imperial College London, UK

This textbook classifies organic chemistry according to mechanism rather than classification of functional groups, with the intention of having students understand by means of problem solving. The emphasis is on the development of skills through a student-centered pedagogical approach. The inclusion of chromatography, spectroscopy, and spectrometry early in the book is an important concept. The book contains the customary chapters on biomolecules, but also presents chapters on industrially important processes and their economics, and environmental chemistry, areas in which every 21st-century-educated scientist should have familiarity.

CRC Press
Market: Chemistry
December 2014: 8-1/2 x 11: 1284pp
Hb: 978-1-482-20690-6: $129.95
ebook: 978-1-482-20691-3
* For full contents and more information, visit: www.crcpress.com/9781482206906

2nd Edition - TEXTBOOK - NEW EDITION

Organic Chemistry
An Acid-Base Approach, Second Edition

Michael B. Smith, University of Connecticut, Storrs, USA

Based on the premise that many, if not most, reactions in organic chemistry can be explained by variations of fundamental acid–base concepts, this book provides a framework for understanding the subject that goes beyond mere memorization. Using several techniques to develop a relational understanding, it helps students gain a more concrete understanding of the most fundamental concepts in organic chemistry that are applied to industry, biological chemistry, biochemistry, molecular biology, and pharmacy.

CRC Press
Market: Chemistry
December 2015: 8-1/2 x 11: 1128pp
Hb: 978-1-482-23823-5: $129.95
ebook: 978-1-482-23826-6
Prev. Ed Hb: 978-1-420-07920-3
* For full contents and more information, visit: www.crcpress.com/9781482238235

Sulfate Reduction for Remediation of Gypsiferous Soils and Solid Wastes

Pimluck Kijjanapanich, UNESCO-IHE Institute for Water Education, Delft, The Netherlands


This book describes the development of a new Sulfate Reduction Bacteria based bioremediation technique for gypsiferous soils. Gypsiferous soils and gypsum contaminated solid wastes, which contain elevated concentrations of sulfate, can cause several agricultural and environmental problems (e.g. low water retention capacity and odor problems). Reduction of the sulfate content of these gypsiferous soils and solid wastes is an option to overcome these problems for gypsiferous soils as well as gypsum contaminated solid wastes treatment to decrease the amount of solid wastes and to improve the quality of these solid wastes and soils for recycling purposes or agricultural applications.

CRC Press
Market: Environmental Engineering
March 2014: 6.7 x 9.5: 160pp
Pb: 978-1-138-01535-7: $79.95
* For full contents and more information, visit: www.crcpress.com/9781138015357

Organic Structures Design
Applications in Optical and Electronic Devices

Edited by Tahsin J. Chow, Academia Sinica, Taipei, Taiwan

The application of organic materials on optical and electronic devices is a fast-growing research area, combining the classical electronic properties of metals and the advantageous properties of organic materials. The functional applications include light-emitting diodes, organic solar cells, field-effect transistors, artificial machines, chemical sensors, and many others. This book provides a review on several topics in this area. The contents are focused mainly on the design and synthesis of organic functional molecules, and also include related topics such as model study on electron transfer phenomena and fabrication technologies of organic nanostructures.

Pan Stanford
December 2014: 6 x 9: 538pp
Hb: 978-9-814-46334-8: $149.95
ebook: 978-9-814-46335-5
* For full contents and more information, visit: www.crcpress.com/9789814463348
Acoustics of Nanodispersed Magnetic Fluids

V. Polunin, Southwest State University, Kursk, Russia

This book presents key information on the acoustic properties of magnetic fluids. The book is based on research carried out by the author as well as on many publications in both the Russian and foreign scientific literature from 1969 onwards. It describes a wide variety of topics, which together lay the foundation of a new scientific research area: the acoustics of nanodispersed media. The book examines the nanoscale structure of matter in specific areas and discusses the following model theory and known features of the propagation of sound waves in magnetised fluids, acoustomagnetic and magnetoacoustic effects in magnetic fluids, vibration and rheological effects of magnetised magnetic fluids, acoustometry of the shape of magnetic nanoaggregates and non-magnetic microaggregates.

CRC Press
Market: Physics
May 2015: 6-1/8 x 9-1/4: 472pp
Hb: 978-1-4398-86107-3 $159.95
ebook: 978-1-4398-86108-0
* For full contents and more information, visit: www.crcpress.com/9781439886107

Chemical Analysis

Modern Materials Evaluation and Testing Methods

Edited by Ana C. F. Ribeiro, University of Coimbra, Portugal, Cecilia I. A. V. Santos, University of Coimbra, Portugal and Gennady E. Zaikov, Kazan National Research Technological University, Russia

Series: AAP Research Notes on Chemistry

This new volume presents leading-edge research in the rapidly changing and evolving field of chemical materials characterization and modification. The topics in the book reflect the diversity of research advances in physical chemistry and electrochemistry, focusing on the preparation, characterization, and applications of polymers and high-density materials. Also covered are various manufacturing techniques. Focusing on the most technologically important materials being utilized and developed by scientists and engineers, the book will help to fill the gap between theory and practice in industry.

Apple Academic Press
Market: Analytical Chemistry
December 2015: 6-1/8 x 9-1/4: 325pp
Hb: 978-1-77188267-5 $149.95
ebook: 978-1-77188259-0
* For full contents and more information, visit: www.crcpress.com/9781771882675

Complex Liquids, Polymers and Membranes

Alok Datta, Saha Institute of Nuclear Physics, Kolkata, India

Soft materials play an essential role in our daily life. They are used for clothing, medicines, dyes, paints, adhesives, lubricants, sports goods, and many other purposes. Even our bodies are mostly composed of soft materials. Complex Liquids, Polymers and Membranes describes how soft materials like liquids, polymers, and liquid crystals behave. It enables the reader to understand the experimental and theoretical tools required to study their structure, bonding, and properties. The book also introduces biomaterials as well as thin films and tubes made out of soft materials.

CRC Press
Market: Materials Science and Engineering
June 2016: 6-1/8 x 9-1/4: 600pp
Hb: 978-1-4665-7704-6 $99.95
ebook: 978-1-4665-7705-3
* For full contents and more information, visit: www.crcpress.com/9781466577046

Electrolytes

Supramolecular Interactions and Non-Equilibrium Phenomena in Concentrated Solutions

Georgii Georgievich Aseyev

The first part of the book covers the electrolyte solution in its stationary state—electrostatic, and various ion-dipole, dipole-dipole, and mutual repulsion interactions. The second part covers the electrolyte solution in its nonstationary status—electrical conductivity, viscosity, and diffusion. This theoretical framework allows for the determination of activity coefficients of concentrated electrolyte solutions, which play a key role in many aspects of electrochemistry and for developing novel advanced processes in inorganic chemical plants.

CRC Press
Market: Chemical Engineering
November 2015: 6-1/8 x 9-1/4: 360pp
Hb: 978-1-4822-4938-5 $212.95
ebook: 978-1-4822-4939-2
* For full contents and more information, visit: www.crcpress.com/9781482249385

Electrospinning for Advanced Energy and Environmental Applications

Edited by Sara Cavaliere, Charles Gerhardt Institute for Molecular Chemistry and Materials, University of Montpellier, France

This book delivers a state-of-the-art overview of the use of electrospun fibers in energy and environmental applications. It first introduces electrospinning and its origins, outlining achievable one-dimensional nanoscaled materials and their applications. It then discusses the use of electrospun materials in energy devices, including low- and high-temperature fuel cells, hydrogen storage, dye-sensitized solar cells, lithium-ion batteries, and supercapacitors. It also explores environmental applications, such as the use of electrospinning-issued materials in membranes for water and air purification, and in sensors and biosensors for pollution control.

CRC Press
Market: Materials Science and Engineering
September 2015: 6-1/8 x 9-1/4: 288pp
Hb: 978-1-4822-2176-7 $159.95
ebook: 978-1-4822-2176-8
* For full contents and more information, visit: www.crcpress.com/9781482221767
**TEXTBOOK**

**Introduction to Fluorescence**

*David M. Jamerson, University of Hawaii, Manoa, USA*

In color throughout, this text helps readers acquire a sound understanding of basic fluorescence theory and practice. It takes them through the history of important discoveries to the most current advances. The author introduces the fundamentals of the fluorescence phenomenon and gives detailed examples of fluorescence applications in the molecular life sciences, including biochemistry, biophysics, clinical chemistry and diagnostics, pharmaceutical science, and cell and molecular biology. The text includes references in each chapter, more than 250 figures, and the chemical structures of the most widely used fluorescent molecules.

CRC Press

Market: Physics

January 2016: 6-1/8 x 9-1/4: 350pp
Hb: 978-1-482-22970-7: $79.95
* For full contents and more information, visit: www.crcpress.com/9781482229707

**Molecular Solar Cells**

*Anders Hagfeldt, Uppsala University, Sweden*

This textbook covers solar cells employing photoelectric dye molecules to harvest sunlight and convert the photons to charge carriers which produce electricity. It also examines dye-sensitized solar cells type molecular solar cells and includes sections on photochemistry, driving force, electron-transfer kinetics, charge carrier separation, charge transport processes, electrical contact properties, experimental techniques for characterization, etc. The principle of DSC has also become a part of the core-chemistry and energy science teaching and research. Many textbooks have sections or chapters dealing with DSC, this is the first devoted entirely to the subject.

CRC Press

December 2015: 6 x 9: 350pp
Hb: 978-1-482-22970-7: $79.95
* For full contents and more information, visit: www.crcpress.com/9781482229707

**Introduction to Solid State Ions**

*Phenomenology and Applications

*C. S. Sunandana*

This book presents a pedagogical, graduate-level treatment of the science and technology of superionic conductors, also known as fast ion conductors or solid electrolytes. It focuses on fundamental phenomenological aspects, including crystal structure, phonon dispersion, electronic band structure, defects, disorder, nonstoichiometry, non-equilibrium thermodynamics, phase transitions, and statistical mechanics of iono-electron transport. It also describes the design, synthesis, and characterization of materials as well as important applications of solid state ions, including solid state batteries, fuel cells, and electrochemical sensors.

CRC Press

Market: Physics

December 2015: 7 x 10: 529pp
Hb: 978-1-482-22970-7: $129.95
* For full contents and more information, visit: www.crcpress.com/9781482229707

**Pathways to Modern Physical Chemistry**

*An Engineering Approach with Multidisciplinary Applications

*Edited by Rainer Wolf, Sandoz Ltd. (Retired), Gennady E. Zaikov, Kazan National Research Technological University, Russia and A. K. Haghi, University of Ottawa, Canada*

This book focuses on recent trends and takes a systematic and practical look at theoretical aspects of materials chemistry. The book describes the characterization and analysis methods for materials and explains physical transport mechanisms in various materials. Not only does this book summarize the classical theories of materials chemistry, but it also exhibits their engineering applications in response to the current key issues. Recent trends in several areas are explored, including polymer science, textile engineering, and chemical engineering science, which have important application to practice.

CRC Press

February 2016: 6-1/8 x 9-1/4: 350pp
Hb: 978-1-771-88322-1: $149.95
* For full contents and more information, visit: www.crcpress.com/9781771883221

**Many-Body Methods for Atoms and Molecules**

*Rajat Kumar Chaudhuri, Indian Institute of Astrophysics, Bangalore, India and Sudip Kumar Chattopadhyay*

This book explores modern many-body perturbative and non-perturbative ab initio methods that have become the dominant and useful approaches in determining molecular structure, properties and interactions. It provides a balanced introduction in conjunction with recent developments to this challenging and dynamic subject, that is useful for both experimentalists and theorists. The book demonstrates the rigorous development of the necessary equations, explanations, and reasoning, and firmly places each equation in context.

CRC Press

April 2016: 6-1/8 x 9-1/4: 380pp
Hb: 978-1-482-21190-0: $129.95
* For full contents and more information, visit: www.crcpress.com/9781482211900

**Perspectives in Crystallography**

*John R. Helliwell, University of Manchester, School of Chemistry, United Kingdom*

The structural knowledge gained from crystallography has been instrumental in acquiring new levels of understanding in numerous scientific areas. This reference provides an overview of the current state of crystallography, reviews its historical origins, and emphasizes the societal impacts of crystallography that allow for sustainability of life. It also discusses the future of crystal structure analysis in the next 100 years and how crystallography can contribute to sustainability of life. The author is editor in chief of Crystallography, where some of this book’s contents have been previously published.

CRC Press

November 2015: 7 x 10: 155pp
Hb: 978-1-498-73210-9: $139.90
* For full contents and more information, visit: www.crcpress.com/9781498732109

Browse and order online: www.crcpress.com
**Physical Chemistry for the Chemical and Biochemical Sciences**

Edited by Jose Luis Lopez-Bonilla, National Polytechnic Institute (IPN), Mexico City, Mexico, Marat Ibragimovich Abdullin, Bashkir State University, Ufa, Russia and Gennady E. Zaikov, Kazan National Research Technological University, Russia

By providing an applied and modern approach, this volume will help readers understand the value and relevance of studying case studies and reviews on chemical and biochemical sciences. Presenting a wide-ranging view of current developments in applied methodologies in chemical and biochemical physics research, the papers in this collection, all written by highly regarded experts in the field, examine various aspects of chemical and biochemical physics and experimentation.

* For full contents and more information, visit: [www.crcpress.com/9781771881494](http://www.crcpress.com/9781771881494)

**The Shroud of Turin**

First Century after Christ!

Giulio Fanti, Padua University, Padova, Italy and Pierandrea Malfi, Padua University, Padova, Italy

The Turin Shroud is the most important and studied relic in the world. Many papers on it have recently appeared in important scientific journals. Scientific studies on the relic until today fail to provide conclusive answers about the identity of the enveloped man and the dynamics regarding the image formation impressed therein. This book not only addresses these issues in a scientific and objective manner but also leads the reader through new search paths. It summarizes the results, in a simple manner for the reader to comprehend easily. Many books on the theme have been already published, but none of them contains such a quantity of scientific news and reports.

* For full contents and more information, visit: [www.crcpress.com/9789814669122](http://www.crcpress.com/9789814669122)

**Textbook**

**Thermodynamics Kept Simple – A Molecular Approach**

What is the Driving Force in the World of Molecules?

Roland Kjellander, University of Gothenburg, Sweden

This book offers a unique way of teaching and thinking about basic thermodynamics that helps students overcome common conceptual problems. It delivers a brilliantly conceived introduction to thermodynamics at the molecular level, presenting the core laws with clear explanations. The text covers key concepts such as entropy, energy transfer, heat exchange, work, enthalpy, free energy, irreversible and reversible processes, chemical equilibrium, and phase transitions in the molecular world, employing simple but well-chosen examples to supply insight into the molecular events underlying the thermodynamic macroscopic description.

* For full contents and more information, visit: [www.crcpress.com/9781482244106](http://www.crcpress.com/9781482244106)

**Single Molecule Science**

**Physical Principles and Models**

Dmitrii E. Makarov, University of Texas, Austin, USA

The observation and manipulation of individual molecules is one of the most exciting developments in modern molecular science, and the utility of single-molecule methods has proven invaluable in such fields as nanoscience and molecular biology. This book provides a general framework necessary for understanding single-molecule phenomena. It introduces the relevant mathematical and physical concepts, and then discusses various approaches to the problem of interpreting single-molecule data. It thoroughly explains the physical principles underlying the major classes of single-molecule experiments, such as fluorescence measurements, force-probe spectroscopy, and nanopore experiments.

* For full contents and more information, visit: [www.crcpress.com/9781466559516](http://www.crcpress.com/9781466559516)

**Understanding Spin Dynamics**

Danuta Kruk, University of Warmia and Mazury in Olsztyn, Poland

This book concentrates on the theory of spin resonance phenomena and the relaxation theory, which have been discussed from first principles to introduce the reader to the language of quantum mechanics used to describe the behaviour of atomic nuclei and electrons. There is a long way from knowing complex formulae to apply them correctly to describe the studied system. The book shows through examples how symbols can be “replaced” in equations by using properties of real systems to formulate descriptions that link the quantities observed in spin resonance experiments with dynamics and structure of molecules.

* For full contents and more information, visit: [www.crcpress.com/9789814463492](http://www.crcpress.com/9789814463492)

**Physical Chemistry of Macromolecules**

**Macro to Nanoscales**

Edited by Chin Han Chan, University Teknologi MARA, Shah Alam, Malaysia, Chin Hua Chia, Universiti Kebangsaan, Bangi, Malaysia and Sabu Thomas, Mahatma Gandhi University, Kerala, India

A comprehensive resource, this book summarizes recent technical research accomplishments in the area of thermodynamics, characterization, and applications of polymer blends. It begins with an overview of thermodynamic behaviors of non-equilibrium polymers, then covers properties of polymer blends, including surface tension, transition, crystallization, morphology, and flow behaviors. It also discusses miscibility and molecular characterizations of polymer blends and reviews applications to various systems. In this time when science has such a strong tendency for diversification, this book demonstrates the relevance of one’s own activities with neighboring branches of activities.

* For full contents and more information, visit: [www.crcpress.com/9781926895642](http://www.crcpress.com/9781926895642)
X-Ray Diffraction: Modern Experimental Techniques

Edited by Oliver H. Seeck, HASYLAB am DESY, Hamburg, Germany and Bridget Murphy, Institut für Experimentalle und Angewandte Physik, Kiel, Germany

High-resolution x-ray diffraction and scattering is a key tool for structure analysis not only in bulk materials but also at surfaces and buried interfaces from the sub-nanometer range to micrometers. This book offers an overview of diffraction and scattering methods currently available at modern synchrotron sources and illustrates bulk and interface investigations of solid and liquid matter with up-to-date research examples. It presents important characteristics of the sources, experimental setup, and new detector developments. The book also considers future exploitation of x-ray free electron lasers for diffraction applications.

Pan Stanford
February 2015: 6 x 9: 414pp
Hb: 978-1-771-88058-9: $164.95

Physical Chemistry Research for Engineering and Applied Sciences, Volume One

Principles and Technological Implications

Edited by Eli M. Pearce, Polytechnic Institute of New York University, New York, USA, Bob A. Howell, Central Michigan University, Mount Pleasant, USA, Richard A. Pethrick, University of Strathclyde, Glasgow, Scotland, UK and Gennady E. Zaikov, Kazan National Research Technological University, Russia

The aim of this book is to provide both a rigorous view and a more practical, understandable view of industrial chemistry and biochemical physics. This book is geared toward readers with both direct and lateral interest in the discipline. This volume is structured into different parts devoted to industrial chemistry and biochemical physics and their applications. Every section of the book has been expanded, where relevant, to take account of significant new discoveries and realizations of the importance of key concepts. Furthermore, emphases are placed on the underlying fundamentals and on acquisition of a broad and comprehensive grasp of the field as a whole.

Apple Academic Press
Market: Chemical Engineering
February 2015: 6 x 9: 400pp
Hb: 978-1-771-88059-6: $164.95
* For full contents and more information, visit: www.crcpress.com/9781771880534

Physical Chemistry Research for Engineering and Applied Sciences, Volume Two

Polymeric Materials and Processing

Edited by Eli M. Pearce, Polytechnic Institute of New York University, New York, USA, Bob A. Howell, Central Michigan University, Mount Pleasant, USA, Richard A. Pethrick, University of Strathclyde, Glasgow, Scotland, UK and Gennady E. Zaikov, Kazan National Research Technological University, Russia

This book presents some fascinating phenomena associated with the remarkable features of high performance polymers and also provides an update on applications of modern polymers. It offers new research on structure-property relationships, synthesis, and purification, and potential applications of high performance polymers.

Apple Academic Press
Market: Chemical Engineering
April 2015: 6 x 9: 274pp
Hb: 978-1-771-88057-2: $164.95
* For full contents and more information, visit: www.crcpress.com/9781771880596

Physical Chemistry Research for Engineering and Applied Sciences, Volume Three

High Performance Materials and Methods

Edited by Eli M. Pearce, Polytechnic Institute of New York University, New York, USA, Bob A. Howell, Central Michigan University, Mount Pleasant, USA, Richard A. Pethrick, University of Strathclyde, Glasgow, Scotland, UK and Gennady E. Zaikov, Kazan National Research Technological University, Russia

This volume presents the various categories of high performance materials and their composites are discussed, and the book also provides an update on applications of modern polymers. In Volume 3, the various categories of high performance materials and their composites are discussed, and the book also provides up-to-date synthesis details, properties, characterization, and applications for such systems in order to give readers and users better information to select the required material.

Apple Academic Press
Market: Chemical Engineering
April 2015: 6 x 9: 290pp
Hb: 978-1-771-88058-9: $164.95
* For full contents and more information, visit: www.crcpress.com/9781771880596
Additives in Polymers
Analysis and Applications

Edited by Alexandr A. Berlin, Russian Academy of Sciences, Moscow, Russia, Svetlana Z. Rogovina, Russian Academy of Sciences, Moscow, Russia and Gennady E. Zaikov, Kazan National Research Technological University, Russia

Additives are selected depending on the type of polymers to which they will be added or the application for which they will be used. The appropriate selection of additives helps develop value-added plastics with improved durability as well as other advantages. This research book provides a range of modern techniques and new research on the use of additives in a variety of applications. The methods and instrumentation described represent modern analytical techniques useful to researchers, product development specialists, and quality control experts in polymer synthesis and manufacturing.

Apple Academic Press
Market: Polymer Science
November 2015: 6 x 9: 364pp
Hb: 978-1-771-88128-9: $139.95
ebook: 978-1-498-72859-1
* For full contents and more information, visit: www.crcpress.com/9781771881289

Algorithmic Techniques for the Polymer Sciences

Bradley S. Tice, CEO and Institute Professor of Chemistry, Advanced Human Design, California, USA

This new book—the first of its kind—examines the use of algorithmic techniques to compress random and non-random sequential strings found in chains of polymers. The book is an introduction to algorithmic complexity. Examples taken from current research in the polymer sciences are used for compression of like-natured properties as found on a chain of polymers. Both theory and applied aspects of algorithmic compression are reviewed. A description of the types of polymers and their uses is followed by a chapter on various types of compression systems that can be used to compress polymer chains into manageable units. The work is intended for graduate and postgraduate university students in the physical sciences and engineering.

Apple Academic Press
Market: Materials Science
October 2014: 6-1/8 x 9-1/4: 256pp
Hb: 978-1-926-89539-0: $149.95
ebook: 978-1-482-25434-1
* For full contents and more information, visit: www.crcpress.com/9781926895390

Biomaterial Applications
Micro to Nanoscales

Edited by Sabu Thomas, Mahatma Gandhi University, Kottayam, India, Nandakumar Kalarikkal, Mahatma Gandhi University, Kerala, India, Weimin Yang, Beijing University of Chemical Technology, China and Snigdha S. Babu, Mahatma Gandhi University, Kerala, India

This book covers a variety of recent research on natural polymers, biomaterials, composites, and their applications. It provides valuable insights into the developments that arose with the merger between biological and polymeric materials that have led to many technological and commercial developments. The extensive research being conducted in the field of bio-based polymers will eventually lead to better health care, cleaner energy sources, and a safer environment for future generations.

Apple Academic Press
Market: Materials Science
December 2014: 6 x 9: 323pp
Hb: 978-1-771-88027-5: $119.95
ebook: 978-1-482-25276-7
* For full contents and more information, visit: www.crcpress.com/9781771880275

Applied Research on Polymer Composites

Edited by Pooria Pasbakhsh, Monash University, Selangor, Malaysia and Gennady E. Zaikov, Kazan National Research Technological University, Russia

Series: AAP Research Notes on Polymer Engineering Science and Technology

This new volume presents leading-edge research in the rapidly changing and evolving field of polymer science as well as on chemical processing. The topics in the book reflect the diversity of research advances in the production and application of modern polymeric materials and related areas, focusing on the preparation, characterization, and applications of polymers. Also covered are various manufacturing techniques. The book helps to fill the gap between theory and practice in industry.

Apple Academic Press
Market: General Chemistry
February 2015: 6 x 9: 342pp
Hb: 978-1-771-88038-1: $129.95
ebook: 978-1-482-25417-4
* For full contents and more information, visit: www.crcpress.com/9781771880381

Applied Methodologies in Polymer Research and Technology

Edited by Abbas Hamrang, Independent Polymer Consultant, Manchester, UK and Devrim Balkose, Izmir Polytechnic Institute, Turkey

This book covers a broad range of polymeric materials and provides industry professionals and researchers in polymer science and technology with a single, comprehensive book summarizing all aspects involved in the functional materials production chain.

Apple Academic Press
Market: General Chemistry
October 2014: 6 x 9: 260pp
Hb: 978-1-771-88040-4: $119.95
ebook: 978-1-482-25434-1
* For full contents and more information, visit: www.crcpress.com/9781771880404

Block Copolymer Nanocomposites

Edited by Galder Kortaberria, University of the Basque Country, Donostia-San Sebastian, Spain and Agnieszka Tercjak, University of the Basque Country, Donostia-San Sebastian, Spain

This book provides a comprehensive overview of the synthesis and characterization of nanocomposites based on block copolymers. Owing to the self-assembly capability of block copolymers generating nanostructures, besides their ability to nanostructure thermosetting matrices such as epoxy and polyester, binary or ternary nanocomposites can be prepared with different nanofillers such as nanoparticles and carbon nanotubes.

Pan Stanford
Market: Materials Science
February 2016: 6 x 9: 450pp
Hb: 978-9-814-66954-2: $149.95
ebook: 978-9-814-66955-9
* For full contents and more information, visit: www.crcpress.com/9789814669542
Compositional Analysis of Polymers
An Engineering Approach
Edited by Aleksandr M. Kochnev, Kazan National Research Technological University, Russia, Oleg V. Stoyanov, Kazan State Technological University, Russia, Gennady E. Zaikov, Kazan National Research Technological University, Russia, and Renat M. Akhmetkhanov, Bashkirian State University, Ufa, Russia

Technical and technological development demands the creation of new materials that are stronger, more reliable, and more durable—materials with new properties. This new book covers a broad range of polymeric materials and technology and provides researchers in polymer science and technology with detailed procedures of experiments with examples of actual applications and demonstrates the advantages and disadvantages of each physical technique. Thus, readers will be able to apply the concepts as described in the book to their own experiments.

CRC Press
Market: Polymer Science
April 2015: 7 x 10: 595pp
Hb: 978-1-498-70321-5: $149.95
* For full contents and more information, visit: www.crcpress.com/9781498703208

Compressible Techniques for Polymer Sciences
Edited by Bradely S. Tice, Advanced Human Design, Cupertino, California, USA

Series: Woodhead Publishing India in Textiles

This book addresses the use of algorithmic complexity to perform compression on polymer strings to reduce the redundant quality while keeping the numerical quality intact. It provides a description of the types of polymers and their uses. It also describes the various types of compression systems that can be used to compress polymer chains into manageable units.

WPI Publishing
Market: Polymer Science
January 2015: 6 x 9: 166pp
Hb: 978-9-380-30831-9: $159.95
ebook: 978-9-380-30888-2
* For full contents and more information, visit: www.crcpress.com/9789380308319

Compression Techniques for Polymer Sciences
Edited by Christian Wohlfarth, Martin-Luther University, Halle (Saale), Germany

There is a continuing interest in thermodynamic properties of polymer solutions at elevated pressures. This updated book provides newly published experimental data from the last decade. It includes nearly 500 newly published references containing approximately 175 new vapor-liquid equilibrium data sets, 25 new liquid-liquid equilibrium data sets, 540 new high-pressure fluid phase equilibrium data sets, 60 new data sets describing PVT properties of polymers, and 20 new data sets with densities or excess volumes.

CRC Press
Market: Polymer Chemistry
February 2015: 7 x 10: 595pp
Hb: 978-1-498-70320-8: $149.95
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Engineering of Polymers and Chemical Complexity, Two-Volume Set
Edited by LinShu Liu, Eastern Regional Research Center, Pullman, Washington, USA, Antonio Ballada, Fas Tech Technology, Milano, Italy, Walter W. Focke, Pretoria University, South Africa and Hans-Joachim Radusch, Martin Luther University, Halle-Saale, Germany

This new two-volume set provides a broad overview of current studies in the engineering of polymers and chemicals with complexitoy of various origins, on scales ranging from single molecules and nano-phenomena to macroscopic chemicals. Starting with a detailed introduction to the history of research on complex chemical systems and its current state of the art and perspectives, the books present chapters that survey the current progress in particular research fields.

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Cellulose-Based Graft Copolymers
Structure and Chemistry
Edited by Vijay Kumar Thakur

This book discusses the synthesis, characterization, and properties of multifunctional cellulose-based graft copolymers, offering an overview of the latest technical accomplishments. Presenting the contributions of accomplished experts in the field of natural cellulose-based polymers, the text addresses a separate biomaterial in each chapter, exploring composition as well as graft copolymerization chemistry. It covers fundamentals and applications, tackles several critical issues, provides suggestions for future work, and supplies deeper insight into the state of the art of advanced cellulose-based graft copolymers.

CRC Press
Market: Polymer Science
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Chemical and Structure Modification of Polymers
Edited by Kajetan Pyrzynski, P.I.W. Delta-Company, Dolk, Poland, Grzegorz Nyszko, Military Institute of Chemistry & Radiometry, Warsaw, Poland and Gennady E. Zaikov, Kazan National Research Technological University, Russia

This timely volume provides an overview of polymer characterization test methods and presents experimental research in polymers using modern methods. Each chapter describes the principle of the respective method, as well as the detailed procedures of experiments with examples of actual applications and demonstrates the advantages and disadvantages of each physical technique. Thus, readers will be able to apply the concepts as described in the book to their own experiments.

Apple Academic Press
Market: Polymer Science
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Engineering of Polymers and Chemical Complexity, Volume I
Current State of the Art and Perspectives
Edited by LinShu Liu, Eastern Regional Research Center, Pullman, Washington, USA and Antonio Ballada, Fas Tech Technology, Milano, Italy
This book provides a broad overview of current studies in the engineering of polymers and chemicals of various origins. The innovative chapters cover the growth of educational, scientific, and industrial research activities among chemists, biologists, and polymer and chemical engineers. This book publishes significant research and reviews reporting new methodologies and important applications in the fields of industrial chemistry, industrial polymers, and biotechnology, as well as the latest coverage of chemical databases and the development of new computational methods and efficient algorithms for chemical software and polymer engineering.

Functional Polymers
Design, Synthesis, and Applications
Edited by Raja Shunmugam, Indian Institute of Science Education & Research, Kolkata, India
This new book covers the synthetic as well application aspects of functional polymers. It highlights modern trends in the field and showcases the recent characterization techniques that are being employed in the field of polymer science. The chapters are written by top-notch scientists who are internationally recognized in the field. The chapters will highlight the modern trend in the field.

Engineering of Polymers and Chemical Complexity, Volume II
New Approaches, Limitations and Control
Edited by Walter W. Focke, Pretoria University, South Africa and Hans-Joachim Radusch, Martin Luther University, Halle-Saale, Germany
This book provides a vast amount of information on new approaches, limitations, and control on current polymers and chemicals complexity of various origins, on scales ranging from single molecules and nano-phenomena to macroscopic chemicals. Starting with a detailed introduction, the book is comprised of chapters that survey the current progress in particular research fields. The chapters, prepared by leading international experts, yield together a fascinating picture of a rapidly developing research discipline that brings chemical technology and polymers to new frontiers.

Handbook of Sustainable Polymers
Processing and Applications
Edited by Vijay Kumar Thakur, Washington State University, Pullman, USA and Manju Kumari Thakur, Himachal Pradesh University, Shimla, India
This book is an archival reference for researchers and students working in the field of sustainable polymers and their applications in industry. It focuses on the processing and applications of diverse sustainable polymers procured from different biorenewable resources that have been rarely reported so far in a single book. Each chapter significantly addresses different aspects of sustainable polymers obtained from natural resources and discusses different processing techniques and possible applications. The book brings together highly accomplished experts in the field of sustainable polymers.

Functional Polymer Blends and Nanocomposites
A Practical Engineering Approach
Edited by Gennady E. Zaikov, Kazan National Research Technological University, Russia, Lillya I. Bazyl'yak, Institute of Physical Organic Chemistry and Coal Chemistry, Lviv, Ukraine and A. K. Haghi, University of Ottawa, Canada
Series: AAP Research Notes on Polymer Engineering Science and Technology
This book details original, theoretical, and important experimental results that use non-routine methodologies often unfamiliar to most readers. It also includes papers on novel applications of more familiar experimental techniques and analyses of composite problems. The book provides comprehensive coverage on the latest developments of research in the ever-expanding area of composite materials and their applications to broad scientific fields spanning physics, chemistry, biology, materials, and more.

Handbook of Sustainable Polymers
Structure and Chemistry
Edited by Vijay Kumar Thakur, Washington State University, Pullman, USA and Manju Kumari Thakur, Himachal Pradesh University, Shimla, India
This book seeks to address the fundamental understanding of the structure and chemistry of sustainable polymers. It covers the fundamentals of sustainable polymers and presents guidelines in a logical and clear manner for students and researchers. The text explores the structure and chemistry of various sustainable polymers, such as cellulose, hemicellulose, lignin, chitosan, starch, guar gum, pectin, and protein, for possible development of green sustainable materials. Each chapter is authored by highly accomplished experts in the field of sustainable polymers and showcases the recent characterization techniques that are being employed in the field of polymer science.
High-Performance Polymers for Engineering-Based Composites

Edited by Omari V. Mukbaniani, Tbilisi State University (TSU), Georgia, Marc J. M. Abadie, Institute for Molecular Chemistry & Material Sciences in Montpellier, France and Tamara Tatrishvili, Institute of Macromolecular Chemistry & Polymeric Materials, Georgia

Series: AAP Research Notes on Polymer Engineering Science and Technology

The book presents a selection of investigations and innovative research in polymer chemistry and advanced materials. The book includes case studies in the field of nanocomposites. The volume provides coverage of new research in polymer science and engineering with applications in chemical engineering, materials science, and chemistry. In addition to synthetic polymer chemistry, it also looks at the properties of polymers in various states (solution, melt, solid). The chapters provide a survey of the important categories of polymers including commodity thermoplastics and fibers, elastomers and thermosets, and engineering and specialty polymers.

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Nanofibers of Conjugated Polymers

A. Sezai Sarac, Istanbul Technical University, Turkey

This book covers the general aspects of electrospraying and discusses the fundamental concepts that can be used to produce nanofibers with the help of mathematical models and equations. It also details the methods through which different polymeric structures can be included in conjugated polymers during electrospraying to form composites or blends of conjugated polymer nanofibers.

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Organic Solar Cells

Fundamentals, Devices, and Upscaling

Edited by Barry P. Rand, Princeton University, New Jersey, USA and Henning Richter, Nano-C, Inc, Westwood, Massachusetts, USA

This book explores the required characteristics of the components present in an organic photovoltaic device, such as transparent electrodes, electron- and hole-conducting layers, and electron donor and electron acceptor materials. It discusses the design, preparation, and evaluation of these materials targeting the highest performance. Taking into account the necessity to optimize many interdependent parameters, the text describes the integration of various components using existing as well as innovative device architectures suitable for mass production. Finally, it assesses the technical feasibility and economic viability of the large-scale manufacture of materials and resulting devices.

Pan Stanford
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Polymers for Packaging Applications

Edited by Sajid Alavi, Kansas State University, Manhattan, USA, Sabu Thomas, Mahatma Gandhi University, Kerala, India, K. P. Sandeep, North Carolina State University, Raleigh, USA, Nandakumar Kalarikkal, Mahatma Gandhi University, Kerala, India, Jini Varghese, Mahatma Gandhi University, Kottayam, India and Srinivasarao Yaragalla, Mahatma Gandhi University, Kottayam, India

This book focuses on food, non-food, and industrial packaging applications of polymers, blends, nanostructured materials, macro, micro and nanocomposites, and renewable and biodegradable materials. It details physical, thermal, and barrier properties as well as sustainability, recycling, and regulatory issues. The book emphasizes interdisciplinary research on processing, morphology, structure, and properties as well as applications in packaging of food and industrial products. It is useful for chemists, physicists, materials scientists, food technologists, and engineers.

Apple Academic Press
Market: General Chemistry
September 2014: 6-1/8 x 9-1/4: 486pp
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ebook: 978-1-482-22455-9
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Polysaccharide Hydrogels

Characterization and Biomedical Applications

Edited by Pietro Matricardi, “Sapienza” University of Rome, Italy, Franco Alhaique, “Sapienza” University of Rome, Italy and Tommasina Coviello, “Sapienza” University of Rome, Italy

This book bridges the gap between preparation of hydrogels, which is often discussed in books and reviews, and their characterization techniques. It aims to offer graduate students as well as researchers, including PhD students and those involved in R&D in pharmaceutical companies and academia, a valid support that can help them find appropriate keys to open the doors to the complex world of polysaccharide hydrogels. The first part of the book gives a wide overview of the most important approaches for the physicochemical characterization of hydrogels while the second one is mainly devoted to biomedical applications.

Pan Stanford
Market: Pharmaceutical Science
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Polysulfide Oligomer Sealants
Synthesis, Properties and Applications

Yuri N. Khakimullin, Kazan National Research Technological University, Russia, Vladimir S. Minkin, Kazan National Research Technological University, Russia, Timur R. Deberdeev, Kazan National Research Technological University, Russia and Gennady E. Zaikov, Kazan National Research Technological University, Russia

This valuable book is devoted to problems of the synthesis, vulcanization, modification, and study of structure and properties of highly filled sealants based on polysulfide oligomers (PSO). The book summarizes information concerning chemistry, synthesis technology, structure, and properties of liquid thiokols and thiokol-containing polyesters. It also presents a literary survey on chemism and mechanisms for liquid thiokols vulcanization involving oxidants or through polyaddition. The book describes formulation principles of sealants, their properties, and application areas.

Apple Academic Press

Market: General Chemistry
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Advanced Polymeric Materials
From Macro- to Nano-Length Scales
Edited by Sabu Thomas, Mahatma Gandhi University, Kottayam, India, Nandakumar Kalairikkal, Mahatma Gandhi University, Kerala, India, Maciej Jaroszewski, Wroclaw University of Technology, Poland and Jasmine P. Jose, Mahatma Gandhi University, Kottayam, Kerala, India

The aim of this new compendium is to provide a solid understanding of the recent developments in advanced polymeric materials from macro- to nano-length scales. Composites are becoming more important because they can help to improve our quality of life, such as being put into service in flight vehicles, automobiles, boats, pipelines, buildings, roads, bridges, and dozens of other products, including medical products. The chapters cover a multitude of important advances, including explanations of the significance of the new fillers, like graphene and carbon nanotubes, in different matrix systems.

Bio-based Composites for High-Performance Materials
From Strategy to Industrial Application
Edited by Wirasak Smithipong, Kasetsart Agricultural and Agro-Industrial Product Improvement Institute, Thailand, Runsgima Chollakup, Kasetsart University, Thailand and Michel Nardin, Institut de Science Des Matériaux de Mulhouse, CNRS, France

This timely text integrates disciplines such as materials science, polymer chemistry, plant science, chemical engineering, and nanotechnology to provide comprehensive coverage of the state of the art in bio-based composite materials. It discusses the raw materials used in bio-based composites, basic design principles, properties, applications, and life cycle assessments. The book also presents a strategic and policy-oriented view of these composites, addressing the competing needs of plants used for food versus plants used for sustainable feedstock.

Biodegradable Polymeric Nanocomposites
Advances in Biomedical Applications
Edited by Dilip Depan

Biomaterials based on polymers perform a time-limited function, but being foreign, they should disappear from the body once that function has been fulfilled. A wide range of polymers have been considered for biomedical applications such as drug delivery, biosensors, and tissue engineering. This book highlights recent developments in biodegradable polymer-based nanocomposites that are specifically aimed at biomedical applications and covers such items as degradation of polymers, in vitro case studies, and the interaction with biological systems at a nanoscale level.

Biofoams
Science and Applications of Bio-Based Cellular and Porous Materials
Edited by Salvatore Iannace, Universita di Napoli Federico II, Napoli, Italy and Chul B. Park, University of Toronto, Ontario, Canada

Written for students, professors, and professionals, this book covers biofoams and porous systems. Topics include bio-based polymers for the development of biodegradable and sustainable polymeric foams, foams in food, foams in biomedical applications, biohybrids and bio-inspired cellular and porous systems for lightweight, smart, and multifunctional structures.
Encyclopedia of Biomedical Polymers and Polymeric Biomaterials, 11 Volume Set
Edited by Munmaya Mishra, c/o Altia Research Center, Richmond, Virginia, USA, Editor in Chief, International Journal of Polymeric Materials and Polymeric Biomaterials, Taylor & Francis, Philadelphia, Pennsylvania, USA
Presenting state-of-the-art research and development on the application of novel polymers in a vital area, this groundbreaking work includes the insight of a large number of contributors from around the world who offer a broad-based perspective on a multitude of topics. This is an authoritative multi-volume reference on the broad subject area of polymer applications in the medical field. Designed for novices to experienced researchers, the encyclopedia is engineered to engage and educate to engineers and scientists (polymer, materials, biomedical engineers, biochemists, molecular biologists), pharmacists, doctors, cardiovascular and plastic surgeons, and students, as well as general readers in academia, industry, and research institutions.
CRC Press
Market: Biomaterials
April 2015: 8-1/2 x 11: 1044pp
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Ebook: 978-1-498-71546-1: $259.95
* For full contents and more information, visit: www.crcpress.com/9781482255553

Functionalyzed Polysulfones
Synthesis, Characterization, and Applications
Edited by Silvia Ioan, “Petru Poni” Institute of Macromolecular Chemistry, Lasi, Romania
This book focuses on polysulfones and their derivatives, which are used as functional materials due to their structural and physical characteristics. The text presents the bioapplications of polysulfones in two categories: blood-contacting devices and cell- or tissue-contacting devices. It analyzes surface wettability and hydrophicity trends, as well as morphological characteristics of modified polysulfones. It also introduces chelating units on the modified polysulfone structure to obtain potential applications, such as surface coatings, adhesives, high-temperature lubricants, electrical insulators, semiconductors, and the reduction of heavy-metal pollution in ecosystems.
CRC Press
Market: Polymer Science
April 2015: 6-1/8 x 9-1/4: 328pp
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Ebook: 978-1-498-71547-8: $259.95
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Foam Extrusion
Principles and Practice, Second Edition
Edited by S.-T. Lee, Sealed Air Corporation, Saddle Brook, NJ, USA and Chul B. Park, University of Toronto, Ontario, Canada
Series: Polymeric Foams
Combining scientific principles with engineering practice, this book discusses the theory, design, processing, and application of degraded foam extraction; presents the collective expertise of leading academic, research, and industry specialists, and educates on the potential of expanded foam. It also captures the innovative field of extrusion technology. The second edition includes new chapters on the latest developments in processing, rheology, and biodegradable and sustainable foams, as well as new coverage of cutting-edge foaming mechanisms and new case studies, examples, and figures.
CRC Press
Market: Materials Science
April 2014: 6-1/8 x 9-1/4: 624pp
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Fractal Mechanics of Polymers
Chemistry and Physics of Complex Polymeric Materials
G. V. Kozlov, Kabardino-Balkarian State University, Russia and Yu G. Yanovskii, Russian Academy of Sciences, Moscow
This new book explores the consideration of relationships that connect the structural and basic mechanical properties of polymeric mediums within the frameworks of fractal analysis with cluster model representations attraction. Incidentally, the choice of any structural model of medium or their combinations is defined by expediency and further usage convenience only. This book presents leading-edge research in this rapidly changing and evolving field.
Apple Academic Press
Market: General Chemistry
November 2016: 6-1/8 x 9-1/4: 384pp
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Green Polymer Composites Technology
Properties and Applications
Edited by Inamuddin
This book is a comprehensive introduction to “green” or environmentally friendly polymer composites developed using renewable polymers of natural origin such as starch, lignin, cellulose acetate, poly-lactic acid (PLA), polyhydroxylalkanoates (PHA), polyhydroxylbutyrate (PHB), etc., and the development of modern technologies for preparing green composites with various applications. The book also discusses major applications of green polymer composites in industries such as medicine, biotechnology, fine chemicals and engineering.
CRC Press
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July 2016: 6-1/8 x 9-1/4: 488pp
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Polymeric Materials & Plastics

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CRC Press
Market: Materials Science and Engineering
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Materials Science of Polymers
Plastics, Rubber, Blends and Composites
Edited by A. K. Haghi, University of Ottawa, Canada, Eduardo A. Castro, Universidad Nacional de La Plata, Buenos Aires, Argentina, Sabu Thomas, Mahatma Gandhi University, Kottayam, India, P. M. Sivakumar, Foreign Postdoctoral Researcher (FPR), RIKEN, Wako Campus, Japan and Andrew G. Mercader, Research Institute of Theoretical and Applied Physical-Chemistry (INIFTA), Argentina
The fundamentals of polymerization, polymer characteristics, rheology and morphology, as well as composition, technology, testing and evaluation of various plastics, rubbers, fibers, adhesives, coatings, and composites are comprehensively presented in this volume. The book presents the developments of advanced polyblends and the respective tools to characterize and predict the material properties and behavior. It provides original and theoretical experimental results that use non-routine methodologies often unfamiliar to many readers. Chapters on novel applications of more familiar experimental techniques and analyses of composite problems are included.
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May 2016: 6-1/8 x 9-1/4: 370pp
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Key Technologies in Polymer Chemistry
Edited by Nikolai D. Morozkin, Bashkir State University, Ufa, Russia, Vadim P. Zakharchov; Bashkir State University, Ufa, Russia and Gennady E. Zaikov, Kazan National Research Technological University, Russia
Series: AAP Research Notes on Polymer Science Engineering and Technology
With contributions from experts from both the industry and academia, this book presents the latest developments in polymer products and chemical processes. It incorporates appropriate case studies, explanatory notes, and schematics for more clarity and better understanding.
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Micro- and Nanostructured Polymer Systems
From Synthesis to Applications
Edited by Sabu Thomas, Mahatma Gandhi University, Kottayam, India, Robert Shanks, RMIT University, Melbourne, Australia and Jithin Joy, Mahatma Gandhi University, Kottayam, Kerala, India
This book focuses on the recent trends in micro- and nano-structured polymer systems, particularly natural polymers, biopolymers, biomaterials, and their composites, blends, and IPNs. This valuable volume covers the occurrence, synthesis, isolation, production, properties and applications, modification, as well as the relevant analysis techniques to reveal the structures and properties of polymer systems. This book will be valuable to scientists, physicians, pharmacists, engineers, and other specialists in a variety of disciplines, both academic and industrial.
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Materials Characterization
Modern Methods and Applications
Edited by Naryanaswami (Mohan) Ranganathan, University of Tours, France
This book gives a comprehensive state-of-the-art treatment to nanindentation techniques and applications (four chapters cover metals, polymers, and rubber—novel applications such as creep and impact tests results at micro/nano level are considered). In fact Chapter 1 is a thorough analysis of this technique, its possibilities, and future developments. There are two chapters regarding corrosion and abrasion resistance of metals and dental composites and three chapters treating fatigue—one on rubber that highlights a hitherto unknown mechanism in a chloroprene rubber. There is one chapter on a very precise technique for modulus measurements up to 1200 °C.
Pan Stanford
Market: Material Science
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Nanocomposites and Functional Materials
Fabrication, Characterization and Application
Yingtao Liu, University of Oklahoma, Norman, USA
This book reviews the recent research activities and publications concerning nanocomposites and functional materials, focusing on their fabrication, characterization, and diverse applications. It is designed to provide a clear idea of all the challenges that lie ahead before a nanocomposite or multifunctional material system can be implemented in a real structure. The book also discusses different techniques, providing pros and cons for each, allowing the reader to decide the best approach for his/her application.
CRC Press
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Natural Fiber Composites
Edited by R.D.S.G. Campilho, Instituto Superior de Engenharia do Porto, Portugal
This book brings value to anyone working with or designing natural fiber composite structures. It helps readers understand the value these materials can add to projects, how to choose the best materials and treatments, how to safely design and fabricate products made of natural fiber composites, and how to test them for safety. It covers the characterization of natural fibers, matrices and respective composites, and how to enhance their performance and processing as well as testing and degradation issues.

Optical Properties of Functional Polymers and Nano Engineering Applications
Edited by Vaibhav Jain, Alion Science and Technology, Annapolis Junction, Maryland, USA and Akshay Kokil, University of Massachusetts Lowell, USA
This comprehensive text provides a basic introduction to the optical properties of polymers, as well as a systematic overview of the latest developments in their nano engineering applications—including L-GRIN lenses, 3D holographic displays, optical gene detection, and more. Covering an increasingly important class of materials relevant not only in academic research but also in industry, this book emphasizes the importance of nano-engineering in improving the fundamental optical properties of the functional polymers, elaborating on high-level research while thoroughly explaining the underlying principles.

Photopolymers
Photoresist Materials, Processes, and Applications
Kenichiro Nakamura, Tokai University, Tokyo, Japan
Photopolymers have led to groundbreaking achievements in the electronics, optical engineering, and medical fields. At present, photopolymers have myriad applications in semiconductor device manufacturing, printed circuit boards (PCBs), ultraviolet (UV) curing, microelectromechanical systems (MEMS), and medical materials. Addressing topics such as chemically amplified resists, immersion lithography, extreme ultraviolet (EUV) lithography, and nanoimprinting, this book covers photopolymers from core concepts to industrial applications, providing the chemical formulae and structures of the materials discussed as well as practical case studies from some of the world's largest corporations.

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Polymers and Polymeric Composites

Properties, Optimization, and Applications

Edited by Liyli I. Bazylak, National Academy of Sciences of Ukraine, Lviv; Gennady E. Zaitkov, Kazan National Research Technological University, Russia; and A. K. Haghi, University of Ottawa, Canada

Series: AAP Research Notes on Polymer Science, Engineering and Technology

This volume highlights the latest developments and trends in advanced polyblends and their structures. It presents the developments of advanced polyblends and respective tools to characterize and predict the material properties and behavior. The book provides important original and theoretical experimental results that use non-routine methodologies often unfamiliar to many readers. Furthermore, chapters on novel applications of more familiar experimental techniques and analyses of composites problems are included, which indicate the need for the new experimental approaches that are presented.

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Market: Materials Science
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CRC Press
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Polymers and Polymeric Composites

New Edition

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This book describes the production, processing, and characteristics of a wide range of materials utilized in the modern tire and rubber industry. Containing contributions from leading specialists in the field, the text investigates the chemistry and modification of raw materials, elastomers, and material compounds for the optimal formulation and engineering of new rubber products. This second edition of the bestselling first adds information on environmental issues, recycling, hydraulic hose and conveyor belting, tire technologies, industrial rubber products, and the physics of rubber materials and manufacturing.
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Series: Chromatographic Science Series

This book provides a comprehensive source of knowledge of new sorbent materials, presenting fundamental principles for their syntheses, and adsorption properties. It presents advanced techniques employed to create specialized sorbents with a wide range of functions, which can be used to enhance the separation and/or purification of useful bioactive compounds, heavy metals, dyes, and more. It discusses original results compared with the most recent developments in the field of separation processes, covering specialized sorbents such as monolith cryogels, composite hydrogels, metal impregnated ion exchangers, and molecularly imprinted polymers.

CRC Press
Market: Chemistry
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eBook: 978-1-466-50439-4: $89.95
* For full contents and more information, visit: www.crcpress.com/9781482220551

Advances in Chromatography, Volume 52

Edited by Eli Grushka, Hebrew University of Jerusalem, Israel and Nelu Grinberg, Boehringer-Ingelheim Pharmaceuticals Inc., Ridgefield, Connecticut, USA

Series: Advances in Chromatography

For more than four decades, scientists and researchers have relied on the Advances in Chromatography series for the most up-to-date information on a wide range of developments in chromatographic methods and applications. For Volume 52, well-known chromatographers offer cutting-edge reviews of chromatographic methods with applications in the life sciences—from aerosol-based detectors to protein biomarker assays. The clear presentation of topics and vivid illustrations for which this series has become known make the material accessible and engaging to chemists at all levels of technical skill.

CRC Press
Market: Chemistry
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eBook: 978-1-466-50440-0
* For full contents and more information, visit: www.crcpress.com/9781482223507

Analysis and Analyzers

Edited by Bela G. Liptak, Liptak Associates, Stamford, Connecticut, USA and Kriszta Venczel

Now available in two volumes sold separately and together, this completely updated and expanded new edition of the Instrumentation and Automation Handbook, Fifth Edition is strategically split to provide the latest chapters from leading experts around the globe on both Analyses and Analyzers as well as Measurement and Safety.

CRC Press
Market: Engineering - Electrical
April 2016: 8-1/2 x 11: 1072pp
Hb: 978-1-498-72768-6: $279.95
eBook: 978-1-498-72769-3
* For full contents and more information, visit: www.crcpress.com/9781498727686


Maria Dolores Ugarte, Ana F. Militino, Public University of Navarre, Pamplona, Spain and Alan T. Arnholt, Appalachian State University, Boone, North Carolina, USA

Since the publication of the popular first edition, the contributed R packages on CRAN have increased from around 1,000 to over 6,000. This second edition explores how some of these new packages make analysis easier and more intuitive as well as create more visually appealing graphs. Along with adding new examples and exercises, this edition improves the existing examples, problems, concepts, data, and functions. Data sets, R functions, and more are available online.

Chapman and Hall/CRC
Market: Statistics
July 2015: 7 x 10: 983pp
Hb: 978-1-466-50440-0: $99.95
eBook: 978-1-466-50440-0
* For full contents and more information, visit: www.crcpress.com/9781466504400

Production of Colloidal Biogenic Selenium and Removal by Different Coagulation-Flocculation Approaches

Lucian C. Staicu, UNESCO-IHE Institute for Water Education, Delft, The Netherlands


Selenium (Se) is a chemical element of concern due to its toxicity and increasing anthropogenic release to the environment. In the current work one of its oxidation states, elemental selenium, Se(0), was investigated with regard to its colloidal properties and solid-liquid separation potential. Among the techniques used, chemical coagulation (addition of metal salts) and electrocoagulation (electrogeneration of the coagulant in situ using an electric charge) showed the highest removal efficiency. In conclusion, biogenic Se(0) must be removed in a biological post-treatment step and several approaches described in this work could be successfully used.

CRC Press
Market: Water Science, Technology and Engineering
July 2015: 6.7 x 9.5: 148pp
Pb: 978-1-138-02819-7: $79.95
* For full contents and more information, visit: www.crcpress.com/9781138028197
Chiroptical Spectroscopy

Fundamentals and Applications
Prasad L. Polavarapu, Vanderbilt University, Nashville, Tennessee, USA

This book details chiroptical spectroscopic methods: electronic circular dichroism (ECD), optical rotatory dispersion (ORD), vibrational circular dichroism (VCD), and vibrational Raman optical activity (VROA). For each technique, the text presents experimental methods for measurements and theoretical methods for analyzing the experimental data. It also includes a set of experiments that can be adopted for undergraduate teaching laboratories. Each chapter is written in an easy-to-follow format for novice readers, with necessary theoretical formalism in appendices for advanced readers.

CRC Press
June 2016: 6-1/8 x 9-1/4: 414pp
Hb: 978-1-466-56956-0: $199.95
eBook: 978-1-466-56957-7: $189.95

* For full contents and more information, visit: www.crcpress.com/9781420092462

Computational Optical Biomedical Spectroscopy and Imaging

Edited by Sarhan M. Musa, Prairie View A&M University, Houston, Texas, USA

Growth in the use of computational optical technology for biomedical research and health care has been explosive. New applications are made possible by emerging technologies in lasers, optical devices, fiber optics, spectroscopy, and imaging, all of which are being applied to medical research, diagnostics, and therapy. This book covers recent discoveries and research in the field by some of the best inventors and researchers in the world. It presents useful computational methods and applications used in optical biomedical spectroscopy and imaging. The book also discusses future applications, directions, opportunities, and challenges in technical industry, academia, and government.

CRC Press
Market: Biomedical Science
January 2015: 7 x 10: 476pp
Hb: 978-1-482-20381-9: $199.95
eBook: 978-1-482-20382-6: $179.95

* For full contents and more information, visit: www.crcpress.com/9781482203819

Handbook of Enhanced Spectroscopy

Edited by Marc Lamy de la Chapelle, Université Paris 13, Bobigny, France, Pietro Giuseppe Gucciardi, CNR Istituto per i Processi Chimico-Fisici, Messina, Italy and Nathalie Lidi Guiguig

Techniques such as Raman, infrared, fluorescence, and even nonlinear spectroscopies have recently grown in revolution and possibilities thanks to the use of nanostructured surfaces. The excitation of localized surface plasmon and the use of specific shapes of nanostructures have made it possible to gain an incredible sensitivity in these spectroscopic techniques. This book provides the reader with an overview of enhanced spectroscopies. Following an introduction to plasmon and electromagnetic effects arising in metallic nanostructures, it reviews the spectroscopic techniques enhanced by the presence of either a nanostructure or a tip.

Pan Stanford
Market: Analytical Chemistry
October 2015: 6 x 9: 546pp
Hb: 978-9-814-61332-3: $179.95
eBook: 978-9-814-61333-0

* For full contents and more information, visit: www.crcpress.com/9789814613323

Condensed Matter Optical Spectroscopy

An Illustrated Introduction
Julian Ionita, University of Bucharest, Faculty of Physics, Romania

This text shows how optical absorption spectroscopy and Raman spectroscopy are powerful techniques for studying condensed matter, particularly new properties that appear when many atoms come together and interact in systems at the atomic, molecular, and nano scales. With simple, illustrative examples throughout, the book emphasizes the visual nature of the field. It helps students understand the spatial arrangements of atoms, which determine properties of the matter and resulting spectra. It also presents the application of molecular symmetry on optical spectra using group theory.

CRC Press
Market: Chemistry / Spectroscopy
August 2014: 7 x 10: 414pp
Pack - Book and Ebook: 978-1-466-56956-0: $79.95

* For full contents and more information, visit: www.crcpress.com/9781466569560

High Brightness Metal Vapor Lasers

Physical Fundamentals and Mathematical Models
M. I. Kazaryan, Russian Academy of Sciences., Moscow, V. M. Batenin, Russian Academy of Sciences., Moscow, V. V. Buchanov, Russian Academy of Sciences., Moscow, A. M. Boichenko, Russian Academy of Sciences., Moscow, I. I. Klimovskii, Russian Academy of Sciences., Moscow, and E. I. Molodykh, Russian Academy of Sciences., Moscow

High brightness metal vapor lasers have become the most bright and powerful in the visible spectral range among all existing laser types, resulting in numerous applications ranging from purely fundamental research to practical application in large-scale commercial problems such as isotope selection. This book presents a full series of fundamental problems on the development of physical fundamentals and mathematical models for practical realization of a high-power laser radiation on self-contained transitions in metal atoms. It is the first fundamental review on physics and the technique of high-brightness metal vapor lasers.

CRC Press
Market: Physics
January 2016 6-1/8 x 9-1/4: 600pp
Hb: 978-1-482-25004-6: $179.95
eBook: 978-1-482-25005-3

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High Brightness Metal Vapor Lasers

Physics and Applications
M. I. Kazaryan, Russian Academy of Sciences., Moscow, V. M. Batenin, Russian Academy of Sciences., Moscow, V. V. Buchanov, Russian Academy of Sciences., Moscow, A. M. Boichenko, Russian Academy of Sciences., Moscow, I. I. Klimovskii, Russian Academy of Sciences., Moscow, and E. I. Molodykh, Russian Academy of Sciences., Moscow

This work presents the physics and applications of high-power laser radiation on self-contained transitions in metal atoms. High brightness metal vapour lasers are considered the most powerful in the visible spectral range among all existing laser types. This has resulted in numerous applications ranging from purely fundamental scientific research problems to practical application in large-scale commercial problems such as isotope selection. The material is presented by highly regarded scientists, and much of the content has not been previously available to western scientists.

CRC Press
Market: Physics
January 2016 6-1/8 x 9-1/4: 600pp
Hb: 978-1-482-25012-1: $179.95
eBook: 978-1-482-25014-5

* For full contents and more information, visit: www.crcpress.com/9781482250121

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High-Resolution XAS/XES
Analyzing Electronic Structures of Catalysts
Edited by Jacinto Sa, Paul Scherrer Institute, Switzerland and Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw
This book covers recent developments in X-ray light sources, detectors, crystal spectrometers, and photon-in-photon-out core level spectroscopy techniques. Providing a comprehensive overview of this exciting field, the text addresses photon-in-photon-out core level spectroscopy applications for the study of catalytic systems, highlighting hard X-ray measurements. Complete with guidelines for the use of this type of spectroscopy, it describes the advantages and disadvantages of each spectrometer developed to perform core level X-ray spectroscopy, detailing methods to elucidate aspects of catalysts under working conditions, such as active sites and molecules adsorption.
CRC Press
Market: Materials Science
July 2014: 6-1/8 x 9-1/4: 244pp
Hb: 978-1-466-59407-4: $187.95
ebook: 978-1-466-59298-8:
* For full contents and more information, visit: www.crcpress.com/9781466592988

Isotope Ratio Mass Spectrometry of Light Gas-Forming Elements
Edited by V.S. Sevastyanov, Vernadsky Institute of Geochemistry and Analytical Chemistry, Russian Academy of Sciences, Moscow
Providing a complete picture of the latest advancements in the field, this book explores different methods of isotope analysis, including spark, secondary-ion, laser, glow discharge, and isotope ratio mass spectrometry. It explains how to determine the isotopic composition of light elements in solid, liquid, and gaseous samples of organic and inorganic substances, aiding readers from a variety of disciplines in identifying the fundamental processes in biological, ecological, and geological systems and in revealing the subtle features of many physicochemical processes and chemical transformations.
CRC Press
Market: Chemistry
July 2014: 6-1/8 x 9-1/4: 244pp
Hb: 978-1-466-59407-4: $187.95
ebook: 978-1-466-59408-1:
* For full contents and more information, visit: www.crcpress.com/9781466594074

Lecture Notes on Impedance Spectroscopy
Volume 5 -
Edited by Olfa Kanoun, Chemnitz University of Technology, Chemnitz, Germany
Impedance Spectroscopy is a powerful measurement method used in many application fields such as electrochemistry, material science, biology and medicine, semiconductor industry and sensors. Using the complex impedance at various frequencies increases the informational basis that can be gained during a measurement. It helps to separate different effects that contribute to a measurement and, together with advanced mathematical methods, non-accessible quantities can be calculated. This book is the fifth in the series Lecture Notes on Impedance Spectroscopy (LNS) and is of interest to graduated students, engineers, researchers and specialists dealing with impedance spectroscopy.
CRC Press
Market: Analytical Chemistry
January 2015: 134pp
Hb: 978-1-138-02754-1: $79.95
ebook: 978-1-315-71366-3:
* For full contents and more information, visit: www.crcpress.com/9781138027541

NMR Spectroscopy in Liquids and Solids
Vladimir I. Bahmutov
This book provides an introduction of the general concepts behind NMR and its applications, including how to perform adequate NMR experiments and interpret data collected in liquids and solids to characterize molecule systems in terms of their structure and dynamics. It covers the theoretical basis of NMR spectroscopy, the theory of NMR relaxation, and the practice of relaxation measurements. NMR spectroscopy and relaxation studies in solution and general principles and strategies involved in solid state NMR studies are also discussed.
CRC Press
Market: Chemistry
October 2015: 8-1/2 x 11: 755pp
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ebook: 978-1-498-71962-9:
* For full contents and more information, visit: www.crcpress.com/9781482262704

Pharmaceutical and Medical Applications of Near-Infrared Spectroscopy, Second Edition
2nd Edition
Emil W. Ciurczak, Doramaxx Consulting, Goldens Bridge, New York, USA and Benoît Igne
Series: Practical Spectroscopy
Now in its second edition, this volume covers the instrumentation, computerization, calibration, and methods development of NIR spectroscopy. It examines novel applications for accurate time- and cost-effective analyses of pharmaceuticals and biomedical applications. The book covers pharmaceutical assays, including qualitative analysis, quantitative analysis, determination of actives in tablets and capsules, and considerations for intact dosage form analysis. It also explores a range of medical applications, including those related to blood glucose measurements, tissue and major organ analysis, fetal analysis, and cancer research.
CRC Press
Market: Spectroscopy
December 2014: 6-1/8 x 9-1/4: 172pp
Hb: 978-1-439-84144-6: $159.95
ebook: 978-1-498-70446-5:
* For full contents and more information, visit: www.crcpress.com/9781420084146

Problems in Organic Structure Determination
A Practical Approach to NMR Spectroscopy
Edited by Roger G. Linington, Simon Fraser University, Burnaby, British Columbia, Canada, Philip G. Williams, University of Hawaii, USA and John B. MacMillan, U.T. Southwestern, Texas, USA
At a point where most introductory organic chemistry texts end, this problems-based workbook picks up the thread to lead students through a graduated set of 120 problems. With extensive detailed spectral data, it contains a variety of problems designed by renowned authors to develop proficiency in organic structure determination. It presents a concept-based learning platform, introducing key concepts sequentially and reinforcing them with problems that exemplify the complexities and underlying principles that govern each concept.
CRC Press
Market: Chemistry
October 2015: 8-1/2 x 11: 755pp
Hb: 978-1-498-71962-9: $159.95
ebook: 978-1-498-71963-6:
* For full contents and more information, visit: www.crcpress.com/9781498719629
Spectral Methods in Geodesy and Geophysics
Christopher Jekeli

This book provides a rigorous treatment of spectral analysis using Fourier-based techniques in the geosciences, specifically geodesy and geophysics that deal with global and regional spatial data. It emphasizes spatial-frequency analysis for data on the plane and sphere. It includes applications to stochastic processes on the plane and sphere, which are important for many estimation problems that are based on some kind of stochastic constraints in inverse theory. It also briefly outlines wavelet analysis, although unusual, it is included to illustrate the contrast to traditional spectral analysis, going more toward a time-frequency analysis.

CRC Press
Market: Physics
June 2016: 6 x 9: 200pp
Hb: 978-1-482-24525-7: $169.95
eBook: 978-1-482-24526-4

* For full contents and more information, visit: www.crcpress.com/9781482245257
Bio-Inspired Wettability Surfaces
Developments in Micro- and Nanostructures
Edited by Zheng Yongmei, Beijing University, China, Cheng Qinfeng, Beijing University, China, Hou Yongping, Beijing University, China, and Yuan Chen, Beijing University, China

Biological surfaces provide endless inspiration for the design and fabrication of functional interface materials with unique wettability, generating promising applications such as micro-fluidic devices, functional textiles, corrosion resistance, liquid transportation, and anti-fogging. This book presents the mechanism of smart wetting control, such as water collection/repellency on biological micro-nanostructure gradient interfaces. It also offers approaches on how to mimic the biological features to realize the bioinspired functional surfaces with unique wettability. The book will help researchers to develop the innovative design of novel materials.

Pan Stanford
Market: Materials Science
June 2015: 6 x 9: 216pp
Hb: 978-9-814-46360-7: $149.95
* For full contents and more information, visit: www.panstanford.com/9789814463607

Biosurfactants
Production and Utilization—Processes, Technologies, and Economics
Edited by Naim Kosaric, University of Western Ontario, London, Canada and Fazilet Vardar Sukan, Ege University, Izmir, Turkey

Biosurfactants can successfully replace and augment the properties of chemically synthesized surface-active agents. This book contains specially chapters dealing with methods for production of biosurfactants on a laboratory and industrial/commercial scale. It presents novel and proven applications of biosurfactants. The new edition is aimed at actual production and applications of biosurfactants in modern biotechnology, reflecting the advances made since the publication of the first edition. A special chapter is devoted to the overview and evaluation of specific selected patents relating to biosurfactants.

CRC Press
Market: Biotechnology
November 2014: 7 x 10: 389pp
Hb: 978-1-466-59669-6: $199.95
ebook: 978-1-466-59670-2/0
* For full contents and more information, visit: www.crcpress.com/9781466596696

Biosurfactants
Research Trends and Applications
Edited by Catherine N. Mulligan, Concordia University, Quebec, Canada, Sanjay K. Sharma, JECRC University, Jaipur, India and Ackmez Mudhoo, University of Mauritius, Mauritius

Biosurfactants have the properties of reducing surface tension, stabilizing emulsions, promoting foaming and are generally non-toxic and biodegradable. Interest in microbial surfactants has been steadily increasing in recent years due to their diversity, environmentally friendly nature, possibility of large-scale production, selectivity, and potential applications in environmental protection. This book provides an up-to-date, coherently written and objectively presented set of book chapters from eminent international researchers who are actively involved in academic and technological research in the area of biosurfactants.

CRC Press
Market: Applied Chemistry
February 2015: 6-1/8 x 9-1/4: 352pp
Hb: 978-1-466-51823-0: $199.95
ebook: 978-1-466-51824-7
* For full contents and more information, visit: www.crcpress.com/9781466518230

Computational Methods for Complex Liquid-Fluid Interfaces
Edited by Mohammad Taebi Rahni, Max Planck Institute of Colloids and Interfaces, Potsdam, Germany, and Sharif Karbaschi and Reinhard Miller, Max Planck Institute of Colloids and Interfaces, Potsdam, Germany

Series: Progress in Colloid and Interface Science

This book highlights key computational challenges involved in the two-way coupling of complex liquid-fluid interfaces. It covers the most important interfacial quantities and their experimental investigations, providing theoretical background and detailed solutions. It describes vital techniques used in interfacial flow problems, such as modern meshless numerical methods and conventional computational fluid dynamics methods. The book also discusses the technicalities of correctly using the computational methods developed for interfacial flows, as well as the simulation of interesting interfacial flow physics.

CRC Press
Market: Chemistry/Fluid Mechanics
December 2015: 7 x 10: 538pp
Hb: 978-1-498-72208-7: $149.95
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CRC Press
Market: Surface and Colloid Chemistry
August 2015: 8-1/2 x 11: 8480pp
Hb: 978-1-466-59045-8: $4200.00
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CRC Press
Market: Surface and Colloid Chemistry
July 2015: 8-1/2 x 11: 8480pp
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ebook: 978-1-466-59061-8
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SURFACE & COLLOID CHEMISTRY

80

Clay Nanocomposites

Edited by Kasper Moth-Poulsen, Chalmers University of Technology, Gothenburg, Sweden

With contributions from chemists, physicists, theoreticians, and engineers, this book covers single-molecule electronics, from the theory through experimental realizations and the chemical synthesis of molecular components to the implementation of molecular components in future integrated circuits. It describes established methods and recent advances, including vibrational effects, switching phenomena, quantum interference, thermal power, and parallel assembly strategies. The authors add more details to the chapters than typically found in the primary literature, so that the book can be read not only by specialists but also by non-experts and students.

Handbook of Single-Molecule Electronics

Edited by Kasper Moth-Poulsen, Chalmers University of Technology, Gothenburg, Sweden

With contributions from chemists, physicists, theoreticians, and engineers, this book covers single-molecule electronics, from the theory through experimental realizations and the chemical synthesis of molecular components to the implementation of molecular components in future integrated circuits. It describes established methods and recent advances, including vibrational effects, switching phenomena, quantum interference, thermal power, and parallel assembly strategies. The authors add more details to the chapters than typically found in the primary literature, so that the book can be read not only by specialists but also by non-experts and students.

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Edited by K. S. Birdi, KSB Consultant, Holte, Denmark

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Introduction to Polymer–Clay Nanocomposites

Ahmet Gurses

This book focuses on polymer–clay nanocomposite materials. It introduces readers to polymers, clays, and organo-clay and discusses the nature of interparticle interactions and physical adsorption, which are predominant in the synthesis of organo-clay; conversion of clay to organo-clay; interactions between functional groups in the interlayer region of clay and modifier ions; synthesis of organo-clays and their uses, and the commercial utilization of organo-clays. The text then covers the preparation of polymer–clay nanocomposites and their characterization, properties, performance, and applications.

Microwave Engineering of Nanomaterials

From Meso to Nanoscale

Edited by Erwann Guenin, Université Paris 13, Bobigny, France

This book presents recent improvements in microwave engineering of materials and nanomaterials. It introduces microwave chemistry and their interactions with materials, several prominent researchers in material sciences and nanosciences show advances in microwave technologies in several domains such as synthesis and modification of polymers, processing of various materials (ceramics, glasses, metallic alloys, and zeolites), and synthesis and functionalization of diverse nanomaterials (carbon nanotubes, MOF semiconductors, inorganic nanoparticles).

Nanocomposites Characterization

Technology and Industrial Applications

Edited by Kay Matin, AlphaSTAR Corporation, USA, Longbeach, California and Frank Abdi, Alpha STAR Co., Long Beach, California, USA

This book is unique as it provides a multi-scale, multi-physics, and statistical analysis combined with multi-scale progressive failure analysis approach. The combination gives a very powerful tool for minimizing tests, improving accuracy, and understanding the effect of statistical nature in materials in addition to the mechanics of the advanced multi-scale material all the way to failure. The book focuses on methodology details backed with comparison of predictions with test data for various types of static, fatigue, dynamic, and crack growth problems.

Physical-Chemical Mechanics of Disperse Systems and Materials

Eugene D. Schuchkin, Johns Hopkins University, Baltimore, MD and Andrei S. Zelenev

Series: Progress in Colloid and Interface Science

This book, based on material used for lecture courses on physical–chemical mechanics, is a comprehensive overview of physical–chemical mechanics, a discipline that bridges solid-state physics and materials science. It investigates the complex physical–chemical interfacial phenomena that occur during the transition of a dispersed system into a material and of the dispersal of a bulk material. It also devotes attention to the experimental methods used in physical–chemical mechanics and the relevant instruments.
Processes of Formation of Micro-and Nanodispersed Systems

A. A. Bochkarev, Kutateladze Institute of Thermodynamics, Novosibirsk, Russia and V. I. Polyakova, Kutateladze Institute of Thermodynamics, Novosibirsk, Russia

This book is a comprehensive analysis and presentation of the physical processes and phenomena that lead to the formation of disperse materials. It also details the properties of disperse materials yielded from various processes. Using currently available data, it compares different methods of producing disperse materials in terms of scale and describes several applications of the experimental results it presents. It represents the current state of research and practice in micro- and nanodispersed systems while highlighting paths to advancement in the field.

CRC Press
Market: Chemistry
November 2015: 6-1/8 x 9-1/4: 462pp
Hb: 978-1-482-25146-3: $174.95
ebook: 978-1-482-25146-3

Surface Phenomena in the Structural and Mechanical Behaviour of Solid Polymers

L. Volynski and N. F. Bakeev, Lomonosov Moscow State University, Russia

This book examines the role of various surface phenomena in structural and mechanical behaviour of amorphous and semicrystalline polymers. A detailed description of the development and healing of interfacial surface as well as the response to diverse external impacts on solid polymers is presented. Nearly all modes of external impact (mechanical, thermal, electrical, etc.) on the polymer entail changes in its interfacial surface, and this process is accompanied by the transfer of the material from bulk to surface, and vice versa. The Rehbinder effect in polymers and the effect of various surface modifications are described, and the role of surface phenomena is highlighted.

CRC Press
Market: Chemistry
January 2016: 6-1/8 x 9-1/4: 544pp
Hb: 978-1-498-74368-6: $169.95
ebook: 978-1-498-74369-3

Surfactant Science and Technology
Retrospects and Prospects

Edited by Laurence S. Romsted, Rutgers University, New Brunswick, NJ

This book provides a broad perspective on recent developments and future possibilities in surfactant science and technology. It contains chapters by leaders in surfactant-based physical, organic, and materials chemistries, including many who participated in a special symposium honoring Kash Mittal’s 100th edited book at the 18th Surfactants in Solution meeting in Melbourne, Australia. Each chapter provides an overview of a specific research area, including past, present, and future directions. Both theory and applications are covered, including micellization and ion binding theories, biosurfactants, liquid formulations, drug delivery, and enhanced oil recovery.

CRC Press
Market: Chemistry
May 2014: 7 x 10: 593pp
Hb: 978-1-439-88295-5: $249.95
ebook: 978-1-439-88296-2

Surfactants in Tribology, Volume 4

Edited by Girma Biresaw, USDA, ARS, NCAUR, CPF, Peoria, Illinois, USA and K.L. Mittal, Hopewell Junction, New York, USA

This fourth volume in a new series offers information on advances in the tribological aspects of innovative areas in micro- and nanodevices, including MEMS, NEMS, biosurfactants, biolubricants, and bioemulsions. Written by a global team of respected authors, it serves as a reference for scientists and engineers developing advanced materials and devices where nanoscale understanding of the tribological properties is critical. The text offers up-to-date coverage of the state of the art, with an emphasis on green solutions. Cutting-edge topics include the superlubricity of fullerenes, nanotribology of SAMs, and the effect of surface texturing on tribological phenomena, among many others.

CRC Press
Market: Materials Science & Engineering
November 2014: 6-1/8 x 9-1/4: 533pp
Hb: 978-1-466-58337-5: $224.95
ebook: 978-1-466-58338-2

Water at Interfaces
A Molecular Approach

Jordi Fraxedas, ICN2 & CSIC, Bellaterra (Barcelona), Spain

This book provides a broad, multidisciplinary introduction to water at interfaces, focusing on its molecular nature. It is written for practicing scientists and engineers who want a fundamental understanding of what water does at surfaces and interfaces. It covers a host of examples to convey general principles, including the hydrophobicity and hydrophilicity of materials, the special structure of interfacial water for biological and electrochemical processes, the role of water at biosurfaces (DNA, proteins, and membranes), friction and adhesion, marine aerosols, ice formation, wetting-dewetting, and filtration.

CRC Press
Market: Chemistry
April 2014: 6-1/8 x 9-1/4: 258pp
Hb: 978-1-439-86104-2: $174.95
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Fundamentals and Technology Advances
Debabrata Das, Namita Khanna and Chitrakshita Nag Dasgupta
This book compiles the fundamentals of biohydrogen production technology. It offers comprehensive coverage of microbiology, biochemistry, feedstock requirements, and molecular biology of the biological hydrogen production processes. It also gives insight into scale-up problems and limitations. In addition, the book discusses mathematical modeling of the processes involved in biohydrogen production and the software required to model the processes. It also summarizes research advances, discusses bottlenecks of the various processes, and covers the process economy, policy, and environmental impact of this technology.

Chemical and Biochemical Engineering
New Materials and Developed Components
Edited by Ali Pourhashemi, Christian Brothers University, Memphis, Tennessee, USA, Gennady E. Zaikov, Kazan National Research Technological University, Russia and A. K. Haghi, University of Ottawa, Canada
Series: AAP Research Notes on Chemical Engineering
This book facilitates the study of problematic chemicals in such applications as chemical fate modeling, chemical process design, and experimental design. This volume provides comprehensive coverage of modern biochemical engineering, detailing the basic concepts underlying the behavior of bioprocesses as well as advances in bioprocess and biochemical engineering science. It combines contemporary engineering science with relevant biological concepts in a comprehensive introduction to biochemical engineering.

Environmental Biotechnology
Biodegradation, Bioremediation, and Bioconversion of Xenobiotics for Sustainable Development
Edited by Jeyabalai Sangeetha, Karnataka University, Dharwad, India, Devajaran Thangadurai, Karnataka University, Dharwad, India, Muniswamy David, Ramakrishna University, Dharwad, India, and Mohd. Azmuddin Abdullah, Universiti Malaysia Terengganu, Kuala Terengganu, Malaysia
With focus on the practical use of modern biotechnology for environmental sustainability, this book provides a thoughtful overview of molecular aspects of environmental studies to create a new awareness of fundamental biological processes and sustainable ecological concerns. It covers the latest research by prominent scientists in modern biology and delineates recent and prospective applications in the sub-areas of environmental biotechnology with special focus on the biodegradation of toxic pollutants, bioremediation of contaminated environments, and biocconversion of organic wastes toward a green economy and sustainable future.

Chemical and Bioprocess Engineering
Trends and Developments
Edited by Shrish Sonawane, National Institute of Technology, Warangal, Andhra Pradesh, India, Y. Pydi Setty, National Institute of Technology, Warangal, Andhra Pradesh, India and Srinu Naik Sapavatu
Examining energy, environment, and sustainability from the chemical engineering point of view, this book highlights critical issues faced by chemical engineers and biochemical engineers worldwide. The book covers recent trends in chemical engineering and bioprocess engineering, such as CFD simulation, statistical optimization, process control, waste water treatment, micro reactors, fluid bed drying, hydrodynamic studies of gas-liquid mixture in pipe, and more. Other chapters cover important ultrasound-assisted extraction, process intensification, polymers and coatings, as well as modelling of bioreactor and enzyme systems and biological nitrification.

Foam Fractionation
Principles and Process Design
Paul Stevenson and Xueliang Li
This book explains the underlying physics of foam fractionation, describes process intensification strategies, provides design guidance for plant-scale installations, contains the latest knowledge of foam fractionation transport processes, and presents a case study of the world’s largest commercial foam fractionation plant producing the food preservative Nisin. It capitalizes on the authors’ extensive practical experience of foam fractionation and allied processes to give process engineers, industrial designers, chemical engineers, academics, and graduate students a greater understanding of the mechanistic basis and real-world applications of foam fractionation.

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Membrane Processing of Liquid Foods and Beverages

Edited by Minh H. Nguyen
Series: Contemporary Food Engineering

A review of the progress in individual membrane technologies of the last decade, this book includes basic principles and theories, advances in design and operation, food applications, and current and future trends and developments. The chapter authors address the available membranes and modules, the basics of the process and tier process design, and specific applications in the food industry.

CRC Press
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Supercritical Fluids Technology in Lipase Catalyzed Processes

Sulaiman Al-Zuhair and Hanifa Taher
This book outlines supercritical fluids as a green alternative reaction medium in catalytic reactions involving lipases. Lipases have a great potential in industrial applications and the text describes their main sources, reaction kinetics, structure, physicochemical characteristics, and applications. It discusses lipase immobilization and its advantages over soluble lipases, immobilization techniques, immobilization materials, and bioreactor configurations using immobilized lipase. It also explores the advantages of non-aqueous media in biochemical synthesis and includes a case study on using SC-CO₂ for biodiesel production.

CRC Press
Market: Engineering - Chemical
December 2015: 6-1/8 x 9-1/4: 160pp
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Principles of Downstream Techniques in Biological and Chemical Processes

Edited by Mukesh Doble, Bhupat & Jyoti Mehta School of BioSciences Building, Chennai, India

Downstream processing is an essential practice in the production and purification of biosynthetic materials, which is especially important in the production of pharmaceutical products. This book covers the fundamentals and the design concepts of various downstream recovery and purification steps (unit operations) involved in biochemical and chemical processes. The book describes cell breakage and recovery of intracellular material, isolation of solids, product recovery, product enrichment, and product polishing and finishing. It also covers basic chemical engineering purification techniques such as distillation, absorption, adsorption, etc.

Apple Academic Press
Market: Chemical Engineering
December 2015: 6 x 9: 234pp
Hb: 978-1-771-88140-1 $119.95
ebook: 978-1-498-73250-5
* For full contents and more information, visit: www.crcpress.com/9781771881401
Environmental Forensics Fundamentals
A Practical Guide
Joana Gloria Petrisor, Vista, California, USA
This book contains state-of-the-art information in the emerging field of environmental forensics. Exemplified through real case studies, it provides an up-to-date overview of main environmental forensics techniques. Emphasizing methodologies targeting both the contaminant and the associated environmental matrix, it presents a variety of challenging situations and offers appropriate solutions through practical application of forensic techniques. The book is meant to function as a “road map” and it presents users with a comprehensive forensic toolkit and the knowledge of how to use it in challenging situations.

Membrane Bioreactor Processes
Principles and Applications
Seong-Hoon Yoon, Ecolab, Naperville, Illinois, USA
A good fundamental understanding of membranes and membrane systems and of biological systems is crucial in properly addressing the evaluation, selection, design, and operation of membrane bioreactors. This book covers nearly all the theoretical and practical aspects of membrane bioreactor technology with up-to-date information. By understanding the ties between theories and practices, readers will not only understand what can be accomplished with current technology, but why this occurs, and how theoretical and practical limits may be overcome in the future.

Fluoride in Drinking Water
Status, Issues, and Solutions
A.K. Gupta, Indian Institute of Technology Kharagpur, India and S. Ayooob, TMI College of Engineering, Kerala, India
The aim of this book is to highlight the dimensions of the problem and suggest scientific solutions. The global status of fluoride pollution is conceptually presented in this book. Most of the recent scientific studies undertaken the world over, are carefully summarized and tabulated so as to generate a global database on the status of fluoride pollution. Further, the health issues and associated human stress effects are scientifically discussed. The conventional approaches used for defluoridation in the fluoride endemic areas are discussed in detail, highlighting their limitations. A comparative evaluation of the technologies used for defluoridation has been presented as well.

Nanocomposites in Wastewater Treatment
Edited by Ajay Kumar Mishra, University of Johannesburg, South Africa
Using an interdisciplinary approach, this book provides a comprehensive discussion about nanocomposites for remediation of waste water and microbial treatment. It presents the fundamental knowledge and recent advancements for research and development. It covers biopolymers-based nanocomposites for organic/inorganic pollutant removal and techniques for decontamination of water.

4th Edition · TEXTBOOK
Fundamentals of Ecotoxicology
The Science of Pollution, Fourth Edition
Michael C. Newman, College of William & Mary, Gloucester Point, Virginia, USA
This new edition has been revised throughout, and is now in full color. It provides more international perspective, and adds more case studies from around the world. It also addresses environmental law. The book has been updated to include emerging issues and important themes and events such as the environmental accidents at Fukushima Japan and in the Gulf of Mexico. It details key environmental contaminants, explores their fates in the biosphere, and discusses bioaccumulation and the effects of contaminants at increasing levels of ecological organization.

Pharmaceutical Accumulation in the Environment
Prevention, Control, Health Effects, and Economic Impact
Edited by Walter E. Goldstein, Goldstein Consulting Company, Las Vegas, Nevada, USA
This book describes health impact concerns and technologies in place and in development, and offers steps leading to proposed solutions. It suggests ways to manage risks to meet challenges that include both private enterprise initiatives and public sector involvement. It proposes the type of controls needed to address pharmaceutical contamination, stressing bioreactors of particular types, augmented by the process modifications needed. The book covers the impact and changes needed at sites such as hospitals, pharmaceutical factories, waste treatment plants, water purification sites, farms, and households.
Phosphate in Soils

Interaction with Micronutrients, Radionuclides and Heavy Metals

Edited by H. Magdi Selim, Louisiana State University, Baton Rouge, USA

Series: Advances in Trace Elements in the Environment

Several studies have suggested varied interactions of heavy metals with phosphates in soils and the effects of phosphate on the bioavailability and mobility of heavy metals. Edited by one of the best specialists in soil science, this book focuses on the impact of phosphate on the fate of heavy metals in soils and heavy metals in the soil-water-plant as affected by phosphate. It features coverage of sorption and mobility influenced by the presence of phosphate in the vadose zone.

Product Stewardship

Life Cycle Analysis and the Environment

Kathleen Sellers, ERM, Boston, Massachusetts, USA

Those in industry who produce goods for market must comply with global product stewardship regulations and also be cognizant of the needs of consumers concerned with sustainability. This book bridges the academic study of life cycle analysis with these practical concerns. It examines multiple product stewardship regulations from around the world and describes present concepts of life cycle assessment in concrete terms and plain English. It also incorporates several real-world case studies to illustrate the challenges of product stewardship.

Wastewater Treatment

Occurrence and Fate of Polycyclic Aromatic Hydrocarbons (PAHs)

Edited by Amy J. Forsgren, Xylem Inc., Sundbyberg, Sweden

Series: Advances in Water and Wastewater Transport and Treatment

Polycyclic Aromatic Hydrocarbons (PAHs) are a group of semi-volatile organic compounds that are formed during the incomplete burning of gas, coal, oil, wood, garbage, or other organic substances. PAHs are a concern because a number of them have been identified as genotoxic and/or carcinogenic. They pose a threat to ecological systems and can cause health problems. A significant source of PAHs is the effluent of wastewater treatment plants. This book explores the occurrence and the treatability of PAHs in wastewater treatment.
Advances in Heat Pump-Assisted Drying Technology

Edited by Vasile Minea, Hydro-Québec Research Institute, Shawinigan, Québec, Canada

Series: Advances in Science & Technology

Conventional dryers offer limited opportunities to increase energy efficiency. Heat pump dryers are more energy and cost effective, as they can recycle drying thermal energy and reduce CO2, particulate, and VOC emissions due to drying. This book provides an introduction to the technology and current best practice. It enables the reader to engage confidently with the technology and provides a wealth of information on theories, principles, current practices and future direction of the technology. It will answer questions about risks, advantages vs. disadvantages, impediments, and will offer solutions to current problems.

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3rd Edition - TEXTBOOK - NEW EDITION

Applied Mathematical Methods for Chemical Engineers, Third Edition

Norman W. Loney, New Jersey Institute of Technology, Newark, USA

This book uses worked examples to showcase several mathematical methods that are essential to solving real-world process engineering problems. The third edition includes additional examples related to process control, Bessel Functions, and contemporary areas such as drug delivery. The author inserts more depth on specific applications such as nonhomogeneous cases of separation of variables, adds a section on special types of matrices such as upper- and lower-triangular matrices, incorporates examples related to biomedical engineering applications, and expands the problem sets of numerous chapters.

CRC Press
Market: Engineering - Chemical
October 2015: 6-1/8 x 9-1/4: 545pp
Hb: 978-1-4665-5299-9 $119.95
ebook: 978-1-4665-5301-9
Prev Ed Hb: 978-0-8493-9578-3
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Compact Heat Exchangers for Energy Transfer Intensification

Low Grade Heat and Fouling Mitigation

Jiri Jaromir Klemes, University of Pannonia, Veszprém, Hungary, Olga Arsenyeva, National Technical University, Kharkiv Polytechnic Institute, Ukraine, Petro Kapustenko, National Technical University, Kharkiv Polytechnic Institute, Ukraine and Leonid Tovazhnyanskyy, National Technical University, Kharkiv Polytechnic Institute, Ukraine

This book not only highlights key developments in compact heat exchangers, but also instills a practical knowledge of the latest process integration and heat transfer enhancement methodologies. Presenting illustrative case studies of applications in food and chemical production plants, the text progresses from the basic principles, terminology, and heat transfer aspects of compactness to the mitigation of fouling in heat exchangers and their systems. It also delivers a thoughtful analysis of the economics of implementation, considering energy–capital trade-off, capital cost estimation, and energy prices.

CRC Press
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Encyclopedic Dictionary of Named Processes in Chemical Technology, Fourth Edition

Alan E. Comyns, Consultant, Chester, UK

In the six years since the third edition was completed, there have been major changes in the chemical industry, reflected in new named processes being developed. Gathering and defining a large portion of special named processes, this fourth edition provides a single-source reference on an extensive array of named processes that are not self-explanatory. Written by a highly experienced and respected author, this user-friendly text is presented in a practical dictionary format that is useful for a broad audience.

CRC Press
February 2014: 7 x 10: 416pp
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* For full contents and more information, visit: www.crcpress.com/9780415695381
Flow Assurance: Fundamentals of Solids in Oil and Gas Production
Jon Steinar Gudmundsson
A multitude of mechanisms are responsible for precipitation and deposition of solids in oil and gas production. This book deals with the basic phenomena regarding the occurrence of obstructions by solids. It further discusses the four most common solids in gas and oil: asphaltene, paraffin wax, gas hydrate and inorganic solids, thus providing a guide on their occurrence and prevention. The book combines all relevant information on solids for the oil and gas industry in one text with detailed appendices, tables and diagrams for more specialist information.
CRC Press
Market: Petroleum Engineering
June 2016: 1.80pp
Hb: 978-0-415-68083-7: $69.95
* For full contents and more information, visit: www.crcpress.com/9780415680837

Introductions to Software for Chemical Engineers
Edited by Mariano Martin
This book introduces the capabilities of various general purpose, mathematical, process modeling and simulation, optimization, and specialized software for use in solving typical problems in fluid mechanics, heat and mass transfer, mass and energy balances, unit operations, reactor engineering, and process and equipment design and control. It employs nitric acid production, methanol and ammonia recycle loops, and SO2 oxidation reactor case studies and other practical examples to demonstrate the real-world applicability of Excel, MATLAB®, Mathcad, CHEMCAD, Aspen HYSYS®, gPROMS, CFD, DEM, GAMS, AIMMS, and more.
CRC Press
Market: Chemical Engineering
July 2014: 6-1/8 x 9-1/4: 611pp
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* For full contents and more information, visit: www.crcpress.com/9781466599369

Handbook of Industrial Drying, Fourth Edition
Edited by Arun S. Mujumdar, National University of Singapore
This Fourth Edition book includes 12 new chapters covering computational fluid dynamic simulation, solar, impingement, and pulse combustion drying; drying of fruits, vegetables, sugar, biomass, and coal; physicochemical aspects of sludge drying; and life-cycle assessment of drying systems. Addressing commonly encountered dryers as well as innovative dryers with future potential, the fully revised text not only delivers a comprehensive treatment of the current state of the art, but also serves as a consultative reference for streamlining industrial drying operations to increase energy efficiency and cost-effectiveness.
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Ion Exchange and Solvent Extraction
A Series of Advances, Volume 22
Edited by Arup K. Sengupta, Lehigh University, Bethlehem, Pennsylvania, USA
Series: Ion Exchange and Solvent Extraction Series
The field of ion exchange has permeated into a wide array of applications ranging from mining to microelectronics, environment to energy, drug delivery to detection, food to fertilizer, chemical cleaning to catalysis, bio-separation to brackish water, and many others. Ion exchange has taken a dominant role in offering solutions to many concurrent problems both in the developed and the developing world. New materials and new processes are rapidly growing. The six chapters assembled in this latest volume reflect diverse contributions from researchers across the globe who are making noticeable strides in the field of ion exchange.
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May 2016: 6-1/8 x 9-1/4: 240pp
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Handbook of Membrane Separations
Chemical, Pharmaceutical, Food, and Biotechnological Applications, Second Edition
Edited by Anil K. Pabby, Bhabha Atomic Research Centre, Tarapur, India, Syed S.H. Rizvi, Cornell University, Ithaca, New York, USA and Ana Maria Sastre Requena, Universitat Politècnica de Catalunya, Barcelona, Spain
This well-rounded handbook provides detailed information on membrane separation technologies from an international team of experts. It provides a comprehensive discussion of membrane applications in the chemical, food, pharmaceutical, and biotechnology industries as well as in the treatment of toxic industrial effluents. It also includes new chapters in the field of membrane science and technology covering recent advances in RO and UF, and biotechnological applications in the chemical, food, pharmaceutical, and biotechnological industries as well as in the treatment of toxic industrial effluents.
CRC Press
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Key Elements in Polymers for Engineers and Chemists
From Data to Applications
Edited by Alexandr A. Berlin, Russian Academy of Sciences, Moscow, Russia, Viktor F. Kablov, Polytechnic Institute, Volzhski Town, Volgograd District, Russia, Andrej A. Pimerzin, Samara State Technical University, Russia and Simon S. Zlottsky, Ufa National Petrochemical Research Technological University, Bashkiriya, Russia
This book provides comprehensive coverage on the latest developments of research in the ever-expanding area of polymers and advanced materials and their applications to broad scientific fields including physics, chemistry, biology, and materials. It presents physical principles in explaining and rationalizing polymeric phenomena. Featuring classical topics that are conventionally considered as part of chemical technology, the book covers the chemical principles from a modern point of view. It analyzes theories to formulate and prove the polymer principles and offers future outlooks on applications of bioscience in chemical concepts.
Apple Academic Press
Market: Chemical Engineering
May 2014: 6 x 9: 454pp
Hb: 978-1-92689580-2: $129.95
ebook: 978-1-92689580-2
* For full contents and more information, visit: www.crcpress.com/9781926895802
Key Engineering Materials, Volume 1
Current State-of-the-Art on Novel Materials
Edited by Devrim Balköse, Izmir Polytechnic Institute, Turkey, Daniel Horak, Professor, Institute of Macromolecular Chemistry, Prague, Czech Republic and Ladislav Soltész, Professor, Slovak Academy of Sciences, Bratislava, Slovak Republic
With coverage of a broad range of key engineering materials, this book provides a single, comprehensive book summarizing all aspects involved in the functional materials production chain. It introduces state-of-the-art technology in key engineering materials, emphasizing the rapidly growing technologies. It takes a unique approach by presenting specific materials, then progresses into a discussion of the ways in which these novel materials and processes are integrated into today's functioning manufacturing industry.

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Key Engineering Materials, Volume 2
Interdisciplinary Concepts and Research
Edited by François Kajzar, University of Angers, France, Eli M. Pearce, Polytechnic University, Brooklyn, New York, USA, Nikolai A. Turovskij, Donetsk National University, Donetsk, Ukraine and Omani V. Mukhsaniani, Tbilisi State University (TSU), Georgia
This book provides innovative chapters on the growth of educational, scientific, and industrial research activities among chemists, biologists, and polymer and chemical engineers and provides a medium for mutual communication between international academia and the industry. It presents significant research and reviews reporting new methodologies and important applications in the fields of industrial chemistry, industrial polymers and biotechnology as well as includes the latest coverage of chemical databases and the development of new computational methods and efficient algorithms for chemical software and polymer engineering.

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Mathematical Methods in Chemical and Biological Engineering
Binay Kanti Dutta, West Bengal Pollution Control Board
This book presents the major and common mathematical methods and techniques—from elementary to a moderately advanced level—that have proven to be useful and have established potential of use in shaping the model-based approach of chemical and biological engineering analysis. Applications are illustrated with copious examples. The examples and exercise problems are based on journal articles on chemical engineering, mathematical and theoretical biology, environmental science and engineering, pharmacetics and drug release, and administration. Emphasis is placed on the background and physical understanding of the problems to prepare students for innovative applications.

CRC Press
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Membrane Fabrication
Edited by Nidal Hillal, Centre for Water Advanced Technologies and Environmental Research (CWATER), College of Engineering, Swansea University, UK, Ahmad Fauzi Ismail, Universiti Teknologi Malaysia, Johor Bahru, Malaysia and Chris Wright, Multidisciplinary Nanotechnology Centre, College of Engineering, Swansea University, UK
Membranes play a crucial role in ensuring the optimum use and recovery of materials in manufacturing. This book examines current membrane fabrication methods and how they are used in the optimization of membrane applications. They present innovative ideas on the development of membrane science and technology with a view toward efficient application of membrane separation processes. Exploring fabrication processes for polymeric, inorganic, and composite membranes, the book details the effects of different fabrication conditions and how these conditions can be controlled to optimize membrane construction and the subsequent application of the membrane system.

CRC Press
Market: Chemical Engineering
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Multistage Separation Processes, Fourth Edition
Fouda M. Khoury, University of Houston, Texas, USA
Building on the previous edition’s approach, this fourth edition covers the theory, mathematical models, and applications for a comprehensive list of processes. Along with more examples and exercises, this edition revises all chapters, adds several new sections, and includes an entirely new chapter on fluid-solid operations. The book can be used as a textbook for undergraduate and graduate students or as a reference for practicing engineers in the process industry.

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Nanocantilever Beams
Modeling, Fabrication and Applications
Edited by Ioana Voiculescu, City College of New York, New York, USA and Mona Zaghloul, George Washington University, Washington, DC, USA
This book is focused on the fabrication and applications of cantilever beams with nanoscale dimensions. The nanometer-size mechanical structures show exceptional properties generated by their reduced dimensions. These properties enable new sensing concepts and transduction mechanisms that will allow enhancing the performances of the actual devices to their fundamental limits. The book is important because no other books with similar topics focus only on nanocantilever beams. The aim of the book is to provide an excellent reference for an audience with a diversity of backgrounds and interests, including students, academic researchers, industry specialists, policymakers, and enthusiasts.
Pan Stanford
Market: Mechanical Engineering
November 2015: 6 x 9: 250pp
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Nanocomposite Membrane Technology
Fundamentals and Applications

P.K. Tewari, Bhabha Atomic Research Centre, Trombay, Mumbai, India

This book is the first to deliver an extensive exploration of nanocomposite membrane technology. Approaching the subject from the materials point of view, the text offers an introduction to the field as well as an overview of the fundamentals and applications. It discusses the history, synthesis, characterization, and processing of nanocomposite membranes. It examines water treatment, gas separation, and biomedical applications, presenting case studies of real-world implementations. It also addresses the associated health, environmental, safety, and societal implications, covering each topic with clarity and detail.

CRC Press
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Polymer Electrolyte Fuel Cells
Physical Principles of Materials and Operation

Michael Eikerling, Simon Fraser University, Vancouver, British Columbia, Canada and Andrei Kulikovsky

This book provides a systematic and profound account of scientific challenges in fuel cell research. The introductory chapters bring readers up to date on the urgency and implications of the global energy challenge; the prospects of electrochemical energy conversion technologies, and the thermodynamic and electrochemical principles underlying the operation of polymer electrolyte fuel cells. The book then presents challenges in fuel cell research as a systematic account of distinct components, length scales, physicochemical processes, and scientific disciplines. The main part of the book focuses on theory and modeling.

CRC Press
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2nd Edition - TEXTBOOK
Principles of Chemical Engineering Processes
Material and Energy Balances, Second Edition

Nayef Ghasem, United Arab Emirates University, Al-Ain and Redhouane Henda, Laurentian University, Sudbury, Ontario, Canada

This book introduces the basic principles and calculation techniques used in chemical engineering. It discusses problems in material and energy balances related to chemical reactors; explains the concepts of dimensions, units, psychrometry, steam properties, and conservation of mass and energy; and demonstrates how MATLAB and Simulink can be used to solve complicated problems. This Second Edition contains additional homework problems and a new chapter related to single- and multiphase systems. Educational software, downloadable exercises, and a solutions manual are available with qualifying course adoption.

CRC Press
Market: Chemical Engineering
November 2014: 6-1/8 x 9-1/4: 468pp
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2nd Edition
Phase Behavior of Petroleum Reservoir Fluids, Second Edition

Karen Schou Pedersen, Calsep A/S, Lyngby, Denmark; Peter L. Christensen, Calsep A/S, Lyngby, Denmark and Jawad Azeem Shaikh, Calsep A/S, Dubai, UAE

This book introduces industry standard methods for modeling the phase behavior of petroleum reservoir fluids at different stages in the process. Featuring new figures, references, and updates throughout, this edition adds simulation results for PVT data obtained with the PC-SAFT equation, describes routine and EOR PVT experiments with enhanced procedural detail, and expands coverage of sampling, compositional analyses, and measurement of PVT data. It provides practical knowledge essential for achieving optimal production of reservoir fluids, and cost-effective design and operations of pipelines and petroleum processing plants.

CRC Press
Market: Chemical and Petroleum Engineering
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TEXTBOOK
Principles of Metallurgical Thermodynamics

Subir Kumar Bose, Indian Institute of Technology Kharagpur, West Bengal and Sanat Kumar Roy, Indian Institute of Technology Kharagpur, West Bengal

This textbook is designed to improve knowledge of thermodynamics-related fundamentals and to examine their effective applications in various aspects of metallurgy. It primarily deals with equilibrium thermodynamics, with an emphasis on reactivities of metals and materials used by the scientific and engineering community. However, it also touches upon some non-equilibrium effects relevant to material scientists. The contents of this book focus on the macroscopic point of view, with a passing reference to the microscopic statistical approach. Many special material systems, their properties, and uses are discussed.

Universities Press
Market: Materials Science & Engineering
August 2014: 6-1/8 x 9-1/4: 750pp
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6th Edition - TEXTBOOK

Principles of Polymer Systems, Sixth Edition
Ferdinand Rodriguez, Cornell University, Ithaca, New York, USA, Claude Cohen, Cornell University, Ithaca, New York, USA, Christopher K. Ober, Cornell University, Ithaca, New York, USA, Lynden Archer, Cornell University, Ithaca, New York, USA

A classic text in the field of chemical engineering, this revised sixth edition offers a comprehensive exploration of polymers at a level geared toward upper-level undergraduates and beginning graduate students. It contains more theoretical background for some of the fundamental concepts pertaining to polymer structure and behavior, while also providing an up-to-date discussion of the latest developments in polymerization systems. New problems have been added to several of the chapters, and a solutions manual is available upon qualifying course adoption.

CRC Press

Market: Polymer Science
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Prev. Ed Hb: 978-1-560-32939-8
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Supercritical Fluid Nanotechnology
Advances and Applications in Composites and Hybrid Nanomaterials
Concepcion Domingo Pascual, Materials Science Institute of Barcelona (ICMAB-CSIC), Bellaterra, Spain and Pascale Subra-Paternault, Université Bordeaux 1, Pessac, France

The environmental and climate program demands technological solutions in the chemical industry that incorporate prevention of pollution. This book concerns the analysis of the advantages of using compressed CO2 to produce not only improved materials in a better way, but also new nanoproducts. Recovering and using CO2, otherwise released into the atmosphere, is a means of recycling emissions resulting from other users. The use of supercritical CO2 is a complex option from a conceptual point of view requiring enhanced technical preparation.

Pan Stanford

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Synthesis, Design, and Resource Optimization in Batch Chemical Plants
Edited by Thokozani Majozi, School of Chemical and Metallurgical Engineering, University of Witwatersrand, Johannesburg, South Africa, Esmael Reshid Seid, University of Pretoria, South Africa and Jui-Yuan Lee, National Taipei University of Technology, Taiwan

This book presents state-of-the art models for the scheduling, synthesis, design, and resource optimization of batch chemical processes. The text describes different ways to represent and capture time in the optimal allocation of tasks to various units with the objective of maximizing throughput or minimizing makespan. It covers synthesis and design where the objective is mainly to yield a chemical facility, which satisfies all the targets with minimum capital cost investment. It also deals with resource conservation aspects, where water and energy take center stage.

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Advanced Oxidation Technologies
Sustainable Solutions for Environmental Treatments
Edited by Marta I. Litter, National University of General San Martín, Prov. de Buenos Aires, Argentina, Roberto J. Candia, National University of General San Martín, Prov. de Buenos Aires, Argentina and J. Martin Meichtry, National University of General San Martín, Prov. de Buenos Aires, Argentina

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Edited by Moayad N. Khalaf, University of Basrah, Iraq

Green Polymers and Environmental Pollution Control examines the latest developments in the important and growing field of producing conventional polymers from sustainable sources. Presenting cutting-edge research from a group of leading international researchers from academia, government, and industrial institutions, the book explains what green polymers are, why green polymers are needed, which green polymers to use, and how manufacturing companies can integrate them into their manufacturing operations. It goes on to provide guidelines for implementing sustainable practices for traditional petroleum-based plastics, biobased plastics, and recycled plastics.

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Green Process Engineering
From Concepts to Industrial Applications
Edited by Martine Poux, University of Toulouse, France, Patrick Cognet, University of Toulouse, France and Christophe Gourdon, University of Toulouse, France

This book provides a set of methods and new approaches in the field of chemical engineering to implement safer, more fuel-efficient processes both in terms of raw materials and energy consumed, and to make processes more sustainable. This concept of sustainable chemical engineering is developed to give all the basics necessary for engineers, research and development, and production. The book also addresses teachers and graduate students in a wide spectrum of disciplines. All the concepts discussed are illustrated with examples and industrial achievements, giving an applied nature to this book.

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Green Chemical Engineering
An Introduction to Catalysis, Kinetics, and Chemical Processes
S. Suresh, Maulana Azad National Institute of Technology, Dept. of Chemical Engineering, Bhopal, India and S. Sundaramoorthy, Pondicherry Engineering, Dept. of Chemical Engineering, India

This book explores a balance between energy and material, applied to chemical reactors with catalysis, to achieve a given purpose. It includes the fundamentals of chemical reaction engineering and explains reactor design fundamentals. The book spans the full range—from the fundamentals of kinetics and heterogeneous catalysis via modern experimental and theoretical results of model studies—to their equivalent large-scale industrial production processes. It also includes significant developments, with recent research case studies and literature.

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Edited by NSTI

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Membrane Technologies for Water Treatment
Removal of Toxic Trace Elements with Emphasis on Arsenic, Fluoride and Uranium

Edited by Alberto Figoli, Institute on Membrane Technology, ITM-CNR, Rende, Italy, Jan Hoinikis, Karlsruhe University of Applied Sciences, Karlsruhe, Germany and Jochen Bundschuh, University of Southern Queensland (USQ), Toowoomba, QLD, Australia & Royal Institute of Technology (KTH), Stockholm, Sweden

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This work focuses on the application of membrane technologies in removing toxic metals/metalloids from water. Particular attention is devoted to the removal of arsenic, uranium, and fluoride. The book describes both pressure driven traditional membrane processes (such as forward osmosis, membrane distillation and membrane bio-reactors) employed in the application of interest. Key aspect of this book is to provide information on both the basics of membrane technologies and on the results depending on the type of technology employed.

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Microwave-Assisted Organic Synthesis
A Green Chemical Approach

Edited by Suresh C. Ameta, PAHER University, Udaipur, India, Pinki B. Punjabi, Mohanlal Sukhadia University, Udaipur, India, Rakshit Ameta, PAHER University, Udaipur, India and Chetna Ameta, Mohanlal Sukhadia University, Udaipur, India

The large-scale production of chemicals to meet various societal needs has created environmental pollution, including pollution from byproducts and improper disposal of waste. With the world facing adverse consequences due to this pollution, green chemistry is increasingly being viewed as a means to address this concern.

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Mitigation of Landfill Gas Emissions

Małgorzata Pawłowska, Lublin University of Technology, Poland

There are many ways of preventing the negative impact of landfills or protecting the environment against such an impact. Some of these preventive and protective measures are described in Mitigation of Landfill Gas Emissions. Special attention is given to the application of anaerobic, aerobic and semi-aerobic bioreactor landfills for control of landfill gas emission. Different types of biotic systems for the oxidation of methane and trace gases, such as biocovers, biofilters, and biowindows, are also presented.

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Resource Recovery to Approach Zero Municipal Waste

Edited by Mohammad J. Taherzadeh, Swedish Centre for Resource Recovery, University of Borås, Sweden and Tobias Richards, Swedish Centre for Resource Recovery, University of Borås, Sweden

Series: Green Chemistry and Chemical Engineering

This book presents the state of the art of solid waste management toward zero waste. It discusses different countries’ laws and regulations, source separation of waste, and conversion of organic/biological waste into compost, biogas, and biofiltration. It considers the combustion of waste in combined heat and power plants, as well as recent developments in waste gasification and pyrolysis. It describes various glass, metal, electronic waste, thermoset composite, paper, and fiber recycling technologies. It also examines landfill mining and encourages product design optimized for recycling.

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Nanotechnology for Sustainable Manufacturing
Edited by David Rickerby, Institute for Environment and Sustainability, European Commission Joint Research Centre, Ispra VA, Italy

Nanomaterials have the potential to contribute to more sustainable manufacturing through cleaner, less wasteful production processes and can substitute conventional materials, leading to savings in raw materials and energy. This book provides an innovative perspective by establishing connections between the subject areas associated with nanotechnology and by bridging academic and industrial research. It also covers methods for assessing the sustainability of nanotechnology-based products and processes using life-cycle analysis, taking into account material and energy consumption during manufacture, use, and final disposal and/or recycling.

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New Microbial Technologies for Advanced Biofuels
Toward More Sustainable Production Methods

Edited by Juan Carlos Serrano-Ruiz, Abengoa Research, Seville, Spain

The world needs renewable and clean forms of energy. Biofuels offer an alternative to fossil fuels, but first-generation biofuels had many challenges to be overcome. One strategy that second-generation biofuels are employing is microbial technology. This compendium volume gathers together recent investigations within this vital field of research. Internationally recognized experts contribute chapters on their individual areas of research within this vital field of study. The book offers an authoritative platform from which graduate students and scientists can build future investigations that will create still more advanced biofuels.

Apple Academic Press
Market: Environmental Engineering
June 2015: 6 x 9: 382pp
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* For full contents and more information, visit: www.crcpress.com/9781771881302
Valorization of Wine Making By-Products

Edited by Matteo Bordiga, PhD, Universita del Piemonte Orientale, Novara, Italy

Vine cultivation and the wine making process generate a significant number of waste by-products, including pruning, stem, pomace and seeds, carbon dioxide, and wastewater. Efficient utilization of food processing by-products represents challenges for the profitability of the food industry. Efforts need to be made to optimize the technology to minimize by-product waste. This book provides a comprehensive overview of wine making by-products and their potential utilization, presenting a number of value adding technologies for the valorization of those products.
Advanced Biofuels
Using Catalytic Routes for the Conversion of Biomass Platform Molecules
Edited by Juan Carlos Serrano-Ruiz, Abengoa Research, Seville, Spain
Written for readers with university-level understanding of chemistry, biology, and engineering, this compendium volume offers evidence that catalytic processing is a flexible and sustainable methodology for the conversion of biomass platforms. The editor, one of the leading figures in this area of study, has collected research that covers key issues of interest to fuel and energy technologists and engineers. The comprehensive coverage of current research will also offer scientists a solid foundation for future research in this critical field of investigation.

Advanced Marine Structures
Srinivasan Chandrasekaran, Indian Institute of Technology Madras, Adyar, Chennai, India
This book presents the various types and forms of marine structures and the functions and limitations of different offshore platforms, and describes their potential environmental loads. It discusses the ultimate load design, plastic design, shear center, and theories of failure, leading to a detailed understanding of plastic design and dynamics. It also explains the details of fluid-structure interaction as well as fracture and fatigue. It emphasizes basic concepts through simple illustrative examples and exercises, and explains design methodologies and guidelines through example structures.

Analytical Methods in Petroleum Upstream Applications
Edited by Cesar Ovalles, Chevron ETC, Richmond, California, USA and Carl E. Rechsteiner Jr., CREchsteiner Consulting, LLC, Petaluma, California, USA
Effective measurement of the composition and properties of petroleum is essential for its exploration, production, and refining. This volume explores advances in the analytical instrumentation that allow more accurate determination of the components, classes of compounds, properties, and features of petroleum. Recognized experts cover a number of analytical techniques developed for residue characterization and promote understanding of the characteristics of heavy petroleum to address problems in production. The book encompasses a multidisciplinary scope from the fields of chemistry, geology, biology, and petroleum.

Architectural, Energy, and Information Engineering
Edited by Wen-Pei Sung, National Chin-Yi University of Technology, Taiping City, Taiwan R.O.C. and Ran Chen
This proceedings volume brings together selected peer-reviewed papers presented at the 2015 International Conference on Architectural, Energy and Information Engineering (AEIE 2015), held July 15-16, 2015 in Hong Kong, China. The proceedings are divided into two parts, Architectural, Energy, and Environmental Engineering and Information Engineering and its Applications. Topics covered include Civil Engineering, Architectural Science, Energy Engineering, Environmental Science and Information Engineering among others. This volume will be of interest to a global audience of academic researchers, industry professionals and policy-makers active in various fields of engineering.

Biomass Processing Technologies
Edited by Vladimir Strezov, Macquarie University, Sydney, Australia and Tim J. Evans
This book is a thoroughly up-to-date treatment of all the available technologies for biomass conversion. Each chapter looks at the viability and implementation of each technology with examples of existing equipment and plants. In addition, the text addresses the economics of biomass processing. The book could also be used as a supplementary text for senior undergraduate courses on biomass processing.

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James G. Speight, CD&T Inc., Laramie, Wyoming, USA
Series: Chemical Industries
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Ghazi A. Karim, University of Calgary, Alberta, Canada
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Clearing of Industrial Gas Emissions
Theory, Calculation, and Practice
Usmanova Regina Ravilevna, Ufa State Technical University of Aviation, Bashkortostan, Russia and Gennady E. Zaikov, Kazan National Research Technological University, Russia
Series: AAP Research Notes on Chemical Engineering
This book presents the newest scientific research data under the theory and practice of wet clearing of industrial gases from dispersion particles. The authors consider the modern aspects of the separation process and gas-dispersed impurities. The book covers three main sections on working out and research of the following types of wet gas purifiers: dynamic scrubbers, wet gas clean apparatuses of shock-inertial act, and bubble dust traps.
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Efficiency and Sustainability in Biofuel Production
Environmental and Land-Use Research
Edited by Barnabas Gikonyo, State University of New York (SUNY), Geneseo, New York, USA
The world’s interest in reducing petroleum use has led to the rapid development of the biofuel industry over the past decade or so. However, there is increasing concern over how current food-based biofuels affect both food security and the environment. Second-generation biofuels, however, use widely available sources such as non-food lignocellulosic-based biomass and fats, oils, and greases. They make practical consideration of how land use can simultaneously support both the world’s food needs and some of its energy needs. This volume consolidates some of the most recent investigations into these issues.
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Coal Production and Processing Technology
Edited by M.R. Riazi, Kuwait University and Rajender Gupta, University of Alberta, Canada
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Electrochemical Energy
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Edited by Pei Kang Shen, Sun Yat-sen University, China (PRC), Chao-Yang Wang, Pennsylvania State University Park, USA, San Ping Jiang, Curtin University, Perth, Australia, Xueliang Sun, University of Western Ontario, London, Canada and Jujun Zhang, National Research Council, Vancouver, British Columbia, Canada
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Edited by Jianhua Fang, Shanghai Jiaotong University, China, Jinli Qiao, Donghua University, Shanghai, China, David P. Wilkinson, University of British Columbia, Vancouver, Canada and Jujuan Zhang, National Research Council, Vancouver, British Columbia, Canada

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Anco S. Blazev, President and CTO, Solar Tech Inc., Tempe, Arizona, USA

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Yatish T. Shah, Norfolk State University, Virginia, USA

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October 2015: 6-1/8 x 9-1/4: 450pp
Hb: 978-1-482-25306-1: $169.95
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**Environment, Energy and Applied Technology**


Edited by Wen-Pei Sung, National Chin-Yi University of Technology, Taiping City, Taiwan R.O.C. and Jimmy C.M. Kao, Institute of Environmental Engineering, National Sun Yat-Sen University, Kaohsiung, Taiwan, R.O.C.

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January 2015: 1012pp
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Kenneth J. Skipka, RTP Environmental Associates Inc., Westbury, New York, USA and Louis Theodore, Manhattan College, New York, USA

Series: Energy and the Environment

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Edited by Brajendra K. Sharma and Girma Biresaw, USDA, ARS, NCAUR, CPF, Peoria, Illinois, USA

This book focuses on research efforts involved in the development of biobased lubricants and fuels. Among other things, it covers the advantages and disadvantages of using vegetable oil lubricants and their availability, the modification of vegetable oils for improving base oil properties, the use of new non-food oils as lubricant base oils, the transesterification route for making biodiesel and its properties dependent on feedstocks, the development of biobased lubricants for various applications and the oleochemical derived surfactants for metalworking applications.

CRC Press
Market: Engineering - Mechanical
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Fischer-Tropsch Synthesis, Catalysts, and Catalysis
Advances and Applications
Edited by Burtron H. Davis, University of Kentucky and Center for Applied Energy Research, Lexington, KY, USA and Mario L. Occelli, MLO Consulting, Atlanta, Georgia, USA
Series: Chemical Industries
The Fischer-Tropsch synthesis method is the studied method of choice for producing a synthetic petroleum substitute. This book offers insights and advances from an international assembly of experts who presented at the fall 2012 ACS meeting held in Philadelphia. Contents include significant recent developments in Fischer-Tropsch technology in the field of renewable resources and green energy. The book also explores new and sophisticated characterization techniques that shed light on the reaction mechanism and provide a glimpse into the processes and reaction rates under realistic commercial process conditions.
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Market: Chemistry
February 2016: 6-1/8 x 9-1/4: 428pp
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Fuel Production from Non-Food Biomass
Corn Stover
Edited by Barnabas Gikonyo, State University of New York (SUNY), Geneseo, New York, USA
The practice of converting corn to ethanol is controversial, with debates currently being waged in both public policy and science. While biofuels from corn have important implications in alleviating some of the global energy crisis, critics argue that it takes away from vital agricultural products needed to feed the world’s growing population. The current volume maintains there is a third way, a method of producing biofuel that only uses biomass that is left behind after all agricultural and nutritional products have been harvested from corn. This biomass is referred to as corn stover. The book serves as an important introduction to this method of producing biofuels from agricultural waste.
Apple Academic Press
Market: Environmental Engineering
May 2015: 6 x 9: 352pp
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Fuel Production with Heterogeneous Catalysis
Edited by Jacinto Sa, Paul Scherer Institute, Switzerland and Institute of Physical Chemistry, Polish Academy of Sciences, Warsaw
This book presents the current state of the art and future perspectives of the heterogeneous catalytic production of fuels, complete with reaction mechanism schemes, engineering solutions, and valuable industry insights. It describes production of fuels from renewable sources using environmentally friendly technologies, exposing the advantages and disadvantages of each production process and suggesting solutions to minimize the impact of fuel transportation. Comprised of chapters authored by leading experts in the field, this authoritative text conveys the importance of catalysis for the sustainable production of fuels.
CRC Press
Market: Chemical and Energy Engineering
September 2014: 6-1/8 x 9-1/4: 318pp
Hb: 978-1-482-20371-4: $188.95
ebook: 978-1-482-20372-1
* For full contents and more information, visit: www.crcpress.com/9781482203714

Geothermal Energy from Oil and Gas Wells
Edited by Jochen Bundschuh, University of Southern Queensland (USQ), Toowoomba, QLD, Australia & Royal Institute of Technology (KTH), Stockholm, Sweden
Series: Sustainable Energy Developments
Describing the geothermal potential of hydrocarbon reservoirs. It explains the design differences of hydrocarbon and geothermal wells and the different stimulation methods used in hydrocarbon and geothermal exploitation. Heat extraction and electric energy generation from abandoned hydrocarbon wells are also described as mechanisms to increase permeability and porosity if the corresponding natural values are too low. Hydrocarbon Reservoirs and Existing Oil and Gas Wells. Geothermal vs Oil and Gas Wells. Electric Power Generation Techniques. Direct Heat Utilization. Rural Electrification. Economic Aspects and Financing. Case Studies.
CRC Press
Market: Energy
June 2016: 300pp
Hb: 978-0-415-62090-1: $239.95
ebook: 978-0-203-12064-8
* For full contents and more information, visit: www.crcpress.com/9780415620901

Graphene
Energy Storage and Conversion Applications
Zhaoqin Liu, Ningbo Institute of Material Technology and Engineering (NIMTE), Chinese Academy of Sciences and Xufeng Zhou
Series: Electrochemical Energy Storage and Conversion
Suitable for readers from broad backgrounds, this book describes the fundamentals and cutting-edge applications of graphene-based materials for energy storage and conversion. It provides an overview of recent advancements in specific energy technologies, such as Li-ion batteries, supercapacitors, fuel cells, and solar cells. It also considers the outlook of industrial applications in the near future. Offering a brief introduction to major graphene synthesis methods, the text details the latest academic and commercial research and developments, covering all potential avenues for graphene’s use in energy-related areas.
CRC Press
Market: Materials Science and Energy Engineering
November 2014: 6-1/8 x 9-1/4: 318pp
Hb: 978-1-482-20375-2: $156.95
ebook: 978-1-482-20376-9
* For full contents and more information, visit: www.crcpress.com/9781482203752

Handbook of Hydrogen Energy
Edited by S.A. Sherif, University of Florida, Gainesville, USA, D. Yogi Goswami, University of South Florida, Tampa, USA, E.K. (Lee) Stefanakos, University of South Florida, Tampa, USA and Aldo Steinfeld, ETH Zurich, Switzerland
Series: Mechanical and Aerospace Engineering Series
This text provides the technical know-how for creating a hydrogen-based economy in which hydrogen is the main energy carrier along with electricity. It outlines the benefits and challenges to converting to a hydrogen economy. It details how hydrogen can be produced efficiently, and how to take advantage of it being an abundant and completely renewable fuel. It examines the advantages and challenges in the areas of hydrogen storage and transportation, and explores ways of efficiently converting it into other forms of energy.
CRC Press
Market: Mechanical Engineering
July 2014: 7 x 10: 1058pp
Hb: 978-1-420-05447-7: $199.95
ebook: 978-1-420-05450-7
* For full contents and more information, visit: www.crcpress.com/9781420054477
Handbook of Refinery Desulfurization

Nour Shafik El-Gendy and James G. Speight, CD&W Inc., Laramie, Wyoming, USA

Series: Chemical Industries

This book describes the operation of the various desulfurization process units in a petroleum refinery. It also explains the processes that produce raw materials for the petrochemical industry. The book contains background chapters on the composition and evaluation of feedstocks and includes diagrams and tables of feedstocks and their respective produce. It also outlines how to decide which method should be employed to remove sulfur from different feedstocks.

Hydraulic Fracturing

Michael Berry Smith, NSI Technologies, LLC, Tulsa, Oklahoma, USA and Carl Montgomery

Series: Emerging Trends and Technologies in Petroleum Engineering

This book explains how to properly engineer and optimize a hydraulically fractured well by selecting the right materials, evaluating the economic benefits, and ensuring the safety and success of the people, project, environment, and equipment. From data estimation to design, operation, and performance, the text presents a logical, step-by-step process for hydraulic fracturing that aids in proper engineering decision making when stimulating a particular reservoir. Numerous problem sets reinforce the learning and aid in risk assessment. Additional material is available from the CRC Press website.

Hydraulic Fracturing Impacts and Technologies

A Multidisciplinary Perspective

Edited by Venki Uddameri, Texas Tech University Lubbock, TX, USA, Audra Morse and Kay J. Tindle, Texas Tech University, Lubbock, USA

This book provides a multidisciplinary review of the potential impacts of hydraulic fracturing. It examines various technical, environmental, scientific, and social aspects pertaining to hydraulic fracturing. The chapters present balanced coverage of the benefits and potential negative impacts of fracturing by bringing together subject-matter experts from various disciplines. The text identifies emerging technologies, regulatory instruments, and management tools to ensure that unconventional oil and gas production will be sustainable and have a small footprint on the environment and society.

Hydrocarbon Process Safety, Second Edition

Clifford Jones, University of Aberdeen, UK

Expanded and updated, this new edition of a bestseller treats this important field in a holistic manner. The structure of the previous book has been retained, but enhanced with new text and illustrations, and more numerical problems with a wider scope. Readers will find much on the background to the industry and details of such centrally important operations as refining, heat exchange, cracking, polymerisation and hydrogenation.

Industrial Biotechnology

Sustainable Production and Bioresource Utilization

Edited by Devarajan Thangadurai, Karnataka University, Dharwad, India and Jeyabalan Sangeetha, Karnataka University, Dharwad, India

The goal of industrial biotechnology is to develop new techniques and technologies to transform renewable raw materials into chemicals, materials, and fuels by the substitution of fossil fuels. With the increase in the world’s population and the resultant growing energy demand, the need for more energy can be successfully met with the advancements in industrial biotechnology. This important new book covers recent advancements, innovations, and technologies in industrial biotechnology, specifically addressing the application of various biomolecules in industrial production and in cleaning and environmental remediation sectors.

Introduction to Bioenergy

Vaughn C. Nelson, West Texas A&M University, Canyon, USA and Kenneth L. Starcher

Series: Energy and the Environment

This book covers numerous sources of energy, including solar energy (the original source), bioenergy (collected and converted energy from the sun), and the biomass resource (plants, crops, and forests). Different conversion processes are described for converting biomass to heat, power/electricity, and biofuels. The measurement (instrumentation) energy parameters, analysis of data, and prediction of energy production are also discussed as well as the economics of bioenergy. Institutional issues from local to national are discussed, along with environmental concerns, regulations, and incentives.

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**Lead-Acid Battery Technologies**

*Fundamentals, Materials, and Applications*

Edited by Joey Jung, EVT Power, Inc. and Kemetco Research, Inc., Vancouver, British Columbia, Canada; Lei Zhang, National Research Council, Vancouver, British Columbia, Canada and Jiujun Zhang, National Research Council, Vancouver, British Columbia, Canada

Series: Electrochemical Energy Storage and Conversion

This book offers a systematic and state-of-the-art overview of the materials, system design, and related issues for the development of lead-acid rechargeable battery technologies. Featuring contributions from leading experts in industry and academia, the text describes the underlying science involved in the operation of lead-acid batteries, highlights advances in materials science and engineering for materials fabrication, delivers a detailed discussion of battery modeling, analyzes the integration of lead-acid batteries with other primary power systems, and explores emerging applications such as electric bicycles and microhybrid vehicles.

CRC Press

Market: Chemical/Energy Engineering

June 2015: 6-1/8 x 9-1/4: 352pp

Hb: 978-0-415-64439-6: $159.95

ebook: 978-1-466-59223-4

* For full contents and more information, visit: [www.crcpress.com/9780415644396](http://www.crcpress.com/9780415644396)

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**Monte Carlo Methods for Particle Transport**

Alirezah Haghighat, Virginia Tech, Arlington, USA

This book explains the fundamental concepts, issues, and limitations of the Monte Carlo method. A practical guide to the method’s application, the text introduces the particle importance equation and its use for variance reduction, describes general and particle-transport-specific variance reduction techniques, presents particle transport eigenvalue issues and methodologies to address these issues, explores advanced formulations based on the author’s research activities, discusses parallel processing concepts and factors affecting parallel performance, and includes illustrative examples, mathematical derivations, computer algorithms, and homework problems.

CRC Press

Market: Nuclear Physics

November 2014: 6-1/8 x 9-1/4: 272pp

Hb: 978-1-466-59259-4: $119.95
ebook: 978-1-466-59258-7

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**Lithium-Ion Batteries**

*Fundamentals and Applications*

Edited by Yuping Wu, Nanjing Tech University, China

Series: Electrochemical Energy Storage and Conversion

This book delivers a systematic overview of the principles, background, design, production, and use of lithium-ion batteries. It begins by introducing the underlying theory and history of lithium-ion batteries, and then describes the key battery components, including negative and positive electrode materials, electrolytes, and separators. The text also discusses electronic conductive agents, binders, solvents for slurry preparation, positive thermal coefficient materials, current collectors, and cases, as well as explores lithium-ion battery assembly processes, electrochemical performance, and applications in power tools, electric vehicles, aerospace, and more.

CRC Press

Market: Energy Engineering

April 2015: 6-1/8 x 9-1/4: 562pp

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* For full contents and more information, visit: [www.crcpress.com/9781466557338](http://www.crcpress.com/9781466557338)

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**Multi-disciplinary Sustainable Engineering: Current and Future Trends**

Proceedings of the 5th Nirma University International Conference on Engineering, Ahmedabad, India, November 26-28, 2015

Edited by Ketan Kotche, Patron NILCONE 2015 and Director, Institute of Technology, Nirma University, Ahmedabad, Gujarat, India; and Madhuri Bhavsar, Chair NILCONE 2015 and Associate Professor, Institute of Technology, Nirma University, Ahmedabad, Gujarat, India

This proceedings book includes peer reviewed and presented research papers by research scholars and professionals from academia, industry and government R&D organizations. The papers included in this proceedings volume present unpublished research of participating researchers related to some specific multi-disciplinary themes addressing sustainable engineering fields like Sustainable Manufacturing Processes; Design and Analysis of Machine & Mechanisms; Energy Conservation and Management; Concrete and Structural Engineering; Infrastructure Project Planning and Management; Chemical Process Development and Design; and Technologies for Green Environment.

CRC Press

Market: Civil Engineering

February 2016: 350pp

Hb: 978-1-138-02845-6: $169.95
ebook: 978-1-315-67688-1

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**Micro & Nano-Engineering of Fuel Cells**

Edited by Dennis Y.C. Leung, The University of Hong Kong, Hong Kong and Jin Xuan, East China University of Science and Technology, Shanghai, China

Series: Sustainable Energy Developments

This edited book brings together leading researchers discussing the recent trends and needs in micro and nano-engineering fuel cells, creating new engineering knowledge, and optimizing the system on a micro and nano-scale. The small scales discussed in this book are particularly important, because most of the underlying interactions governing the fuel cell performance and more information, visit: [www.crcpress.com/9780415644396](http://www.crcpress.com/9780415644396)

CRC Press

Market: Mechanical Engineering

April 2015: 304pp

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**Nanostructured Energy Devices**

Equilibrium Concepts and Kinetics

Juan Bisquert, Universitat Jaume I, Castello, Spain

This book covers the physical principles and applications of a range of nanoscale materials and devices that are key for the energy revolution, including hybrid and organic solar cells, lithium batteries, and supercapacitors. Topics discussed range from the fundamental concepts of operating nanoscale energy devices to advanced device modeling. Modeling is presented as a function of the characterization techniques used to test device properties, emphasizing impedance spectroscopy characteristics, since it provides a unifying theme that connects the properties of the different energy devices.

CRC Press

Market: Energy Engineering

November 2014: 6-1/8 x 9-1/4: 352pp

Hb: 978-1-439-83602-6: $162.95
ebook: 978-1-439-83603-3

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New Biotechnologies for Increased Energy Security
The Future of Fuel

Edited by Juan Carlos Serrano-Ruiz, Abengoa Research, Seville, Spain
The information contained in this compendium volume sets the stage for the future’s large-scale production of biofuels. Biomass is an abundant carbon-neutral renewable feedstock for producing fuel. First-generation biofuels gained attention for their problems, but the authors of this book demonstrate that they are well on their way to creating practical and sustainable second-generation biofuels. The book begins with an introduction to synthetic biology. Next, it covers pretreatment technologies, advanced microbial technologies, genetic engineering as it relates to biofuel technologies, and nanotechnology and chemical engineering in relation to biofuels.

Apple Academic Press
Market: Bioengineering
May 2015: 6 x 9: 340pp
Hb: 978-1-771-88146-3: $139.95
ebook: 978-1-771-88236-1
* For full contents and more information, visit: www.crcpress.com/9781771881463

Oil Spill Impacts
Taxonomic and Ontological Approaches

Edited by Yejun Wu
Oil spill research is interdisciplinary and includes coastal and marine environmental science, biological sciences, chemistry, disaster management, geology, sociology, and government policy. The main purpose of studying oil spill incidents is to assess their impacts and understand how to prevent, investigate, and mitigate their damages. This book presents a taxonomy and a topic map of oil spill concepts, focusing on the environmental, social and economic impacts of oil spills, using the 2010 Gulf of Mexico spill as the primary case.

CRC Press
Market: Engineering - Environmental
January 2016: 6 1/8 x 9 1/4: 300pp
Hb: 978-1-498-71214-9: $129.95
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Petroleum and Gas Field Processing, Second Edition

Hussein K. Abdel-Aal, National Research Center, Cairo, Egypt
- (Retired), Mohamed A. Aggour and Mohamed A. Fahim
Series: Chemical Industries
This book provides an all-inclusive guide to surface petroleum operations. It solves various problems encountered in the field processing of oil and gas. The book delivers an expanded and updated treatment that covers the principles and procedures related to the processing of reservoir fluids for the separation, handling, treatment, and production of quality petroleum oil and gas products. With five new chapters, this second edition covers additional subjects, in particular natural gas, economics and profitability, oil field chemicals, and piping and pumps. The book also contains worked out examples and case studies from a variety of oil field operations.

CRC Press
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September 2015: 6 1/8 x 9 1/4: 397pp
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Prev. Ed Hb: 978-0-824-70762-4
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2nd Edition
Production Chemicals for the Oil and Gas Industry, Second Edition

Malcolm A. Kelland, University of Stavanger, Norway
This text discusses a wide variety of production chemicals used by the oil and gas industry for down-hole and topside applications both onshore and offshore. It reviews all past and present classes of production chemicals, providing numerous difficult-to-obtain references. Unlike other texts that focus on how products perform in the field, this book focuses on the specific structures of chemicals that are known to deliver the required or desired performance. Where known, it also details the environmental aspects of the chemicals discussed and their success in the field.

CRC Press
Market: Chemical Engineering
March 2014: 7 x 10: 454pp
Hb: 978-1-439-87379-3: $174.95
ebook: 978-1-439-87381-6
* For full contents and more information, visit: www.crcpress.com/9781439873793

Production of Liquid Hydrocarbon Fuels from Biomass

Edited by Juan Carlos Serrano Ruiz, Universidad de Cordoba, Spain
As the demand for fossil fuels grows faster than production, the search for new fuels to replace fossil fuels is gaining in importance, and liquid biofuels are considered good candidates. This book reviews the technologies available today, as well as a number of promising new technologies, for the production of liquid hydrocarbon transportation fuels from biomass resources. Examples of everyday use of biofuels and liquid hydrocarbon fuels are featured throughout the book.

CRC Press
Market: Chemical Engineering
June 2016: 5 1/2 x 8 1/2: 232pp
Hb: 978-1-466-51238-2: $169.95
ebook: 978-1-466-51239-9
* For full contents and more information, visit: www.crcpress.com/9781466512382

Refining Used Lubricating Oils

Series: Chemical Industries
Used lubricating oil is a valuable resource. This book examines recycling processes for a range of products with different properties and different criteria. It also compares the various recycling methods and resulting products to conventional products obtained from original refining processes. The reviews, data, and comparisons provided by the authors allow readers to identify which processes are likely to produce a product with specific properties, and enable them to combine this with an analysis of the economic data to identify attractive oil recycling propositions.

CRC Press
Market: Chemical Engineering
April 2014: 6 1/8 x 9 1/4: 466pp
Hb: 978-1-466-55150-3: $224.95
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* For full contents and more information, visit: www.crcpress.com/9781466551503

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Safety and Reliability in the Oil and Gas Industry
A Practical Approach
B.S. Dhillon, University of Ottawa, Department of Mechanical Engineering, Ontario, Canada

Each year billions of dollars are spent in the area of oil and gas to design, construct/maintain, operate, and maintain various types of equipment/systems around the globe. Safety and reliability have become an important issue due to various types of accidents and problems over the years. There has been a large number of journal and conference proceedings articles on safety and reliability in the oil and gas industry. However, there is no book that covers both these topics within its framework. The main goal of this book is to combine these two topics into a single volume and to eliminate the need to consult many different and diverse sources in obtaining desired information.

Solar Fuels
Materials, Physics, and Applications
Theodore Goodson, III

Written for use as a text and reference for those interested in how new materials may be used to capture, store, and use solar energy for alternative energy resources in everyday life, this book discusses the fundamentals of the kinds of materials and the physics involved in the mechanisms and design. The book offers clear examples of the current state-of-the-art in the field of organic and inorganic solar cell materials and devices and includes experiments testing solar capability and standardized examples. It also gives a clear outline of the challenges that face the field. A CD-ROM and color insert is included.

Small-Scale Gas to Liquid Fuel Synthesis
Edited by Nick Kanellopoulos, National Center for Scientific Research “Demokritos”, Greece

This book explores next-generation technologies geared toward overcoming the significant cost and technical barriers prohibiting the extensive use of conventional gas to liquid (GTL) processes for the exploitation of small and/or isolated natural gas reservoirs. This concise text highlights key research activities of two large European projects—Innovative Catalytic Technologies & Materials for Next Gas to Liquid Processes (NEXT-GTL) and Oxidative Coupling of Methane followed by Oligomerization to Liquids (OCMOL)—examining novel technical developments that reduce the costs associated with air fractioning and syngas production.

Solar Energy Conversion and Storage
Photochemical Modes
Edited by Suresh C. Ameta, Pacific Academy of Higher Education and Research (PAHER) University, Udaipur, India

This state-of-the-art reference showcases the latest advances in solar cell technology while offering valuable insight into the future of solar energy conversion and storage. The book describes various types of solar cells, including photovoltaic cells, photogalvanic cells, photoelectrochemical cells, and dye-sensitized solar cells. It also covers photogeneration of hydrogen, photoreduction of carbon dioxide, artificial/mimicking photosynthesis, generation of electricity from solar cells, methods for storing solar energy in the form of chemical energy, and emerging trends such as the use of nanoparticles.

Surface Chemistry and Geochemistry of Hydraulic Fracturing
K. S. Birdi, KSB Consultant, Holte, Denmark

Unique in focus, this book examines the surface chemistry and phenomena in the hydrofracking process. Under great scrutiny as of late, the physico-chemical properties of hydrofracking are fully detailed and explained in this book, including the adsorption/desorption of gas on the shale reservoir surface and relevant waste-water treatment dependent on various surface chemistry principles. Written by a long-time expert in the field, it presents an unbiased account of the hard science and engineering involved in a resource gaining growing attention in the field.

Sustainable Bioenergy Production
Edited by Lijun Wang, North Carolina Agricultural & Technical State University, Greensboro, USA

This book provides comprehensive knowledge and skills for the analysis and design of sustainable biomass production, bioenergy processing, and biofinery systems for professionals in the bioenergy field. Focusing on topics vital to the sustainability of the bioenergy industry, this book is divided into four sections: Fundamentals of Engineering Analysis and Design of Bioenergy Production Systems, Sustainable Biomass Production and Supply Logistics, Sustainable Bioenergy Processing, and Sustainable Biofinery Systems. It pinpoints trends in future research and development and assembles essential references and data to address sustainability in the bioenergy industry.
Unconventional Oil and Gas Resources
Exploitation and Development
Edited by Usman Ahmed, Unconventional Energy Resources International, Galveston, Texas and D. Nathan Meehan, Baker Hughes Incorporated, Houston, Texas, USA
Series: Emerging Trends and Technologies in Petroleum Engineering
In the next decade, over 100,000 shale wells and one to two million hydraulic fracturing stages could be executed, with industry spending close to $1 trillion. This growth requires knowledgeable professionals in all areas of exploitation and development. The book starts with basics of unconventional resources and delves into subsurface measurements and associated interpretation, plus all disciplines associated with drilling, completion, stimulation, production, reservoir, monitoring techniques, the associated software, and overall unconventional resource development workflow. It covers emerging technology like data mining and future areas of technological development.
CRC Press
Market: Engineering - Chemical
April 2016: 8-1/2 x 11: 856pp
Hb: 978-1-498-75940-3: $199.95
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Water for Energy and Fuel Production
Yatish T. Shah, Norfolk State University, Virginia, USA
Series: Green Chemistry and Chemical Engineering
This text describes water’s use in the production of raw fuels, as an energy carrier (e.g., hot water and steam), and as a reactant, reaction medium, and catalyst for the conversion of raw fuels to synthetic fuels. It explains how supercritical water is used to convert fossil- and bio-based feedstock to synthetic fuels in the presence and absence of a catalyst. It also explores water as a direct source of energy and fuel, such as hydrogen from water dissociation, methane from water-based clathrate molecules, and more.
CRC Press
Market: Engineering - Chemical
May 2014: 6-1/8 x 9-1/4: 440pp
Hb: 978-1-482-21618-9: $199.95
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Wax Deposition
Experimental Characterizations, Theoretical Modeling, and Field Practices
Zhenyu Huang, Assured Flow Solutions LLC, Sugar Land, Texas, USA, Sheng Zheng, University of Michigan, Ann Arbor, USA and H. Scott Fogler, University of Michigan, Ann Arbor, USA
Series: Emerging Trends and Technologies in Petroleum Engineering
This book provides a detailed description of the thermodynamic and transport theories for wax deposition modeling as well as a comprehensive review of laboratory testing for the establishment of appropriate field control strategies. Offering valuable insight from academic research and the flow assurance industry, this text aids engineers in identifying the severity and in providing guidance to control the problem of wax deposition. The book also shows students and researchers how thermodynamics, heat, and mass transfer principles can be applied to solve a problem common to the petroleum industry.
CRC Press
Market: Petroleum Engineering
May 2015: 6-1/8 x 9-1/4: 184pp
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Electromagnetic, Mechanical, and Transport Properties of Composite Materials

Rajinder Pal, University of Waterloo, Ontario, Canada

Series: Surfactant Science

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CRC Press

Market: Materials Science & Engineering

August 2014: 6-1/8 x 9-1/4: 442pp
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Ebook: 978-1-466-57624-7

* For full contents and more information, visit: www.crcpress.com/9781420089219

TEXTBOOK

Environmental Transport Phenomena

A. Eduardo Sáez, University of Arizona, Tucson, USA and James C. Baygents, University of Arizona, Tucson, USA

Series: Green Chemistry and Chemical Engineering

This book offers a detailed yet accessible introduction to transport phenomena. It begins by explaining the underlying principles and mechanisms that govern mass transport, and continues by tackling practical problems spanning all subdisciplines of environmental science and chemical engineering. Assuming some knowledge of ordinary differential equations and a familiarity with basic fluid mechanics applications, this classroom-tested text addresses mass conservation and macroscopic mass balances, placing a special emphasis on applications to environmental processes and presenting a mathematical framework for formulating and solving transport phenomena problems.

CRC Press

Market: Engineering - Chemical

December 2014: 6-1/8 x 9-1/4: 244pp
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Ebook: 978-1-466-57624-7

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Edited by Kambiz Vafai, University of California, Riverside, USA

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CRC Press

Market: Materials Science and Biotechnology

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Hb: 978-1-439-88554-3: $229.95

* For full contents and more information, visit: www.crcpress.com/9781439885543

3rd Edition - TEXTBOOK

Transport Phenomena Fundamentals, Third Edition

Joel L. Plawsky, Rensselaer Polytechnic Institute, Troy, New York, USA

Series: Chemical Industries

This text is designed for a streamlined two-term transport phenomena course. The first part of the book takes students through the balance equation in the context of diffusive transport. Each chapter adds a term to the balance equation, highlighting the effects of that addition on the physical behavior of the system and the underlying mathematical description. The second half of the book builds on the balance equation description of diffusive transport by introducing convective transport terms, focusing on partial rather than ordinary differential equations.

CRC Press

Market: Engineering - Mechanical

January 2014: 7 x 10: 838pp
Hb: 978-1-466-55533-4: $139.95
Ebook: 978-1-466-55535-8

* For full contents and more information, visit: www.crcpress.com/9781466555334

2nd Edition - NEW EDITION


Edited by Efthathios Michaelides, Clayton T. Crowe, Washington State University, Pullman, USA and John D. Schwarzkopf, Los Alamos National Laboratory, New Mexico, USA

Series: Mechanical and Aerospace Engineering Series

This edition differs from the previous one in that the first three chapters cover fundamental concepts and methods pertaining to all types and applications of multiphase flow, with the remaining chapters essentially on applications and engineering systems relevant to multiphase flow and heat transfer. The chapters have been realigned to avoid unnecessary repetition of fundamental theory and methods. Additionally, the editors have stripped the nomenclature from each chapter and have formed a common set of nomenclature used throughout the book.

CRC Press

Market: Engineering - Mechanical

June 2016: 8-1/2 x 11: 1176pp
Hb: 978-1-498-70101-3: $359.95
Ebook: 978-1-498-70102-0

* For full contents and more information, visit: www.crcpress.com/9781498701006
Coagulation and Ultrafiltration in Seawater Reverse Osmosis Pretreatment

S. Assiyeh Alizadeh Tabatabai, UNESCO-IHE Institute for Water Education, Delft, The Netherlands

This study investigates the role of coagulation in enhancing hydraulic performance and permeate quality of ultrafiltration (UF) membranes and provides insight into options for minimizing or ideally eliminating coagulation from UF pre-treatment to seawater reverse-osmosis (SWRO). Results show that coagulation improves UF hydraulic performance mainly by reducing non-backwashable fouling of the membranes. Further reducing particle size of the coating suspensions to the lower nanometre range is expected to be more effective in reducing the required equivalent dose and is recommended for future research.

CRC Press
Market: Water Science, Technology and Engineering
July 2014: 6.7 x 9.5: 220pp
Pb: 978-1-138-02666-5: $93.95
* For full contents and more information, visit: www.crcpress.com/9781138026665

Cold Gas Dynamic Spray

Edited by Roman Gr. Maev, University of Windsor, Canada and Volf Leshchynsky, University of Windsor, Canada

Step-by-step, this text explains how cold gas dynamic spray works and what it can do. It walks the reader through the very first principles of cold spraying all the way through powder preparation, problems related to the transport and injection of a powder into a gas-powder jet, metallurgy of coating formation, methods of cold spray (CS) coatings characterization, and application of the deposited coatings. Featuring a clear layout and a number of high-quality figures, the book comprises a balanced mixture of engineering practice-oriented information and theoretical background.

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Maria do Carmo Coimbra, University of Porto, Portugal, Alírio Egidio Rodrigues, University of Porto, Portugal, Jaime Duarte Rodrigues, Rui Jorge Mendes Robalo and Rui Manuel Pires Almeida

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Practical Applications for Safe and Reliable Operations
James A. Klein, ABS Consulting, Maple Grove, Minnesota, USA and Bruce K. Vaughan

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Ashok Kumar Verma

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