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Arturo Reynolds ■ Adrienne Curtis
Editors

A Guide to

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CHEMISTRY RESEARCH AND APPLICATIONS

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Advances in
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Research

Analytical
Chemistry &
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Chemistry
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Summaries

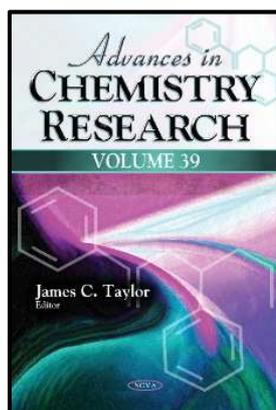
Geology &
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Advances in Chemistry Research Series



Advances in Chemistry Research

Edited by James C. Taylor

In Chapter One, the part gas chromatography-mass spectrometry (GC-MS) and liquid chromatography-mass spectrometry (LC-MS) plays in the discovery and verification of PAEs in food and beverages is confronted by Francesa Serrano, Naiara Pardo-Mates, and Oscar Núñez. In Chapter Two, Joanna Cabaj and Jadwiga Sołoducho examine the recent advancements made in the electrochemical and optical sensors for the detection of catecholamines. Afterwards, Vladislav Yu. Vasilyev analyzes experimental data on ruthenium thin film deposition kinetics in Chapter Three. In Chapter Four, Li Fu discusses catechol, a natural polyphenolic compound that can be highly toxic and is frequently created through factory practices. In Chapter Five, Dinesh C. Bilehal, Mahadev C. Khetagoudar, and Mahadev B. Chetti present a study on Multi-residue GC-MS/MS chromatographic method that has proven useful in the confirmation of 47 multiclass pesticide residues in mango samples. Next, Chapter Six by Hiroshi Matsudam deliberates on the development of innovative nanocomposite ceramics sintered using conventional alumina powders and mixed with calcium stearate sintering additive. In Chapter Seven, Y. Kohzuki studies the interaction concerning a dislocation and numerous divalent impurities to try to determine whether the divalent ionic size is a vital factor for the deformation characteristics. In the final chapter, aromatic aldehydes are applied in a one-pot reaction with enolizable ketones, acetonitrile, and acetyl chloride in the presence of KHSO₄ at room temperature to allow for resultant β -acetamido ketones in high yields. Farzin Rafizadeh and Farahnaz K. Behbahani present this study to show that this method is both efficient and ecofriendly.

Volume 39 HB 9781536126136 £217.50 November 2017 Nova Science Publishers 250 pages

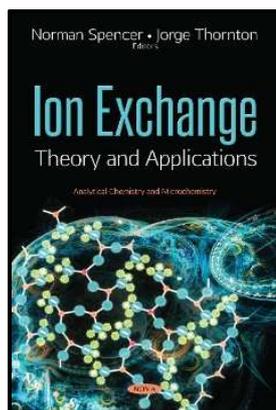
Volume 40 HB 9781536127911 £217.50 December 2017 Nova Science Publishers 180 pages

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Volume 42 HB 9781536129199 £130.50 December 2017 Nova Science Publishers 195 pages

Volume 43 HB 9781536130782 £217.50 March 2018 Nova Science Publishers 204 pages

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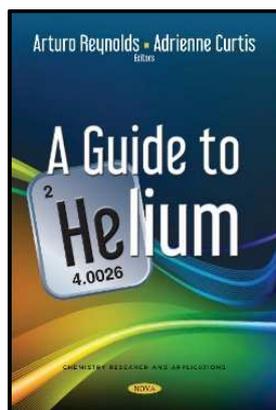


Ion Exchange Theory & Applications

Edited by Norman Spencer, Jorge Thornton

Ion exchange materials are extremely effective absorbents generally containing some functional groups with insoluble structures, which have high affinity capacities towards the targets among a series of structurally similar ions or ion groups. In recent decades, the various methods used to preparing the absorbents for contaminant removal and resource recycle from environment have been extensively studied under the backgrounds of environment pollution and resource shortages. Molecular imprinting technology (MIT) was developed rapidly as a research hot topic to prepare ion exchange materials with shape memory effects. In consideration of the advantages of molecular imprinted polymers (MIPs), including high adsorption capacities, high selectivity, easy recycle etc., their applications in the separation and concentration of target molecules or ions have been widely explored. This book briefly narrates the fundamentals and preparations of MIPs, and particularly focus on the research advances relevant to human-living environment including water, atmosphere and soil. An overview of the most important applications of the ion exchange method in the treatment of industrial wastewaters which contain heavy metal ions, and the main environmental benefits of this method are highlighted. The most important ion exchangers used in environment remediation processes, including their classification and environmental utilizations, are presented as well. The influence of operating conditions on the ion exchange process is discussed, both from efficiency and mechanism perspectives. Also, the opportunities and challenges, which make that the ion exchange method to be still an important research issue at international level, are reviewed. Other chapters familiarize the reader with innovative practices to develop sustainable water treatment methods; review the use of adsorption materials, including raw biomasses, and ion exchange resins for the treatment of olive mill wastewater; various examples of selective removal of heavy metal ions discharged in an effluent from electroplating plants, metal finishing operations, as well as mining and electronics industries through ion exchange are presented and finally; the principal mechanisms and specific features of the copper ion exchange in alkali silicate glasses is explored.

HB 9781536123517 £199.99 November 2017 Nova Science Publishers 135 pages

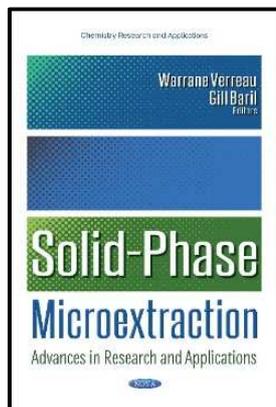


A Guide to Helium

Edited by Arturo Reynolds, Adrienne Curtis

In this collection, the authors present a new theoretical approach free from limitations of perturbation theory for calculating atomic emission spectra in an alternating electric field. The following problems are studied for the emission spectrum of helium: dependences of the AC Stark effect, transition probabilities and spectral line intensities on the electric field parameters, reasons for the change in the emission color with increasing electric field frequency, mechanisms of a sudden increase in spectral line intensities, and their quenching in the electric field and mechanisms of the formation of spectral line profiles in the electric field. This study has real-world applications in plasma spectroscopy, gas discharge physics, laser physics, and astrophysics. Next, the authors discuss the sampling and analytical procedure for helium in forensic practice. In cases of suspected helium exposure, the analysis of helium is commonly performed by the gas chromatography (GC) with thermal conductivity detector or gas chromatography-mass spectrometry (GC/MS) in combination with head-space (HS) method. A subsequent study is presented on the description of the process of ionization of the Helium atom by using a single-active-electron (SAE) model (archetype of a system to an active electron) by an intense and high frequency laser field and by a pulse combining infrared photons and one of its harmonics. The authors mathematically solve the ESDT for an active electron system, using the most efficient numerical simulation methods, followed by a spectral analysis of the wave function for the representation of the photoelectron spectrum of the studied system. This book presents an overview of the theoretical methods which have been developed to analyze electron-atom collisions in the presence of an external laser beam. Various important aspects of the theory of multiphoton free-free transitions are explored, after which a study on the collisions of electrons with atoms in the presence of the laser field is reviewed. The way in which the dressing of the atomic states by the external radiation field can affect the dynamics of the electron-impact collisions is also discussed. The final research studies the phononic crystal. The modeling of this device leads to the study of the interactions between photons and phonons, while also helping in the development and improvement of integrated acousto-optics devices. The goal is to seek a maximum coupling of this interaction by way of a strong confinement of the waves in the microcavities.

PB 9781536131642 £82.99 April 2018 Nova Science Publishers 146 pages

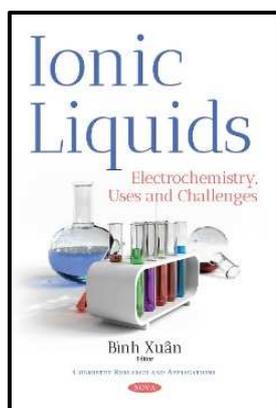


Solid-Phase Microextraction Advances in Research & Applications

Edited by Warrane Verreanu, Gill Baril

In Chapter One, the specific patterns and applications of microextraction techniques in bionalysis are reviewed. The various microextraction techniques can be classified into two rudimentary categories: solid-phase microextraction and liquid-phase microextraction, which are derived from conventional solid-phase extraction and liquid-liquid extraction, correspondingly. Next, an overview of the application of solid-phase microextraction in assessing target chemical families in different alcoholic beverages is provided. The results re-count the last 10 years of scientific publications, concentrating on the extraction conditions used for investigating different compounds in wines, beer and spirits according to the chemical families. Additionally, the authors discuss optimization strategies for achieving accurate quantification. Chapter Three presents research on solid phase microextraction its advantages. Since solid phase microextraction was presented in the early 1990s, there has been an increase in research on new methodical solutions in many research facilities around the world that could potentially increase use of this technique. In Chapter Four, modern uses of new sorbent coatings in solid-phase microextraction are analyzed. The combination of molecularly imprinted polymers with solid phase microextraction results in a possible technique for sample preparation, predominantly considering their described success in recent literature.

PB 9781536128291 £82.99 December 2017 Nova Science Publishers 124 pages

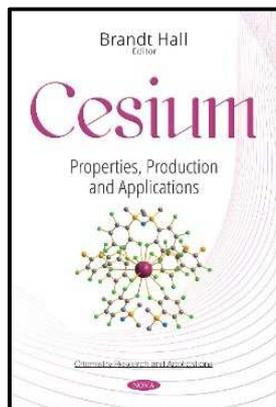


Ionic Liquids Electrochemistry, Uses & Challenges

Edited by Binh Xuân

Chapter One by V. S. Protsenko, A. A. Kityk, L. S. Bobrova, D. A. Shaiderov, and F. I. Danilov examines the effect of water addition on some physicochemical properties of deep eutectic solvents through experimentation. In Chapter Two, Maria Rita Ortega Vega and Célia de Fraga Malfatti deliberate on ionic liquids electrochemical behavior for corrosion inhibition of different metals. In Chapter Three, Junpeng Li and Rui Wang present the process and mechanism of electrochemical synthesis of DMC in ionic liquids. Xinpeng Liu, Sen Qiao, and Rui Wang provide an overview of the applications of ionic liquids on the electrochemical reduction of CO₂ in Chapter Four. In Chapter Five, Ola Lasekan, Somayeh Gholivand, Tan Chin Ping, Faridah Abas, Leong Sze Wei, and Megala Muniandy study the biocatalyst process for the esterification of dihydrocaffeic acid (DHCA) with different ionic liquids: 1-butyl-3-methylimidazolium bis(trifluoromethylsulfonyl) imide, 1-butyl-3-methylimidazoliumhexafluorosphosphate, 1-hexyl-3-methylimidazoliumhexafluorosphosphate, 1-octyl-3-methylimidazoliumhexafluorosphosphate. In Chapter Six, Ola Lasekan continues with a study on predicting wine quality, with the suggestion that investors should further their knowledge on all aspects of winemaking. Finally, Ines Ben Hmad and Ali Gargouri review the advantages of ionic liquids in biorefinery processes in Chapter Seven.

PB 9781536126891 £82.99 December 2017 Nova Science Publishers 119 pages

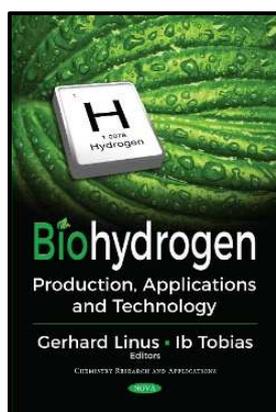


Cesium **Properties, Production & Applications**

Edited by Brandt Hall

In the first chapter, Tatiana P. Pogrebnaya, Stanley F. Mwanga, and Alexander M. Pogrebnoi present a study where a diversity of molecular and ionic clusters of cesium halides was emphasized; structure and stability of the species were determined. In the second chapter, a variety of cesium corrosion tests were performed on the FBR fuel cladding materials to explore the corrosion behavior on FBR cladding materials. In the third chapter, present a study finding that salmonids are effective monitoring animals concerning contamination of the marine ecosystems. In the final chapter, Dylan J. Sures and May Nyman present an overview of existing radiocesium sequestration techniques along with a perspective on cesium in polyoxometalate model systems.

PB 9781536125474 £82.99 December 2017 Nova Science Publishers 119 pages

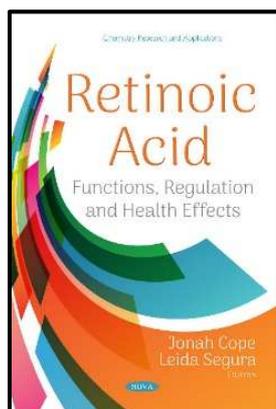


Biohydrogen **Production, Applications & Technology**

Edited by Gerhard Linus, Ib Tobias

In this book, the potential biofuel biohydrogen is studied in terms of its generation, applications, and technology. In the first chapter, Caroline V. Rodrigues, Kamili O. Santana, Lorena O. Pires, Michel Brienzo, and Sandra I. Maintinguer provide a theoretical assessment about the biological methods of hydrogen production, as well as examine their applications on research that has been done regarding waste degradation, encouraging sustainable systems for clean energy generation. In the second chapter, Fernando Grijalva-Hernández, Hugo Iván Velázquez-Sánchez, Juan Carlos Figueroa-Estrada, and Ricardo Aguilar-López present a study where a kinetic model for Hydrogen production by *Desulfovibrio* bacteria was substantiated using experimental data and used to conduct a local sensitivity analysis. Next, Biniam T. Maru, Magda Constantí, and Francesc Medina evaluate the way in which glycerol may be used to produce biochemical products through dark fermentation, as well as studying its use as a carbon source. Bringing the book to a close, Albanez, R., Lovato, G., Zaiat, M., Ratusznei, S.M., and Rodrigues, J.A.D. parallel AnSBBR that used pure substrates for hydrogen/methane production with AnSBBR that used hydrogen production runoff to produce methane.

PB 9781536124835 £77.50 October 2017 Nova Science Publishers 124 pages

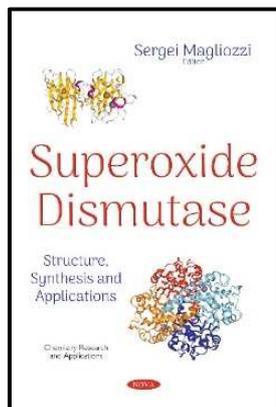


Retinoic Acid **Functions, Regulation and Health Effects**

Edited by Jonah Cope, Leida Segura

In this book, the authors examine retinoic acid and how it plays important role in a wide range of biological processes including proliferation and differentiation especially epithelial tissues. The mechanism of actions of retinoic acid in human keratinocytes and dermal fibroblasts are reviewed, as well as its clinical use in dermatological treatments. Next, the control of gene expression in hepatocytes is discussed. Retinoic acids (RA), including all-trans and 9-cis retinoic acids, are the bioactive components that bind and activate their cognate nuclear receptors to regulate target genes. The authors conclude by testing whether increased progesterone can bias sex ratios in the domestic hen. They determine that there is not a significant shift of the sex ratio after these preliminary experiments. These results suggest the existence of progesterone as additional inducer of meiosis in embryonic germ cell and independently of RA signaling in the chicken.

PB 9781536131567 £71.50 March 2018 Nova Science Publishers 98 pages

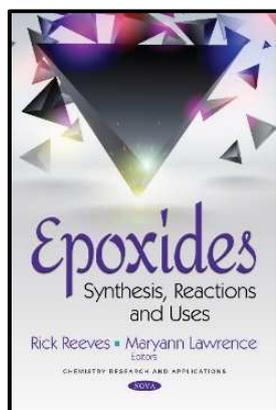


Superoxide Dismutase Structure, Synthesis and Applications

Edited by Sergei Magliozzi

In this compilation, the authors comprehensively investigate SOD effects in the homeostasis of mammal endometrium, using available information on several species and their team experience relating to the topic. In addition, they also address its role in endometrial integrity and some uterine clinical conditions and infertility. The current knowledge of plant SODs, their abiotic-stress modulated expression and activity, and analyses results on genetic engineering of plant SODs are summarized. Significance of superoxide dismutases in the crop improvement for stress tolerance is also discussed. This book reviews the oxidative stress and damage to plants, while also summarizing the characteristics of SOD enzymes and discussing their involvement in the tolerance of plants against abiotic stress. Additionally, many authors have studied the protective role of SOD in the mice cochlea, however more recently the role of SOD gene polymorphisms in the susceptibility of sudden sensorineural hearing loss has been investigated. Therefore, the authors also examine the role of SOD in the cochlea and its involvement in the pathogenesis of noise induced hearing loss, age related hearing loss and sudden sensorineural hearing loss.

PB 9781536130805 £82.99 February 2018 Nova Science Publishers 131 pages

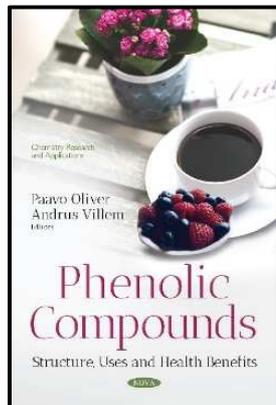


Epoxides Synthesis, Reactions and Uses

Edited by Rick Reeves, Maryann Lawrence

This book opens with a discussion on the syntheses of acyclic polyketides by using epoxide opening reactions. The stereoselective epoxidations of allylic alcohols, including catalytic asymmetric epoxidation reactions and stereospecific reactions due to substrate-control, are described shortly. Afterwards, different epoxide opening reactions and applications in natural product synthesis are reviewed. The authors highlight the recent advances in catalytic one-pot synthesis of epoxides. The versatility of organometallic catalysts in epoxidation of alkenes are considered an important point of research in the context of these transformations. Later, occurrence of carotenoid 5,6-epoxides, their chemical synthesis, the separation of stereoisomers, some transformations of 5,6-epoxy-carotenoids, and their biological processes are described. Following this, the methodologies for the deoxygenation of epoxides using oxomolybdenum and oxorhenium complexes as efficient catalysts are described, allowing "a large community of readers, in particularly the community that works in catalysis, organic and organometallic chemistry, ready access to the novel methodologies developed."

PB 9781536129601 £82.99 December 2017 Nova Science Publishers 85 pages



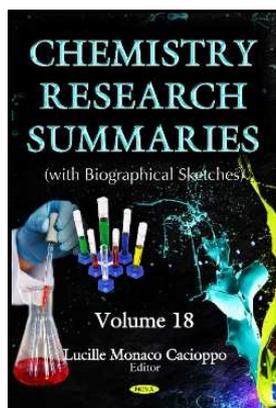
Phenolic Compounds Structure, Uses and Health Benefits

Edited by Paavo Oliver, Andrus Villem

Phenolic Compounds: Structure, Uses and Health Benefits opens with a discussion on phenolic substances such as gallic acid, catechin, chlorogenic acid, caffeic acid, p-coumaric acid, ferulic acid, and quercetin. The most common analytical methods (based on spectrophotometric, chromatographic or electrochemical techniques) for determining phenolic compounds applied to a wide range of sample sources are presented. Additionally, the authors study the high concentrations of bioactive substances in fruit berries in order to determine the link between daily fruit intake and human health. A review of the modern literature on extraction, filtration, and adsorption that may be combined with advanced oxidation treatments to minimize the environmental impact of the remaining wastes is presented, especially focusing on phenolic compounds recovery from olive mill liquidwastes. Lastly, the authors provide an overview on the antiradical and antioxidizing properties of calix[n]arenes and calix[n]resorcinols as part of a larger discussion on the impact of "preorganization" of antioxidant fragments attached to calix[n]arene and calix[n]resorcinol scaffolds and their intramolecular synergy on antioxidant activity.

PB 9781536128819 £82.99 December 2017 Nova Science Publishers 109 pages

Chemistry Research Summaries Series



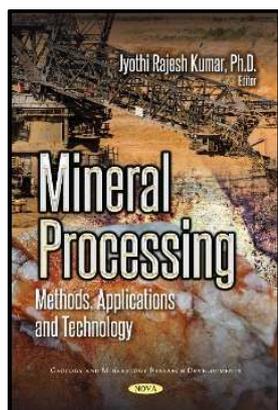
Chemistry Research Summaries

Edited by Lucille Monaco Cacioppo

This book is a compilation of research summaries from a number of different focuses in the field of chemistry research.

Volume 18 HB 9781536129649 £199.99 December 2017 Nova Science Publishers 191 pages

Volume 19 HB 9781536129977 £199.99 January 2018 Nova Science Publishers 413 pages



Mineral Processing

Methods, Applications and Technology

Jyothi Rajesh Kumar

Metal usage by humans is vigorously increasing day-by-day. Since the turn of the new millennium, human needs have mainly depended on different types of metal. Ores and minerals are the primary natural sources of metals. In order to process metals, manufacturers require certain methods and technology. This reference book provides six widely used varieties of metal synthesizing and the chapters are contributed by internationally reputed professors and researchers. Chapter One focuses on biomineralization. Biomineralization is an art of nature; it is an important process where organisms produce hierarchical mineral structures with diverse functions for their survival. This process happens through the self-organization of organic and inorganic molecules under ambient conditions, resulting in highly structured materials with remarkable physical and chemical properties. Chapter Two refers to the application of biological methods in mineral processing. Chapter Three describes monazite mineral processing; monazite is the main resource of rare earth metals such as uranium and thorium. In this chapter, monazite mining, beneficiation and metallurgical routes are discussed. Chapter Four defines the hydrometallurgy of rare earth metals, including scandium. Chapter Five deals with ore extraction technology through computer aided engineering techniques. The final chapter concludes with the processing technology used to treat primary and secondary sources for base metal recovery.

HB 9781536128925 £139.50 January 2018 Nova Science Publishers 151 pages

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Chemistry - May 2017

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Retinoic Acid

Functions, Regulation
and Health Effects

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