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## CHEMISTRY

ADVANCES IN APPLIED SCIENCE AND ENGINEERING

# INNOVATIONS AND CHALLENGES IN MODERN PHYSICAL CHEMISTRY



A .K. Haghi, PhD  
Editor

NOVA

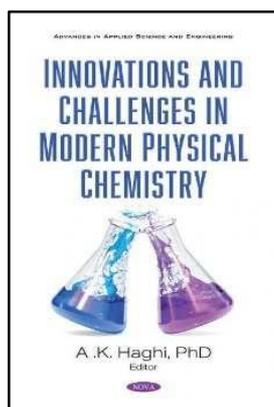
TITLES PUBLISHED BY NOVA SCIENCE

- Advances in Applied Science & Engineering
- Advances in Chemistry Research
- Analytical Chemistry & Microchemistry
- Chemistry Research & Applications
- Geology & Mineralogy Research Developments
- Nuclear Materials & Disaster Research

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### Advances in Applied Science & Engineering



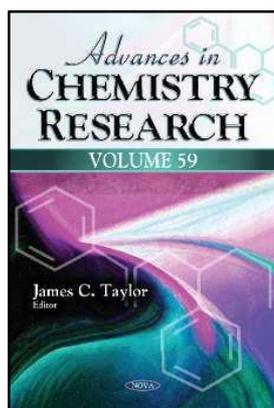
#### **Innovations and Challenges in Modern Physical Chemistry Research and Practices**

Edited by A.K. Haghi

This volume introduces readers to some of the latest research applications of physical chemistry. The compilation of this volume was motivated by the tremendous increase of useful research work in the field of physical chemistry and related subjects in recent years, and the need for communication between physical chemists, physicists, and biophysicists. This volume reflects the huge breadth and diversity in research and the applications in physical chemistry and physical chemistry techniques, providing case studies that are tailored to particular research interests. It examines the industrial processes for emerging materials, determines practical use under a wide range of conditions, and establishes what is needed to produce a new generation of materials.

HB 9781536181814 £146.99 August 2020 Nova Science Publishers 206 pages

## Advances in Chemistry Research



### Advances in Chemistry Research

Edited by James C. Taylor

This compilation opens with a study on the catalytic conversion of methanol to olefins, mainly SAPO-34 and ZSM-5, as well as the synthesis, properties, applications.

A description of phenylalanine ammonia-lyase is presented in relation to structure, localization, expression, regulation, assay methods and the factors influencing phenylalanine ammonia-lyase activity, as well as its importance to the phenylpropanoid pathway for plant growth and development.

The authors critically analyze the development of molecular nanocatalysts based on organochalcogenligands and their applications in the transfer of hydrogenation.

Following this, the progress in applications of dimensional analysis and similarity theory in electrochemical kinetics and electrochemical engineering is discussed. The use of dimensionless groups in problems of current density distribution and electrochemical mass transfer is described and the similarity criteria involved are considered.

The authors focus on various solvent-minimized sample pre-treatment procedures which are inexpensive and offer minimal exposure to toxic organic solvents during sample analysis.

The concluding chapter explores bis-azides, i.e., organic compounds presenting two azido groups in their structures. Their utility in synthetic group transformation is covered, as well as in polymer chemistry, the preparation of bioactive compounds, click chemistry, and in the synthesis of cross-linked DNA.

Volume 59 - HB 9781536171129 £229.99 March 2020 Nova Science Publishers 260 pages

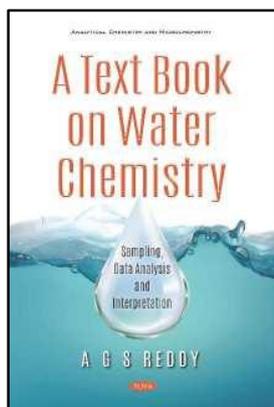
Volume 60 - HB 9781536174496 £229.99 May 2020 Nova Science Publishers 265 pages

Volume 61 - HB 9781536176278 £229.99 May 2020 Nova Science Publishers 286 pages

Volume 62 - HB 9781536179217 £229.99 July 2020 Nova Science Publishers 284 pages

Volume 63 - HB 9781536183016 £229.99 August 2020 Nova Science Publishers 245 pages

## Analytical Chemistry & Microchemistry



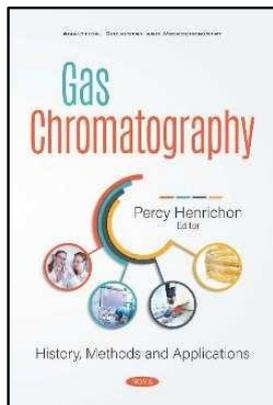
### A Text Book on Water Chemistry

#### Sampling, Data Analysis and Interpretation

A G S Reddy

The aim of the book is to provide domain-specific text/reference material pertaining water chemistry/hydrogeochemistry catering to students of geology, hydrogeology, civil engineers, hydrochemistry and environmental sciences. It will also be very much useful to professionals involved in water supply, treatment, and researchers engaged in water chemistry. The book is intended to provide ample realistic examples on water quality pertaining to varied geological environs, which would help in easy understanding of concepts. Question bank and exercises with keys/answers are provided for each chapter, which would facilitate the readers to assess their understanding and also facilitate in competitive tests. The book covers all the topics related to water chemistry with emphasis on ground water. Interpretation techniques for major ion content of water are deliberated exhaustively. Procedure of preparation of plots, graphs and calculations of various indices both manually and using simple software are discussed in detail.

HB 9781536167030 £284.99 February 2020 Nova Science Publishers 570 pages



## Gas Chromatography History, Methods and Applications

Edited by Percy Henrichon

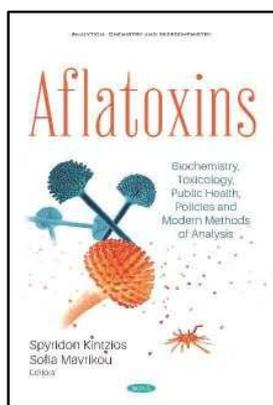
*Gas Chromatography: History, Methods and Applications* focuses on the main applications of gas chromatography in clinical and forensic toxicology, mainly in the determination of drugs of abuse including the new psychoactive substances in several types of biological matrices.

The authors go on to investigate the analysis of gaseous or volatile substances using sensor gas chromatography equipped with a semiconductor gas sensor detector. The simplicity, ease of handling, and high sensitivity of this method allow results to be obtained rapidly, which may provide valuable information for forensic diagnosis.

This compilation addresses the way in which food adulteration practices are potentially harmful to human health and so food safety and authenticity constitute an important issue in food chemistry. The chemical composition of foodstuffs is an excellent indicator of quality, origin, authenticity and/or adulteration.

The concluding study aims to determine the organic compounds of vinasse through gas chromatography-mass spectrometry GC-MS. Vinasse is a byproduct of ethanol and poses long-term risk to public health because of its persistent and toxic nature.

PB 9781536173505 £87.99 February 2020 Nova Science Publishers 211 pages



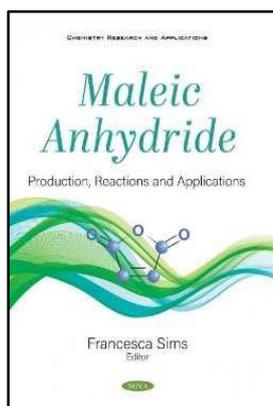
## Aflatoxins Biochemistry, Toxicology, Public Health, Policies and Modern Methods of Analysis

Edited by Spyridon Kintzios

Aflatoxins are a group of highly toxic mycotoxins, which naturally occur as fungal secondary metabolites, and can be detected in food and feed. "*Aflatoxins: Biochemistry, Toxicology, Public Health, Policies and Modern Methods of Analysis*" discusses general issues that occur by this mycotoxin contamination in foods and feeds. The book is divided into 9 chapters that summarize aflatoxins' biological effects on human health, methods for their determination, and strategies for risk mitigation and legislation.

The first part covers the biochemical effects of aflatoxins on human and animal health, as well as techniques for biomonitoring. The chapters in the second part describe all the physicochemical and biological assays for aflatoxin determination and analysis. In addition, special attention is given also in the predictive modeling of *Aspergillus flavus* growth and aflatoxins production. Furthermore, a chapter is dedicated to the use of metabolomics in *Aspergillus* research. In the last part, the book goes on examining the regulatory provisions for aflatoxin contamination control. The book is intended to provide an update to scientists, industry professionals and the general public in the recent advances within the field of aflatoxins.

HB 9781536167856 £211.99 February 2020 Nova Science Publishers 346 pages



## Maleic Anhydride Production, Reactions and Applications

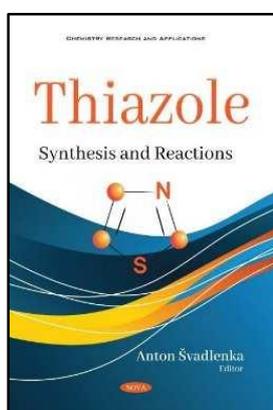
Edited by Francesca Sims

This compilation opens with a distinct perspective on the solubility of maleic anhydride, presenting the research findings regarding the identification of the most suitable solvent selection for systems containing maleic anhydride.

A survey of more recent developments with particular emphasis on the past 10 years is also provided.

The authors review maleic-anhydride-polypropylene as compatibilizer in polypropylene nanocomposites with various types of nanofillers such as clay, carbon nanotube, graphene and metal oxide, focusing on their preparation, properties and performance.

PB 9781536184617 £87.99 August 2020 Nova Science Publishers 159 pages



## Thiazole Synthesis and Reactions

Edited by Anton Švadlenka

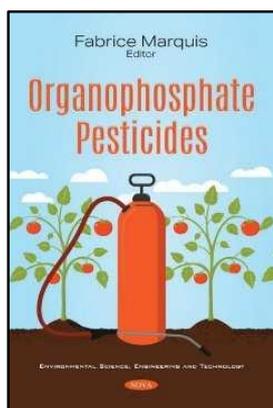
Thiazole or 1,3-thiazole is a five-member heterocyclic compound that contains a sulfur atom and a nitrogen atom. The term “thiazoles” also refers to a large family of molecules containing one or more thiazole rings.

The design and synthesis of novel thiazole derivatives as anti-cancer agents has been the focal point of recent research, in great part because of their biological properties and their applications in drug development.

In Thiazole: Synthesis and Reactions, an attempt is made to review the reports of recent research advances in the area of aqueous phase synthesis of thiazoles and benzothiazoles, particularly those published in the last decade.

In closing, the authors showcase the recent research advances in thiazole/benzothiazole synthesis involving microwave irradiation.

PB 9781536184020 £75.99 August 2020 Nova Science Publishers 139 pages



## Organophosphate Pesticides

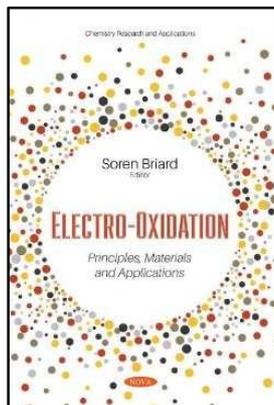
Edited by Fabrice Marquis

In this compilation, the authors present progress in research concerning protection from organophosphates activity, as well as an overview of the methods for their removal from the environment and decontamination of contaminated persons.

New developments in research on biosensors is also presented based on the enzyme (or bacteria)-functionalized nanostructures for organophosphorus pesticide detection.

The closing study focuses on how the application of computational methods to the investigation of organophosphorous pesticides is a significant step towards a complete understanding of their behavior in any type of environment.

PB 9781536183078 £75.99 August 2020 Nova Science Publishers 113 pages



## Electro-Oxidation Principles, Materials and Applications

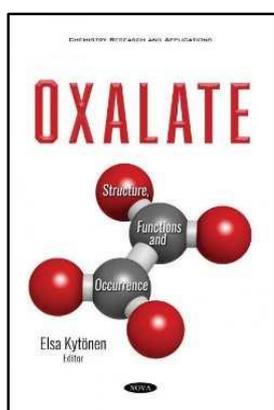
Edited by Soren Briard

*Electro-Oxidation: Principles, Materials and Applications* provides an overview of the most relevant literature and novel research in nanostructured Pt-based electrocatalysts for low-temperature polymer electrolyte membrane fuel cells directly fed by C2-C4 alcohols.

An overview of different voltammetric sensors based on the electro-oxidation of clinically important compounds is provided, and the applications of voltammetry extended from single to multi-component determination are discussed.

Additionally, a brief review is provided regarding the main results and conclusions obtained and published by the authors' research groups in recent years related to the preparation and characterization of different types of electrocatalysts using aBCs as catalyst support.

PB 9781536183061 £87.99 August 2020 Nova Science Publishers 171 pages



## Oxalate Structure, Functions and Occurrence

Edited by Elsa Kytönen

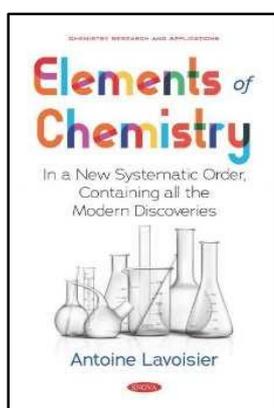
*Oxalate: Structure, Functions and Occurrence* first summarizes the various factors contributing to calculi formation, along with different therapeutic measures including medicinal plants/drugs which have been experimentally proven to exhibit antiurolithiatic activity employing various mechanisms.

The authors discuss the known transition metal oxalates, their synthetic analogues, thermal and magnetic behaviour, and reaction pathways, particularly for energy materials such as Li ion, as well as supercapacitor and redox flow battery systems.

A number of possible synthetic pathways for the generation of oxalic acid in plants and fungi are presented and briefly discussed. An important number of studies have shown that ascorbic acid is the major substrate for the synthesis of oxalic acid in plants. Therefore, the so called "Wheeler-Smirnoff" mechanism, which explains the biosynthesis of ascorbic acid in the plant kingdom, is discussed in detail.

Lastly, this compilation explores how hyperoxaluria can be a pathway through which kidney dysfunction occurs in persons due to diabetes mellitus or obesity and thus lead to a gradual deterioration of renal function.

PB 9781536183030 £87.99 August 2020 Nova Science Publishers 164 pages

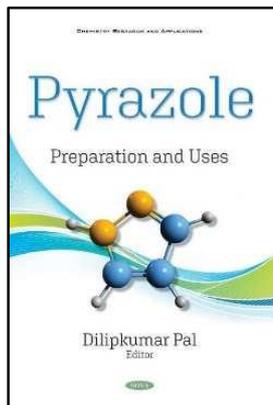


## Elements of Chemistry In a New Systematic Order, Containing all the Modern Discoveries

Robert Kerr

Lavoisier is one of the giants of chemistry. In this book, he lays out all of the theories of early chemistry and how to conduct experiments. He ties the old chemistry (alchemy) into the new, and it is here that the kernels of modern chemical nomenclature begin. He is rightfully called "The Father of Modern Chemistry". Anyone who is serious about learning chemistry should read this book.

HB 9781536175349 £211.99 March 2020 Nova Science Publishers 392 pages



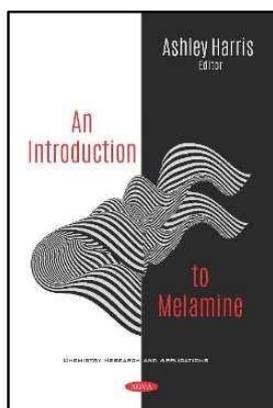
## Pyrazole Preparation and Uses

Edited by Dilipkumar Pal

This book has comprehensively reviewed the latest information on pyrazoles, their preparations and uses. It provides extended ideas on pyrazole and its derivatives including their synthesis, chemistry, structure activity relationship (SAR) and therapeutic applications. The health promoting properties of these pyrazoles are discussed in this book with different therapeutic applications of pyrazole scaffold. Topics related to pyrazole and its analogues as potential anticancer, anti-angiogenesis, antiviral, antioxidative, anti-convulsive, anthelmintic, anti-inflammatory, antidiabetic agents are described in this book in detail.

Furthermore, current status and future prospects of pyrazole moiety in drug discovery, importance of it in plant systems, its relevance in neurological drug discovery, its potency as herbicidal and antimicrobial agents have been enumerated through different chapters. In a summary, this book is a valuable resource for research scholars, academics, students, industrialists and subject experts working in the multidisciplinary fields like medicinal chemistry, synthetic chemistry, biochemistry, pharmacology, natural product chemistry and other related areas in the field of pyrazole derivatives drug discovery and research.

HB 9781536182507 £284.99 August 2020 Nova Science Publishers 563 pages



## An Introduction to Melamine

Edited by Ashley Harris

In this compilation, technical and critical aspects concerning confirmatory methods for the analysis of melamine and its analogous, including cyanuric acid, ammeline, and ammelide in foodstuffs are discussed. Moreover, an overview of the concentrations of melamine and related compounds reported in the recent literature for different food items are summarized, as the results from monitoring these compounds in food products indicate their continuing presence in the food chain.

Although high level of adulteration has ceased, melamine is still a popular material for pesticides, farm animal feed fillers, fire retardants, anti-wrinkles and mild abrasives. As such, the authors discuss how low-dose contamination of melamine to the environment cannot be ignored.

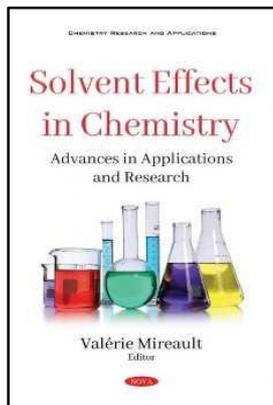
Next, melamine-formaldehyde resin was chosen to form shell material due to its good thermo-mechanical and water-resistant properties. A series of experiments are conducted on changing the emulsifying system and a discussion of the results is provided.

Additionally, a sensitive chemical sensor is developed to detect melamine selectively by an electrochemical approach, where ternary mixed metal oxide nanoparticles were prepared through the wet-chemical process. The calcined ZnO/CuO/Co<sub>3</sub>O<sub>4</sub> NPs are investigated by field emission scanning electron microscopy, energy-dispersive X-ray spectroscopy, X-ray photoelectron spectroscopy, powder X-ray diffraction, ultraviolet visible spectroscopy, and Fourier-transform infrared spectroscopy.

The authors evaluate the formation of melamine-derived particles in aqueous and biological matrices using different analytical techniques for studying the bioaccumulation of melamine-cyanurate in tissues, including kidney stones.

Lastly, cadmium doped antimony oxide nanostructures are synthesized by a facile wet-chemical method at a low temperature to detect melamine from aqueous solutions. The calcined cadmium doped antimony oxide nanostructures are characterized systematically by FE-SEM, EDS, UV/Vis., FTIR spectroscopy, powder XRD and XPS techniques.

PB 9781536171365 £87.99 March 2020 Nova Science Publishers 204 pages



## Solvent Effects in Chemistry Advances in Applications and Research

Edited by Valérie Mireault

In *Solvent Effects in Chemistry: Advances in Applications and Research*, a critical review of solvent influence on the performance of metal catalysts in the hydrogenation of carbonyl compounds, specifically unsaturated aldehydes, ketones and ketoesters, is provided.

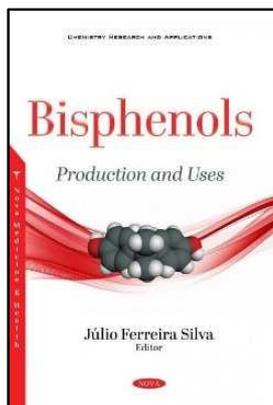
Additionally, the effects of solvent on the kinetics and mechanism of different reactions, stability, and sensitivity of the nanostructures are investigated.

The uses of a large of variety of solvents varying from non-polar low basic solvents to polar strong basic solvents are discussed, showing that the properties of different solvents strongly influence the product composition of both studied reactions.

The effects of solvent on the isomerization of monoterpenes epoxides as  $\alpha$ - and  $\beta$ -pinene epoxide, limonene epoxide, verbenol epoxide, and nopol epoxide are explained from molecular and mechanistic points of view.

The concluding study explores how heterolytic bond dissociation forms ionic species, while the corresponding homolytic bond dissociation results in the formation of neutral radical species.

HB 9781536182262 £211.99 October 2020 Nova Science Publishers 285 pages



## Bisphenols Production and Uses

Edited by Júlio Ferreira Silva

In this compilation, in addition to information on the synthetic method of some types of bisphenols, the authors provide an overview of the adverse effects of these chemicals on some risk factors of non-communicable diseases in children and adolescents.

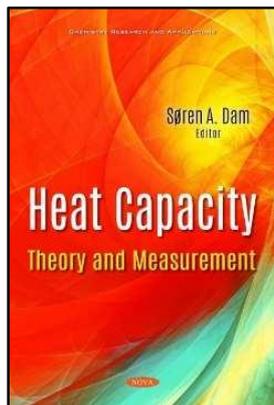
Next, a brief review of the synthesis of bisphenolic antioxidants is provided, and their catalytic systems and antioxidant activities are highlighted.

Recent developments in the preparation of sensors based on functionalized carbon nanotubes for the removal of bisphenol A are described. Different functional groups such as inorganic nanoparticles, alumina, graphene oxide, alginate, magnetic nanoparticles, and polymers could be supported on the surface of carbon nanotubes.

The authors investigate recent developments in the preparation of graphene nanocomposites for the removal of the bisphenol A from water. Different functional groups loaded on graphene nanocomposite including polymer, -cyclodextrin, magnetic, and inorganic nanoparticles are investigated.

Humans are exposed to bisphenol A on a regular basis, with the most significant source of risk arising from contact through their diet (food and drink containers). As such, the concluding study focuses on the effects of bisphenols on health.

PB 9781536181876 £75.99 July 2020 Nova Science Publishers 137 pages



## Heat Capacity Theory and Measurement

Edited by Søren A. Dam

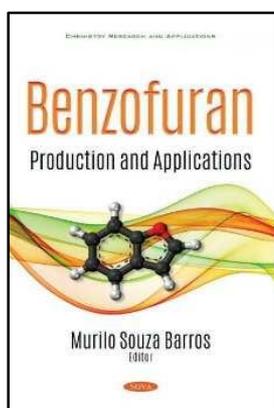
In *Heat Capacity: Theory and Measurement*, the incidence of the second law of thermodynamics on heat capacity is examined with respect to heat flux taking place in a thermodynamically irreversible manner, as well as with respect to irreversible heat capacity ( $CIR = QIR/\Delta T$ ).

In another study, the heat capacities of aqueous mixtures of monoethanolamine with piperazine were measured from (303.15 to 353.15) K with a micro-reaction calorimeter ( $\mu RC$ ) at an interval of 5 K.

The authors discuss how heat capacity is a significant thermodynamic quality because of its intrinsic significance and its connection with other thermodynamic properties like enthalpy, entropy and Gibbs energy.

The closing study explores how the excess partial molar heat capacity of the water in binary aqueous-solvent mixtures (W + S), CPWE, provides insight into water structure enhancement, if present.

PB 9781536181425 £87.99 July 2020 Nova Science Publishers 177 pages



## Benzofuran Production and Applications

Edited by Murilo Souza Barros

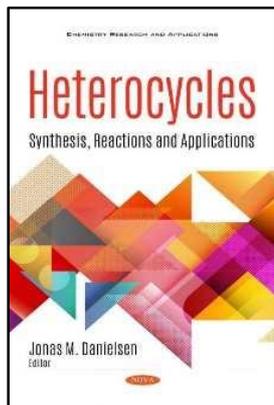
Benzofurans have garnered the attention of medicinal chemists due to their broad pharmacological activity. *Benzofuran: Production and Applications* provides insight into the natural origin of these compounds, reported biological activities for various analogs, synthetic routes to obtain benzofurans substituted at different heterocycle sites, and controlled release encapsulation methods.

Dihydrobenzofuran neolignans are secondary metabolites arising from the coupling of two phenylpropanoid units during the shikimate biosynthetic pathway. In this compilation, the natural sources and synthetic routes from which dihydrobenzofuran neolignans can be obtained are reviewed, and their biological potential is highlighted.

Additionally, the authors focus on the palladium and rhodium catalyzed multiple C-H functionalizations in the synthesis of benzofurans and their derivatives. The use of Ir and Ru salts is also explored.

A review of the aspects related to cancer initiation and progress, as well as the applications of benzofurans as structural frameworks for the development of new drugs against cancer, is provided.

HB 9781536178739 £146.99 May 2020 Nova Science Publishers 234 pages



## Heterocycles Synthesis, Reactions and Applications

Edited by Jonas M. Danielsen

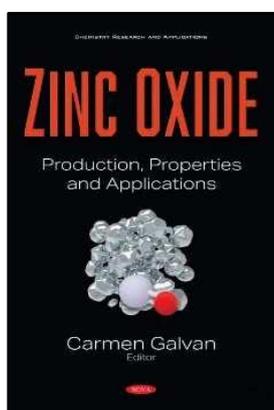
Considering the extensive applications that have been discovered for naphthoquinone-triazole hybrids in the search for new bioactive molecules, *Heterocycles: Synthesis, Reactions and Applications* first comprehensively addresses recent synthetic strategies for their preparation.

The authors highlight recent developments in reaction strategies for the synthesis of dihydro-, tetrahydro-, pyrano-pyrans and tetrahydrofurans and their applications in natural product synthesis.

The important structural features of heterocyclic compounds are reviewed, as well as their deviation from the planar configuration in the form of puckering or buckling, and methods of suppression.

The closing study explores the reaction of azides with Grignard or organolithium reagents in an inter- or intramolecular fashion to form linear or cyclic triazene intermediates, respectively.

PB 9781536178043 £146.99 May 2020 Nova Science Publishers 231 pages



## Zinc Oxide Production, Properties and Applications

Edited by Carmen Galvan

In *Zinc Oxide: Production, Properties and Applications*, the authors first provide a summary of the natural sources available for the synthesis of zinc oxide nanoparticles, enlisting some plant-mediated synthesized zinc oxide nanoparticles showing promising antimicrobial, antioxidant, cytotoxic and photocatalytic properties.

Important technological opportunities and challenges emphasizing the electrical and optoelectronic features of elongated zinc oxide nanoparticle nanosystems are reviewed.

The various nonlinear optical phenomenon observed in zinc oxide thin film, including nonlinear absorption, nonlinear refraction, nonlinear scattering and harmonic generations are introduced.

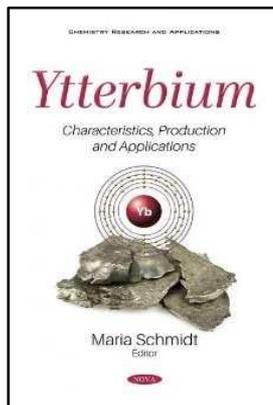
Selected literature on the use of zinc oxide nanoparticles for the immobilization of enzymes is reviewed, as well as the use of zinc oxide nanoparticle/enzyme systems in the fabrication of biosensors.

The authors explore transition metal doped zinc oxide nanoparticles for a wide range of catalytic organic reactions, further exploring their catalytic applications for organic transformations at mild reaction conditions.

The basic concepts behind the development of nanostructured zinc oxide nanoparticles, including the solid state reaction, hydrothermal method, solvothermal method and co-precipitation method are discussed.

Lastly, a facile, eco-friendly synthesis of zinc oxide nanoparticles using the peel extract of *Musa paradisiaca* L, *Punica granatum* L, and *Citrus reticulata* Blanco as bioreducing agent is reported.

HB 9781536177534 £211.99 July 2020 Nova Science Publishers 290 pages



## Ytterbium Characteristics, Production and Applications

Edited by Maria Schmidt

*Ytterbium: Characteristics, Production and Applications* outlines the properties and uses of ytterbium, focusing on its isotopic characteristics and its abundance in some important geological materials.

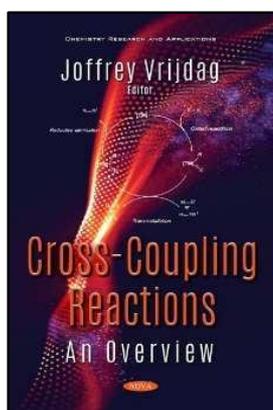
The authors explore structures formed by depositing submonolayer quantities of ytterbium atoms on different silicon and germanium surfaces, addressing the earliest stages of ytterbium/silicon and germanium interface formation.

In addition, this compilation provides an overview of the methods used to extract and separate rare earth elements from natural deposits or from secondary resources.

The crucial spectroscopic properties of ytterbium that induce the efficiency of ytterbium-doped materials or fibers for optical sensing of temperature are reviewed.

Laser irradiation is studied in the context of its application in cleaning, a complicated process incorporating photo-thermal, photochemical and mechanical processes on the intended work materials.

HB 9781536177268 £146.99 June 2020 Nova Science Publishers 262 pages



## Cross-Coupling Reactions An Overview

Edited by Joffrey Vrijdag

*Cross-Coupling Reactions: An Overview* opens with an overview of the fundamentals and applications of the young and fast developing area of transition metal catalyzed/mediated oxidative (dehydrogenative) C-H/C-H coupling reactions between two (hetero)arenes.

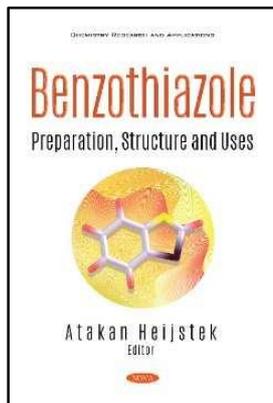
Continuing, the authors highlight the recent advances regarding the ligand supported transition metal-catalyzed domino (cascade) or one-pot syntheses of various heterocycles involving cross-coupling reactions.

The recent advances in Cu catalyzed tandem reactions for heterocycle synthesis are also addressed. Cu metal chemistry has garnered attention as a potential alternative to precious transition metals, being cheaper, more sustainable and more easily available.

A comprehensive account of research on green chemical routes is provided, involving various palladium metal-based catalysts utilized in facilitating cross-coupling reaction in aqueous media.

Reported decarboxylative cross-coupling reactions are discussed along with suitable examples, focusing on their mechanism of action.

PB 9781536176780 £178.99 May 2020 Nova Science Publishers 268 pages



## **Benzothiazole Preparation, Structure and Uses**

Edited by Atakan Heijstek

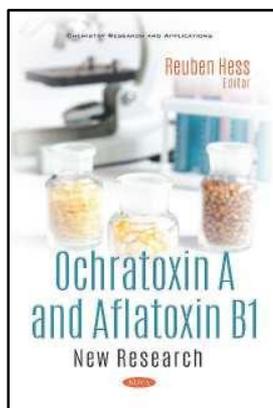
Benzothiazole is an aromatic heterocyclic compound with the chemical formula of  $C_7H_5NS$ . *Benzothiazole: Preparation, Structure and Uses* opens with a review on the synthesis of benzothiazoles for their anticancer, antimicrobial, antidiabetic, anticonvulsant, anti-inflammatory, anthelmintic, analgesic, antiviral and antitubercular activities.

Following this, considering the versatile nature of benzothiazole, various benzothiazole derivatives with anticonvulsant and anticancer activity are discussed in detail.

A report on the design strategies, detailed photo-physical properties and applications of benzothiazoles is provided in an effort to help researchers overcome existing challenges in designing novel excited state intramolecular proton transfer benzothiazole fluorescent molecules.

In closing, the authors present recent updates on the usefulness and structure-activity relationship of benzothiazole derivatives for the development of novel anticancer agents.

PB 9781536175486 £75.99 March 2020 Nova Science Publishers 210 pages



## **Ochratoxin A and Aflatoxin B1 New Research**

Edited by Reuben Hess

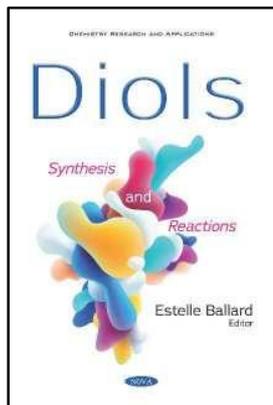
*Ochratoxin A and Aflatoxin B1: New Research* first presents the latest knowledge regarding the occurrence of ochratoxin A in dry-cured meat and dairy products, as well as relevant food safety issues. Different remediation strategies such as heating, ripening, drying, storage and the use of microbial cultures, which have been adopted for the prevention or decontamination of ochratoxin A, are critically reviewed.

Next, the authors assess the occurrence of ochratoxin A in different types of dry-fermented sausages and hams produced by various households in Croatia, proposing that in order to avoid contamination, the production of household-based meat and meat products should run under standardized and well-controlled conditions.

In the subsequent study, a total of sixty mold-contaminated rice, corn and groundnut samples were collected from one of the Cauvery delta regions of Tamil Nadu, India, and analyzed to determine the co-occurrence of ochratoxin A and citrinin, and the respective mycotoxigenic fungal strains that produce these toxins.

Besides the known adverse effects of alcohol, beer could also be the source of several mycotoxins such as aflatoxin B1. Aflatoxin B1 is the most toxic among the identified aflatoxins and classified into group I as a human carcinogen by the International Agency for Research on Cancers. The stability of aflatoxin B1 during the brewing process, as well as the most important detection techniques and sample treatment used for the determination of this compound are evaluated.

PB 9781536174168 £75.99 March 2020 Nova Science Publishers 147 pages



## Diols Synthesis and Reactions

Edited by Estelle Ballard

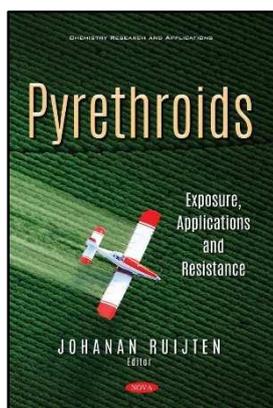
*Diols: Synthesis and Reactions* discusses the applications of the gem-diol chemical group in organic synthesis and atmospheric processes, as well as their effects on odorant receptors and on the catalytic sites of enzymes.

Following this, the reactions of cyclophosphazenes are studied using numerous diols, leading to the formation of regioisomers; open chain, spiro, ansa and bridged-structures and their mixtures. This investigation has many advantages in terms of obtaining products with high yield, ease of isolation and high reactivity potential.

Additionally, the authors review the hydrogenation of *cis*-2-butene-1,4-diol over supported metal catalysts, with particular emphasis on the different reaction mechanisms. *cis*-2-Butene-1,4-diol is an interesting multifunctional substrate, chosen as a probe molecule to study the liquid phase hydrogenation of unsaturated diols due to its versatility.

The closing chapter presents a global review of the level of molecular complexity that can be synthesized from accessible reagents: amines and diols. Acceptorless dehydrogenative condensations will also be explored in view of their applications in the synthesis of heterocycles.

PB 9781536172263 £87.99 January 2020 Nova Science Publishers 162 pages



## Pyrethroids Exposure, Applications and Resistance

Edited by Johan Ruijten

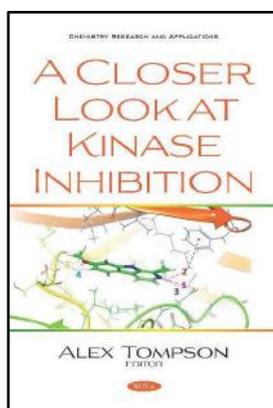
Pyrethroids have been employed in crop fields all over the world. However, the use of this chemical class of insecticides raised concerns about environmental contamination and toxic effects on non-target species, including health issues on human population.

Therefore, *Pyrethroids: Exposure, Applications and Resistance* presents recent literature about the biodegradation of pyrethroids with emphasis on studies performed in soil at fields and in controlled environments.

The authors chapter briefly discuss pyrethroid exposure, toxicity, effects and their applications in different fields. A detailed insight on microbial mediated transformation of pyrethroids is also provided.

In closing, the current status of pyrethroid resistance in the dengue vector is reviewed, and the underlying biochemical and molecular mechanisms that may potentially play a role in the resistance are characterized. This knowledge may aid in understanding challenges in mosquito control.

PB 9781536181982 £87.99 July 2020 Nova Science Publishers 197 pages



## A Closer Look at Kinase Inhibition

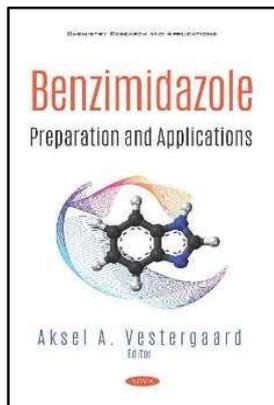
Edited by Alex Tompson

*A Closer Look at Kinase Inhibition* opens with a discussion on the roles of various tyrosine kinases inhibitors and molecular mechanisms of acquired resistance to tyrosine kinase inhibitor drugs therapy in colon-rectal cancer.

The authors summarize host cell and viral protein kinases, the progress in their use, and the repurposing of approved kinase inhibitors as broad-spectrum antivirals.

The key kinases, namely CLK1, DYRK1A, CDK5, GSK3 and CK1, are analyzed as data indicate that targeting these proteins may have therapeutic promise against Alzheimer's disease.

HB 9781536169737 £146.99 February 2020 Nova Science Publishers 212 pages



## Benzimidazole Preparation and Applications

Edited by Aksel A. Vestergaard

*Benzimidazole: Preparation and Applications* first defines the structure, physical and chemical properties of the benzimidazole compound class. Further conventional and alternative synthesis methods and important reactions of these compound derivatives are illustrated with examples.

The authors provide an overview of benzimidazole-based synthetic medicine and their significant applications in treating various ailments. The chemical reactions of benzimidazole with other heterocyclic compounds/chemical reagents produce a lot of new substituted molecules, which have potential pharmaceutical applications.

A literature review is presented focusing on the synthesis of chiral compounds and their subsequent applications as therapeutic compounds in order to better evaluate the results so far.

Additionally, the authors discuss how benzimidazole derivatives play a vital role in organic light emitting diodes as emissive materials, host materials, electron transport materials, hole blocking materials, etc., and have pharmaceutical applications such as antimicrobial, antihypertensive, anti-HIV and anticancer.

Following this, this collection examines classes of potential chemosensors possessing benzimidazole moieties which are capable of both visual and optical estimation of target analytes over a broad concentration range and without interference of contemporary analytes.

Important methodologies used for the synthesis of variedly substituted benzimidazoles are presented along with their multi-target therapeutic uses.

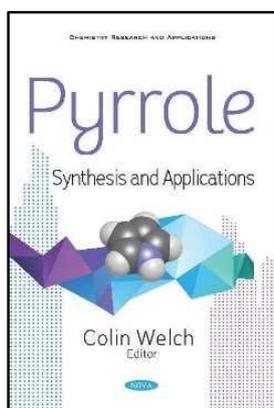
The latest research on anti-tumor and antimicrobial benzimidazole compounds, as well as structure-activity correlations, drug design, clinical and preclinical studies is also presented.

Benzimidazole-based polymers with various architecture and copolymers are discussed with a variation of properties such as mechanical, thermal stability, thermo-oxidative stability and enhanced performance.

The penultimate chapter covers a critical analysis of the recent developments in benzimidazole framework research and the future scope of benzimidazole framework in ligand designing.

In closing, the synthesis and biological properties of coordination compounds containing benzimidazole derivatives are presented and discussed.

HB 9781536169867 £211.99 February 2020 Nova Science Publishers 398 pages



## Pyrrole Synthesis and Applications

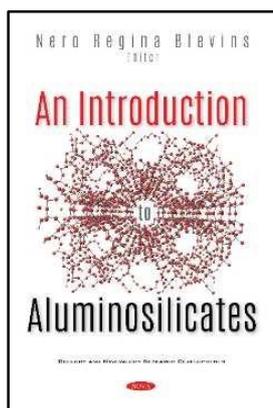
Edited by Colin Welch

*Pyrrole: Synthesis and Applications* provides an overview of polypyrrole synthesis by different methods such as chemical polymerization, electro-polymerization, photo-initiated polymerization and  $\gamma$  irradiated polymerization.

Pyrrole derivatives play a crucial role in organic chemistry, medicinal chemistry, and heterocyclic chemistry. Pyrrole scaffold is extensively used in the synthesis of drug molecules with various pharmacological properties, as well as in material sciences.

Finally, the authors review studies on the electrical properties of hybrid polymers which revealed that their electrical conductivity increased markedly with the proportion of pyrrole in the initial mixture. This is attributed to the formation of an electrically conducting polymer network in the non-conducting methacrylate matrix.

PB 9781536171372 £75.99 April 2020 Nova Science Publishers 114 pages



### **An Introduction to Aluminosilicates**

Edited by Nero Regina Blevins

*An Introduction to Aluminosilicates* first reviews the main advances in methods of obtaining synthetic montmorillonite for environmental and biomedical areas. The perspectives and main challenges in the application of these materials is critically analyzed.

The authors next study Polyhydroxy metal complexes of Al, Fe, Zr, Cr and Ti (inorganic pillarizing agents) for the synthesis of pillared clays.

Information is provided on the possibility of using amorphous aluminosilicates as a modifying additive in the formulation of cement-based dry building mixtures. The physicochemical properties of the additive are considered, and the results of XRD and DTA analyzes are presented.

The authors investigate the molecular orientation and surface morphology of organized molecular films with regard to solid-state structures for organo-modified aluminosilicates by a surface pressure-area isotherm, in-plane and out-of plane X-ray diffraction, and atomic force microscopy.

A new method for the synthesis of amorphous mesoporous aluminosilicates with acidic properties and a narrow pore size distribution in the range of 2-7 nm is also explored.

The urease immobilization of composite adsorbents polyacrylamide-bentonite, polyacrylamide-chitosan, and polyacrylamide-chitosan-bentonite is assessed, produced from polyacrylamide as a hydrogel, bentonite as an aluminosilicate mineral, and chitosan as a polysaccharide.

Following this, the authors provide a brief overview of literature data where crystalline aluminosilicates have been utilized for the capture and immobilization of radionuclides.

The physicochemical properties of as-synthesized layered aluminosilicate are characterized by small angle PXRD, FTIR, porosity studies, thermal studies,  $^{27}\text{Al}$  MAS NMR, and morphological studies.

Subsequently, this compilation addresses the way in which magnetic nanoparticles have proven to be frequently occurring building blocks for hybrid structure construction and, moreover, have shown innovative prospects as multifunctional adsorbents.

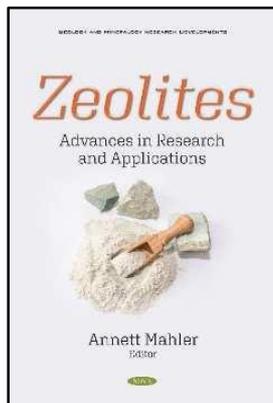
Modern methods for the synthesis of highly dispersed micro- and micromesoporous mordenite with a high degree of crystallinity, as well as high crystallinity mordenite with a hierarchical porous structure, methods for modifying the mentioned crystalline aluminosilicates as a result of postsynthetic treatments, and modern adsorption and catalytic systems based on them are described.

Next, the high activity and selectivity of high crystallinity zeolite Y with a hierarchical porous structure in the synthesis of practically important oligomers of various unsaturated compounds is established.

The authors highlight that the aluminosilicate present in kaolin may also be used in the production of zeolitic materials, and some details of this application are explained.

The adsorptive features of PAAm-Ch-Z for  $\text{Th}^{4+}$  are investigated in view of its dependency on pH, concentration, time, temperature and ionic strength. The parameters derived from the compatibility of experimentally obtained data to Langmuir, Freundlich and Dubinin-Radushkevich, van t'Hoff, pseudo first-/second-order and Weber Morris models are utilized in the evaluation of adsorption and its thermodynamics and kinetics.

HB 9781536172508 £211.99 April 2020 Nova Science Publishers 496 pages



## **Zeolites** **Advances in Research and Applications**

Edited by Annett Mahler

Zeolite is a mineral that consists mainly of aluminosilicate, and its major commercial use is as a surfactant.

Over the last decade, significant efforts have been devoted to the development of micro-mesoporous zeolite materials, which are also referred to as mesostructured zeolites.

Zeolites show potential as heterogeneous catalysts for terpenes valorisation into fragrances and flavours, replacing the homogenous catalysts.

The results of research on of zeolite catalysts for selective reduction of nitrogen oxides by C1-C4-hydrocarbons and ethanol are demonstrated, in particular, the selective reduction activity of Ag/BEA catalysts.

The authors also explore the synthesis of hierarchical zeolites using green templates such as natural polymers, surfactants and biological agents, as traditional templates are expensive and toxic.

The recent developments in dehydration of organics, organic/organic separation, desalination and gas separation using zeolite membranes are reviewed in detail.

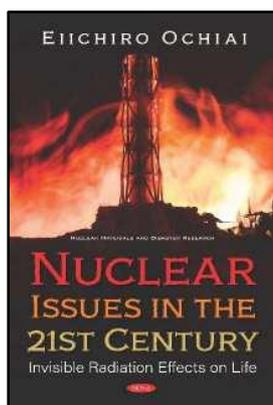
Studies on the synthesis of zeolites in alkali-activated materials and the physicochemical changes of alkali-activated materials induced by these zeolites are presented.

Due to their stability, form selectivity, non-corrosiveness, and environmental compatibility, zeolites are suggested as a suitable option for the thermal catalytic cracking process.

The authors provide fundamental research data on the Cuban zeolite in Detoxsan®, including its different medical applications in comparison to the available literature regarding the medical use of zeolites.

HB 9781536177350 £211.99 May 2020 Nova Science Publishers 243 pages

## **Nuclear Materials & Disaster Research**



## **Nuclear Issues in the 21st Century** **Invisible Radiation Effects on Life**

Eiichiro Ochiai

Ionizing Radiation due to radioactive material produced by the nuclear industry in both military and peaceful uses is causing subtle, invisible, yet very serious effects on life including our own. The effects have been observed in many situations including the nuclear weapon tests, nuclear power plant accidents and others all around the world. This treatment outlines these facts and discusses the scientific bases for the radiation effects.

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