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SARAI NASH

Lignin and Lignans Springer

Exponential growth of the worldwide population requires increasing amounts of water, food, and energy. However, as the quantity of available fresh water and energy sources directly affecting cost of food production and transportation diminishes, technological solutions are necessary to secure sustainable supplies. In direct response to this reality, this book focuses on the water-energy-food nexus and describes in depth the challenges and processes involved in efficient water and energy production and management,

wastewater treatment, and impact upon food and essential commodities. The book is organized into 4 sections on water, food, energy, and the future of sustainability, highlighting the interplay among these topics. The first section emphasizes water desalination, water management, and wastewater treatment. The second section discusses cereal processing, sustainable food security, bioenergy in food production, water and energy consumption in food processing, and mathematical modeling for food undergoing phase changes. The third section discusses fossil fuels, biofuels, synthetic fuels, renewable energy, and carbon capture. Finally, the book concludes with a discussion of the future of sustainability, including coverage of the

role of molecular thermodynamics in developing processes and products, green engineering in process systems, petrochemical water splitting, petrochemical approaches to solar hydrogen generation, design and operation strategy of energy-efficient processes, and the sustainability of process, supply chain, and enterprise. Royal Society of Chemistry
The collection of the six contributions of the 7th International Seminar on Modern Synthetic Methods, written by leading experts in their fields, gives an overview on the state of the art, trends, and new accomplishments in solvent effects on chemical transformations, in reactions on surfaces, in the synthesis of oligosaccharides and nucleid acid

analogues, and in antibody catalysis. This volume is an invaluable companion to both the active research chemists and the advanced students, fascinated by the world of biologically important compounds and by the creativity in synthetic techniques directed towards their preparation.

Efficient Methods for Preparing

Silicon Compounds Springer Science & Business Media

Progress in Filtration and Separation contains reference content on fundamentals, core principles, technologies, processes, and applications. It gives detailed coverage of the latest technologies and research, models, applications and standards, practical implementations, case studies, best practice, and process selection. Extensive worked examples are included that cover basic calculations through to process design, including the effects of key variables. Techniques and topics covered include pervaporation, electrodialysis, ion exchange, magnetic (LIMS, HIMS, HGMS), ultrasonic, and more. Solves the needs of university based researchers and R&D engineers in industry for high-level

overviews of sub-topics within the solid-liquid separation field Provides insight and understanding of new technologies and methods Combines the expertise of several separations experts

Nanotechnology for Energy and Water
Newnes

This expanded, revised, and updated second edition of Innovations in Green Chemistry and Green Engineering provides a comprehensive introduction to the state-of-the-art in this key area of sustainability research. Processes that meet the objectives of green chemistry and chemical engineering minimize waste and energy use, and eliminate toxic by-products. Given the ubiquitous nature of products from chemical processes in our lives, green chemistry and chemical engineering are vital components of any sustainable future. Peer-reviewed articles from worldwide experts present the latest developments on topics ranging from organic batteries and green catalytic transformations to green nanoscience and nanotoxicology. Now under the leadership of distinguished Editors from the Chinese Academy of Sciences, this volume in the Encyclopedia of Sustainability Science and

Technology, Second Edition, is an essential, one-stop reference for professionals in research and industry. The book also fills the need for an authoritative course text in environmental and green chemistry and chemical engineering at the upper-division undergraduate and graduate levels.

Activity Coefficients at Infinite Dilution: C10-C36 with O2S and H2O John Wiley & Sons

This book presents the applications of ion-exchange materials in the chemical and food industries. It includes topics related to the application of ion exchange chromatography in water softening, purification and separation of chemicals, separation and purification of food products and catalysis. This title is a highly valuable source of knowledge on ion-exchange materials and their applications suitable for postgraduate students and researchers but also to industrial R&D specialists in chemistry, chemical, and biochemical technology. Additionally, this book will provide an in-depth knowledge of ion-exchange column and operations suitable for engineers and industrialists. The Synthesis and Reactions of Organic

Compounds CRC Press

A comprehensive and interdisciplinary resource filled with strategic insights, tools, and techniques for the design and construction of hybrid materials. Hybrid materials represent the best of material properties being combined for the development for materials with properties otherwise unavailable for application requirements. *Novel Nanoscale Hybrid Materials* is a comprehensive resource that contains contributions from a wide range of noted scientists from various fields, working on the hybridization of nanomolecules in order to generate new materials with superior properties. The book focuses on the new directions and developments in design and application of new materials, incorporating organic/inorganic polymers, biopolymers, and nanoarchitecture approaches. This book delves deeply into the complexities that arise when characteristics of a molecule change on the nanoscale, overriding the properties of the individual nanomolecules and generating new properties and capabilities altogether. The main topics cover hybrids of carbon nanotubes and metal nanoparticles,

semiconductor polymer/biopolymer hybrids, metal biopolymer hybrids, bioorganic/inorganic hybrids, and much more. This important resource: Addresses a cutting-edge field within nanomaterials by presenting groundbreaking topics that address hybrid nanostructures Includes contributions from an interdisciplinary group of chemists, physicists, materials scientists, chemical and biomedical engineers Contains applications in a wide-range of fields—including biomedicine, energy, catalysis, green chemistry, graphene chemistry, and environmental science Offers expert commentaries that explore potential future avenues of future research trends *Novel Nanoscale Hybrid Materials* is an important resource for chemists, physicists, materials, chemical and biomedical engineers that offers the most recent developments and techniques in hybrid nanostructures.

Solid Acids and Bases Springer

This exciting new book is a unique compilation of data from a wide range of chemical and spectroscopic instrumentation and the integration of nanostructure characterisation drawn from physical, chemical, electrochemical,

spectroscopic and electron microscopic measurements. It fills a gap in the current nanomaterials literature by documenting the latest research from scientific journals to provide a concise yet balanced and integrated treatment of an interesting topic: titanium oxide nanostructures within the emerging and fashionable area of nanomaterials. The book, a valuable reference point, is aimed at professionals, postgraduates and industrial research workers in nanomaterials. Readers will gain a knowledge of the methods for synthesising nanomaterials as well as an understanding of their structure and resulting physical characteristics together with a knowledge of their (existing and potential) applications.

Sustainable Carbon Materials from Hydrothermal Processes Oxford University Press, USA

The consumption of petroleum has surged during the 20th century, at least partially because of the rise of the automobile industry. Today, fossil fuels such as coal, oil, and natural gas provide more than three quarters of the world's energy. Unfortunately, the growing demand for fossil fuel resources comes at a time of

diminishing reserves of these nonrenewable resources. The worldwide reserves of oil are sufficient to supply energy and chemicals for only about another 40 years, causing widening concerns about rising oil prices. The use of biomass to produce energy is only one form of renewable energy that can be utilized to reduce the impact of energy production and use on the global environment. Biomass can be converted into three main products such as energy, biofuels and fine chemicals using a number of different processes. Today, it is a great challenge for researchers to find new environmentally benign methodology for biomass conversion, which are industrially profitable as well. This book focuses on the conversion of biomass to biofuels, bioenergy and fine chemicals with the interface of biotechnology, microbiology, chemistry and materials science. An international scientific authorship summarizes the state-of-the-art of the current research and gives an outlook on future developments. [Hydrosilylation](#) Academic Press

Solid Acids and Bases: Their Catalytic Properties reviews developments in the

studies of acidic and basic properties of solids, including the efficacy and special characteristics of solid acid and base catalysts. This book discusses the determination of basic and acidic properties on solid surfaces and relationship between acid strength and acid amount. The structure and acid-base properties of mixed metal oxides and correlation between acid-base properties and catalytic activity and selectivity are also deliberated. This publication is useful to professional chemists and graduate students in the fields of organic, inorganic and physical chemistry, petroleum chemistry and catalysis, including readers interested in the acidic and basic properties on solid surfaces.

Applications of Ion Exchange Materials in Chemical and Food Industries Albany, N.Y. : J. Munsell

This is the first book to describe the synthesis and characterization of the materials used in polymer-supported synthesis. The authors cover not only the classical polymers and their use in homogeneous, heterogeneous and micellar catalysis, but also such new developments as "enzyme-labile linkers",

illustrating how to simplify the purification process and avoid waste. The result is a wealth of useful information -- for beginners and experts alike - in one handy reference, removing the need for difficult and time-consuming research among the literature.

Synthesis, Properties and Applications MDPI

The collection of contributions in this volume presents the most up-to-date findings in catalytic hydrogenation. The individual chapters have been written by 36 top specialists each of whom has achieved a remarkable depth of coverage when dealing with his particular topic. In addition to detailed treatment of the most recent problems connected with catalytic hydrogenations, the book also contains a number of previously unpublished results obtained either by the authors themselves or within the organizations to which they are affiliated. Because of its topical and original character, the book provides a wealth of information which will be invaluable not only to researchers and technicians dealing with hydrogenation, but also to all those concerned with homogeneous and heterogeneous

catalysis, organic technology, petrochemistry and chemical engineering. *The Water-Food-Energy Nexus* Wiley Praise for the previous editions "An excellent text . . . will no doubt provide the benchmark for comparative works for many years." —Journal of the American Chemical Society "An excellent state-of-the-art compilation of catalytic asymmetric chemistry . . . should be included in any chemistry reference collection." —Choice "This is a tremendous resource and an excellent read. I recommend immediate purchase." —Perkin Transactions Since this important work was first published in 1993, the field of catalytic asymmetric synthesis has grown explosively, spawning effective new methods for obtaining enantiomerically pure compounds on a large scale and stimulating new applications in diverse fields—from medicine to materials science. *Catalytic Asymmetric Synthesis, Third Edition* addresses these rapid changes through contributions from highly recognized world leaders in the field. This seminal text presents detailed accounts of the most important catalytic asymmetric reactions known today, and discusses

recent advances and essential information on the initial development of certain processes. An excellent working resource for academic researchers and industrial chemists alike, the Third Edition features: Six entirely new chapters focusing on novel approaches to catalytic asymmetric synthesis including non-conventional media/conditions, organocatalysis, chiral Lewis and Bronsted acids, CH activation, carbon-heteroatom bond-forming reactions, and enzyme-catalyzed asymmetric synthesis A new section focusing on the important new reaction, asymmetric metathesis, in carbon-carbon bond-forming reactions Updated chapters on hydrogenation, carbon-carbon bond-forming reactions, hydrosilylations, carbonylations, oxidations, amplifications and autocatalysis, and polymerization reactions Retaining the best of its predecessors but now thoroughly up to date, *Catalytic Asymmetric Synthesis, Third Edition* serves as an excellent desktop reference and text for researchers and students from the upper-level undergraduates through experienced professionals in industry or academia. **Construction, Biomedical, and other**

Industrial Applications Elsevier

The importance of biofuels in greening the transport sector in the future is unquestionable, given the limited available fossil energy resources, the environmental issues associated to the utilization of fossil fuels, and the increasing attention to security of supply. This comprehensive reference presents the latest technology in all aspects of biofuels production, processing, properties, raw materials, and related economic and environmental aspects. Presenting the application of methods and technology with minimum math and theory, it compiles a wide range of topics not usually covered in one single book. It discusses development of new catalysts, reactors, controllers, simulators, online analyzers, and waste minimization as well as design and operational aspects of processing units and financial and economic aspects. The book rounds out by describing properties, specifications, and quality of various biofuel products and new advances and trends towards future technology.

revista del Departamento de Ciencias
John Wiley & Sons

Biobased Surfactants: Synthesis, Properties, and Applications, Second Edition, covers biosurfactant synthesis and applications and demonstrates how to reduce manufacturing and purification costs, impurities, and by-products. Fully updated, this book covers surfactants in biomedical applications, detergents, personal care, food, pharmaceuticals, cosmetics, and nanotechnology. It reflects on the latest developments in biobased surfactant science and provides case scenarios to guide readers in efficient and effective biobased surfactant application, along with strategies for research into new applications. This book is written from a biorefinery-based perspective by an international team of experts and acts as a key text for researchers and practitioners involved in the synthesis, utilization, and development of biobased surfactants. Describes new and emerging biobased surfactants and their synthesis and development Showcases an interdisciplinary approach to the topic, featuring applications to chemistry, biotechnology, biomedicine, and other areas Presents the entire lifecycle of biobased surfactants in detail

Optimization of Biodiesel and Biofuel Process Modern Synthetic Methods 1995 Biomass, Biopolymer-Based Materials and Bioenergy: Construction, Biomedical and Other Industrial Applications covers a broad range of material types, including natural fiber reinforced polymer composites, particulate composites, fiberboard, wood fiber composites, and plywood composite that utilize natural, renewable and biodegradable agricultural biomass. In terms of bioenergy, the authors explore not only the well-known processing methods of biofuels, but also the kinetics of biofuels production pathways, a techno-economic analysis on biomass gasification, and biomass gasification with further upgrading into diesel additives and hybrid renewable energy systems for power generation. Further chapters discuss advanced techniques for the development of biomass-based composites, biopolymer-based composites, biomass gasification, thermal kinetic design and techno-economic analysis of biomass gasification. By introducing these topics, the book highlights a totally new research theme in biopolymer-based composite materials

and bioenergy. Covers a broad range of different research fields, including biopolymer and natural fiber reinforcement used in the development of composites Demonstrates key research themes in materials science and engineering, including materials processing, polymer science, biofuel processing, and thermal and kinetic studies Presents valuable information for those working in research and development departments, and for graduate students (Masters and PhDs) *Phenolic Antioxidants in Foods: Chemistry, Biochemistry and Analysis* Springer Science & Business Media It is zero hour for a new US water policy! At a time when many countries are adopting new national approaches to water management, the United States still has no cohesive federal policy, and water-related authorities are dispersed across more than 30 agencies. Here, at last, is a vision for what we as a nation need to do to manage our most vital resource. In this book, leading thinkers at world-class water research institution the Pacific Institute present clear and readable analysis and recommendations for a new federal water

policy to confront our national and global challenges at a critical time. What exactly is at stake? In the 21st century, pressures on water resources in the United States are growing and conflicts among water users are worsening. Communities continue to struggle to meet water quality standards and to ensure that safe drinking water is available for all. And new challenges are arising as climate change and extreme events worsen, new water quality threats materialize, and financial constraints grow. Yet the United States has not stepped up with adequate leadership to address these problems. The inability of national policymakers to safeguard our water makes the United States increasingly vulnerable to serious disruptions of something most of us take for granted: affordable, reliable, and safe water. This book provides an independent assessment of water issues and water management in the United States, addressing emerging and persistent water challenges from the perspectives of science, public policy, environmental justice, economics, and law. With fascinating case studies and first-person accounts of what helps and hinders good

water management, this is a clear-eyed look at what we need for a 21st century U.S. water policy.

Catalytic Hydrogenation Springer

Plant foods are an essential part of our daily diet and constitute one of the highest contributors to the world economy. These foods are rich in phenolic compounds, which play a significant role in maintaining our health. This textbook presents a comprehensive overview of the chemistry, biochemistry and analysis of phenolic compounds present in a variety of foods. The text can be used as a singular source of knowledge for plant food science and technology, covering all of the important chemical, biochemical and analytical aspects needed for a thorough understanding of phenolic antioxidants in foods. *Phenolic Antioxidants In Foods: Chemistry, Biochemistry, and Analysis* is comprised of three sections. The first section covers the basic concepts of antioxidants, their chemistry and their chemical composition in foods, providing a detailed introduction to the concept. The second section covers the biochemical aspects of phenolic antioxidants, including their biosynthetic pathways, biological

effects and the molecular mechanism of antioxidant effects in the biological system. This section promotes an understanding of the fundamental biochemical reactions that take place in foods and after digestion and absorption. The third section covers the analytical chemistry used in the analysis of phenolic antioxidants in foods, including the basic analytical procedures, methods for analysis and chromatographic and spectroscopic analyses. This section is significant for aspiring food chemists and manufacturers to evaluate the nature and chemistry of phenolic antioxidants in foods. Featuring helpful quizzes, section summaries, and key chapter points, this textbook is the perfect learning tool for advanced chemistry undergraduates and post-graduates looking to gain a fundamental understanding of phenolic antioxidants in food products.

The Interface of Biotechnology, Chemistry and Materials Science Springer Science & Business Media

The second edition of *Comprehensive Organic Synthesis*—winner of the 2015 PROSE Award for Multivolume Reference/Science from the Association of

American Publishers—builds upon the highly respected first edition in drawing together the new common themes that underlie the many disparate areas of organic chemistry. These themes support effective and efficient synthetic strategies, thus providing a comprehensive overview of this important discipline. Fully revised and updated, this new set forms an essential reference work for all those seeking information on the solution of synthetic problems, whether they are experienced practitioners or chemists whose major interests lie outside organic synthesis. In addition, synthetic chemists requiring the essential facts in new areas, as well as students completely new to the field, will find *Comprehensive Organic Synthesis, Second Edition* an invaluable source, providing an authoritative overview of core concepts. Winner of the 2015 PROSE Award for Multivolume Reference/Science from the Association of American Publishers Contains more than 170 articles across nine volumes, including detailed analysis of core topics such as bonds, oxidation, and reduction Includes more than 10,000 schemes and images Fully revised and updated;

important growth areas—including combinatorial chemistry, new technological, industrial, and green chemistry developments—are covered extensively
Novel Nanoscale Hybrid Materials OECD Publishing
 Over the past four decades, there has been immense progress in every area of lignin science, ranging from the enzymology of lignin biodegradation, to the delignification of wood fiber during pulping and bleaching, to advances in spectroscopy. *Lignin and Lignans: Advances in Chemistry* captures the developments that have been achieved by world-class scientists in the most critical aspects of this burgeoning field. Tools for the characterization of lignin and lignans After an overview of the topic, the book discusses the significance and comparative performances of the most commonly used chemical degradation methods and presents lignin structural information based on the use of these methods. Next, the book explores spectroscopic methods, including UV-visible absorption, fluorescence, Raman, infra red (IR), near-infrared (NIR), nuclear

magnetic resonance (NMR), and heteronuclear NMR spectroscopy. It then compares the results of studies of lignin in situ with studies of isolated lignins. Predicting reactivity The authors discuss polymer properties related to thermal stability and molecular motion of lignin in the solid state. They describe applications of electronic structure calculations to the chemistry of lignin, and they explore lignin reactions that occur during the chemical pulping of wood by soda, kraft, AQ, and polysulfide processes. Chemistry associated with industrial processes The book describes chemical pulp bleaching, oxidative and reductive lignin-retaining bleaching, and lignin biodegradation. It also examines the application of microorganisms and the enzymes they produce in the manufacturing of chemical and mechanical pulp. The book closes with chapters on photodegradation and chromophore formation and the pharmacological properties of lignans. Highlighting significant developments on selected topics, this essential reference for those in industry and academia is designed to fuel further research and discovery in this specialized area,

especially in the emerging field of biorefining.

Processes, Technologies, and Challenges
Elsevier

Efficient Methods for Preparing Silicon Compounds is a unique and valuable handbook for chemists and students involved in advanced studies of preparative chemistry in academia and industry. Organized by the various coordination numbers (from two to six) of the central silicon atom of the reported

compounds, this book provides researchers with a handy and immediate reference for any compound or properties needed in the area. Edited by a renowned expert in the field, each chapter explores a different type of compound, thoroughly illustrated with useful schemes and supplemented by additional references. Knowledgeable contributors report on a broad range of compounds on which they have published and which are already used on a broad scale or have the

potential to be used in the very near future to develop a new field of research or application in silicon chemistry. Includes contributions and edits from leading experts in the field Includes detailed chemical schemes and useful references for each preparative method Organized by the coordination numbers of the central silicon atom for each compound for easy navigation Serves as a go-to primer for researchers in novel compositions of silicon matter