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Biofuels and Sustainability - Kazuhiko Takeuchi 2018-07-13
This open access book presents a comprehensive analysis of biofuel use strategies from an interdisciplinary perspective using sustainability science. This interdisciplinary perspective (social science-natural science) means that the strategies and policy options proposed will have significant impacts on the economy and society alike. Biofuels are expected to contribute to reducing greenhouse gas emissions, revitalizing economies in agricultural communities and alleviating poverty. However, despite these anticipated benefits, international organizations such as the FAO, OECD and UN have published reports expressing concerns that biofuel promotion may lead to deforestation, water pollution and water shortages. The impacts of biofuel use are extensive, cross-sectoral and complex, and as such, comprehensive analyses are required in order to assess the extent to which biofuels can contribute to sustainable societies. Applying interdisciplinary sustainability science concepts and methodologies, the book helps to enhance the establishment of a sustainable society as well as the development of appropriate responses to a global need for urgent action on current issues related to biofuels.
Noos - 2000
Solid Acids and Bases - Kozo Tanabe 2012-12-02
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.
Biolubricants - Jan C.J. Bart 2012-12-18
Lubricants are essential in engineering, however more sustainable formulations are needed to avoid adverse effects on the ecosystem. Bio-based lubricant formulations present a promising solution. Biolubricants: Science and technology is a comprehensive, interdisciplinary and timely review of this important subject. Initial chapters address the principles of lubrication, before systematically reviewing fossil and bio-based feedstock resources for biodegradable lubricants. Further chapters describe catalytic, (bio) chemical functionalisation processes for transformation of feedstocks into commercial products, product development, relevant legislation, life cycle assessment, major product groups and specific performance criteria in all major applications. Final chapters consider markets for biolubricants, issues to consider when selecting and using a lubricant, lubricant disposal and future trends. With its distinguished authors, Biolubricants: Science and technology is a comprehensive reference for an industrial audience of oil formulators and lubrication engineers, as well as researchers and academics with an interest in the subject. It provides an essential overview of scientific and technological developments enabling the cost-effective improvement of biolubricants, something that is crucial for the green future of the lubricant industry. A comprehensive, interdisciplinary and timely review of bio-based lubricant formulations Addresses the principles of lubrication Reviews fossil and bio-based feedstock resources for biodegradable lubricants
Adsorption from Solutions of Non-Electrolytes - J. J. Kipling 2017-01-31
Adsorption from Solutions of Non-Electrolytes provides a general discussion of the subject, which has so far been given little or no attention in current textbooks of physical chemistry. A general view of the subject is particularly needed at a time when we wish to see how far it will be possible to use theories of solutions to explain the phenomena of adsorption. The book opens with an introductory chapter on the types of interface, aspects of adsorption from solution, types of adsorption, and classification of systems. This is followed by separate chapters on experimental methods, adsorption at the liquid-solid interface, adsorption from completely miscible and partially liquids, adsorption of gases and solids from solution, adsorption of polymers, and adsorption in multicomponent systems. Subsequent chapters deal with factors influencing competitive adsorption at the liquid-solid interface. adsorption at the liquid-vapor and liquid-liquid interface, kinetics and thermodynamics of adsorption from the liquid phase, the use of columns in adsorption, and use of adsorption from solution to measure surface area.
Modern Synthetic Methods 1995 - Beat Ernst 1995
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 catalyis. 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.
Capillary Electrophoresis of Carbohydrates - Pierre Thibault 2008-02-03
A collection of cutting-edge techniques for using capillary electrophoresis (CE) to analyze complex carbohydrates. These readily reproducible protocols provide methods for sample preparation, analysis of mono- and oligosaccharides, glycoproteins, and glycoconjugates. A useful appendix describes the structures of the most commonly encountered carbohydrate residues and olgosaccharides from mammalian and bacterial origins. Each protocol contains detailed information on reagents, apparatus, notes, comments, and tips on procedures.
Spectroscopic Methods for Nanomaterials Characterization - Sabu Thomas 2017-05-19
Nanomaterials Characterization Techniques, Volume Two, part of an ongoing series, offers a detailed analysis of the different types of spectroscopic methods currently being used in nanocharacterization. These include, for example, the Raman spectroscopic method for the characterization of carbon nanotubes (CNTs). This book outlines the different kinds of spectroscopic tools being used for the characterization of nanomaterials and discusses under what conditions each should be used. The book is intended to cover all the major spectroscopic techniques for nanocharacterization, making it an important resource for both the academic community at the research level and the industrial community involved in nanomanufacturing. Explores how spectroscopy and X-ray-based nanocharacterization techniques are applied in modern industry Analyzes all the major spectroscopy and X-ray-based nanocharacterization techniques, allowing the reader to choose the best for their situation Presents a method-orientated approach that explains how to successfully use each technique

Biofuels Production and Processing Technology - M.R. Riazi 2017-10-10
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.
Metal Organic Frameworks as Heterogeneous Catalysts - Francesc X. Llabrés i Xamena 2013-07-01
Catalysis has always been part of the development of mankind; from the fermentation of alcoholic drinks, through the development of fertilisers in the agricultural revolution and production of bulk chemicals in the 20th Century. Today, society demands improved production routes with greater product output and energy efficiency; the ultimate goal to achieving this would be having all catalytic reactions in concert, effectively functioning like a biological cell. Metal organic frameworks (MOFs) are a relatively new type of hybrid material. Their crystalline porous structure, built up from organic and inorganic building blocks, presents a vast array of composition, porosity and functionality offering enormous potential in catalytic systems. This book examines the latest research and discovery in the use of MOFs in catalysis, highlighting the extent to which these materials have been embraced by the community. Beyond presenting a digest of recent research by major players in the field, the book presents the strategies behind recent developments, providing a lasting reference for seasoned researchers and newcomers to the field.
OECD-FAO Agricultural Outlook 2019-2028 - OECD 2019-07-08
The Agricultural Outlook 2019-2028 is a collaborative effort of the Organisation for Economic Co-operation and Development (OECD) and the Food and Agriculture Organization (FAO) of the United Nations. It brings together the commodity, policy and country expertise of both organisations as well ...
Catalytic Asymmetric Synthesis - Takahiko Akiyama 2022-05-27
Seminal text presenting detailed accounts of the most important catalytic asymmetric reactions known today This book covers the preparation of enantiomerically pure or enriched chemical compounds by use of chiral catalyst molecules. While reviewing the most important catalytic methods for asymmetric organic synthesis, this book highlights the most important and recent developments in catalytic asymmetric synthesis. Edited by two well-qualified experts, sample topics covered in the work include: Metal catalysis, organocatalysis, photoredox catalysis, enzyme catalysis C-H bond functionalization reactions Carbon-carbon bond formation reactions, carbon-halogen bond formation reactions, hydrogenations, polymerizations, flow reactions Axially chiral compounds Retaining the best of its predecessors but now thoroughly up to date with the important and recent developments in catalytic asymmetric synthesis, the 4th edition of Catalytic Asymmetric Synthesis serves as an excellent desktop reference and text for researchers and students, from upper-level undergraduates all the way to experienced professionals in industry or academia.
Solvents and Solvent Effects in Organic Chemistry - Christian Reichardt 2006-03-06
In most cases, every chemist must deal with solvent effects, whether voluntarily or otherwise. Since its publication, this has been the standard reference on all topics related to solvents and solvent effects in organic chemistry. Christian Reichardt provides reliable information on the subject, allowing chemists to understand and effectively use these phenomena. 3rd updated and enlarged edition of a classic 35% more contents excellent, proven concept includes current developments, such as ionic liquids indispensable in research and industry From the reviews of the second edition: "...This is an immensely useful book, and the source that I would turn to first when seeking virtually any information about solvent effects." —Organometallics
A Twenty-First Century US Water Policy - Juliet Christian-Smith 2012-07-02
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.
Biomass, Biofuels, Biochemicals - S. Saravanamurugan 2019-10-23
Biomass, Biofuels, Biochemicals: Recent Advances in Development of Platform Chemicals provides a detailed overview on the experimentally developed methods that facilitate platform chemicals derivation from biomass-based substrates with robust catalyst systems. In addition, the book highlights the green chemistry approach towards platform chemical production. Chapters discuss platform chemicals and global market volumes, the optimization of process schemes and reaction parameters with respect to achieving a high yield of targeted platform chemicals, such as sugars and furonic compounds by modifying the respective catalytic system, the influence of solvents on reaction selectivity and product distribution, and the long-term stability of employed catalysts. Overall, the objectives of the book are to provide the reader with an understanding of the societal importance of platform chemicals, an assessment of the techno-economic viability of biomass valorization processes, catalyst design for a specific reaction, and the design of a catalytic system. Covers recent developments on platform chemicals Provides comprehensive technological developments on specific platform chemicals Covers organic transformations, catalytic synthesis, thermal stability, reaction parameters and solvent effect Includes case studies on the production of a number of chemicals, such as Levulinic acid, glycerol, phenol derivatives, and more
Green Chemistry - Paul T. Anastas 1998
The history of environmental protection has dealt with hazardous substances by cleaning them up or treating them after the substances have formed. Green Chemistry, however, designs products and processes so that no hazardous materials are used or made in the first place. With applications fromplastic to paints, from automobiles to pharmaceuticals, Green Chemistry is revolutionising science and industry and its impact on the environment.
Green Synthetic Approaches for Biologically Relevant Heterocycles - Goutam Brahmachari 2021-03-20
Green Synthetic Approaches for Biologically Relevant Heterocycles, Second Edition, Volume One: Advanced Synthetic Techniques reviews this significant group of organic compounds within the context of sustainable methods and processes, expanding on the first edition with fully updated coverage and a whole range of new chapters. Volume One explores advanced synthetic techniques, with each chapter presenting in-depth coverage of various green protocols for the synthesis of a wide variety of bioactive heterocycles that are classified on the basis of ring-size and/or the presence of heteroatoms. Techniques covered range from high pressure cycloaddition reactions and microwave irradiation to sustainable one-pot domino reactions. This updated edition is an essential resource on sustainable approaches for academic researchers, R&D professionals, and students working across medicinal, organic, natural product and green chemistry. Provides fully updated coverage of the field of greener heterocycle synthesis Includes new chapters on varied multicomponent reactions, alongside both traditional and novel approaches Presents information in an accessible style with an emphasis on sustainability
Chemistry of Phytopotentials: Health, Energy and Environmental Perspectives - LD Khemani 2011-12-02

Since the beginning of human civilization, plants have been our true companions. Plants contribute not only to our existence but also serve us through discovery, design and the treatment of various diseases where there is no satisfactory cure in modern medicine. This has focused Natural Product Chemists to unravel plants therapeutic potential in the light of modern analytical and pharmacological understandings. Presence of multiple active phytochemicals in medicinal plants offers exciting opportunity for the development of novel therapeutics, providing scientific justification for their use in traditional medicines. Non-food plants have been recognized as biofactories for the production of eco-friendly value added materials including agricultural, food products, enzymes, nutraceuticals etc. They have also been widely explored for personal care, industrial products and sources of energy generation. The proven efficacy of botanicals has been appreciated by the scientific community and strengthened plant-human relationship. The synergism in the Phytoproducts, the result of the interaction of two or more moieties, is not simply additive but multiplicative. Recent acceptance of the Food and Drug Administration (US) for herbal-medicine based preparation has renewed interest in Natural Product Research. The year 2011 is declared as the International Year of Chemistry (IYC 2011) by the United Nations Assembly. On this occasion, the present conference CPHEE 2011 aims to offer chemists from diverse areas to come to a common platform to share the knowledge and unveil the chemistry and magic potentials of phytoproducts for the mankind.

Beet-Sugar Handbook - Mosen Asadi 2006-06-23

The first all-in-one reference for the beet-sugar industry Beet-Sugar Handbook is a practical and concise reference fortechnologists, chemists, farmers, and research personnel involvedwith the beet-sugar industry. It covers: * Basics of beet-sugar technology * Sugarbeet farming * Sugarbeet processing * Laboratory methods of analysis The book also includes technologies that improve the operation andprofitability of the beet-sugar factories, such as: * Juice-softening process * Molasses-softening process * Molasses-desugaring process * Refining cane-raw sugar in a beet-sugar factory The book ends with a review of the following: * Environmental concerns of a beet-sugar factory * Basics of science related to sugar technology * Related tables for use in calculations Written in a conversational, engaging style, the book is userfriendly and practical in its presentation of relevant scientificand mathematical concepts for readers without a significantbackground in these areas. For ease of use, the book highlightsimportant notes, defines technical terms, and presents units inboth metric and British systems. Operating problem-solving relatedto all stations of sugarbeet processing, frequent practicalexamples, and given material/energy balances are other specialfeatures of this book.

Account of Arnold's Campaign Against Quebec - John Joseph Henry 1877

Polyphosphoesters - Kolio D. Troev 2012-01-30

Polyphosphoesters are a multifunctional, environmentally friendly, and cost-efficient material, making them an important subject. The design of this type of material plays a key role in the progress of industry, agriculture, and medicine. This book introduces the chemistry, characterization and application of polyphosphoesters including comprehensive coverage of poly(alkylene H-phosphonate)s, poly(alkylene phosphate)s, poly(alkyl or aryl phosphonate)s, and poly(alkyl phosphite)s and poly(alkyl phosphinite)s. Each polymer is discussed in detail including methods, properties, and applications. This book is useful for students and practitioners preparing to work, or in the process of working, in the exciting field of polymer chemistry. Presents a unique look at an important, multifunctional and environmentally friendly material Outlines methods used to prepare different polyphosphoesters Comprehensive examination of the properties of polyphosphoesters

Titanate and Titania Nanotubes - Dmitry V. Bavykin 2010

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 and patent literature to provide a concise yet balanced and integrated treatment of an interesting topic: titanium oxide nanostructures within the emerging fashionable area of nanomaterials. Of particular interest are the following key chapters: * Modification and Coating Techniques - provides a unique summary and discussion of available techniques to coat surfaces with nanostructured materials * Chemical Properties - relates structure to surface chemistry and hence applications * Structural and Physical Properties - reviews the relationship between nanostructure and physical properties providing a basis for the rationalisation of applications 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 and a knowledge of their (existing and potential) applications.

The Chemistry of Peroxides - Zvi Rappoport 2006

Comprehensive Organic Chemistry - Derek Barton

Polymeric Materials in Organic Synthesis and Catalysis - Michael R. Buchmeiser 2006-03-06

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.

Carbon Materials for Catalysis - Philippe Serp 2009-02-04

This is the first comprehensive book covering all aspects of the use of carbonaceous materials in heterogeneous catalysis. It covers the preparation and characterization of carbon supports and carbon-supported catalysts; carbon surface chemistry in catalysis; the description of catalytic, photo-catalytic, or electro-catalytic reactions, including the development of new carbon materials such as carbon xerogels, aerogels, or carbon nanotubes; and new carbon-based materials in catalytic or adsorption processes. This is a premier reference for carbon, inorganic, and physical chemists, materials scientists and engineers, chemical engineers, and others.

Optimization of Biodiesel and Biofuel Process - Diego Luna 2021-09-02

Although the compression ignition (C.I.) engine, invented by Rudolf Diesel, was originally intended to work with pure vegetable oils as fuel, more than a century ago, it was adapted to be used with a fuel of fossil origin, obtained from oil. Therefore, there would be no technical difficulties in returning to the primitive design of using biofuels of renewable origin, such as vegetable oils. The main drawback is found in the one billion C.I. engines which are currently in use, which would have to undergo a modification in the injection system in order to adapt them to the higher viscosity of vegetable oils in comparison to that of fossil fuels. Thus, the gradual incorporation of biofuels as substitutes of fossil fuels is mandatory.

Applications of Ion Exchange Materials in Chemical and Food Industries - Inamuddin 2019-02-04

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.

Sonochemical Reactions - Selcan Karakuş 2020-03-25

This book was written by authors in the field of ultrasound-assited synthesis and their applications. Among others, some of the topics covered are: ultrasound-assited synthesis of metal/metal oxide nanoparticles, graphene nanosheets, and ultrasound applications. In this book, authors focused on recent studies, applications, and new technological developments on fundamental properties of the ultrasound process.

The Chemistry of Oils and Fats - Frank Gunstone 2009-02-12

The three major macronutrients are proteins, carbohydrates, andlipids (oils and fats). This book is devoted to lipids, which arean important part of life for all of us. What are these materialsin molecular terms? Where do they come from? What happens to thembetween the harvesting of crops and the appearance of

the oils andfats in different products in the supermarket? How does natureproduce these molecules and can we act on nature to modify thematerials to increase their beneficial properties? How importantare the minor products present in the fats that we consume? Sinceoils and fats vary, how can we analyse them? What are theirphysical, chemical and nutritional properties? How do the fats thatwe consume affect our health and well-being in both quantitativeand qualitative terms? What are their major food and non-fooduses? This book provides a broad source of reference on oils and fatschemistry for graduates entering the food and oleochemicalindustries, postgraduate researchers and nutritionists. It offers apoint of entry to the detailed literature.

Biomass, Biopolymer-Based Materials, and Bioenergy - Deepak Verma 2019-01-12

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)

Efficient Methods for Preparing Silicon Compounds - Herbert W Roesky 2016-05-12

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

Biodiesel Science and Technology - Jan C.J. Bart 2010-02-19

Biodiesel production is a rapidly advancing field worldwide, with biodiesel fuel increasingly being used in compression ignition (diesel) engines. Biodiesel has been extensively studied and utilised in developed countries, and it is increasingly being introduced in developing countries, especially in regions with high potential for sustainable biodiesel production. Initial sections systematically review feedstock resources and vegetable oil formulations, including the economics of vegetable oil conversion to diesel fuel, with additional coverage of emerging energy crops for biodiesel production. Further sections review the transesterification process, including chemical (catalysis) and biochemical (biocatalysis) processes, with extended coverage of industrial process technology and control methods, and standards for biodiesel fuel quality assurance. Final chapters cover the sustainability, performance and environmental issues of biodiesel production, as well as routes to improve glycerol by-product usage and the development of next-generation products. Biodiesel science and technology: From soil to oil provides a comprehensive reference to fuel engineers, researchers and academics on the technological developments involved in improving biodiesel quality and production capacity that are crucial to the future of the industry. Evaluates biodiesel as a renewable energy source and documents global biodiesel development The outlook for biodiesel science and technology is presented exploring the challenges faced by the global diesel industry Reviews feedstock resources and vegetable oil formation including emerging crops and the agronomic potential of underexploited oil crops

Biomass Conversion - Chinnappan Baskar 2012-05-08

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.

Progress in Filtration and Separation - 2014-10-14

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

Sustainable Carbon Materials from Hydrothermal Processes - Maria-Magdalena Titirici 2013-06-10

The production of low cost and environmentally friendly highperforming carbon materials is crucial for a sustainable future.Sustainable Carbon Materials from Hydrothermal Processesdescribes a sustainable and alternative technique to produce carbonfrom biomass in water at low temperatures, a process known asHydrothermal Carbonization (HTC). Sustainable Carbon Materials from Hydrothermal Processespresents an overview of this new and rapidly developing field,discussing various synthetic approaches, characterization of thefinal products, and modern fields of application for of sustainablecarbon materials. Topics covered include: • Green carbon materials • Porous hydrothermal carbons • HTC for the production of valuable carbon hybridmaterials • Functionalization of hydrothermal carbonmaterials • Characterization of HTC materials • Applications of HTC in modern nanotechnology: Energystorage, electrocatalysis in fuel cells, photocatalysis, gasstorage, water purification, sensors, bioapplications • Environmental applications of HTC technology: Biocharproduction, carbon sequestration, and waste conversion • Scale-up in HTC Sustainable Carbon Materials from Hydrothermal Processeswill serve as a comprehensive guide for students and newcomers inthe field, as well as providing a valuable source of informationfor researchers and investors looking for alternative technologiesto convert biomass into useful products.

Nanotechnology for Energy and Water - Gagan Anand 2017-09-29

This volume originates from the proceedings of the International Conference on Nano for Energy and Water (NEW) & Indo French Workshop on Water Networking, 22-24 February, 2017 in Dehar. NEW-2017 is aimed at students, educators, researchers, scientists, engineers and industrialists, engaged in a wide range of nanotechnology fields and related applications. NEW-2017 will provide an ideal environment to develop new collaborations and meet experts of thematic areas. The conference aims to exchange the technical/scientific information with the representatives of various industries and R & D Organisations, to provide technical support to government and non-government agencies across the globe in policy planning

and implementation in the relevant areas, to promote and document the recent developments in nanotechnology for energy and water applications and to highlight the future need of nanotechnology in different fields.

Alternative Solvents for Green Chemistry - Francesca Kerton 2015-11-09

Everyone is becoming more environmentally conscious and therefore, chemical processes are being developed with their environmental burden in mind. This also means that more traditional chemical methods are being replaced with new innovations and this includes new solvents. Solvents are everywhere, but how necessary are they? They are used in most areas including synthetic chemistry, analytical chemistry, pharmaceutical production and processing, the food and flavour industry and the materials and coatings sectors. However, the principles of green chemistry guide us to use less of them, or to use safer, more environmentally friendly solvents if they are essential. Therefore, we should always ask ourselves, do we really need a solvent? Green chemistry, as a relatively new sub-discipline, is a rapidly growing field of research. Alternative solvents - including supercritical fluids and room temperature ionic liquids - form a significant portion of research in green chemistry. This is in part due to the hazards of many conventional solvents (e.g. toxicity and flammability) and the significant contribution that solvents make to the waste generated in many chemical processes. Solvents are important in analytical chemistry, product purification, extraction and separation technologies, and also in the modification of materials. Therefore, in order to make chemistry more sustainable in these fields, a knowledge of alternative, greener solvents is important. This book, which is part of a green chemistry series, uses examples that tie in with the 12 principles of green chemistry e.g. atom efficient reactions in benign solvents and processing of renewable chemicals/materials in green solvents. Readers get an overview of the many different kinds of solvents, written in such a way to make the book appropriate to newcomers to the field and prepare them for the 'green choices' available. The book also removes some of the mystique associated with 'alternative solvent' choices and includes information on solvents in different fields of chemistry such as analytical and materials chemistry in addition to catalysis and synthesis. The latest research developments, not covered elsewhere, are included such as switchable solvents and biosolvents. Also, some important areas that are often overlooked are described such as naturally sourced solvents (including ethanol and ethyl lactate) and liquid polymers (including poly(ethyleneglycol) and poly(dimethylsiloxane)). As well as these additional alternative solvents being included, the book takes a more general approach to solvents, not just focusing on the use of solvents in synthetic chemistry. Applications of solvents in areas such as analysis are overviewed in addition to the more widely recognised uses of alternative solvents in organic synthesis. Unfortunately, as the book shows, there is no universal green solvent and readers must ascertain their best options based on prior chemistry, cost, environmental benefits and other factors. It is important to try and minimize the number of solvent changes in a chemical process and therefore, the importance of solvents in product purification, extraction and separation technologies are highlighted. The book is aimed at newcomers to the field whether research students beginning investigations towards their thesis or industrial researchers curious to find out if an alternative solvent would be suitable in their work.

Catalytic Hydrogenation - L. Cervený 1986-08-01

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 - I. M. Mujtaba 2017-09-11

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.