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KEY=OF - MILES BOOTH

Hydrogen and Fuel Cell

Technologies and Market Perspectives

Springer This book introduces readers to hydrogen as an essential energy carrier for use with renewable sources of primary energy. It provides an overview of the state of the art, while also highlighting the developmental and market potential of hydrogen in the context of energy technologies; mobile, stationary and portable applications; uninterruptible power supplies and in the chemical industry. Written by experienced practitioners, the book addresses the needs of engineers, chemists and business managers, as well as graduate students and researchers.

Thermophysical Properties of Chemicals and Hydrocarbons

William Andrew Compiled by an expert in the field, the book provides an engineer with data they can trust. Spanning gases, liquids, and solids, all critical properties (including viscosity, thermal conductivity, and diffusion coefficient) are covered. From C1 to C100 organics and Ac to Zr inorganics, the data in this handbook is a perfect quick reference for field, lab or classroom usage. By collecting a large - but relevant - amount of information in one source, the handbook enables engineers to spend more time developing new designs and processes, and less time collecting vital properties data. This is not a theoretical treatise, but an aid to the practicing engineer in the field, on day-to-day operations and long range projects. Simplifies research and significantly reduces the amount of time spent collecting properties data Compiled by an expert in the field, the book provides an engineer with data they can trust in design, research, development and manufacturing A single, easy reference for critical temperature dependent properties for a wide range of hydrocarbons, including C1 to C100 organics and Ac to Zr inorganics

Ionic Liquids

Classes and Properties

BoD - Books on Demand Room temperature ionic liquids (RTILs) are an interesting and valuable family of compounds. Although they are all salts, their components can vary considerably, including imidazolium, pyridinium, ammonium, phosphonium, thiazolium, and triazolium cations. In general, these cations have been combined with weakly coordinating anions. Common examples include tetrafluoroborate, hexafluorophosphate, triflate, triflimide, and dicyanamide. The list of possible anionic components continues to grow at a rapid rate. Besides exploring new anionic and cation components, another active and important area of research is the determination and prediction of their physical properties, particularly since their unusual and tunable properties are so often mentioned as being one of the key advantages of RTILs over conventional solvents. Despite impressive progress, much work remains before the true power of RTILs as designer solvents (i.e. predictable selection of a particular RTIL for any given application) can be effectively harnessed.

Fundamentals of Ionic Liquids

From Chemistry to Applications

John Wiley & Sons Written by experts who have been part of this field since its beginnings in both research and academia, this textbook introduces readers to this evolving topic and the broad range of applications that are being explored. The book begins by examining what it is that defines ionic liquids and what sets them apart from other materials. Chapters describe the various types of ionic liquids and the different techniques used to synthesize them, as well as their properties and some of the methods used in their measurement. Further chapters delve into synthetic and electrochemical applications and their broad use as "Green" solvents. Final chapters examine important applications in a wide variety of contexts, including such devices as solar cells and batteries, electrochemistry, and biotechnology. The result is a must-have resource for any researcher beginning to work in this growing field, including senior undergraduates and postgraduates.

Electrochemical Aspects of Ionic Liquids

John Wiley & Sons The second edition is based on the original book, which has been revised, updated and expanded in order to cover the latest information on this rapidly growing field. The book begins with a description of general and electrochemical properties of ionic liquids and continues with a discussion of applications in biochemistry, ionic devices, functional design and polymeric ionic liquids. The new edition includes new chapters on Li ion Batteries and Actuators, as well as a revision of existing chapters to include a discussion on purification and the effects of impurities, adsorption of ionic liquids on interfaces and on the electrochemical double layer, among other topics.

Milk and Dairy Products in Human Nutrition

Production, Composition and Health

John Wiley & Sons Milk is nature's most complete food, and dairy products are considered to be the most nutritious foods of all. The traditional view of the role of milk has been greatly expanded in recent years beyond the horizon of nutritional subsistence of infants: it is now recognized to be more than a source of nutrients for the healthy growth of children and nourishment of adult humans. Alongside its major proteins (casein and whey), milk contains biologically active compounds, which have important physiological and biochemical functions and significant impacts upon human metabolism, nutrition and health. Many of these compounds have been proven to have beneficial effects on human nutrition and health. This comprehensive reference is the first to address such a wide range of topics related to milk production and human health, including: mammary secretion, production, sanitation, quality standards and chemistry, as well as nutrition, milk allergies, lactose intolerance, and the bioactive and therapeutic compounds found in milk. In addition to cow's milk, the book also covers the milk of non-bovine dairy species which is of economic importance around the world. The Editors have assembled a team of internationally renowned experts to contribute to this exhaustive volume which will be essential reading for dairy scientists, nutritionists, food scientists, allergy specialists and health professionals.

Metrology for Inclusive Growth of India

Springer Nature This book describes the significance of metrology for inclusive growth in India and explains its application in the areas of physical-mechanical engineering, electrical and electronics, Indian standard time measurements, electromagnetic radiation, environment, biomedical, materials and Bhartiya Nirdehak Dravyas (BND®). Using the framework of "Aswal Model", it connects the metrology, in association with accreditation and standards, to the areas of science and technology, government and regulatory agencies, civil society and media, and various other industries. It presents critical analyses of the contributions made by CSIR-National Physical Laboratory (CSIR-NPL), India, through its world-class science and apex measurement facilities of international equivalence in the areas of industrial growth, strategic sector growth, environmental protection, cybersecurity, sustainable energy, affordable health, international trade, policy-making, etc. The book will be useful for science and engineering students, researchers, policymakers and entrepreneurs.

Ionic Liquids II

Springer The series Topics in Current Chemistry Collections presents critical reviews from the journal Topics in Current Chemistry organized in topical volumes. The scope of coverage is all areas of chemical science including the interfaces with related disciplines such as biology, medicine and materials science. The goal of each thematic volume is to give the non-specialist reader, whether in academia or industry, a comprehensive insight into an area where new research is emerging which is of interest to a larger scientific audience. Each review within the volume critically surveys one aspect of that topic and places it within the context of the volume as a whole. The most significant developments of the last 5 to 10 years are presented using selected examples to illustrate the principles discussed. The coverage is not intended to be an exhaustive summary of the field or include large quantities of data, but should rather be conceptual, concentrating on the methodological thinking that will allow the non-specialist reader to understand the information presented. Contributions also offer an outlook on potential future developments in the field. The chapters "Ionic Liquid-Liquid Chromatography: A New General Purpose Separation Methodology", "Proteins in Ionic Liquids: Current Status of Experiments and Simulations", "Lewis Acidic Ionic Liquids" and "Quantum Chemical Modeling of Hydrogen Bonding in Ionic Liquids" are available open access under a Creative Commons Attribution 4.0 International License via link.springer.com.

Nanocatalysis in Ionic Liquids

John Wiley & Sons Edited and written by renowned experts in the field, this is the first book to reflect the state of the art of nanocatalysis in ionic liquids. Divided into two core areas, the first part of the book describes the different classes of metal nanoparticles as well as their synthesis in ionic liquids, while the second focuses on such emerging issues as the application of such systems to energy and biomass conversion.

Ionic Liquids in Biotransformations and Organocatalysis

Solvents and Beyond

John Wiley & Sons This book addresses the use of ionic liquids in biotransformation and organocatalysis. Its major parts include: an overview of the fundamentals of ionic liquids and their interactions with proteins and enzymes; the use of ILs in biotransformations; non-solvent applications such as additives, membranes, substrate anchoring, and the use of ILs in organocatalysis (from solvents to co-catalysts and new reactivities, as well as non-solvent applications such as anchoring and immobilization).

Diesel Generator Handbook

Newnes This book is an authoritative reference work covering the range of mechanical and electrical topics embodied in the practical design and application of diesel generating plant.

Ionic Liquid Properties

From Molten Salts to RTILs

Springer This volume deals with substances in the liquid state that range from high melting salts, such as calcium fluoride, through slags, such as silicates, down to lower melting salts, such as lithium nitrate, molten hydrated salts, such as magnesium chloride hexahydrate, to room temperature ionic liquids, such as 1,3-dimethylimidazolium tetraphenylborate. It provides the reader with annotated, critically examined, and compiled data for such materials. The data includes a variety of thermochemical, structural, and transport properties. The book includes correlations of measured properties; these correlations should enable the reader to estimate, on a sound basis, properties for ionic liquids that have not yet been measured.

Electrodeposition from Ionic Liquids

John Wiley & Sons Reflecting the dramatic rise in interest shown in this field over the last few years, this book collates the widespread knowledge into one handy volume. It covers in depth all classes of ionic liquids thus far in existence, with the individual chapters written by internationally recognized experts. The text is written to suit several levels of difficulty, containing information on basic physical chemistry in ionic liquids, a theory on the conductivity as well as plating protocols suited to undergraduate courses. The whole is rounded off with an appendix providing experimental procedures to enable readers to experiment with ionic liquids for themselves.

Nuclear Reprogramming and Stem Cells

Springer Science & Business Media Research into the field of stem cell biology has developed exponentially over recent years, and is beginning to offer significant promise for unravelling the molecular basis of a multitude of disease states. Importantly, in addition to offering the opportunity to delve deeply into the mechanisms that drive disease aetiology the research is realistically opening the doors for development of targeted and personalized therapeutic applications that many considered, until recently, to be nothing more than a far fetched dream. This volume provides a timely glimpse into the methods that have been developed to instigate, and the mechanisms that have been identified to drive, the process of nuclear reprogramming, chronicling how the field has developed over the last 50-60 years. Since the early 1950s a small number of notable experiments have provided significant impetus to the field, primarily the demonstration of reprogramming ability, first by the complex cytoplasmic milieu that constitutes the amphibian egg, then that of the mammalian egg, and finally that of the mammalian embryonic stem cell. Most recently, the demonstration that a limited pool of defined molecules is capable of reprogramming a multitude of cell types has provided massive impetus and facilitated transition towards realistic therapeutic application. We have therefore reproduced some of the key articles that elegantly document these dramatic stages of development of the field in an inclusive appendix to the book, for the benefit of readers keen to investigate the history of how the field of stem cell biology has evolved. Owing to the ever broadening nature of this field, and the incredible rate at which it is evolving, the main content of this volume focuses on areas that have shown significant movement in recent years, are most likely to translate into personalized therapeutic application, and thus provide greatest potential for significant impact on human health in the not too distant future. We recognize that research into many other disease states and cell types are all equally worthy of discussion. We would therefore like to acknowledge those researchers involved whose work we have not been able to include in this volume. Nuclear Reprogramming and Stem Cells will serve as a valuable resource for all researchers in the field of stem cell biology, including those just setting out on their career path as well as those already established in the field.

Understanding Host-Microbiome Interactions - An Omics Approach

Omics of Host-Microbiome Association

Springer This book offers up-to-date information on different microbiomes, their community composition and interactive functions with the host, bringing together information from diverse research reports to provide an overview of the rapid developments in meta-omics technologies. It is a valuable resource for scientists, researchers, postgraduate and graduate students interested in understanding the impact and importance of next generation sequencing technologies on different hosts and their microbiomes.

Free Radicals in Biology and Medicine

Oxford University Press Free Radicals in Biology and Medicine has become a classic text in the field of free radical and antioxidant research. Now in its fifth edition, the book has been comprehensively rewritten and updated whilst maintaining the clarity of its predecessors. Two new chapters discuss 'in vivo' and 'dietary' antioxidants, the first emphasising the role of peroxiredoxins and integrated defence mechanisms which allow useful roles for ROS, and the second containing new information on the role of fruits, vegetables, and vitamins in health and disease. This new edition also contains expanded coverage of the mechanisms of oxidative damage to lipids, DNA, and proteins (and the repair of such damage), and the roles played by reactive species in signal transduction, cell survival, death, human reproduction, defence mechanisms of animals and plants against pathogens, and other important biological events. The methodologies available to measure reactive species and oxidative damage (and their potential pitfalls) have been fully updated, as have the topics of phagocyte ROS production, NADPH oxidase enzymes, and toxicology. There is a detailed and critical evaluation of the role of free radicals and other reactive species in human diseases, especially cancer, cardiovascular, chronic inflammatory and neurodegenerative diseases. New aspects of ageing are discussed in the

context of the free radical theory of ageing. This book is recommended as a comprehensive introduction to the field for students, educators, clinicians, and researchers. It will also be an invaluable companion to all those interested in the role of free radicals in the life and biomedical sciences.

Phospholipids Handbook

CRC Press Employing a multidisciplinary approach to phospholipid research, this work catalogues the current knowledge of this class of molecules and details the general, chemical, physical and structural properties of phospholipid monolayers and bilayers. Phospholipid applications are also covered.

Electrostatics of Soft and Disordered Matter

CRC Press Recently, there has been a surge of activity to elucidate the behavior of highly charged soft matter and Coulomb fluids in general. Such systems are ubiquitous, especially in biological matter where the length scale and the strength of the interaction between highly charged biomolecules are governed by strong electrostatic effects. Several interesting limits have been discovered in the parameter space of highly charged many-particle Coulomb matter where analytical progress is possible and completely novel and unexpected results have been obtained. One of the challenges in highly charged matter is to correctly describe systems with finite coupling strength in the transition regime between weak and strong couplings. After studying the fluctuations of both, several theories have been developed that describe this experimentally highly relevant regime. At the same time, computer simulation algorithms and computing power have advanced to the level where all-ion simulations, including many-body and polarization effects, are possible; the new theories thus can be subjected to numerical confirmation. Another important question is the effect of the structural disorder on electrostatic interactions. It has recently been demonstrated, both theoretically and experimentally, that charge disorder can impose long-range interaction between charged or even uncharged surfaces. These interactions might become very significant in biological processes. Filling a void in the literature, this volume cross-pollinates different theoretical and simulation approaches with new experiments and ties together the low temperature, high coupling constant, and disorder parameters in a unified description of the electrostatic interactions, which largely determine the stability and conformations of most important biological macromolecules. With striking graphical illustrations, the book presents a unified view of the current advances in the field of Coulomb (bio)colloidal systems, building on previous literature that summarized the field over 20 years ago. Leading scientists in the field offer a detailed introduction to different modern methods in statistical physics of Coulomb systems. They detail various approaches to elucidate the behavior of strongly charged soft matter. They also provide experimental and theoretical descriptions of disorder effects in Coulomb systems, which have not been discussed in any other book.

Growth of Farm Animals

General aspects of growth; Cells structure; Chemical composition cells; Protein synthesis and the genetic code; Mitosis; Cellular proliferation; Cellhyperplasia and hypertrophy; Tissues; Hormonal, genetic and immunological influences on growth; The immune system; Gametes, fertilization and embryonic growth; Meiosis; gametes and fertilization; Embryonic development; The uterus, the placenta and embryonic attachment; Prenatal and postnatal growth; Efficiency and growth; Efficiency, slaughter weight and marketing; Compensatory growth; Growth and puberty in breeding animals; Measuring growth; The future demand for meat and meat products; The future possibilities for technical advance.

Handbook of Milk of Non-Bovine Mammals

John Wiley & Sons THE ONLY SINGLE-SOURCE GUIDE TO THE LATEST SCIENCE, NUTRITION, AND APPLICATIONS OF ALL THE NON-BOVINE MILKS CONSUMED AROUND THE WORLD Featuring contributions by an international team of dairy and nutrition experts, this second edition of the popular Handbook of Milk of Non-Bovine Mammals provides comprehensive coverage of milk and dairy products derived from all non-bovine dairy species. Milks derived from domesticated dairy species other than the cow are an essential dietary component for many countries around the world. Especially in developing and under-developed countries, milks from secondary dairy species are essential sources of nutrition for humanity. Due to the unavailability of cow milk and the low consumption of meat, the milks of non-bovine species such as goat, buffalo, sheep, horse, camel, Zebu, Yak, mare and reindeer are critical daily food sources of protein, phosphate and calcium. Furthermore, because of hypoallergenic properties of certain species milk including goats, mare and camel are increasingly recommended as substitutes in diets for those who suffer from cow milk allergies. This book: Discusses key aspects of non-bovine milk production, including raw milk production in various regions worldwide Describes the compositional, nutritional, therapeutic, physio-chemical, and microbiological characteristics of all non-bovine milks Addresses processing technologies as well as various approaches to the distribution and consumption of manufactured milk products Expounds characteristics of non-bovine species milks relative to those of human milk, including nutritional, allergenic, immunological, health and cultural factors Features six new chapters, including one focusing on the use of non-bovine species milk components in the

manufacture of infant formula products. Thoroughly updated and revised to reflect the many advances that have occurred in the dairy industry since the publication of the acclaimed first edition, Handbook of Milk of Non-Bovine Mammals, 2nd Edition is an essential reference for dairy scientists, nutritionists, food chemists, animal scientists, allergy specialists, health professionals, and allied professionals.

Mathematical Reviews

Special Distillation Processes

Elsevier Special distillation processes are required for separation of mixtures close to boiling point or for forming azeotrope mixtures into their pure components. In Special Distillation Processes, the authors focus on latest developments in the field, such as separation methods that may prove useful for solving problems encountered during research. Topics include extraction, membrane and adsorption distillation involving the separation principle, process design and experimental techniques. The relationship between the processes and the techniques are also presented. Comprehensive and easy-to-read, this book provides key information needed to understand the processes and is a valuable reference source for chemical engineers as well as students wishing to branch out in chemical engineering. * The only comprehensive book available on special distillation processes * Contains a thorough introduction to recent developments in the field * A valuable reference for students and engineers in chemical engineering

Solid Oxide Fuel Cell Lifetime and Reliability

Critical Challenges in Fuel Cells

Academic Press Solid Oxide Fuel Cell Lifetime and Reliability: Critical Challenges in Fuel Cells presents in one volume the most recent research that aims at solving key issues for the deployment of SOFC at a commercial scale and for a wider range of applications. To achieve that, authors from different regions and backgrounds address topics such as electrolytes, contaminants, redox cycling, gas-tight seals, and electrode microstructure. Lifetime issues for particular elements of the fuel cells, like cathodes, interconnects, and fuel processors, are covered as well as new materials. They also examine the balance of SOFC plants, correlations between structure and electrochemical performance, methods for analysis of performance and degradation assessment, and computational and statistical approaches to quantify degradation. For its holistic approach, this book can be used both as an introduction to these issues and a reference resource for all involved in research and application of solid oxide fuel cells, especially those developing understanding in industrial applications of the lifetime issues. This includes researchers in academia and industrial R&D, graduate students and professionals in energy engineering, electrochemistry, and materials sciences for energy applications. It might also be of particular interest to analysts who are looking into integrating SOFCs into energy systems. Brings together in a single volume leading research and expert thinking around the broad topic of SOFC lifetime and durability Explores issues that affect solid oxide fuel cells elements, materials, and systems with a holistic approach Provides a practical reference for overcoming some of the common failure mechanisms of SOFCs Features coverage of integrating SOFCs into energy systems

Ionic Liquids

Physicochemical Properties

Elsevier This comprehensive database on physical properties of pure ionic liquids (ILs) contains data collected from 269 peer-reviewed papers in the period from 1982 to June 2008. There are more than 9,400 data points on the 29 kinds of physicochemical properties for 1886 available ionic liquids, from which 807 kinds of cations and 185 kinds of anions were extracted. This book includes nearly all known pure ILs and their known physicochemical properties through June 2008. In addition, the authors incorporate the main applications of individual ILs and a large number of references. Nearly 50 tables include typical data, experimental and modelling or simulation comparison, and model parameters, enhancing the application of ILs 100 figures--from QSPR, EOS and gE models to quantum and molecular simulations--help readers understand ILs at molecular level Applications illustrate the role of IL properties in industry, in particular the development of novel clean processes and products

CRC Handbook of Thermophysical and Thermochemical Data

CRC Press The CRC Handbook of Thermophysical and Thermochemical Data is an interactive software and handbook package that provides an invaluable source of reliable data embracing a wide range of properties of chemical substances, mixtures, and reacting systems. Use the handbook and software together to quickly, and easily generate property values at any desired temperature, pressure, or mixture composition.

Handbook of Relativistic Quantum Chemistry

Springer This handbook covers new methodological developments and applications of relativistic quantum chemistry. It also pays attention to the foundation of relativistic quantum mechanics and addresses a number of fundamental issues that have not been covered by any book. For instance, what is the appropriate relativistic many-electron Hamiltonian? How to do relativistic explicit/local correlation? How to formulate relativistic properties? How to combine double-group and time-reversal symmetries? How to do QED calculations for molecules? Just to name a few. This book aims to establish the big picture of relativistic molecular quantum mechanics, ranging from pedagogic introduction for uninitiated readers, advanced methodologies and efficient algorithms for experts, to possible future perspectives, such that the reader knows when/how to apply/develop the methodologies. This self-contained two-volume book can be regarded as a supplement to the three-volume "Handbook of Computational Chemistry", which contains no relativity at all. It is to be composed of 6 sections with different chapters (will be further expanded), each of which is to be written by the most active experts, who will be invited upon approval of this proposal.

Microbiological Safety and Quality Aspects of Fermented Dairy Products

Frontiers Media SA

Biorefineries and Chemical Processes

Design, Integration and Sustainability Analysis

John Wiley & Sons As the range of feedstocks, process technologies and products expand, biorefineries will become increasingly complex manufacturing systems. Biorefineries and Chemical Processes: Design, Integration and Sustainability Analysis presents process modelling and integration, and whole system life cycle analysis tools for the synthesis, design, operation and sustainable development of biorefinery and chemical processes. Topics covered include: Introduction: An introduction to the concept and development of biorefineries. Tools: Included here are the methods for detailed economic and environmental impact analyses; combined economic value and environmental impact analysis; life cycle assessment (LCA); multi-criteria analysis; heat integration and utility system design; mathematical programming based optimization and genetic algorithms. Process synthesis and design: Focuses on modern unit operations and innovative process flowsheets. Discusses thermochemical and biochemical processing of biomass, production of chemicals and polymers from biomass, and processes for carbon dioxide capture. Biorefinery systems: Presents biorefinery process synthesis using whole system analysis. Discusses bio-oil and algae biorefineries, integrated fuel cells and renewables, and heterogeneous catalytic reactors. Companion website: Four case studies, additional exercises and examples are available online, together with three supplementary chapters which address waste and emission minimization, energy storage and control systems, and the optimization and reuse of water. This textbook is designed to bridge a gap between engineering design and sustainability assessment, for advanced students and practicing process designers and engineers.

Investigations on the Theory of the Brownian Movement

Courier Corporation Five early papers evolve theory that won Einstein a Nobel Prize: "Movement of Small Particles Suspended in a Stationary Liquid Demanded by the Molecular-Kinetic Theory of Heat"; "On the Theory of the Brownian Movement"; "A New Determination of Molecular Dimensions"; "Theoretical Observations on the Brownian Motion"; and "Elementary Theory of the Brownian Motion."

Phase-Field Methods in Materials Science and Engineering

John Wiley & Sons This comprehensive and self-contained, one-stop source discusses phase-field methodology in a fundamental way, explaining advanced numerical techniques for solving phase-field and related continuum-field models. It also presents numerical techniques used to simulate various phenomena in a detailed, step-by-step way, such that readers can carry out their own code developments. Features many examples of how the methods explained can be used in materials science and engineering applications.

Catalyst Separation, Recovery and Recycling

Chemistry and Process Design

Springer Science & Business Media This book looks at new ways of tackling the problem of separating reaction products from homogeneous catalytic solutions. The new processes involve low leaching supported catalysts, soluble supports such as polymers and dendrimers and unusual solvents such as water, fluorinated organics, ionic liquids and supercritical fluids. The advantages of the different possibilities are discussed alongside suggestions for further research that will be required for commercialisation. Unlike other books, in addition to the chemistry involved, the book looks at the process design that would be required to bring the new approaches to fruition. Comparisons are given with existing processes that have already been successfully applied and examples are given where these approaches are not suitable. The book includes: - New processes for the separation of products from solutions containing homogeneous catalysts - Catalysts on insoluble or soluble supports - fixed bed catalysts - continuous flow or ultrafiltration - Biphasic systems: water - organic, fluorous - organic, ionic liquid - organic, supercritical fluids (monophasic or biphasic with water, organic or ionic liquid) - Comparisons with current processes involving atmospheric or low temperature distillation - Consideration of Chemistry and Process Design - Advantages and disadvantages of each process exposed - Consideration of what else is need for commercialisation

Structure of Electrified Interfaces

Wiley-VCH This second volume in the Frontiers of Electrochemistry series provides a modern description of the metal-solution interface and describes the advances made in interfacial electrochemistry during the past decade. Contributing authors summarize the impact of new ex situ and in situ techniques in studying electrode surfaces, and illustrate the significance of the development of new experimental techniques and the availability of reliable data in the theory of electrified interfaces. The review articles demonstrate how a molecular picture of the interface has emerged from traditional models that treated the solution as a dielectric and metal as an electronic continuum. Annotation copyright by Book News, Inc., Portland, OR

Advances in Carbon Capture

Methods, Technologies and Applications

Woodhead Publishing Advances in Carbon Capture reviews major implementations of CO₂ capture, including absorption, adsorption, permeation and biological techniques. For each approach, key benefits and drawbacks of separation methods and technologies, perspectives on CO₂ reuse and conversion, and pathways for future CO₂ capture research are explored in depth. The work presents a comprehensive comparison of capture technologies. In addition, the alternatives for CO₂ separation from various feeds are investigated based on process economics, flexibility, industrial aspects, purification level and environmental viewpoints. Explores key CO₂ separation and compare technologies in terms of provable advantages and limitations Analyzes all critical CO₂ capture methods in tandem with related technologies Introduces a panorama of various applications of CO₂ capture

Ionic Liquids in Synthesis

"The second, completely revised and enlarged edition of what has become the standard reference work in this fascinating field brings together the latest developments, supplemented by numerous practical tips, providing those working in both research and industry with an indispensable source of information. New contributions have been added, to reflect the fact that industrial processes are already established, and ionic liquids are now commercially available. A must for everyone working in the field."--Publisher's description.

Thermodynamic Models for Industrial Applications

From Classical and Advanced Mixing Rules to Association Theories

John Wiley & Sons Using an applications perspective Thermodynamic Models for Industrial Applications provides a unified framework for the development of various thermodynamic models, ranging from the classical models to some of the most advanced ones. Among these are the Cubic Plus Association Equation of State (CPA EoS) and the Perturbed Chain Statistical Association Fluid Theory (PC-SAFT). These two advanced models are already in widespread use in industry and academia, especially within the oil and gas, chemical and polymer industries. Presenting both classical models such as the Cubic Equations of State and more advanced models such as the CPA, this book provides the critical starting point for choosing the most appropriate calculation method for accurate process simulations. Written by two of the developers of these models, Thermodynamic Models for Industrial Applications emphasizes model selection and model development and includes a useful "which model for which application" guide. It also covers industrial requirements as well as discusses the challenges of thermodynamics in the 21st Century.

Photoelectron Spectroscopy

Principles and Applications

Springer Science & Business Media An up-to-date introduction to the field, treating in depth the electronic structures of atoms, molecules, solids and surfaces, together with brief descriptions of inverse photoemission, spin-polarized photoemission and photoelectron diffraction. Experimental aspects are considered throughout and the results carefully interpreted by theory. A wealth of measured data is presented in tabular for easy use by experimentalists.

Modern Techniques of Surface Science

Cambridge University Press Revised and expanded second edition of the standard work on new techniques for studying solid surfaces.

Solid-State Photoemission and Related Methods

Theory and Experiment

John Wiley & Sons Photoemission is one of the principal techniques for the characterization and investigation of condensed matter systems. The field has experienced many developments in recent years, which may also be put down to important achievements in closely related areas. This timely and up-to-date handbook is written by experts in the field who provide the background needed by both experimentalists and theorists. It represents an interesting framework for showing the connection between theory and experiment by bringing together different concepts in the investigation of the properties of materials. The work addresses the geometric and electronic structure of solid surfaces and interfaces, theoretical methods for direct computation of spectra, experimental techniques for data acquisition, and physical models for direct data interpretation. It also includes such recent developments as full hemisphere acceptance in photoemission, two-electron photoemission, (e, 2e) electron diffraction, and photoelectron-electron/hole interaction.

Van der Waals Forces

A Handbook for Biologists, Chemists, Engineers, and Physicists

Cambridge University Press This book should prove to be the definitive work explaining van der Waals forces, how to calculate them and take account of their impact under any circumstances and conditions. These weak intermolecular forces are of truly pervasive impact, and biologists, chemists, physicists and engineers will profit greatly from the thorough grounding in these fundamental forces that this book offers. Parsegian has organized his book at three successive levels of mathematical sophistication, to satisfy the needs and interests of readers at all levels of preparation. The Prelude and Level 1 are intended to give everyone an overview in words and pictures of the modern theory of van der Waals forces. Level 2 gives the formulae and a wide range of algorithms to let readers compute the van der Waals forces under virtually any physical or physiological conditions. Level 3 offers a rigorous basic formulation of the theory.

Surface Tension in Microsystems

Engineering Below the Capillary Length

Springer Science & Business Media This book describes how surface tension effects can be used by engineers to provide mechanical functions in miniaturized products (1 mm). Even if precursors of this field such as Jurin or Laplace already date back to the 18th century, describing surface tension effects from a mechanical perspective is very recent. The originality of this book is to consider the effects of capillary bridges on solids, including forces and torques exerted both statically and dynamically by the liquid along the 6 degrees-of-freedom. It provides a comprehensive approach to various applications, such as capillary adhesion (axial force), centering force in packaging and micro-assembly (lateral force) and recent developments such as a capillary motor (torque).