

Chemical Equilibrium Test By Kouji Tairakawa

This book covers the fundamentals of thermodynamics required to understand electrical power generation systems, honing in on the application of these principles to nuclear reactor power systems. It includes all the necessary information regarding the fundamental laws to gain a complete understanding and apply them specifically to the challenges of operating nuclear plants. Beginning with definitions of thermodynamic variables such as temperature, pressure and specific volume, the book then explains the laws in detail, focusing on pivotal concepts such as enthalpy and entropy, irreversibility, availability, and Maxwell relations. Specific applications of the fundamentals to Brayton and Rankine cycles for power generation are considered in-depth, in support of the book's core goal- providing an examination of how the thermodynamic principles are applied to the design, operation and safety analysis of current and projected reactor systems. Detailed appendices cover metric and English system units and conversions, detailed steam and gas tables, heat transfer properties, and nuclear reactor system descriptions.

"The accompanying interactive, searchable and hyperlinked CD-ROM includes all of the WWR2 data tables, graphs, charts and maps, as well as detailed sections on indicator and case study developments..."--p. [4] of cover.

This book presents a comprehensive review of the methods and approaches being adopted to push forward the boundaries of computational catalysis.

Neurobionics

Strong Metal-support Interactions

Nanoalloys

Japanese Current Research

Fundamentals and Applications of Anion Separations

ISIJ International

Leading graphene research theorist Mikhail I. Katsnelson systematically presents the basic concepts of graphene physics in this fully revised second edition. The author illustrates and explains basic concepts such as Berry phase, scaling, Zitterbewegung, Kubo, Landauer and Mori formalisms in quantum kinetics, chirality, plasmons, commensurate-incommensurate transitions and many others. Open issues and unsolved problems introduce the reader to the latest developments in the field. New achievements and topics presented include the basic concepts of Van der Waals heterostructures, many-body physics of graphene, electronic optics of Dirac electrons, hydrodynamics of electron liquid and the mechanical properties of one atom-thick membranes. Building on an undergraduate-level knowledge of quantum and statistical physics and solid-state theory, this is an important graduate textbook for students in nanoscience, nanotechnology and condensed matter. For physicists and material scientists working in related areas, this is an excellent introduction to the fast-growing field of graphene science.

Summarizing the emerging field of N-heterocyclic carbenes used in organocatalysis, this is an excellent overview of the synthesis and applications of NHCs focusing on carbon-carbon and carbon-heteroatom bond formation. Alongside comprehensive coverage of the synthesis, characteristics and applications, this handbook and ready reference also includes chapters on NHCs for polymerization reactions and natural product synthesis.

This volume contains leading edge research and authoritative reviews in meteor science. It provides a comprehensive view of meteoroid research including the dynamics, sources and distribution of these bodies. Techniques for investigation of meteor phenomena in the book include conventional and large aperture radar systems, spacecraft detection, optical systems, spectral measurements, and laboratory based interplanetary dust particle studies.

Synthesis, Structure and Properties

Computational Chemistry and Catalysis Viewpoints

Thermodynamics In Nuclear Power Plant Systems

Handbook of Fermented Functional Foods

Theory and Materials

Transition Metals in Coordination Environments

This book documents the proceedings of the symposium "Fundamentals and Applications of Anion Separations" held during American Chemical Society National Meeting in Chicago, Illinois, August 25-30, 2001. Nearly 40 papers devoted to discussions on anion separation related to fundamental research and applications were presented. The symposium, sponsored by Osram Sylvania, BetzDearbom, and the Separation Science & Technology Subdivision of the Industrial & Engineering Chemistry Division of the American Chemical Society was organized by Bruce A. Moyer, Chemical Sciences Division, Oak Ridge National Laboratory, P.O. Box 2008, Building. 4500S, Oak Ridge, TN 37831-6119, and Raj P. Singh, Chemicals and Powders R&D, Osram Sylvania, Chemical and Metallurgical Products Division, Towanda, PA 18848. It drew presenters from Australia, the Czech Republic, France, Germany, Japan, South Africa, Thailand, the United Kingdom, and the United States. Separations constitute an integral part of chemical industry. Chemical products typically originate in resources that must be concentrated and purified, chemically transformed, and subjected to fmal purification. Effluent streams from the processes must be treated to recycle reusable components and to remove environmentally harmful species. Some industrial processes are devoted to environmental cleanup after pollution has occurred. In addition, many analytical methods require a separation for preconcentration, or a separation may be an inherent part of the analysis itself. Micro separations occurring at membranes or interfaces are also related phenomena employed for ion sensing. Many species targeted for separation are naturally anionic. Although the standard separations techniques ofextraction, ion exchange, adsorption, precipitation, etc.

Maximize efficiency and minimize pollution: the breakthrough technology of high temperature air combustion (HiTAC) holds the potential to overcome the limitations of conventional combustion and allow engineers to finally meet this long-standing imperative. Research has shown that HiTAC technology can provide simultaneous reduction of CO2 and nitric oxide emissions and reduce energy consumption for a specific process or requirement. High Temperature Air Combustion: From Energy Conservation to Pollution Reduction provides the first comprehensive exposition of the principles and practice of HiTAC. With a careful balance of theory and practice, it reviews the historical background, clearly describes HiTAC combustion phenomena, and shows how to simulate and apply the technology for significant energy savings, reduced equipment size, and lower emissions. It offers design guidelines for high performance industrial furnaces, presents field trials of practical furnaces, and explores potential applications of HiTAC in other fields, including the conversion of solid waste fuels to cleaner fuels, stationary gas turbine engines, internal combustion engines, and other advanced energy-to-power conversion systems.

Developed through an intensive research project sponsored by the Japanese government, HiTAC now promises to revolutionize our paradigm for using all kinds of fossil, alternative, waste, and derived fuels for energy conversion and utilization in industry. This book is your opportunity to understand its principles, learn about the technology, and begin to use it to the benefit of your application, your company, and the environment.

This book presents the results from the Japanese Fisheries Research Agency's 3-year intensive monitoring of radionuclides in a variety of fish, plankton, benthos, and their living environments after the Fukushima Daiichi Nuclear Power Plant (FNPP) accident in March 2011. The book reveals the dynamics of contamination processes in marine and freshwater fish, mediated by the contamination of water, sediments, and food organisms; it also clarifies the mechanisms by which large variations in the level of contamination occurs among individual fish. Most importantly, the book includes a large amount of original measurement data collected in situ and for the first time assesses diffusion of radiocesium across the Pacific using both in situ data and a numerical simulation model. Also introduced are several new approaches to evaluate the impact of the release of radionuclides, including the measurement of radiation emission from an otolith section to identify the main period of contamination in fish. The FNPP accident represents a rare instance where the environmental radioactivity level was elevated steeply through atmospheric fallout and direct discharge of radioactive water into the sea over a short period of time.

Replete with precise scientific data, this book will serve as an important resource for research in fields such as fishery science, oceanography, ecology, and environmentalology, and also as a solid basis for protecting fisheries from damage resulting from harmful rumors among the general public.

Jet Cutting Technology

Purification Process and Characterization of Ultra High Purity Metals

INIS Atomindeks

Nuclear Science Information of Japan. Oral Presentation

International Aerospace Abstracts

Carbon Nanotubes

Materials Science Forum Vol. 31

Technological advances have greatly increased the potential for, and practicability of, using medical neurotechnologies to revolutionize how a wide array of neurological and nervous system diseases and dysfunctions are treated. These technologies have the potential to help reduce the impact of symptoms in neurological disorders such as Parkinson's Disease and depression as well as help regain lost function caused by spinal cord damage or nerve damage. Medical Neurobionics is a concise overview of the biological underpinnings of neurotechnologies, the development process for these technologies, and the practical application of these advances in clinical settings. Medical Neurobionics is divided into three sections. The first section focuses specifically on providing a sound foundational understanding of the biological mechanisms that support the development of neurotechnologies. The second section looks at the efforts being carried out to develop new and exciting bioengineering advances. The book then closes with chapters that discuss practical clinical application and explore the ethical questions that surround neurobionics. A timely work that provides readers with a useful introduction to the field, Medical Neurobionics will be an essential book for neuroscientists, neuroengineers, biomedical researchers, and industry personnel.

Ion-exchange Technology I: Theory and Materials describes the theoretical principles of ion-exchange processes. More specifically, this volume focuses on the synthesis, characterization, and modelling of ion-exchange materials and their associated kinetics and equilibria. This title is a highly valuable source not only to postgraduate students and researchers but also to industrial R&D specialists in chemistry, chemical, and biochemical technology as well as to engineers and industrialists.

Plasma Catalysis

Polymer Gels

Impacts of the Fukushima Nuclear Accident on Fish and Fishing Grounds

Marine Radioactivity

INIS Atomindex

Application of Basic Science to Metallurgical Processing

This book starts with an extended introductory treatise on the fundamentals before moving on to a detailed description of the new methods of purification of transition metals and rare earth metals.

Plasma CatalysisMDPI

Fermented foods have been an important part of the human diet in many cultures for many centuries. Modern research, especially on the immune system, is revealing how these foods and their active ingredients impact human health. Handbook of Fermented Functional Foods presents the latest data on fermented food products, their production processes, an

AB INITIO Molecular Orbital Theory

PFAS in paper and board for food contact

Modern Meteor Science

Physics Briefs

Gas Phase Metal Reactions

Plasma catalysis is gaining increasing interest for various gas conversion applications, such as CO2 conversion into value-added chemicals and fuels, N2 fixation for the synthesis of NH3 or NOx, methane conversion into higher hydrocarbons or oxygenates. It is also widely used for air pollution control (e.g., VOC remediation). Plasma catalysis allows thermodynamically difficult reactions to proceed at ambient pressure and temperature, due to activation of the gas molecules by energetic electrons created in the plasma. However, plasma is very reactive but not selective, and thus a catalyst is needed to improve the selectivity. In spite of the growing interest in plasma catalysis, the underlying mechanisms of the (possible) synergy between plasma and catalyst are not yet fully understood. Indeed, plasma catalysis is quite complicated, as the plasma will affect the catalyst and vice versa. Moreover, due to the reactive plasma environment, the most suitable catalysts will probably be different from thermal catalysts. More research is needed to better understand the plasma–catalyst interactions, in order to further improve the applications.

*Poly- and perfluorinated alkyl substances (PFAS) are used in paper and board food contact materials (FCMs) and they have been found to be highly persistent, bioaccumulative and toxic. The purpose of the Nordic workshop and of this report is to: * create an overview of the use of PFAS in FCMs of paper and board and of the toxicity and migration into food of the various substances * provide an overview of whether appropriate risk assessments for fluorinated substances exist as a basis for specific regulations or recommendations * provide an overview of whether analytical methods suitable for analysing and regulating the substances are available * discuss the possibility and structure of national regulations or Nordic recommendations for PFAS in FCMs of paper and board. Risk management to reduce the total content of organically bound fluorine in paper and board FCMs is supported.*

This book focuses on the electronic properties of transition metals in coordination environments. These properties are responsible for the unique and intricate activity of transition metal sites in bio- and inorganic catalysis, but also pose challenges for both theoretical and experimental studies. Written by an international group of recognized experts, the book reviews recent advances in computational modeling and discusses their interplay using experiments. It covers a broad range of topics, including advanced computational methods for transition metal systems; spectroscopic, electrochemical and catalytic properties of transition metals in coordination environments; metalloenzymes and biomimetic compounds; and spin-related phenomena. As such, the book offers an invaluable resource for all researchers and postgraduate students interested in both fundamental and application-oriented research in the field of transition metal systems.

A Shared Responsibility

Ion Exchange Technology I

Transactions of the Iron and Steel Institute of Japan

Scientific and Technical Aerospace Reports

An Interdisciplinary View

Physikalische Berichte

The book brings together, for the first time, all aspects of reactions of metallic species in the gas phase and gives an up-to-date overview of the field. Reactions covered include those of atomic, other free radical and transient neutral species, as well as ions. Experimental and theoretical work is reviewed and the efforts to establish a closer link between these approaches are discussed. The field is mainly approached from a fundamental point-of-view, but the applied problems which have helped stimulate the interest are pointed out and form the major subject of the final chapters. These emphasize the competition between purely gas-phase and gas-surface reactions.

This volume contains papers presented at the 11th International Conference on Jet Cutting Technology, held at St. Andrews, Scotland, on 8-10 September 1992. Jetting techniques have been successfully applied for many years in the field of cleaning and descaling. Today, however, jet cutting is used in operations as diverse as removing cancerous growths from the human body, decommissioning sunsea installations and disabling explosive munitions. The diversity is reflected in the papers presented at the conference. The papers were divided into several main sections: jetting basics -- materials; jetting basics -- fluid mechanics; mining and quarrying; civil engineering; new developments; petrochem; cleaning and surface treatment; and manufacturing. The high quality of papers presented at the conference has further reinforced its position as the premier event in the field. The volume will be of interest to researchers, developers and manufacturers of systems, equipment users and contractors.

Bimetallic nanoparticles, also called nanoalloys, are at the heart of nanoscience because of their ability to tune together composition and size for specific purposes. By approaching both their physical and chemical properties, Nanoalloys: Synthesis, Structure & Properties provides a comprehensive reference to this research field in nanoscience by addressing the subject from both experimental and theoretical points of view, providing chapters across three main topics: Growth and structural properties Thermodynamics and electronic structure of nanoalloys Magnetic, optic and catalytic properties The growth and elaboration processes which are the necessary and crucial part of any experimental approach are detailed in the first chapter. Three chapters are focused on the widely used characterization techniques sensitive to both the structural arrangements and chemistry of nanoalloys. The electronic structure of nanoalloys is described as a guide of useful concepts and theoretical tools. Chapters covering thermodynamics begin with bulk alloys, going to nanoalloys via surfaces in order to describe chemical order/disorder, segregation and phase transitions in reduced dimension. Finally, the optical, magnetic and catalytic properties are discussed by focusing on nanoparticles formed with one element to track the modifications which occur when forming nanoalloys. The range and detail of Nanoalloys: Synthesis, Structure & Properties makes it an ideal resource for postgraduates and researchers working in the field of nanoscience looking to expand and support their knowledge of nanoalloys.

Annual Index/abstracts of SAE Technical Papers

Hybrid Laser-Arc Welding

Continuous Manufacturing of Pharmaceuticals

Perspectives and Applications

N-Heterocyclic Carbenes in Organocatalysis

Ceramic Abstracts

This book summarizes the recent advances in the science and engineering of polymer-gel-based materials in different fields. It also discusses the extensive research developments for the next generation of smart materials. It takes an in-depth look at the current perspectives and market opportunities while pointing to new possibilities and applications. The book addresses important topics such as stimuli responsive polymeric nanoparticles for cancer therapy; polymer gel containing metallic materials; chemotherapeutic applications in oncology; conducting polymer-based gels and their applications in biological sensors; imprinted polymeric gels for pharmaceutical and biomedical purposes; applications of biopolymeric gels in the agricultural sector; application of polymer gels and their nanocomposites in electrochemistry; smart polyelectrolyte gels as a platform for biomedical applications; agro-based polymer gels and their application in purification of industrial water wastes; polymer gel composites for bio-applications. It will be of interest to researchers working in both industry and academia.

This book on Marine Radioactivity sets out to cover most of the aspects of marine radioactivity which have been the focus of scientific study in recent decades. The authors and their reviews divide into topic areas which have defined the field over its history. They cover the suite of natural radioisotopes which have been present in the oceans since their formation and quantitatively dominate the inventory of radioactivity in the oceans. Also addressed are the suite of artificial radionuclides introduced to the oceans as a consequence of the use of the atom for development of nuclear energy, nuclear weapons and various applications of nuclear science. The major source of these continues to derive from the global fallout of atmospheric tests of nuclear weapons in the 1950s and 1960s but includes both planned and accidental releases of radioactivity from both civilian and military nuclear technology. The other division of the major study direction depends on whether the objective is to use the radionuclides as powerful tools to study oceanic processes, to describe and understand the ocean distribution of the various natural or artificial radionuclides or to assess the different radionuclides' impact on and pathways to man or marine organisms. The oceans cover 70% of the Earth's surface and thus contains a corresponding large share of the Earth's radioactivity. Marine Radioactivity covers topics of recent scientific study in this young field. It examines both natural radioactivity (radioactivity naturally present in oceans since their formation) and artificial radioactivity (radioactivity introduced by man and use of atomic and nuclear energy) with regard to possible effects on the global environment.

Carbon nanotubes have been studied extensively in relation to fullerenes, and together with fullerenes have opened a new science and technology field on nano scale materials. A whole range of issues from the preparation, structure, properties and observation of quantum effects in carbon nanotubes in comparison with O-D fullerenes are discussed. In addition, complementary reviews on carbon nanoparticles such as carbon nano-capsules, onion-like graphite particles and metal-coated fullerenes are covered. This book aims to cover recent research and development in this area, and so provide a convenient reference tool for all researchers in this field. It is also hoped that this book can serve to stimulate future work on carbon nanotubes.

Hydrogen Storage Materials

The Biomedical Engineering of Neural Prostheses

Vinyl Cations

High Temperature Air Combustion

Water

Computational Catalysis

Hybrid laser-arc welding (HLAW) is a combination of laser welding with arc welding that overcomes many of the shortfalls of both processes. This important book gives a comprehensive account of hybrid laser-arc welding technology and applications. The first part of the book reviews the characteristics of the process, including the properties of joints produced by hybrid laser-arc welding and ways of assessing weld quality. Part two discusses applications of the process to such metals as magnesium alloys, aluminium and steel as well as the use of hybrid laser-arc welding in such sectors as ship building and the automotive industry. With its distinguished editor and international team of contributors, Hybrid laser-arc welding is a valuable source of reference for all those using this important welding technology. Reviews arc and laser welding including both advantages and disadvantages of the hybrid laser-arc approach Explores the characteristics of the process including the properties of joints produced by hybrid laser-arc welding and ways of assessing weld quality Examines applications of the process including magnesium alloys, aluminium and steel with specific focus on applications in the shipbuilding and automotive industries

Vinyl Cations provides a comprehensive and detailed treatment of the reactive intermediate in which the electron-deficient carbon is an integral part of a π unsaturation. This book emphasizes that the reaction through vinyl cations is a viable pathway among the multitude of mechanistic routes for vinylic substitution. The aryl, ethynyl, and allenyl cations from the viewpoint of direct solvolytic generation from appropriate allenyl precursors are briefly discussed. Other topics include the preparative aspects of electrophilic additions to alkynes, participation of allenyl bonds in solvolyses, and vinyl cations generated through diazonium ions. The nature of the cationic intermediates, migrations across the double bond, thirenium ions, and species related to vinyl cations are likewise elaborated. This publication is beneficial to chemists and researchers concerned with vinyl cations.

This book addresses the formulation of theoretical molecular orbital models starting from quantum mechanics, and compares them to experimental results. It draws on a series of models that have already received widespread application and are available for new applications.

Options for risk management of poly- and perfluorinated substances

From Energy Conservation to Pollution Reduction

Materials Transactions, JIM.

The Physics of Graphene

Chemical Engineering Abstracts

A comprehensive look at existing technologies and processes for continuous manufacturing of pharmaceuticals As rising costs outpace new drug development, the pharmaceutical industry has come under intense pressure to improve the efficiency of its manufacturing processes. Continuous process manufacturing provides a proven solution. Among its many benefits are: minimized waste, energy consumption, and raw material use; the accelerated introduction of new drugs; the use of smaller production facilities with lower building and capital costs; the ability to monitor drug quality on a continuous basis; and enhanced process reliability and flexibility. Continuous Manufacturing of Pharmaceuticals prepares professionals to take advantage of that exciting new approach to improving drug manufacturing efficiency. This book covers key aspects of the continuous manufacturing of pharmaceuticals. The first part provides an overview of key chemical engineering principles and the current regulatory environment. The second covers existing technologies for manufacturing both small-molecule-based products and protein/peptide products. The following section is devoted to process analytical tools for continuously operating manufacturing environments. The final two sections treat the integration of several individual parts of processing into fully operating continuous process systems and summarize state-of-art approaches for innovative new manufacturing principles. Brings together the essential know-how for anyone working in drug manufacturing, as well as chemical, food, and pharmaceutical scientists working on continuous processing Covers chemical engineering principles, regulatory aspects, primary and secondary manufacturing, process analytical technology and quality-by-design Contains contributions from researchers in leading pharmaceutical companies, the FDA, and academic institutions Offers an extremely well-informed look at the most promising future approaches to continuous manufacturing of innovative pharmaceutical products Timely, comprehensive, and authoritative, Continuous Manufacturing of Pharmaceuticals is an important professional resource for researchers in industry and academe working in the fields of pharmaceuticals development and manufacturing.