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Porosity

Fundamentals of Kinematics and Dynamics of Machines and Mechanisms

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Carbon Materials for Catalysis

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LEWIS JOSEPH

Porosity BoD - Books on Demand

This book reviews health hazards associated with wastewater use and water pollutants. Chapters present applications of green materials made of agricultural waste, activated carbon and

magnetic materials for wastewater treatment. The removal of toxic metals using algal biomass and the removal of toxic dyes using chitosan composite materials are also discussed. The book includes reviews on the removal of phenols, pesticides, and on the use of ionic liquid-modified activated carbon for the treatment of textile wastewater.

[Fundamentals of Kinematics and Dynamics of Machines and Mechanisms](#) Elsevier

For many decades, the lead-acid battery has been the most

widely used energy-storage device for medium- and large-scale applications (approximately 100Wh and above). In recent years, the traditional, flooded design of the battery has begun to be replaced by an alternative design. This version - the valve-regulated lead-acid (VRLA) battery - requires no replenishment of the water content of the electrolyte solution, does not spill liquids, and can be used in any desired orientation. Since the VRLA battery operates in a somewhat different manner from its flooded counterpart, considerable technological development has been necessary to meet the exacting performance requirements of the full range of applications in which rechargeable batteries are used. The valve-regulated design is now well established in the industrial battery sector, and also appears set to be adopted widely for automotive duty. This book provides a comprehensive account of VRLA technology and its uses. In the future, all industrial processes - including the manufacture of batteries - will be required to conform to the conventions of sustainability. Accordingly, the crucial areas of the environmental impact associated with the production and use of VRLA batteries and the recycling of spent units are also treated thoroughly. Valve-Regulated Lead-Acid Batteries gives an essential insight into the science that underlies the development and operation of VRLA batteries and is a comprehensive reference source for those involved in the practical use of the technology in key energy-storage applications. Covers all major advances in the field Provides a comprehensive account of VRLA technology and its uses First book dedicated to this technology
Carbon-Based Material for Environmental Protection and Remediation Academic Press

Carbon materials are one of the most fascinating materials because of their unique properties and potential use in several applications. They can be obtained from residues or by using advanced synthesis technologies like chemical vapor deposition. The carbon family is very broad, ranging from classical activated carbons to more advanced species such as carbon nanotubes and graphene. The surface chemistry is one of the most interesting aspects of this broad family of materials, which allows the incorporation of different types of chemical functionalities or heteroatoms on the carbon surface, such as O, N, B, S, or P, which can modify the acid-base character, hydrophobicity/hydrophilicity, or the electronic properties of these materials and, thus, determine the final application. This book represents a collection of original research articles and communications focused on the synthesis, properties, and applications of heteroatom-doped functional carbon materials. Valorization of Agri-Food Wastes and By-Products BoD - Books on Demand
High surface area, a microporous structure, and a high degree of surface reactivity make activated carbons versatile adsorbents, particularly effective in the adsorption of organic and inorganic pollutants from aqueous solutions. Activated Carbon Adsorption introduces the parameters and mechanisms involved in the activated carbon adsorption
Applied Water Science, Volume 2 John Wiley & Sons
Feeding our globally expanding population is one of the most critical challenges of our time and improving food and agricultural production efficiencies is a key factor in solving this problem. Currently, one-third of food produced for humans is wasted, and

for every pound of food produced, roughly an equal amount of nonfood by-product is also generated, creating a significant environmental impact. In *Integrated Processing Technologies for Food and Agricultural By-Products* experts from around the world present latest developments, recognizing that while some by-products have found use as animal feed or are combusted for energy, new technologies which integrate conversion of production and processing by-products into higher-value food or nonfood products, nutraceuticals, chemicals, and energy resources will be a critical part of the transition to a more sustainable food system. Organized by agricultural crop, and focusing on those crops with maximum economic impact, each chapter describes technologies for value-added processing of by-products which can be integrated into current food production systems. *Integrated Processing Technologies for Food and Agricultural By-Products* is a valuable resource for industry professionals, academics, and policy-makers alike. Provides production-through-processing coverage of key agricultural crops for a thorough understanding and translational inspiration. Describes and discusses major by-product sources, including physical and chemical biomass characterizations and associated variability in detail. Highlights conversions accomplished through physical, biological, chemical, or thermal methods and demonstrates examples of those technologies.

Carbon Materials for Catalysis Elsevier

Organic pollutants cause several environmental problems if discharged to air or water body. The occurrence of organic pollutants in the ecosystem, their risk and removal methods are very important issues. This book deals with several aspects of

organic pollutants, especially in the light of organic pollutants monitoring, risk assessment as well as the practical application of different techniques for removing it from the environment. The book is divided into three sections contains 9 chapters. The first section explains monitoring of organic pollutants in soil and water. The second section discusses its risk to human, soil and plants. The third section focuses on the different treatment process for the removal of organic pollutants.

Classifications, Properties and Applications Elsevier
Metal Oxide-Carbon Hybrid Materials: Synthesis, Properties and Applications reviews the advances in the fabrication and application of metal oxide-carbon-based nanocomposite materials. Their unique properties make them ideal materials for gas-sensing, photonics, catalysis, opto-electronic, and energy-storage applications. In the first section, the historical background to the hybrid materials based on metal oxide-carbon and the hybridized metal oxide composites is provided. It also highlights several popular methods for the preparation of metal oxide-carbon composites through solid-state or solution-phase reactions, and extensively discusses the materials' properties. Fossil fuels and renewable energy sources cannot meet the ever-increasing energy demands of an industrialized and technology-driven global society. Therefore, the role of metal oxide-carbon composites in energy generation, hydrogen production, and storage devices, such as rechargeable batteries and supercapacitors, is of extreme importance. These problems are discussed in the second section of the book. Rapid industrialization has resulted in serious environmental issues which in turn have caused serious health problems that require

the immediate attention of researchers. In the third section, the use of metal oxide-carbon composites in water purification, photodegradation of industrial contaminants, and biomedical applications that can help to clean the environment and provide better healthcare solutions is described. The final section is devoted to the consideration of problems associated with the development of sensors for various applications. Numerous studies performed in this area have shown that the use of composites can significantly improve the operating parameters of such devices. Metal Oxide-Carbon Hybrid Materials: Synthesis, Properties and Applications presents a comprehensive review of the science related to metal oxide-carbon composites and how researchers are utilizing these materials to provide solutions to a large array of problems. Reviews the fundamental properties and fabrication methods of metal-oxide-carbon composites Discusses applications in energy, including energy generation, hydrogen production and storage, rechargeable batteries, and supercapacitors Includes current and emerging applications in environmental remediation and sensing

Adsorption and Its Applications in Industry and Environmental Protection: Applications in environmental protection Cambridge University Press

Volume II contains chapters written by authoritative specialists on the broad spectrum of environmental topics in order to find a way for intense anthropogenic activities to coexist with the natural environment. The book highlights a wide spectrum of themes referring to the environmental analysis and control and molecular modelling of both sorbents and adsorption environmentally-friendly processes. Also covered are new trends in applications of

colloidal science for protecting soil systems, purification and production of drinking water, water and groundwater treatment, new environmental adsorbents for removal of pollutants from wastewaters and sewages, selective sorbents for hot combustion gases, some corrosion aspects and ecological adsorption of heating and cooling pumps. The volume concludes with a comprehensive bibliography, which includes the period 1967-1997, on adsorptive separations, environmental applications, PSA, parametric pumping, ion-exchange and chromatography. All articles give both the scientific background of the phenomena discussed and indicate practical aspects.

Electrochemical Capacitors: Fundamentals to Applications
Nova Science Publishers

This book discusses multiways in the porous materials. It involves materials with a large number of holes, and it highlights the synthesis, structure, and surface properties of porous materials closely related to more applications, such as support, catalyst, energy storage, chemical reactions, and optical applications. It studies the effect of the filling materials, the thermal treatments, and the porous density in the improvement of physical properties, electrical and energy efficiency, and the generation of new materials. Some synthetic process will be discussed with the effect of some parameters on the final characteristics of the prepared porous structures.

Porous Carbon Materials from Sustainable Precursors John Wiley & Sons

Activated carbons produced in the German Democratic Republic are tested with regard to their capability to adsorb radioiodine and radioactive methyl iodide. The physico-chemical properties of

the available types of activated carbon are summarized. Activated carbons with most favorable properties are selected, considering different parameters. It is attempted to improve the adsorptive properties of the selected carbons by preparing them with $\text{Cu}(\text{NO}_3)_2$, AgNO_3 or KI. Furthermore, the influence of water vapor, temperature and carbon dioxide on the effectiveness of the carbon was tested. Methods and results of the tests are presented.

Classifications, Properties and Applications BoD - Books on Demand

The study of the kinematics and dynamics of machines lies at the very core of a mechanical engineering background. Although tremendous advances have been made in the computational and design tools now available, little has changed in the way the subject is presented, both in the classroom and in professional references. *Fundamentals of Kinematics and Dynamics of Machines and Mechanisms* brings the subject alive and current. The author's careful integration of Mathematica software gives readers a chance to perform symbolic analysis, to plot the results, and most importantly, to animate the motion. They get to "play" with the mechanism parameters and immediately see their effects. The downloadable resources contain Mathematica-based programs for suggested design projects. As useful as Mathematica is, however, a tool should not interfere with but enhance one's grasp of the concepts and the development of analytical skills. The author ensures this with his emphasis on the understanding and application of basic theoretical principles, unified approach to the analysis of planar mechanisms, and introduction to vibrations and rotordynamics.

Activated Carbon BoD - Books on Demand

Nanomaterials in Chromatography: Current Trends in Chromatographic Research Technology and Techniques provides recent advancements in the wide variety of chromatographic techniques applied to nanotechnology. As nanomaterials' unique properties can improve detection sensitivity and miniaturize the devices used in analytical procedures, they can substantially affect the evaluation and analysis ability of scientists and researchers and foster exciting developments in separation science. The book includes chapters on such crucial topics as the use of nanomaterials in sample preparation and the legalization of nanomaterials, along with a section on reducing the cost of the analysis process, both in terms of chemicals and time consumption. Presents several techniques for nanomaterials in chromatography, including well-known materials like carbon nanomaterials and functionalized nanomaterials Includes suggested readings at the end of each chapter for those who need further information or specific details, from standard handbooks, to journal articles Covers not only applications of nanomaterials in chromatography, but also their environmental impact in terms of toxicity and economic effects

Activated Carbon Woodhead Publishing

Chemical separations are of central importance in many areas of environmental science, whether it is the clean up of polluted water or soil, the treatment of discharge streams from chemical processes, or modification of a specific process to decrease its environmental impact. This book is an introduction to chemical separations, focusing on their use in environmental applications. The authors first discuss the general aspects of separation

technology as a unit operation. They also describe how property differences are used to generate separations, the use of separating agents, and the selection criteria for particular separation techniques. The general approach for each technology is to present the chemical and/or physical basis for the process and explain how to evaluate it for design and analysis. The book contains many worked examples and homework problems. It is an ideal textbook for undergraduate and graduate students taking courses on environmental separations or environmental engineering.

Science and Technology John Wiley & Sons

Emerging and Nanomaterial Contaminants in Wastewater: Advanced Treatment Technologies describes the state-of-the-art of remediation technologies, such as those involving nanotechnology, filtration devices (e.g. membranes), strategies involving adsorption and precipitation processes, development of new sorbents, nanosorbents, biosorbents, green technology, bio-electrokinetics, degradation of pollutants, advanced oxidative process, oxidative electrochemical and photocatalytic processes, catalytic degradation, and emerging hybrid technologies, such as photocatalyst membrane photoreactors using TiO₂. Scientists and researchers in academia and industry will benefit from this comprehensive resource on the fundamental science behind the mechanisms at which wastewater sources can be purified from emerging contaminants. Provides a fundamental understanding of emerging contaminants to help readers select appropriate remediation technologies Discusses, in detail, new and advanced green technologies that remove emerging contaminants from wastewater Shows how to ensure water quality and save public

health by protecting water resources from contaminants
Element-Doped Functional Carbon-Based Materials Elsevier
Valorization of Agri-Food Wastes and By-Products: Recent Trends, Innovations and Sustainability Challenges addresses the waste and by-product valorization of fruits and vegetables, beverages, nuts and seeds, dairy and seafood. The book focuses its coverage on bioactive recovery, health benefits, biofuel production and environment issues, as well as recent technological developments surrounding state of the art of food waste management and innovation. The book also presents tools for value chain analysis and explores future sustainability challenges. In addition, the book offers theoretical and experimental information used to investigate different aspects of the valorization of agri-food wastes and by-products. Valorization of Agri-Food Wastes and By-Products: Recent Trends, Innovations and Sustainability Challenges will be a great resource for food researchers, including those working in food loss or waste, agricultural processing, and engineering, food scientists, technologists, agricultural engineers, and students and professionals working on sustainable food production and effective management of food loss, wastes and by-products. Covers recent trends, innovations, and sustainability challenges related to food wastes and by-products valorization Explores various recovery processes, the functionality of targeted bioactive compounds, and green processing technologies Presents emerging technologies for the valorization of agri-food wastes and by-products Highlights potential industrial applications of food wastes and by-products to support circular economy concepts

Integration of Adsorption and Biological Treatment

Bentham Science Publishers

This monograph provides comprehensive coverage of technologies which integrate adsorption and biological processes in water and wastewater treatment. The authors provide both an introduction to the topic as well as a detailed discussion of theoretical and practical considerations. After a review of the basics involved in the chemistry, biology and technology of integrated adsorption and biological removal, they discuss the setup of pilot- and full-scale treatment facilities, covering powdered as well as granular activated carbon. They elucidate the factors that influence the successful operation of integrated systems. Their discussion on integrated systems expands from the effects of environmental to the removal of various pollutants, to regeneration of activated carbon, and to the analysis of such systems in mathematical terms. The authors conclude with a look at future needs for research and development. A truly valuable resource for environmental engineers, environmental and water chemists, as well as professionals working in water and wastewater treatment.

Principles of Chemical Separations with Environmental Applications

Elsevier

Activated Carbon Fiber and Textiles provides systematic coverage of the fundamentals, properties, and current and emerging applications of carbon fiber textiles in a single volume, providing industry professionals and academics working in the field with a broader understanding of these materials. Part I discusses carbon fiber principles and production, including precursors and pyrolysis, carbon fiber spinning, and carbonization

and activation. Part II provides more detailed analysis of the key properties of carbon fiber textiles, including their thermal, acoustic, electrical, adsorption, and mechanical behaviors. The final section covers applications of carbon fiber such as filtration, energy protection, and energy and gas storage. Features input from an editor who is an expert in his field: Professor Jonathan Chen has a wealth of experience in the area of activated carbon fiber materials Provides systematic and comprehensive coverage of the key aspects of activated carbon fiber textiles, from their principles, processing, and properties to their industrial applications Offers up-to-date coverage of new technology for the fiber and textiles industries Covers applications such as filtration, energy protection, and energy and gas storage

Porous Carbons

Routledge

Biochemical Engineering and Biotechnology, 2nd Edition, outlines the principles of biochemical processes and explains their use in the manufacturing of every day products. The author uses a direct approach that should be very useful for students in following the concepts and practical applications. This book is unique in having many solved problems, case studies, examples and demonstrations of detailed experiments, with simple design equations and required calculations. Covers major concepts of biochemical engineering and biotechnology, including applications in bioprocesses, fermentation technologies, enzymatic processes, and membrane separations, amongst others Accessible to chemical engineering students who need to both learn, and apply, biological knowledge in engineering principals Includes solved problems, examples, and demonstrations of detailed experiments with simple design

equations and all required calculations Offers many graphs that present actual experimental data, figures, and tables, along with explanations

Valve-Regulated Lead-Acid Batteries MDPI

Following in the lineage of Adsorption by Carbons (Bottani & Tascon, 2008), this work explores current research within contemporary novel carbon adsorbents. Both basic and applied aspects are discussed for this important class of materials. The first section of the book introduces physical adsorption and carbonaceous materials, and is followed by a section concerning the fundamentals of adsorption by carbons. This leads to development of a series of theoretical concepts that serve as an introduction to the following section in which adsorption is mainly envisaged as a tool to characterize the porous texture and surface chemistry of carbons. Particular attention is paid to novel nanocarbons, and the electrochemistry of adsorption by carbons is also addressed. Finally, several important technological applications of gas and liquid adsorption by carbons in areas such as environmental protection and energy storage constitute the last section of the book. Encompasses fundamental science of adsorption by carbons, in one location, supporting current R&D without extensive literature review Describes adsorption as it is currently applied to major novel types of carbon materials,

including carbon gels, carbide-derived carbons, zeolite-templated carbons, hydrothermal carbons, carbon nanohorns and graphene Specific discussion of fuel storage, environmental remediation and biomedical applications, of contemporary interest to many surface chemists and applications-focused researchers

Green Adsorbents National Academies Press

Porous carbon materials are at the heart of many applications, including renewable energy storage and generation, due to their superior physical properties and availability. The environmentally-friendly production of these materials is crucial for a sustainable future. This book focuses on the transformation of sustainable precursors into functional, porous carbonaceous materials via the two most significant approaches: Starbon® and Hydrothermal Carbonisation. Covering cutting-edge research and emerging areas, chapters cover applications of porous carbon materials in catalysis and separation science as well as in energy science. Moreover, the challenges of characterization of these materials and their commercialization are explained by worldwide experts. The content will be accessible and valuable to post-graduate students and senior researchers alike and it will serve as a significant reference for academics and industrialists working in the areas of materials science, catalysis and separation science.

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