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Design and Operation of heat Exchangers and Their Networks presents a comprehensive and detailed analysis on the thermal design methods for the most common types of heat exchangers, with a focus on their networks, simulation procedures for their operations, and measurement of their thermal performances. The book addresses the fundamental theories and principles of heat transfer performance of heat exchangers and their applications and then applies them to the use of modern computing technology. Topics discussed include cell methods for condensers and evaporators, dispersion models for heat exchangers, experimental methods for the evaluation of heat exchanger performance, and thermal calculation algorithms for multi-stream heat exchangers and heat exchanger networks. Includes MATLAB codes to illustrate how the technologies and methods discussed can be easily applied and developed. Analyses a range of different models, applications, and case studies in order to reveal more advanced solutions for industrial applications. Maintains a strong focus on the fundamental theories and principles of the heat transfer performance of heat exchangers and their applications for complex flow arrangement. Artificial Intelligence Planning Systems documents

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the proceedings of the First International Conference on AI Planning Systems held in College Park, Maryland on June 15-17, 1992. This book discusses the abstract probabilistic modeling of action; building symbolic primitives with continuous control routines; and systematic adaptation for case-based planning. The analysis of ABSTRIPS; conditional nonlinear planning; and building plans to monitor and exploit open-loop and closed-loop dynamics are also elaborated. This text likewise covers the modular utility representation for decision-theoretic planning; reaction and reflection in tetris; and planning in intelligent sensor fusion. Other topics include the resource-bounded adaptive agent, critical look at Knoblock's hierarchy mechanism, and traffic laws for mobile robots. This publication is beneficial to students and researchers conducting work on AI planning systems.

This book draws on insights that originated from the Circular Economy and Zero Waste initiatives. Together these approaches try to boost the shift from “waste” to “resources” management. The content of this book is partially organized from a stakeholder perspective, revealing the managerial implications for public and private actors. Next to public policies, also illustrations come from the private sector. Petstar, Texperium and Walmart generously shared some of their best practices at in this regard. Cases from China, Indonesia, Mexico,

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the Netherlands and Romania are discussed in this book. In all of these different contexts they show ways to create collaborative schemes in order to “retain” the resources’ values as much as product quality and financial circumstances permit. The reader can thus take advantage of the pragmatic viewpoints that aim to inspire policy makers, researchers, students, organisations and communities to boost the needed changes towards a Zero Waste Economy.

This book complies latest advancement in the field of environmental biotechnology. It focuses on topics that comprises industrial, environment and agricultural related issues to microbiological studies and exhibits correlation between biological world and dependence of humans on it. It is designed into three sections covering the role of environmental biotechnology in industry, environmental remediation, and agriculture. Ranging from micro-scale studies to macro, it covers up a huge domain of environmental biotechnology. Overall the book portrays the importance of modern biotechnology technologies in solving the problems in modern day life. The book is a ready reference for practicing students, researchers of biotechnology, environmental engineering, chemical engineering and other allied fields likewise.

This book focuses on sustainable energy systems. While several innovative and alternative concepts

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are presented, the topics of energy policy, life cycle assessment, thermal energy, and renewable energy also play a major role. Models on various temporal and geographical scales are developed to understand the conditions of technical as well as organizational change. New methods of modeling, which can fulfil technical and physical boundary conditions and nevertheless consider economic environmental and social aspects, are also developed.

The energy crisis and pollution have posed significant risks to the environment, transportation, and economy over the last century. Thus, green energy becomes one of the critical global technologies and the use of nanomaterials in these technologies is an important and active research area. This book series presents the progress and opportunities in green energy sustainability. Developments in nanoscaled electrocatalysts, solid oxide and proton exchange membrane fuel cells, lithium ion batteries, and photovoltaic techniques comprise the area of energy storage and conversion. Developments in carbon dioxide (CO₂) capture and hydrogen (H₂) storage using tunable structured materials are discussed. Design and characterization of new nanoscaled materials with controllable particle size, structure, shape, porosity and band gap to enhance next generation energy systems are also included. The technical topics covered in this series are metal organic frameworks, nanoparticles, nanocomposites, proton exchange membrane fuel cell

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catalysts, solid oxide fuel cell electrode design, trapping of carbon dioxide, and hydrogen gas storage.

Urbanisation and climate change are pushing cities to find novel pathways leading to a sustainable future. The urban context may be viewed as a new experimentation space to accelerate the transition to a circular economy. Urban symbiosis and the circular economy are emerging concepts attracting more and more attention within the urban context. Moreover, new business models are emerging around sharing and peer-to-peer practices, which are challenging existing roles of actors in society. These developments are having an important impact on the flows of resources and the use of the city infrastructure, and each research area has taken a different perspective in the analysis of such impacts. This Special Issue aims to explore what a “circular city” could constitute and how and why cities engage in circularity. This Special Issue includes seven high-quality papers on the theories and practices of circular cities. Actors, concepts, methods, tools, the barriers to and enablers of circular cities are discussed and a solid base and inspiration for the future development of circular cities are provided.

Covers all the published and all the important unpublished decisions and opinions of the Department of the Interior ...

This expert volume provides specialized coverage of the current state of the art in carbon gels. Carbon gels represent a promising class of materials with high added value applications and many assets, like the ability to accurately tailor their structure, porosity, and surface

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composition and easily dope them with numerous species. The ability to obtain them in custom shapes, such as powder, beads, monoliths, or impregnated scaffolds opens the way towards numerous applications, including catalysis, adsorption, and electrochemical energy storage, among others. Nevertheless, it remains a crucial question as to which design synthesis and manufacturing processes are viable from an economic and environmental point of view. The book represents the perspectives of renowned specialists in the field, specially invited to conduct a one-day workshop devoted to carbon gels as part of the 19th International Sol-Gel Conference, SOL-GEL 2017, held on September 3rd, 2017 in Liège, Belgium. Addressing properties and synthesis through applications and industry outlook, this book represents essential reading for advanced graduate students through practicing researchers interested in these exciting materials.

Achieving the Circular Economy Exploring the Role of Local Governments, Business and Civic Society in an Urban Context MDPI

This book features expert contributions on key sustainability aspects of urban water management in Chinese agglomerations. Both technical and institutional pathways to sustainable urban water management are developed on the basis of a broad, interdisciplinary problem analysis.

Heavy-Duty Electric Vehicles: From Concept to Reality presents a step-by-step design and development guide for heavy-duty electric vehicles.

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It also offers practical insights based on the commercial application of an electric city bus. Heavy-duty electric vehicle design is challenging due to a lack of clear understanding of the government policies, R&D directions and uncertainty around the performance of various subsystems in an electric powertrain. Therefore, this book discusses key technical aspects of motors, power electronics, batteries and vehicle control systems, and outlines the system integration strategies necessary for design and safe operation of electric vehicles in practice. This comprehensive book serves as a guide to engineers and decision makers involved in electric vehicle development programs and assists them in finding the suitable electric powertrain solution for a given heavy-duty vehicle application. Offers an overview of various standards and regulations that guide the electric vehicle design process and a comprehensive discussion on various government policies and incentive schemes propelling the growth of heavy electric vehicle markets across the world; Provides a comparative evaluation of different electric drivetrain concepts and a step-by-step power calculation guide for heavy-duty electric powertrain; Explains material selection and manufacturing methods for next generation batteries; Discusses key elements and design rules for creating a robust high voltage energy storage system, appropriate packaging and its support

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systems including charging network; Includes a concise description of torque mapping, power management and fault handling strategies for inverter drive and control systems; Features case studies to better understand complex topics like charging system requirements and vehicle control system diagnostics.

This book provides up-to-date information on the state of the art in applications of biotechnological and microbiological tools for protecting the environment. Written by leading international experts, it discusses potential applications of biotechnological and microbiological techniques in solid waste management, wastewater treatment, agriculture, energy and environmental health. This first volume of the book “Environmental Microbiology and Biotechnology,” covers three main topics: Solid waste management, Agriculture utilization and Water treatment technology, exploring the latest developments from around the globe regarding applications of biotechnology and microbiology for converting wastes into valuable products and at the same time reducing the environmental pollution resulting from disposal. Wherever possible it also includes real-world examples. Further, it offers advice on which procedures should be followed to achieve satisfactory results, and provides insights that will promote the transition to the sustainable utilization of various waste products.

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This volume focuses on the collection of waste and waste streams as an integral aspect of sustainable waste management. The authors take economic models and behavioral studies into account to go beyond just descriptions of waste collections technologies and collection route design. Models and tools for sustainable waste collection are described in detail, and the authors provide a comprehensive, integrated methodology to design waste collection systems that reduce environmental impacts, are economically viable, and achieve buy-in and participation from target populations. Part I of the book provides fundamentals and context on waste hierarchy, including waste prevention, reduction and reuse, waste collection itself, and steps such as preparation for recycling, recycling, treatment, and landfilling. Background in environmental, social, and economic concerns surrounding waste collection is also provided here. Part II addresses tools for design, operation, and maintenance of waste collection systems. Part III focuses on how the tools presented in Part II can be used to support sustainability assessments and decisions that consider the entire life cycle of waste and the role of waste collection programs in waste prevention, reduction, reuse, recycling, treatment, and disposal. Part IV addresses the challenges of developing sustainable waste management systems and addresses the role of waste collection in

sustainable waste management in the future. The book is designed to help public and private decision-makers and academics deepen their knowledge and understanding of the contexts, obstacles and challenges of a variety of business types involved in Industrial Symbiosis and Circular Economy practices. Industrial Symbiosis is reported in the Action Plan on the Circular Economy developed by the European Commission in 2015 (COM / 2015/0614 final) and in its revision of 14 March 2017, but relatively little is known of how these practices start, develop or fail, and mutate in a rapidly changing context. Including selected contributions presented at the 24th ISDRS 2018 Conference, “Actions for a Sustainable World: from theory to practice” in the two theme tracks “5c. Circular economy, zero waste & innovation” and “5g. Industrial symbiosis, networking and cooperation as part of industrial ecology”, this book offers a transdisciplinary perspective on real experiences of industrial symbiosis, performed both by industries and the scientific community, best practices, success and unsuccessful cases (implemented or under implementation), with the final aim to promote the adoption of Industrial Symbiosis as an operational and systematic tool for the Circular Economy. In particular, a focus on the environmental, social, and economic impact of Circular Economy and Industrial Symbiosis

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practices, and how those impacts may be context and/or scale dependent is given.

Investigation on biobased nanomaterials has provided new insights into the rapidly advancing fields of the biomedical and environmental sciences by showing how these nanomaterials are effective in biomedicine and environmental remediation. These particles hold tremendous prospective applications, and are likely to become the next generation of particles in these areas. As such, research is ongoing and the data generated should have the potential for a sustainable future in both the environmental and biomedical fields. This book presents important findings on the role of and identification of novel applications of biobased nanomaterials. Unlike other books in this field, this book focuses entirely on sustainable application and remediation in biomedicine and environmental science. The chapters are written in such a way as to make them accessible to the reader, and furthermore, the volume can be readily adopted as a reference, or used as a guide for further research. This project was based on recent research (the last 5 years) and developed through an extensive literature search. The editors have also compiled some advanced, outstanding texts that should be of benefit to graduate students in their research. Implementing the Circular Economy for Sustainable Development presents the concept of the circular

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economy with the goal of understanding its present status and how to better implement it, particularly through environmental policies. It first tackles the definition of a circular economy in the context of sustainability and the differences in defining the concept across disciplines, including its fallibilities and practical examples. It then goes on to discuss the implementation of a circular economy, including the increasing variety of technological, mechanical, and chemical procedures to contend with and the need for stakeholder support in addition to improved business models. The second half of the book, therefore, presents tools, approaches, and practical examples of how to shape environmental policy to successfully implement a circular economy. It analyzes deficiencies of current regulations and lays the groundwork for the design of integrated environmental policies for a circular economy. Authored by an expert in environmental economics with decades of experience, *Implementing the Circular Economy for Sustainable Development* is a timely, practical guide for sustainability researchers and policymakers alike to move more efficiently toward a circular economy and sustainable development. Presents a clear view of the critical components, features, and issues of a circular economy Discusses a variety of practical examples from current policies in the context of a circular economy to better understand the challenges

associated with its implementation Analyzes strengths and weaknesses of current environmental policies and their interactions with innovations in engineering and science

Advanced Technology for the Conversion of Waste into Fuels and Chemicals: Volume 1: Biological Processes presents advanced and combined techniques that can be used to convert waste to energy, including combustion, gasification, paralysis, anaerobic digestion and fermentation. The book focuses on solid waste conversion to fuel and energy and presents the latest advances in the design, manufacture, and application of conversion technologies. Contributors from the fields of physics, chemistry, metallurgy, engineering and manufacturing present a truly trans-disciplinary picture of the field. Chapters cover important aspects surrounding the conversion of solid waste into fuel and chemicals, describing how valuable energy can be recouped from various waste materials. As huge volumes of solid waste are produced globally while huge amounts of energy are produced from fossil fuels, the technologies described in this comprehensive book provide the information necessary to pursue clean, sustainable power from waste material. Presents the latest advances in waste to energy techniques for converting solid waste to valuable fuel and energy Brings together contributors from physics, chemistry, metallurgy,

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engineering and the manufacturing industry Includes advanced techniques such as combustion, gasification, paralysis, anaerobic digestion and fermentation Goes far beyond municipal waste, including discussions on recouping valuable energy from a variety of industrial waste materials Describes how waste to energy technologies present an enormous opportunity for clean, sustainable energy Processing Technology for Bio-Based Polymers: Advanced Strategies and Practical Aspects brings together the latest advances and novel technologies surrounding the synthesis and manufacture of biopolymers, ranging from bio-based polymers to synthetic polymers from bio-derived monomers. Sections examine bio-based polymer chemistry, discuss polymerization process and emerging design technologies, cover manufacturing and processing approaches, explain cutting-edge approaches and innovative applications, and focus on biomedical and other key application areas. Final chapters provide detailed discussion and an analysis of economic and environmental concerns, practical considerations, challenges, opportunities and future trends. This is a valuable resource for researchers, scientists and advanced students in polymer science, bio-based materials, nanomaterials, plastics engineering, biomaterials, chemistry, biotechnology, and materials science and engineering, as well as R&D professionals, engineers and industrialists

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interested in the development of biopolymers for advanced products and applications. Focuses on the processing of bio-based polymers, covering both traditional methods and innovative new approaches Offers novel opportunities and ideas for developing or improving technologies for biopolymer research, preparation and application Examines other key considerations, including reliability and end product, economic concerns, and environmental and lifecycle aspects

The 31st European Symposium on Computer Aided Process Engineering: ESCAPE-31, Volume 50 contains the papers presented at the 31st European Symposium of Computer Aided Process Engineering (ESCAPE) event held in Istanbul, Turkey. It is a valuable resource for chemical engineers, chemical process engineers, researchers in industry and academia, students and consultants in the chemical industries. Presents findings and discussions from the 31st European Symposium of Computer Aided Process Engineering (ESCAPE) event

Includes decisions of the District of Columbia Court of Appeals, 1902-1934, the United States Court of Appeals for the District of Columbia Circuit, 1934-1959, and various other courts of the District of Columbia.

Mega-guide to 1,573 colleges and universities. 2018 edition of The Complete Book of Colleges includes indexes listing schools according to cost, location, size, and selectivity.

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Hazardous Waste Management: An Overview of Advanced and Cost-Effective Solutions includes the latest practical knowledge and theoretical concepts for the treatment of hazardous wastes. The book covers five major themes, namely, ecological impact, waste management hierarchy, hazardous waste characteristics and regulations, hazardous wastes management, and future scope of hazardous waste management. It serves as a comprehensive and advanced reference for undergraduate students, researchers and practitioners in the field of hazardous wastes and focuses on the latest emerging research in the management of hazardous waste, the direction in which this branch is developing as well as future prospects. The book deals with all these components in-depth, however, particular attention is given to management techniques and cost-effective, economically feasible solutions for hazardous wastes released from various sources. Comprehensively explores the impact of hazardous wastes on human health and ecosystems Discusses toxicity across solid waste, aquatic food chain and airborne diseases Categorically elaborates waste treatment and management procedures with current challenges Discusses future challenges and the importance of renewing technologies

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