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Process Plant Equipment
Elsevier
The Leading Integrated Chemical Process Design

Guide: Now with New Problems, New Projects, and More More than ever, effective design is the focal point of sound chemical engineering. Analysis, Synthesis, and Design of Chemical Processes, Third Edition, presents design as a creative process that integrates both the big picture and the small details – and knows which to stress when, and why. Realistic from start to finish, this book moves readers beyond classroom exercises into open-ended, real-world process problem solving. The authors introduce integrated techniques for every facet of the discipline, from finance to operations, new plant design to existing process optimization. This fully updated Third Edition presents entirely new problems at the end of every chapter. It also adds extensive coverage of batch process design, including realistic examples of equipment sizing for batch sequencing; batch scheduling for multi-product plants; improving production via intermediate storage and parallel equipment; and new optimization techniques specifically for batch processes. Coverage includes Conceptualizing and analyzing chemical processes: flow diagrams, tracing, process conditions, and more Chemical process economics: analyzing capital and manufacturing costs, and predicting or assessing profitability

Synthesizing and optimizing chemical processing: experience-based principles, BFD/PFD, simulations, and more Analyzing process performance via I/O models, performance curves, and other tools Process troubleshooting and “debottlenecking” Chemical engineering design and society: ethics, professionalism, health, safety, and new “green engineering” techniques Participating successfully in chemical engineering design teams Analysis, Synthesis, and Design of Chemical Processes, Third Edition, draws on nearly 35 years of innovative chemical engineering instruction at West Virginia University. It includes suggested curricula for both single-semester and year-long design courses; case studies and design projects with practical applications; and appendixes with current equipment cost data and preliminary design information for eleven chemical processes – including seven brand new to this edition.

Digital Transformation for the Process Industries Elsevier

Accompanying CD-ROM contains the newest version of CAPCOST, HENSAD software and an additional appendix presenting preliminary design information for fifteen key chemical processes. The CD also includes six additional projects, plus chapters on outcomes assessment, written and oral communications, and a written report case study.

Process Systems Engineering Springer Science & Business

Media

Analysis, Synthesis and Design of Chemical ProcessesPearson Education

Practical Process Research and Development CRC Press

In a highly authoritative and systematic manner, this book offers an in-depth treatment of the essence of the case–based reasoning strategy and case-based design dwelling upon the algorithmic facet of the paradigm. It provides an excellent applied research framework by showing how this development can be effectively utilized in the real word complicated environment of process engineering, a pursuit that is rarely reported in the literature in such a comprehensive manner.

Improvements in Bio-Based Building Blocks Production Through Process Intensification and Sustainability Concepts Elsevier

Applications in Design and Simulation of Sustainable Chemical Processes addresses the challenging applications in designing eco-friendly but efficient chemical processes, including recent advances in chemistry and catalysis that rely on renewable raw materials. Grounded in the fundamental knowledge of chemistry, thermodynamics, chemical reaction engineering and unit operations, this book is an indispensable resource for developing and designing innovating chemical processes by employing computer simulations as an efficient conceptual tool. Targeted to graduate and post graduate students in chemical engineering, as well as to professionals, the book aims to advance their skills in process innovation and conceptual design. The work completes the book Integrated Design and Simulation of Chemical Processes by Elsevier (2014) authored by the same team. Includes comprehensive case studies of innovative processes

based on renewable raw materials Outlines Process Systems Engineering approach with emphasis on systematic design methods Employs steady-state and dynamic process simulation as problem analysis and flowsheet creation tool Applies modern concepts, as process integration and intensification, for enhancing the sustainability

Designing Renewable Energy Systems Elsevier

Algae have a long history of use as foods and for the production of food ingredients. There is also increasing interest in their exploitation as sources of bioactive compounds for use in functional foods and nutraceuticals. Functional ingredients from algae for foods and nutraceuticals reviews key topics in these areas, encompassing both macroalgae (seaweeds) and microalgae. After a chapter introducing the concept of algae as a source of biologically active ingredients for the formulation of functional foods and nutraceuticals, part one explores the structure and occurrence of the major algal components. Chapters discuss the chemical structures of algal polysaccharides, algal lipids, fatty acids and sterols, algal proteins, phlorotannins, and pigments and minor compounds. Part two highlights biological properties of algae and algal components and includes chapters on the antioxidant properties of algal components, anticancer agents derived from marine algae, anti-obesity and anti-diabetic activities of algae, and algae and cardiovascular health. Chapters in part three focus on the extraction of compounds and fractions from algae and cover conventional and alternative technologies for the production of algal polysaccharides. Further chapters discuss enzymatic

extraction, subcritical water extraction and supercritical CO2 extraction of bioactives from algae, and ultrasonic- and microwave-assisted extraction and modification of algal components. Finally, chapters in part four explore applications of algae and algal components in foods, functional foods and nutraceuticals including the design of healthier foods and beverages containing whole algae, prebiotic properties of algae and algae-supplemented products, algal hydrocolloids for the production and delivery of probiotic bacteria, and cosmeceuticals from algae. Functional ingredients from algae for foods and nutraceuticals is a comprehensive resource for chemists, chemical engineers and medical researchers with an interest in algae and those in the algaculture, food and nutraceutical industries interested in the commercialisation of products made from algae. Provides an overview of the major compounds in algae, considering both macroalgae (seaweeds) and microalgae Discusses methods for the extraction of bioactives from algae Describes the use of algae and products derived from them in the food and nutraceutical industries

Sustainable Design Through Process Integration

Academic Press

Energy Systems Engineering is one of the most exciting and fastest growing fields in engineering. Modeling and simulation plays a key role in Energy Systems Engineering because it is the primary basis on which energy system design, control, optimization, and analysis are based. This book contains a specially

curated collection of recent research articles on the modeling and simulation of energy systems written by top experts around the world from universities and research labs, such as Massachusetts Institute of Technology, Yale University, Norwegian University of Science and Technology, National Energy Technology Laboratory of the US Department of Energy, University of Technology Sydney, McMaster University, Queens University, Purdue University, the University of Connecticut, Technical University of Denmark, the University of Toronto, Technische Universit ä t Berlin, Texas A&M, the University of Pennsylvania, and many more. The key research themes covered include energy systems design, control systems, flexible operations, operational strategies, and systems analysis. The addressed areas of application include electric power generation, refrigeration cycles, natural gas liquefaction, shale gas treatment, concentrated solar power, waste-to-energy systems, micro-gas turbines, carbon dioxide capture systems, energy storage, petroleum refinery unit operations, Brayton cycles, to name but a few.

Functional Ingredients from Algae for Foods and Nutraceuticals Elsevier

The five volume set LNCS 10960 until 10964 constitutes the refereed proceedings of the 18th International Conference on Computational Science and Its Applications, ICCSA 2018, held in Melbourne, Australia, in July

2018. Apart from the general tracks, ICCSA 2018 also includes 34 international workshops in various areas of computational sciences, ranging from computational science technologies, to specific areas of computational sciences, such as computer graphics and virtual reality. The total of 265 full papers and 10 short papers presented in the 5-volume proceedings set of ICCSA 2018, were carefully reviewed and selected from 892 submissions.

Multi-Objective Optimization in Chemical Engineering Springer Nature

3rd Generation Biofuels: Disruptive Technologies to Enable Commercial Production is a comprehensive volume on all aspects of algal biofuels, offering the latest advances on commercial implementation. In addition to the fundamentals, the book discusses all applied aspects of 3rd generation biofuels production, including design approaches, unit operations of the upstream and downstream biomass processing, and every potential microalgae-based energy product, including microbial fuel cells. Policy, economic, environmental, and regulatory issues are addressed in a dedicated section. Finally, the book presents pilot and demonstration-scale projects for 3rd generation biofuels production in the format of a white paper. Each chapter reviews the state of the art, discusses the disruptive technological approaches that will potentially enable large-scale production, and concludes with specific recommendations on how to achieve commercial competitiveness. The book provides readers with an invaluable reference for researchers, graduates, and practitioners working in the areas of renewable energy, bioenergy and alternative fuels, and biotechnology. Offers a sequential framework for the design of process plants using 3rd generation feedstock Presents dedicated sections on case studies at pilot and demonstration scales as well as on policy, economic, and environmental issues Provides

a global perspective on biofuels production, with more than 40 contributions from world-renounced experts

26th European Symposium on Computer Aided Process Engineering Walter de Gruyter GmbH & Co KG

Current development results in a linear flow from raw material to waste, which cannot be sustainable in the long term. Plus, a global population of 7 billion people means that there are 7 billion waste producers in the world. At present, dumping and landfilling are the primary practices for getting rid of municipal solid waste (MSW). However, this waste contains resources that we ' ve yet to utilize. To create sustainable societies, we need to approach zero waste by recovering these resources. There are cities and countries where zero waste is close to becoming a reality. Landfilling of organic waste is forbidden in Europe, and countries such as Sweden, Germany, Belgium, and Switzerland have developed a variety of technologies to recover resources from MSW. Resource Recovery to Approach Zero Municipal Waste explores the solid waste management laws and regulations of different countries, comparing the latest resource recovery technologies and offering future perspectives. The book tackles the many technical, social, ecological, economical, and managerial aspects of this complex subject while promoting the development of sustainable societies to achieve a greener global environment.

Chemical Engineering Design Springer Nature
There are many comprehensive design books, but none of them provide a significant number of detailed economic design examples of typically complex industrial processes. Most of the current design books cover a wide variety of topics associated with process design. In addition to discussing flowsheet development and equipment design, these textbooks go into a lot of detail on engineering economics and other many peripheral subjects such as written and oral skills, ethics, "green" engineering and product design. This book presents general process design principles in a concise readable form that can be easily comprehended by students and engineers when developing effective flow sheet and control structures. Ten detailed case studies presented illustrate an in-depth and quantitative way the application of these general principles. Detailed economic steady-state designs are developed that satisfy economic criterion such as minimize total annual cost of both capital and energy or return on incremental capital investment. Complete detailed flow sheets and Aspen Plus files are provided. Then conventional PI control structures are be developed and tested for their ability to maintain product quality during disturbances. Complete Aspen Dynamics files are be provided of the dynamic simulations.

Air Pollution Control Technology Handbook Elsevier
" Process Plant Equipment Book is another greatpublication from Wiley as a reference book for final year studentsas well as those who will work or are working in chemicalproduction plants and refinery… " -Associate Prof.Dr. Ramli Mat, Deputy Dean

(Academic), Faculty of ChemicalEngineering, Universiti Teknologi Malaysia " ⋯give[s] readers access to both fundamentalinformation on process plant equipment and to practical ideas, bestpractices and experiences of highly successful engineers fromaround the world⋯ The book is illustrated throughout withnumerous black & white photos and diagrams and also containscase studies demonstrating how actual process plants haveimplemented the tools and techniques discussed in the book. Anextensive list of references enables readers to explore eachindividual topic in greater depth⋯ " – Stainless Steel World and Valve World, November 2012 Discover how to optimize process plant equipment, fromselection to operation to troubleshooting From energy to pharmaceuticals to food, the world depends onprocessing plants to manufacture the products that enable people tosurvive and flourish. With this book as their guide, readers havethe information and practical guidelines needed to select, operate,maintain, control, and troubleshoot process plant equipment so thatit is efficient, cost-effective, and reliable throughout itslifetime. Following the authors' careful explanations andinstructions, readers will find that they are better able to reducedowntime and unscheduled shutdowns, streamline operations, andmaximize the service life of processing equipment. Process Plant Equipment: Operation, Control, andReliability is divided into three sections: Section One: Process Equipment Operations covers suchkey equipment as valves, pumps, cooling towers, conveyors, andstorage tanks Section Two: Process Plant Reliability sets forth avariety of tested and proven tools and methods to assess and ensurethe reliability and mechanical integrity of process equipment,including failure analysis, Fitness-for-Service assessment,engineering economics for chemical processes, and process componentfunction and

performance criteria Section Three: Process Measurement, Control, andModeling examines flow meters, process control, and processmodeling and simulation Throughout the book, numerous photos and diagrams illustrate theoperation and control of key process equipment. There are also casestudies demonstrating how actual process plants have implementedthe tools and techniques discussed in the book. At the end of eachchapter, an extensive list of references enables readers to exploreeach individual topic in greater depth. In summary, this text offers students, process engineers, andplant managers the expertise and technical support needed tostreamline and optimize the operation of process plant equipment,from its initial selection to operations to troubleshooting.

Computational Science and Its Applications – ICCSA 2018

Springer Science & Business Media

This book adds a new dimension to the sustainability assessment of food waste reduction and valorisation: policy analysis. Featuring a transdisciplinary analysis by key experts in the field, it identifies the drivers of change in food-waste reduction and valorisation technologies by looking, for example, at the regulatory framework and at policy actions undertaken by local and global actors. The book explores the development of regulations and policies for food-waste prevention, management, and valorisation at a global as well as European Union level. It also discusses the notion of food waste in legal terms and investigates the effects of the lack of a standard, universal definition of food waste on the efficient use of by-products, promising processes and products for technological and commercial exploitation. Utilising mathematical mapping methods to assess food consumption impacts and providing supply chain models that allow the testing of consumption scenarios, the book goes on to discuss a series of emerging technologies (tested at lab scale and/ or pilot scale) and

opportunities for the valorisation of food waste.

Food Waste Reduction and Valorisation Woodhead Publishing

The book discusses a multi-objective optimization approach in LCA that allows the flexible construction of comprehensive Pareto fronts to help understand the weightings and relative importance of its elements. The methodology is applied to the pertinent topics of thermochemical wood conversion, deep geothermal energy, and regional energy planning.

Renewable Energy and Sustainable Buildings John Wiley & Sons

A text to the advances and development of novel technologies in the production of high-value products from economically viable raw materials Lignocellulosic Biorefining Technologiesis an essential guide to the most recent advances and developments of novel technologies in the production of various high-value products from economically viable raw materials. Written by a team of experts on the topic, the book covers important topics specifically on production of economical and sustainable products such as various biofuels, organic acids, enzymes, biopigments, biosurfactants, etc. The book highlights the important aspects of lignocellulosic biorefining including structure, function, and chemical composition of the plant cell wall and reviews the details about the various components present in the lignocellulosic biomass and their characterizations. The authors explore the various

approaches available for processing lignocellulosic biomass into second generation sugars and focus on the possibilities of utilization of lignocellulosic feedstocks for the production of biofuels and biochemicals. Each chapter includes a range of clear, informative tables and figures, and contains relevant references of published articles. This important text: Provides cutting-edge information on the recent developments in lignocellulose biorefinery Reviews production of various economically important and sustainable products, such as biofuels, organic acids, biopigments, and biosurfactants Highlights several broad-ranging areas of recent advances in the utilization of a variety of lignocellulosic feedstocks Provides a valuable, authoritative reference for anyone interested in the topic Written for post-graduate students and researchers in disciplines such as biotechnology, bioengineering, forestry, agriculture, and chemical industry, Lignocellulosic Biorefining Technologies is an authoritative and updated guide to the knowledge about various biorefining technologies.

Analysis, Synthesis, and Design of Chemical Processes John Wiley & Sons

This volume (II) contains all publications accepted for the symposiums and workshops held in parallel with the 10th International Work-Conference on Artificial Neural Networks (IWANN 2009), covering a wide spectrum of technological areas such as distributed computing,

artificial intelligence, bioinformatics, soft computing and ambient-assisted living: · DCAI 2009 (International Symposium on Distributed Computing and Artificial Intelligence), covering artificial intelligence and its applications in distributed environments, such as the Internet, electronic commerce, mobile communi- tions, wireless devices, distributed computing, and so on. This event accepted a total of 96 submissions selected from a submission pool of 157 papers, from 12 different countries. · IWAAL 2009 (International Workshop of Ambient-Assisted Living), covering solutions aimed at increasing the quality of life, safety and health problems of elderly and disabled people by means of technology. This event accepted a - tal of 42 submissions selected from a submission pool of 78 papers, from 9 d- ferent countries. · IWPACBB 2009 (Third International Workshop on Practical Applications of Computational Biology and Bioinformatics), covering computational biology and bioinformatics as a possibility for knowledge discovery, modelling and - timization tasks, aiming at the development of computational models so that the response of biological complex systems to any perturbation can be p- dicted. This event accepted a total of 39 submissions selected from a subm- sion pool of 75 papers, from 6 different countries.

Analysis, Synthesis and Design of Chemical Processes Springer

This book contains selected papers presented during the World Renewable Energy Network ' s 28thanniversary congress at the University of Kingston in London. The forum highlighted the

integration of renewables and sustainable buildings as the best means to combat climate change. In-depth chapters written by the world's leading experts highlight the most current research and technological breakthroughs and discuss policy, renewable energy technologies and applications in all sectors – for heating and cooling, agricultural applications, water, desalination, industrial applications and for the transport sectors. Presents cutting-edge research in green building and renewable energy from all over the world; Covers the most up-to-date research developments, government policies, business models, best practices and innovations; Contains case studies and examples to enhance practical application of the technologies.

Distributed Computing, Artificial Intelligence, Bioinformatics, Soft Computing, and Ambient Assisted Living John Wiley & Sons

27th European Symposium on Computer Aided Process Engineering, Volume 40 contains the papers presented at the 27th European Society of Computer-Aided Process Engineering (ESCAPE) event held in Barcelona, October 1-5, 2017. It is a valuable resource for chemical engineers, chemical process engineers, researchers in industry and academia, students, and consultants for chemical industries. Presents findings and discussions from the 27th European Society of Computer-Aided Process Engineering (ESCAPE) event

Biofuels and Biorefining Butterworth-Heinemann

Imagine if your process manufacturing plants were running so well that your production, safety, environmental, and profitability

targets were being met so that your subject matter experts could focus on data-driven business improvements. Through proper use and analysis of your existing operations data, your company can become an industry leader and reward your stakeholders. Written in an engaging and easily understandable manner, this book demonstrates a step-by-step process of how an organization can effectively utilize technology and make the necessary culture changes to achieve operational excellence. You will see how several industry-leading companies have used an effective real-time data infrastructure for mission-critical business use cases. The book also addresses challenges involved, such as effectively integrating operational (OT) data with business (IT) systems to enable a more proactive, predictive management model for a fleet of process plants. Some of the things you will take away: Learn how a real-time data infrastructure enables transformation of raw sensor data into contextualized information for operational insights and business process improvement. Understand how reusing the same operational data for multiple use cases significantly impacts fleet management, profitability, and asset stewardship. See how a simple digital unit template representing production flows can be repeatedly used to identify critical inefficiencies in plant operations. Discover best practices of deploying real-time situational awareness alerts and predictive analytics. Realize how to transform your organization into a data-driven culture for continuous sustainable improvement. Find out how leading companies integrate operations data with business intelligence and predictive analytics tools in a corporate on-premises or cloud-enabled environment. Learn how industry-leading companies have imaginatively used a real-time data infrastructure to improve yields, reduce cycle times, and slash operating costs. This book is targeted for process industries production and operations

leadership, senior engineers, IT management, CIOs, and service providers to those industries. Academics will benefit from latest data analysis strategies. This book guides readers to use the best, results-proven approaches to ensure operational excellence.

Methanol Frontiers Media SA

Improvements in Bio-Based Building Blocks Production Through Process Intensification and Sustainability Concepts discusses new information on the production and cost of bio-based building blocks. From a technical point-of-view, almost all industrial materials made from fossil resources can be substituted using bio-based counterparts. However, the cost of bio-based production in many cases exceeds the cost of petrochemical production. In addition, new products must be proven to perform at least as good as their petrochemical equivalents, have a lower environmental impact, meet consumer demand for environmentally-friendly products, factor in population growth, and account for limited supplies of non-renewables. This book outlines the application of process intensification techniques which allow for the generation of clean, efficient and economical processes for bio-based chemical blocks production. Includes synthesis and process design strategies for intensified processes Describes multi-objective optimization applied to the production of bio-based building blocks Presents the controllability of processes where the production of bio-based building blocks is involved Provides examples using aspen and MATLAB Introduces several sustainable indexes to evaluate production processes Presents process intensification techniques to improve performance in productive processes