Chemical Product Design Toward A Perspective Through Case Studies

#chemical product design #product development case studies #chemical engineering perspective #industrial design principles #process innovation strategies

Explore the intricate world of chemical product design, offering a fresh perspective uniquely illuminated through practical case studies. This resource provides valuable insights into effective product development strategies, showcasing real-world applications and key principles essential for modern chemical engineering and innovation.

Chemical Product Design: Towards a Perspective through Case Studies

Chemical Product Design: Towards a Perspective through Case Studies provides a framework for chemical product design problems which are clearly defined together with different solution approaches. This book covers the latest methods and tools currently available in the field and discusses future challenges that the chemical industry is faced with. It focuses on important issues of chemical product design and provides a good overview on industrial chemical product design problems through case studies supplied by leading experts. The editors of Chemical Product Design teach chemical product design at graduate level courses and also serve as consultants for various chemical companies. They have also developed experimental techniques for chemical product design as well as computer-aided design methods and tools. Highlights important issues of chemical product design through case studies Case studies supplied by leading experts in chemical product design Provides a complete framework for chemical product design

Chemical Product Design and Formulation

Chemical Product Formulation Design and Optimization Explore the cutting-edge in chemical product formulation and design In Chemical Product Formulation Design and Optimization: Methods, Techniques, and Case Studies, a team of renowned technologists and engineers delivers a practice guide to chemical product design. Offering real-world case studies for disinfectant formulation, the optimization of defined media, and the formulation of biocomposites, the book contains introduction to the current product design process. In addition to the background of related statistical techniques, readers will find: Clear illustrations, figures, and tables that improve understanding and retention of critical topics Thorough introductions to the mathematical principles of chemical product design A complete examination of intellectual property considerations in the chemical product design process Ideal for process and chemical engineers, Chemical Product Formulation Design and Optimization: Methods,

Techniques, and Case Studies is a must-read resource for professionals in the pharmaceutical and cosmetics industry as well as chemical engineers working in the food, paint, and dye industries who seek a one-stop resource that includes the latest advances in chemical product formulation.

Chemical Product Technology

Chemical Product Technology focuses on materials chemistry and introduces industrial manufacturing technologies for different product types. The author presents a full cycle of product development for the materials that are used in everyday live, such as cosmetics, dyes, drugs, papers, textiles, agrochemicals, etc., starting from product selection and up to setup of manufacturing process.

Tools For Chemical Product Design

Tools for Chemical Product Design: From Consumer Products to Biomedicine describes the challenges involved in systematic product design across a variety of industries and provides a comprehensive overview of mathematical tools aimed at the design of chemical products, from molecular design to customer products. Chemical product design has become increasingly important over the past decade and includes a wide range of sectors including gasoline additives and blends in the petroleum industry, active ingredients and excipients in the pharmaceutical industry, and a variety of consumer products and specialty chemicals. Traditionally, such products have been designed through trial and error methods, which not only are time-consuming, but more importantly only provide limited knowledge that can be translated into next generation products. Features an impressive collection of contributions from leading researchers in the field Presents the latest tools available across a variety of industries Describes the challenges involved in systematic product design as well as the latest methods for solving such problems Covers a wide range of sectors including gasoline additives and blends in the petroleum industry, active ingredients and excipients in the pharmaceutical industry, and a variety of consumer products and specialty chemicals

Product and Process Design Principles

"The new 4th edition of Seider’s 'Product and Process Design Principles : Synthesis, Analysis and Design' covers content for process design courses in the chemical engineering curriculum, showing how process design and product design are inter-linked and why studying the two is important for modern applications. A principal objective of this new edition is to describe modern strategies for the design of chemical products and processes, with an emphasis on a systematic approach. This fourth edition presents two parallel tracks : (1) product design ("what to make"), and (2) process design ("how to make"), with an emphasis on process design. Process design instructors can show easily how product designs lead to new chemical processes. Alternatively, product design can be taught in a separate course subsequent to the process design course."--adapted from description on publisher web site.

Principles and Case Studies of Simultaneous Design

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.

Product-Driven Process Design

Product-driven process design – from molecule to enterprise provides process engineers and process engineering students with access to a modern and stimulating methodology to process and product design. Throughout the book the links between product design and process design become evident while the reader is guided step-by-step through the different stages of the intertwining product and process design activities. Both molecular and enterprise-wide considerations in design are introduced and addressed in detail. Several examples and case studies in emerging areas such as bio- and food-systems, pharmaceuticals and energy are discussed and presented. This book is an excellent guide and companion for undergraduate, graduate students as well as professional practitioners.

Product and Process Design

Product and Process Design: Driving Innovation is a comprehensive textbook for students and industrial professionals. It treats the combined design of innovative products and their innovative manufacturing processes, providing specific methods for BSc, MSc, PDEng and PhD courses. Students, industrial innovators and managers are guided through all design steps in all innovation stages (discovery, concept, feasibility, development, detailed engineering, and implementation) to successfully obtain novel products and their novel processes. The authors' decades of innovation experience in industry, as well as in teaching BSc, MSc, and post-academic product and process design courses, thereby including the latest design publications, culminate in this book.

Chemical Engineering in the Pharmaceutical Industry

A guide to the development and manufacturing of pharmaceutical products written for professionals in the industry, revised second edition The revised and updated second edition of Chemical Engineering in the Pharmaceutical Industry is a practical book that highlights chemistry and chemical engineering. The book's regulatory quality strategies target the development and manufacturing of pharmaceutically active ingredients of pharmaceutical products. The expanded second edition contains revised content with many new case studies and additional example calculations that are of interest to chemical engineers. The 2nd Edition is divided into two separate books: 1) Active Pharmaceutical Ingredients (API's) and 2) Drug Product Design, Development and Modeling. The active pharmaceutical ingredients book puts the focus on the chemistry, chemical engineering, and unit operations specific to development and manufacturing of the active ingredients of the pharmaceutical product. The drug substance operations section includes information on chemical reactions, mixing, distillations, extractions, crystallizations, filtration, drying, and wet and dry milling. In addition, the book includes many applications of process modeling and modern software tools that are geared toward batch-scale and continuous drug substance pharmaceutical operations. This updated second edition: Contains 30new chapters or revised chapters specific to API, covering topics including: manufacturing quality by design, computational approaches, continuous manufacturing, crystallization and final form, process safety Expanded topics of scale-up, continuous processing, applications of thermodynamics and thermodynamic modeling, filtration and drying Presents updated and expanded example calculations Includes contributions from noted experts in the field Written for pharmaceutical engineers, chemical engineers, undergraduate and graduate students, and professionals in the field of pharmaceutical sciences and manufacturing, the second edition of Chemical Engineering in the Pharmaceutical Industryf ocuses on the development and chemical engineering as well as operations specific to the design, formulation, and manufacture of drug substance and products.

Chemical Product Design

The chemical industry is changing, going beyond commodity chemicals to a palette of higher value added products. This groundbreaking book, now revised and expanded, documents this change and shows how to meet the challenges implied. Presenting a four-step design process - needs, ideas, selection, manufacture - the authors supply readers with a simple design template that can be applied to a wide variety of products. Four new chapters on commodities, devices, molecules/drugs and microstructures show how this template can be applied to products including oxygen for emphysema patients, pharmaceuticals like taxol, dietary supplements like lutein, and beverages which are more satisfying. For different groups of products the authors supply both strategies for design and summaries of relevant science. Economic analysis is expanded, emphasizing the importance of speed-to-market, selling ideas to investors and an expectation of limited time in the market. Extra examples, homework problems and a solutions manual are available.

Formulation Product Technology

Formulation Product Technology focuses on materials chemistry and introduces industrial manufacturing technologies for different product types. Besides addressing the fundamentals and the corresponding unit operations, the author presents a full cycle of product development for the materials that are used in everyday live. Various performance and personal chemicals, such as paints, coatings, dyes, laundry detergents, glass and concrete, pesticides, diapers, skin care and hair care products, etc. are discussed starting from product selection and up to setup of manufacturing process. Additional new products discussed: dyes for textiles, decorative products, hand sanitizers, deodorants, pesticides. Easy-to-understand introduction to formulation product design. Covers all main product types of modern chemical industry.

Conceptual Design of Crystallization Processes

The book presents, in a unified manner, various crystallization design methods. It discusses in detail the geometric framework for representing complex phase behavior involving multiple solutes, enantiomers, hydrates, compounds, polymorphs, and solid solutions through visualization of high-dimensional phase diagrams. It also describes how the impact of transport processes is accounted for using kinetically controlled process paths.

Process Industries 1

Of crucial economic and societal importance, process industries transform matter by chemical, physical or biological means. They cover broad fields such as chemistry, oil, pharmacy, metallurgy and agri-food, to name a few. As a result of knowledge exchange between the academic and industrial worlds, Process Industries 1 decrypts the operations and technical management of these industries in order to formulate and manufacture products with use-value, in a sustainable way. Using concrete examples, this book presents the fundamentals for defining the reaction and purification conditions that form the basis of chemical engineering. The unit operations – the technological building blocks of the production units – are the subject of scientific and technical descriptions supplemented by numerous videos. Frameworks, written by well-known specialists, provide a deep understanding of topics related to these themes. Process Industries 1 is intended for students, teachers, professionals and decision-makers interested in learning more about these industries.

Design & Development of Biological, Chemical, Food and Pharmaceutical Products

Design and Development of Biological, Chemical, Food and Pharmaceutical Products has been developed from course material from the authors' course in Chemical and Biochemical Product Design which has been running at the Technical University Denmark for years. The book draws on the authors' years of experience in academia and industry to provide an accessible introduction to this field, approaching product development as a subject in its own right rather than a sideline of process engineering In this subject area, practical experience is the key to learning and this textbook provides examples and techniques to help the student get the best out of their projects. Design and Development of Biological, Chemical, Food and Pharma Products aims to aid students in developing good working habits for product development. Students are challenged with examples of real problems that they might encounter as engineers. Written in an informal, student-friendly tone, this unique book includes examples of real products and experiences from real companies to bring the subject alive for the student as well as placing emphasis on problem solving and team learning to set a foundation for a future in industry. The book includes an introduction to the subject of Colloid Science, which is important in product development, but neglected in many curricula. Knowledge of engineering calculus and basic physical chemistry as well as basic inorganic and organic chemistry are assumed. An invaluable text for students of product design in chemical engineering, biochemistry, biotechnology, pharmaceutical sciences and product development. Uses many examples and case studies drawn from a range of industries. Approaches product development as a subject in its own right rather than a sideline of process engineering Emphasizes a problem solving and team learning approach. Assumes some knowledge of calculus, basic physical chemistry and basic transport phenomena as well as some inorganic and organic chemistry.

Particulate Products

Particulate products make up around 80% of chemical products, from all industry sectors. Examples given in this book include the construction materials, fine ceramics and concrete; the delicacies, chocolate and ice cream; pharmaceutical, powders, medical inhalers and sun screen; liquid and powder paints. Size distribution and the shape of the particles provide for different functionalities in these products. Some functions are general, others specific. General functions are powder flow and require – at the typical particulate concentrations of these products – that the particles cause adequate rheological behavior during processing and/or for product performance. Therefore, this book addresses particle packing as well as its relation to powder flow and rheological behavior. Moreover, general relationships to particle size are discussed for e.g. color and sensorial aspects of particulate products. Product-specific functionalities are often relevant for comparable product groups. Particle size distribution and shape provide, for example, the following functionalities: - dense particle packing in relation to sufficient strength is required in concrete construction, ceramic objects and pharmaceutical tablets - good sensorial properties (mouthfeel) to chocolate and ice cream - effective dissolution, flow and compression properties for pharmaceutical powders - adequate hiding power and effective coloring of paints for protection and the desired esthetical appeal of the objects - adequate protection of our body against sun light by sunscreen - effective particle transport and deposition to desired locations for medical inhalers and powder paints. Adequate particle size distribution, shape and porosity of particulate products have to be achieved in order to reach optimum product performance. This requires adequate management of design and development as well as sufficient knowledge of the underlying principles of physics and chemistry. Moreover, flammability, explosivity and other health hazards from powders, during handling, are taken into account. This is necessary, since great risks may be involved. In all aspects, the most relevant parameters of the size distribution (and particle shape) have to be selected. In this book, experts in the different product fields have contributed to the product chapters. This provides optimum information on what particulate aspects are most relevant for behavior and performance within specified industrial products and how optimum results can be obtained. It differs from other books in the way that the critical aspects of different products are reported, so that similarities and differences can be identified. We trust that this approach will lead to improved optimization in design, development and quality of many particulate products.

18th European Symposium on Computer Aided Process Engineering

The 18th European Symposium on Computer Aided Process Engineering contains papers presented at the 18th European Symposium of Computer Aided Process Engineering (ESCAPE 18) held in Lyon, France, from 1-4 June 2008. The ESCAPE series brings the latest innovations and achievements by leading professionals from the industrial and academic communities. The series serves as a forum for engineers, scientists, researchers, managers and students from academia and industry to: - present new computer aided methods, algorithms, techniques related to process and product engineering, - discuss innovative concepts, new challenges, needs and trends in the area of CAPE. This research area bridges fundamental sciences (physics, chemistry, thermodynamics, applied mathematics and computer sciences) with the various aspects of process and product engineering. The special theme for ESCAPE-18 is CAPE for the Users! CAPE systems are to be put in the hands of end users who need functionality and assistance beyond the scientific and technological capacities which are at the core of the systems. The four main topics are: - off-line systems for synthesis and design, - on-line systems for control and operation, - computational and numerical solutions strategies, - integrated and multi-scale modelling and simulation, Two general topics address the impact of CAPE tools and methods on Society and Education. * CD-ROM that accompanies the book contains all research papers and contributions * International in scope with guest speeches and keynote talks from leaders in science and industry * Presents papers covering the latest research, key top areas and developments in Computer Aided Process Engineering

19th European Symposium on Computer Aided Process Engineering

The 19th European Symposium on Computer Aided Process Engineering contains papers presented at the 19th European Symposium of Computer Aided Process Engineering (ESCAPE 19) held in Cracow, Poland, June 14-17, 2009. The ESCAPE series serves as a forum for scientists and engineers from academia and industry to discuss progress achieved in the area of CAPE. * CD-ROM that accompanies the book contains all research papers and contributions * International in scope with guest speeches and keynote talks from leaders in science and industry * Presents papers covering the latest research, key top areas and developments in computer aided process engineering (CAPE)

20th European Symposium of Computer Aided Process Engineering

ESCAPE-20 is the most recent in a series of conferences that serves as a forum for engineers, scientists, researchers, managers and students from academia and industry to present and discuss progress being made in the area of "Computer Aided Process Engineering" (CAPE). CAPE covers computer-aided methods, algorithms and techniques related to process and product engineering. The ESCAPE-20 scientific program reflects the strategic objectives of the CAPE Working Party: to check the status of historically consolidated topics by means of their industrial application and to evaluate their emerging issues. * Includes a CD that contains all research papers and contributions * Features a truly international scope, with guest speakers and keynote talks from leaders in science and industry * Presents papers covering the latest research, key topical areas, and developments in computer-aided process engineering (CAPE)

17th European Symposium on Computed Aided Process Engineering

The 17th European Symposium on Computed Aided Process Engineering contains papers presented at the 17th European Symposium of Computer Aided Process Engineering (ESCAPE 17) held in Bucharest, Romania, from 27-30 May 2007. The ESCAPE series serves as a forum for scientists and engineers from academia and industry to discuss progress achieved in the area of Computer Aided Process Engineering (CAPE). The main goal was to emphasize the continuity in research of innovative concepts and systematic design methods as well the diversity of applications emerged from the demands of sustainable development. ESCAPE 17 highlights the progresss software technology needed for implementing simulation based tools. The symposium is based on 5 themes and 27 topics, following the main trends in CAPE area: Modelling, Process and Products Design, Optimisation and Optimal Control and Operation, System Biology and Biological Processes, Process Integration and Sustainable Development. Participants from 50 countries attended and invited speakers presented 5 plenary lectures tackling broad subjects and 10 keynote lectures. Satellite events added a plus to the scientific dimension to this symposium. * All contributions are included on the CD-ROM attached to the book * Attendance from 50 countries with invited speakers presenting 5 plenary lectures tackling broad subjects and 10 keynote lectures

21st European Symposium on Computer Aided Process Engineering

The European Symposium on Computer Aided Process Engineering (ESCAPE) series presents the latest innovations and achievements of leading professionals from the industrial and academic communities. The ESCAPE series serves as a forum for engineers, scientists, researchers, managers and students to present and discuss progress being made in the area of computer aided process engineering (CAPE). European industries large and small are bringing innovations into our lives, whether in the form of new technologies to address environmental problems, new products to make our homes more comfortable and energy efficient or new therapies to improve the health and well being of European citizens. Moreover, the European Industry needs to undertake research and technological initiatives in response to humanity's "Grand Challenges," described in the declaration of Lund, namely, Global Warming, Tightening Supplies of Energy, Water and Food, Ageing Societies, Public Health, Pandemics and Security. Thus, the Technical Theme of ESCAPE 21 will be "Process Systems Approaches for Addressing Grand Challenges in Energy, Environment, Health, Bioprocessing & Nanotechnologies."

10th International Symposium on Process Systems Engineering - PSE2009

This book contains the proceedings of the 10e of a series of international symposia on process systems engineering (PSE) initiated in 1982. The special focus of PSE09 is how PSE methods can support sustainable resource systems and emerging technologies in the areas of green engineering. * Contains fully searchable CD of all printed contributions * Focus on sustainable green engineering * 9 Plenary papers, 21 Keynote lectures by leading experts in the field

22nd European Symposium on Computer Aided Process Engineering

Computer aided process engineering (CAPE) plays a key design and operations role in the process industries. This conference features presentations by CAPE specialists and addresses strategic planning, supply chain issues and the increasingly important area of sustainability audits. Experts collectively highlight the need for CAPE practitioners to embrace the three components of sustainable develop-

ment: environmental, social and economic progress and the role of systematic and sophisticated CAPE tools in delivering these goals. Contributions from the international community of researchers and engineers using computing-based methods in process engineering Review of the latest developments in process systems engineering Emphasis on a systems approach in tackling industrial and societal grand challenges

11th International Symposium on Process Systems Engineering - PSE2012

While the PSE community continues its focus on understanding, synthesizing, modeling, designing, simulating, analyzing, diagnosing, operating, controlling, managing, and optimizing a host of chemical and related industries using the systems approach, the boundaries of PSE research have expanded considerably over the years. While early PSE research was largely concerned with individual units and plants, the current research spans wide ranges of scales in size (molecules to processing units to plants to global multinational enterprises to global supply chain networks; biological cells to ecological webs) and time (instantaneous molecular interactions to months of plant operation to years of strategic planning). The changes and challenges brought about by increasing globalization and the the common global issues of energy, sustainability, and environment provide the motivation for the theme of PSE2012: Process Systems Engineering and Decision Support for the Flat World. Each theme includes an invited chapter based on the plenary presentation by an eminent academic or industrial researcher Reports on the state-of-the-art advances in the various fields of process systems engineering Addresses common global problems and the research being done to solve them

GeNeDis 2014

The 1st World Congress on Geriatrics and Neurodegenerative Disease Research (GeNeDis 2014), will focus on recent advances in geriatrics and neurodegeneration, ranging from basic science to clinical and pharmaceutical developments and will provide an international forum for the latest scientific discoveries, medical practices and care initiatives. Advances information technologies will be discussed along with their implications for various research, implementation and policy concerns. In addition, the conference will address European and global issues in the funding of long-term care and medico-social policies regarding elderly people. GeNeDis 2014 takes place in Corfu, Greece, 10-13 April 2014. This volume focuses on the sessions that address geriatrics.

10th International Symposium on Process Systems Engineering

The 10th International Symposium on Process Systems Engineering, PSE'09, will be held in Salvador-Bahia, Brazil on August 16-20, 2009. The special focus of PSE 2009 is Sustainability, Energy and Engineering. PSE 2009 is the tenth in the triennial series of international symposia on process systems engineering initiated in 1982. The meeting is brings together the worldwide PSE community of researchers and practitioners who are involved in the creation and application of computing-based methodologies for planning, design, operation, control and maintenance of chemical and petrochemical process industries. PSE'09 will look at how the PSE methods and tools can support sustainable resource systems and emerging technologies in the areas of green engineering: environmentally conscious design of industrial processes. PSE methods and tools support: - sustainable resource systems - emerging technologies in the areas of green engineering - environmentally conscious design of industrial processes

Chemical Process Design

This practical how-to-do book deals with the design of sustainable chemical processes by means of systematic methods aided by computer simulation. Ample case studies illustrate generic creative issues, as well as the efficient use of simulation techniques, with each one standing for an important issue taken from practice. The didactic approach guides readers from basic knowledge to mastering complex flow-sheets, starting with chemistry and thermodynamics, via process synthesis, efficient use of energy and waste minimization, right up to plant-wide control and process dynamics. The simulation results are compared with flow-sheets and performance indices of actual industrial licensed processes, while the complete input data for all the case studies is also provided, allowing readers to reproduce the results with their own simulators. For everyone interested in the design of innovative chemical processes.

Industrial Product Design of Solids and Liquids

Offering invaluable insights from a chemist with over 35 years experience in the industry, this practical guide incorporates numerous practical examples and case studies to explain the concepts included here. The author explains the processes involved in product design, how to set up experiments, and ultimately how to scale-up. Among the host of topics covered is a discussion of recent advances in the fundamentals and innovative technologies leading to new and improved products. Industrial Product Design of Solids and Liquids: A Practical Guide is essential reading for the pharmaceutical, cosmetics and personal care, food, fragrance, paints, plastics and agricultural industries.

Advances in Marine Antifouling Coatings and Technologies

Marine biofouling can be defined as the undesirable accumulation of microorganisms, algae and animals on structures submerged in seawater. From the dawn of navigation, marine biofouling has been a major problem for shipping in such areas as reduced speed, higher fuel consumption and increased corrosion. It also affects industries using off-shore structures such as oil and gas production and aquaculture. Growing concerns about the environmental impact of antifouling coatings has led to major new research to develop more environmentally-friendly alternatives. Advances in marine antifouling coatings and technologies summaries this wealth of research and its practical implications. This book is divided into four sub-sections which discuss: marine fouling organisms and their impact, testing and development of antifouling coatings, developments in chemically-active marine antifouling technologies, and new surface approaches to the control of marine biofouling. It provides an authoritative overview of the recent advances in understanding the biology of fouling organisms, the latest developments on antifouling screening techniques both in the field and in the laboratory, research on safer active compounds and the progress on nontoxic coatings with tailor-made surface properties. With its distinguished editors and international team of contributors, Advances in marine antifouling coatings and technologies is a standard reference for manufacturers of marine antifouling solutions, the shipping industry, oil and gas producers, aquaculture and other industries using offshore structures, and academics researching this important area. Assesses marine antifouling organisms and their impact, including a historical review and directions for future research Discusses developments in antifouling coatings examining chemically-active and new surface approaches Reviews the environmentally friendly alternative of safer active compounds and the progress of non-toxic compounds

12th International Symposium on Process Systems Engineering and 25th European Symposium on Computer Aided Process Engineering

25th European Symposium on Computer-Aided Process Engineering contains the papers presented at the 12th Process Systems Engineering (PSE) and 25th European Society of Computer Aided Process Engineering (ESCAPE) Joint Event held in Copenhagen, Denmark, 31 May - 4 June 2015. The purpose of these series is to bring together the international community of researchers and engineers who are interested in computing-based methods in process engineering. This conference highlights the contributions of the PSE/CAPE community towards the sustainability of modern society. Contributors from academia and industry establish the core products of PSE/CAPE, define the new and changing scope of our results, and future challenges. Plenary and keynote lectures discuss real-world challenges (globalization, energy, environment, and health) and contribute to discussions on the widening scope of PSE/CAPE versus the consolidation of the core topics of PSE/CAPE. Highlights how the Process Systems Engineering/Computer-Aided Process Engineering community contributes to the sustainability of modern society Presents findings and discussions from both the 12th Process Systems Engineering (PSE) and 25th European Society of Computer-Aided Process Engineering (ESCAPE) Events Establishes the core products of Process Systems Engineering/Computer Aided Process Engineering Defines the future challenges of the Process Systems Engineering/Computer Aided Process Engineering community

13th International Symposium on Process SystemsEngineering – PSE 2018, July 1-5 2018

Process Systems Engineering brings together the international community of researchers and engineers interested in computing-based methods in process engineering. This conference highlights the contributions of the PSE community towards the sustainability of modern society and is based on the 13th International Symposium on Process Systems Engineering PSE 2018 event held San Diego, CA, July 1-5 2018. The book contains contributions from academia and industry, establishing the core products of PSE, defining the new and changing scope of our results, and future challenges. Plenary and keynote lectures discuss real-world challenges (globalization, energy, environment and health)

and contribute to discussions on the widening scope of PSE versus the consolidation of the core topics of PSE. Highlights how the Process Systems Engineering community contributes to the sustainability of modern society Establishes the core products of Process Systems Engineering Defines the future challenges of Process Systems Engineering

Chemical Product Design

Until recently, the chemical industry has been dominated by the manufacture of bulk commodity chemicals such as benzene, ammonia, and polypropylene. However, over the last decade a significant shift occurred. Now most chemical companies devote any new resources to the design and manufacture of specialty, high value-added chemical products such as pharmaceuticals, cosmetics, and electronic coatings. Although the jobs held by chemical engineers have also changed to reflect this altered business, their training has remained static, emphasizing traditional commodities. This ground-breaking text starts to redress the balance between commodities and higher value-added products. It expands the scope of chemical engineering design to encompass both process design and product design. The authors use a four-step procedure for chemical product design - needs, ideas, selection, manufacture - drawing numerous examples from industry to illustrate the discussion. The book concludes with a brief review of the economic issues. Chemical engineering students and beginning chemical engineers will find this text an inviting introduction to chemical product design.

Proceedings of the 8th International Conference on Foundations of Computer-Aided Process Design

This volume collects together the presentations at the Eighth International Conference on Foundations of Computer-Aided Process Design, FOCAPD-2014, an event that brings together researchers, educators, and practitioners to identify new challenges and opportunities for process and product design. The chemical industry is currently entering a new phase of rapid evolution. The availability of low-cost feedstocks from natural gas is causing renewed investment in basic chemicals in the OECD, while societal pressures for sustainability and energy security continue to be key drivers in technology development and product selection. This dynamic environment creates opportunities to launch new products and processes and to demonstrate new methodologies for innovation, synthesis and design. FOCAPD-2014 fosters constructive interaction among thought leaders from academia, industry, and government and provides a showcase for the latest research in product and process design. Focuses exclusively on the fundamentals and applications of computer-aided design for the process industries. Provides a fully archival and indexed record of the FOCAPD14 conference Aligns the FOCAPD series with the ESCAPE and PSE series

Towards Sustainable Chemical Processes

Towards Sustainable Chemical Processes describes a comprehensive framework for sustainability assessment, design and the processes optimization of chemical engineering. Beginning with the analysis and assessment in the early stage of chemical products' initiating, this book focuses on the combination of science sustainability and process system engineering, involving mathematical models, industrial ecology, circular economy, energy planning, process integration and sustainability engineering. All chapters throughout answered two fundamental questions in depth: (1) what tools and models are available to be used to assess and design sustainable chemical processes, (2) what the core theories and concepts are to get into the sustainable chemical process fields. Therefore, Towards Sustainable Chemical Processes is an indispensable guide for chemical engineers, researchers, students, practitioners and consultants in sustainability related area. Provides innovative, novel and comprehensive methods and models for sustainability assessment, design and optimization, and synthesis and integration of chemical engineering processes Combines sustainability science with process system engineering Integrates mathematical models, industrial ecology, circular economy, energy planning, process integration and sustainability engineering Includes new case studies related to renewable energy, resource management, process synthesis and process integration

Green Chemistry and Engineering

The past, present, and future of green chemistry and greenengineering From college campuses to corporations, the past decade witnesseda rapidly growing interest in understanding sustainable chemistryand engineering. Green Chemistry and Engineering: A PracticalDesign Approach integrates the two disciplines into a singlestudy tool for students and a practical guide for working chemistsand engineers. In Green Chemistry and Engineering, theauthors—each highly experienced in implement-

ing greenchemistry and engineering programs in industrialsettings—provide the bottom-line thinking required to notonly bring sustainable chemistry and engineering closer together,but to also move business towards more sustainable practices andproducts. Detailing an integrated, systems-oriented approach thatbridges both chemical syntheses and manufacturing processes, thisinvaluable reference covers: Green chemistry and green engineering in the movement towardssustainability Designing greener, safer chemical synthesis Designing greener, safer chemical manufacturing processes Looking beyond current processes to a lifecycle thinkingperspective Trends in chemical processing that may lead to more sustainablepractices The authors also provide real-world examples and exercises topromote further thought and discussion. The EPA defines green chemistry as the design of chemical-products and processes that reduce or eliminate the use orgeneration of hazardous substances. Green engineering is describedas the design, commercialization, and use of products and processesthat are feasible and economical while minimizing both thegeneration of pollution at the source and the risk to human healthand the environment. While there is no shortage of books on eitherdiscipline, Green Chemistry and Engineering is the first totruly integrate the two.

Chemical Process Simplification

While emphasizing conservation and sustainable strategies, this book provides steps to improve the manufacturing technologies used in creating products. By simplifying the chemistry, process development, manufacturing practices and processes, the book provides a structured approach to producing quality products with little waste, making the process not only efficient but environmentally friendly. Illustrated with case studies, this is an essential resource for chemical engineers, chemists, plant engineers, and operating personnel in any chemical related businesses.

The British National Bibliography

The current chemical engineering curriculum concentrates on process: the efficient manufacturing in quantity of traditional chemical products such as ammonia and benzene. However, many chemical companies now invent and manufacture specialty products with particular properties such as pharmaceuticals, cosmetics, and electronic coatings, and their employees need to know how to design the products as well as manufacture them. James Wei, a famous chemical engineer, is writing this book to provide theories and case studies in product engineering the design of new, useful products with desired properties. The first section relates historical case studies of successful product invention and development by individuals and companies. The second part of the book describes the toolbox of molecular structure-property relations. A desired product needs to have certain properties (for example, phase transition or thermal properties) and the chemist must find or design a molecular structure with the required properties This section will instruct chemists in the analysis of structure and property information. The third section is concerned with the next stage: product research and design. It will discuss improving the desired product by additives and blending, among other strategies. It will also cover future challenges in product engineering.

Product Engineering

Green Chemistry in Practice: Greener Material and Chemical Innovation Through Collaboration collects a unique set of case studies based on researchers' experiences in developing practical, green chemistry-driven solutions to industry problems as part of the Greener Solutions Program at the Berkeley Center for Green Chemistry. Beginning with an introduction to green chemistry, the book goes on to provide an overview of the interdisciplinary approach taken by the Center, which aims to bring about a generational transformation toward the design and use of inherently safer chemicals and materials through research, teaching and outreach. This is followed by four detailed case studies revealing each step of the process involved in assessing and designing greener solutions to real-world problems in the fields of preservatives, textiles, additive manufacturing, and green energy. Drawing together the hands-on, practical experience of an interdisciplinary team from across academia and industry, Practice in Green Chemistry provides a unique insight into the practicalities of applying green chemistry principles in support of a global push toward a more sustainable world. Green Chemistry in Practice: Greener Material and Chemical Innovation Through Collaboration is also a valuable resource for both academia and industry students and researchers. Reviews the foundational principles of green chemistry in the context of real-world scenarios Highlights successes, pitfalls, and practical steps to take when working with a multifaceted, interdisciplinary group Supports those involved in designing and implementing green solutions across a whole range of fields

Green Chemistry in Practice

30th European Symposium on Computer Aided Chemical Engineering, Volume 47 contains the papers presented at the 30th European Symposium of Computer Aided Process Engineering (ESCAPE) event held in Milan, Italy, May 24-27, 2020. 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 30th European Symposium of Computer Aided Process Engineering (ESCAPE) event Offers a valuable resource for chemical engineers, chemical process engineers, researchers in industry and academia, students, and consultants for chemical industries

30th European Symposium on Computer Aided Chemical Engineering

D’une importance économique et sociétale capitale, les industries de procédés transforment la matière par voie chimique, physique ou biologique. Elles couvrent de vastes domaines tels que la chimie, le pétrole, la pharmacie, la métallurgie ou encore l’agroalimentaire. Résultat de la mise en commun de connaissances des mondes académique et industriel, Les industries de procédés 1 décrypte le fonctionnement et le management technique de ces industries, pour formuler et fabriquer d’une manière durable des produits à valeur d’usage. À l’aide d’exemples concrets, il présente les fondamentaux qui permettent de définir les conditions de réaction et de purification à la base du génie des procédés. Les opérations unitaires, briques technologiques des ateliers de production, font l’objet de descriptifs scientifiques et techniques complétés par de nombreuses vidéos. Des encadrés, rédigés par des spécialistes reconnus, offrent une compréhension profonde de sujets en lien avec ces thématiques. L’ouvrage s’adresse aux étudiants, aux enseignants, aux professionnels et aux décideurs désireux d’approfondir leur connaissance de ces industries.

Les industries de procédés 1