

Optimisation Of Existing Heat Integrated Refinery

Emerging Research in Sustainable Energy and Buildings for a Low-Carbon Future Robert J. Howlett, John R. Littlewood, Lakhmi C.

Jain.2021-02-06 This book contains an introduction and 20 studies, each describing a recent research investigation in the area of sustainable and resilient buildings, built environment infrastructure and renewable energy. Contributions are from many different countries of the world and on a range of topics, representing a sample of research within the 'sustainable energy and buildings' field. The book begins with chapters on the sustainable design of buildings, followed by descriptions of issues relating to the renovation, restoration and reconstruction of existing buildings, or in one case a railway wagon. The next part of the book covers factors that form barriers or impediments to low or zero carbon buildings, followed by studies of issues relating to policy and certification. There then follow four chapters on various topics related to sustainable buildings - undergraduate courses, insurance issues, biophilia relating to buildings and thermal conductivity measurement. There are several chapters relating to renewable energy, followed by two chapters with a sustainable transport theme, one relating to electric vehicles, and the other about a sustainable road infrastructure. The final chapter is on the manufacture of sustainable building components for the UK housing sector. The book is of use to engineers, scientists, researchers, practitioners, academics and all those who are interested to develop and use sustainability science and technology for the betterment of our planet and humankind, and to mitigate climate change reality.

The Chemical Engineer .2007

Chemical Process Retrofitting and Revamping Gade Pandu Rangaiah.2016-01-22 The proposed book will be divided into three parts. The chapters in Part I provide an overview of certain aspect of process retrofitting. The focus of Part II is on computational techniques for solving process retrofit problems. Finally, Part III addresses retrofit applications from diverse process industries. Some chapters in the book are contributed by practitioners whereas others are from academia. Hence, the book includes both new developments from research and also practical considerations. Many chapters include examples with realistic data. All these feature make the book useful to industrial engineers, researchers and students.

Petroleum Refining Design and Applications Handbook, Volume 5 A. Kayode Coker.2023-06-22 PETROLEUM REFINING With no new refineries having been built in decades, companies continue to build onto or reverse engineer and re-tool existing refineries. With so many changes in the last few years alone, books like this are very much in need. There is truly a renaissance for chemical and process engineering going on right now across multiple industries. This fifth and final volume in the "Petroleum Refining Design and Applications Handbook" set, this book continues the most up-to-date and comprehensive coverage of the most significant and recent changes to petroleum refining, presenting the state-of-the-art to the engineer, scientist, or student. Besides the list below, this groundbreaking new volume describes blending of products from the refinery, applying the ternary diagrams and classifications of crude oils, flash point blending, pour point blending, aniline point blending, smoke point and viscosity blending, cetane and diesel indices. The volume further reviews refinery operational cost, cost allocation of actual usage, project and economic evaluation involving cost estimation, cash flow involving return on investment, net present values, discounted cash flow rate of return, net present values, payback period, inflation and sensitivity analysis, and so on. It reviews global effects on the refining economy, carbon tax, carbon foot print, global warming potential, carbon dioxide equivalent, carbon credit, carbon offset, carbon price, and so on. It reviews sustainability in petroleum refining and alternative fuels (biofuels and so on), impact of the overall greenhouse effects, carbon capture and storage in refineries, process intensification in

biodiesel, biofuel from green diesel, acid-gas removal and emerging technologies, carbon capture and storage, gas heated reformer unit, pressure swing adsorption process, steam methane reforming for fuel cells, grey, blue and green hydrogen production, new technologies for carbon capture and storage, carbon clean process design, refinery of the future, refining and petrochemical industry characteristics. The text is packed with Excel spreadsheet calculations and Honeywell UniSim Design software in some examples, and it includes an invaluable glossary of petroleum and petrochemical technical terminologies. Useful as a textbook, this is also an excellent, handy go-to reference for the veteran engineer, a volume no chemical or process engineering library should be without. Written by one of the world's foremost authorities, this book sets the standard for the industry and is an integral part of the petroleum refining renaissance. It is truly a must-have for any practicing engineer or student in this area.

Pinch Analysis and Process Integration Ian C. Kemp.2011-04-01 Pinch analysis and related techniques are the key to design of inherently energy-efficient plants. This book shows engineers how to understand and optimize energy use in their processes, whether large or small. Energy savings go straight to the bottom line as increased profit, as well as reducing emissions. This is the key guide to process integration for both experienced and newly qualified engineers, as well as academics and students. It begins with an introduction to the main concepts of pinch analysis, the calculation of energy targets for a given process, the pinch temperature and the golden rules of pinch-based design to meet energy targets. The book shows how to extract the stream data necessary for a pinch analysis and describes the targeting process in depth. Other essential details include the design of heat exchanger networks, hot and cold utility systems, CHP (combined heat and power), refrigeration and optimization of system operating conditions. Many tips and techniques for practical application are covered, supported by several detailed case studies and other examples covering a wide range of industries, including buildings and other non-process situations. The only dedicated pinch analysis and process integration guide, fully revised and expanded supported by free downloadable energy targeting software The perfect guide and reference for chemical process, food and biochemical engineers, plant engineers and professionals concerned with energy optimisation, including building designers Covers the practical analysis of both new and existing systems, with full details of industrial applications and case studies

Sustainability of Products, Processes and Supply Chains .2015-04-30 Sustainability of Products, Processes and Supply Chains: Theory and Applications presents the recent theoretical developments and applications on the interface between sustainability and process systems engineering. It offers a platform for cutting-edge, holistic analyses of key challenges associated with computer-aided tools for incorporating sustainability principles and approaches into the design and operations of multi-scale process systems, ranging from molecular and products systems, to energy and chemical processes, and supply chains. Presents recent theoretical developments and applications on the interface between sustainability engineering and process engineering Offers cutting-edge, holistic analyses of key challenges associated with computer-aided tools for incorporating sustainability principles and approaches into the design and operations of multi-scale process systems Brings together the perspectives of leading researchers to stimulate innovative thinking in terms of sustainability

24th European Symposium on Computer Aided Process Engineering .2014-06-20 The 24th European Symposium on Computer Aided Process Engineering creates an international forum where scientific and industrial contributions of computer-aided techniques are presented with applications in process modeling and simulation, process synthesis and design, operation, and process optimization. The organizers have broadened the boundaries of Process Systems Engineering by inviting contributions at different scales of modeling and demonstrating vertical and horizontal integration. Contributions range from applications at the molecular level to the strategic level of the supply chain and sustainable development. They cover major classical themes, at the same time exploring a new range of applications that address the production of renewable forms of energy, environmental footprints and sustainable use of resources and water.

Petroleum Refining Design and Applications Handbook, Volume 4 A. Kayode Coker.2023-01-12 PETROLEUM REFINING This fourth volume in the Petroleum Refining set, this book continues the most up-to-date and comprehensive coverage of the most significant and recent changes to petroleum refining, presenting the state-of-the-art to the engineer, scientist, or student. This book provides the design of heat exchanger equipment, crude oil fouling in pre-heat train exchangers, crude oil fouling models, fouling mitigation and monitoring, prevention and control of liquid and gas side fouling, using the Excel spreadsheet and UniSim design software for the design of shell and tube heat exchangers, double pipe heat exchangers, air-cooled exchangers, heat loss tracing for process piping, pinch analysis for hot and cold utility targets and process safety incidents involving these equipment items and pertinent industrial case studies. Use of UniSim Design (UniSim STE) software is illustrated in further elucidation of the design of shell and tube heat exchangers, condensers, and UniSim ExchangerNet R470 for the design of heat exchanger networks using pinch analysis. This is important for determining minimum cold and hot utility requirements, composite curves of hot and cold streams, the grand composite curve, the heat exchanger network, and the relationship between operating cost index target and the capital cost index target against ΔT_{min} . Useful as a textbook, this is also an excellent, handy go-to reference for the veteran engineer, a volume no chemical or process engineering library should be without. Written by one of the world's foremost authorities, this book sets the standard for the industry and is an integral part of the petroleum refining renaissance. It is truly a must-have for any practicing engineer or student in this area. This groundbreaking new volume: Assists engineers in rapidly analyzing problems and finding effective design methods and select mechanical specifications Provides improved design manuals to methods and proven fundamentals of process design with related data and charts Covers a complete range of basic day-to-day petroleum refining operations topics with new materials on significant industry changes Extensive Excel spreadsheets for the design of process vessels for mechanical separation of two-phase and three-phase fluids, double-pipe heat exchanger, air-cooled exchanger, pinch analysis for hot and cold utility targets. Provides UniSim ®-based case studies for enabling simulation of key processes outlined in the book Helps achieve optimum operations and process conditions and shows how to translate design fundamentals into mechanical equipment specifications Has a related website that includes computer applications along with spreadsheets and concise applied process design flow charts and process data sheets Provides various case studies of process safety incidents in refineries and means of mitigating these from investigations by the US Chemical Safety Board Includes a vast Glossary of Petroleum and Technical Terminology

The Refinery of the Future James G. Speight.2010-12-21 As feedstocks to refineries change, there must be an accompanying change in refinery technology. This means a movement from conventional means of refining heavy feedstocks using (typically) coking technologies to more innovative processes that will coax the last drips of liquid fuels from the feedstock. This book presents the evolution of refinery processes during the last century and as well as the means by which refinery processes will evolve during the next three-to-five decades. Chapters contain material relevant to (1) comparisons of current feedstocks with heavy oil and bio-feedstocks; (2) evolution of refineries since the 1950s, (3) properties and refinability of heavy oil and bio-feedstocks, (4) thermal processes vs. hydroprocesses, and (5) evolution of products to match the environmental market. Process innovations that have influenced refinery processing over the past three decades are presented, as well as the relevant patents that have the potential for incorporation into future refineries. • Comparison of current feedstocks with heavy oil and bio-feedstocks. • Evolution of refineries over the past three decades. • Properties and refinability of heavy oil and bio-feedstocks. • Thermal processes vs. Hydroprocesses. • Evolution of products to match the environmental market. Investigates the engineering and plant design challenges presented by heavy oil and bio-feedstocks Explores the legislative and regulatory climate, including increasingly stringent environmental requirements Examines the trade-offs of thermal processes vs. hydroprocesses

Petroleum Refining Design and Applications Handbook A. Kayode Coker.2018-07-31 There is a renaissance that is occurring in chemical and process engineering, and it is crucial for today's scientists, engineers, technicians, and operators to stay current. With so many changes over the last few decades in equipment and processes, petroleum refining is almost a living document, constantly needing updating. With no new refineries being built, companies are spending their capital re-tooling and adding on to existing plants. Refineries are like small cities, today, as they grow bigger and bigger and more and more complex. A huge percentage of a refinery can be changed, literally, from year to year, to account for the type of crude being refined or to integrate new equipment or processes. This book is the most up-to-date and comprehensive coverage of the most significant and recent changes to petroleum refining, presenting the state-of-the-art to the engineer, scientist, or student. Useful as a textbook, this is also an excellent, handy go-to reference for the veteran engineer, a volume no chemical or process engineering library should be without. Written by one of the world's foremost authorities, this book sets the standard for the industry and is an integral part of the petroleum refining renaissance. It is truly a must-have for any practicing engineer or student in this area.

Chemical Process Engineering Volume 2 A. Kayode Coker,Rahmat Sotudeh-Gharebagh.2022-06-20 CHEMICAL PROCESS ENGINEERING Written by one of the most prolific and respected chemical engineers in the world and his co-author, also a well-known and respected engineer, this two-volume set is the “new standard” in the industry, offering engineers and students alike the most up-to-date, comprehensive, and state-of-the-art coverage of processes and best practices in the field today. This new two-volume set explores and describes integrating new tools for engineering education and practice for better utilization of the existing knowledge on process design. Useful not only for students, university professors, and practitioners, especially process, chemical, mechanical and metallurgical engineers, it is also a valuable reference for other engineers, consultants, technicians and scientists concerned about various aspects of industrial design. The text can be considered as complementary to process design for senior and graduate students as well as a hands-on reference work or refresher for engineers at entry level. The contents of the book can also be taught in intensive workshops in the oil, gas, petrochemical, biochemical and process industries. The book provides a detailed description and hands-on experience on process design in chemical engineering, and it is an integrated text that focuses on practical design with new tools, such as Microsoft Excel spreadsheets and UniSim simulation software. Written by two of the industry’s most trustworthy and well-known authors, this book is the new standard in chemical, biochemical, pharmaceutical, petrochemical and petroleum refining. Covering design, analysis, simulation, integration, and, perhaps most importantly, the practical application of Microsoft Excel-UniSim software, this is the most comprehensive and up-to-date coverage of all of the latest developments in the industry. It is a must-have for any engineer or student’s library.

Hydroprocessing for Clean Energy Frank (Xin X.) Zhu,Richard Hoehn,Vasant Thakkar,Edwin Yuh.2017-01-04 Provides a holistic approach that looks at changing process conditions, possible process design changes, and process technology upgrades Includes process integration techniques for improving process designs and for applying optimization techniques for improving operations focusing on hydroprocessing units. Discusses in details all important aspects of hydroprocessing - including catalytic materials, reaction mechanism, as well as process design, operation and control, troubleshooting and optimization Methods and tools are introduced that have a successful application track record at UOP and many industrial plants in recent years Includes relevant calculations/software/technologies hosted online for purchasers of the book

26th European Symposium on Computer Aided Process Engineering .2016-06-17 26th European Symposium on Computer Aided Process Engineering contains the papers presented at the 26th European Society of Computer-Aided Process Engineering (ESCAPE) Event held at Portorož Slovenia, from June 12th to June 15th, 2016. Themes discussed at the conference include Process-product Synthesis, Design and Integration, Modelling, Numerical analysis, Simulation and Optimization, Process Operations and Control and Education in CAPE/PSE. Presents findings and

discussions from the 26th European Society of Computer-Aided Process Engineering (ESCAPE) Event

Petroleum Refining and Petrochemical Based Industries in Eastern India. .2000

Aircraft Thermal Management Mark Ahlers.2016-03-02 The simultaneous operation of all systems generating, moving, or removing heat on an aircraft is simulated using integrated analysis which is called Integrated Energy System Analysis (IESA) for this book. Its purpose is to understand, optimize, and validate more efficient system architectures for removing or harvesting the increasing amounts of waste heat generated in commercial and military aircraft. In the commercial aircraft industry IESA is driven by the desire to minimize airplane operating costs associated with increased system weight, power consumption, drag, and lost revenue as cargo space is devoted to expanded cooling systems. In military aircraft thermal IESA is also considered to be a key enabler for the successful implementation of the next generation jet fighter weapons systems and countermeasures. This book contains a selection of papers relevant to aircraft thermal management IESA published by SAE International. They cover both recently developed government and industry- funded thermal management IESA such as the Integrated Vehicle Energy Technology (INVENT) program, and older published papers still relevant today which address modeling approaches.

Fossil Energy Update .1982

Energy Footprints of the Bio-refinery, Hotel, and Building Sectors Subramanian Senthilkannan Muthu.2018-08-29 This book deals with the energy footprints of biorefineries and the hotel and buildings sector. It presents footprint case studies, which include background information, methodological frameworks, assessment checklists, calculation tools and techniques, applications, challenges and limitations. It also discusses the application of each indicator/framework in various industrial sectors and the associated challenges, along with outlooks for the future. Consumption and conservation of energy are key elements in any industry's sustainability strategy.

Crude Oil Fouling Francesco Coletti,Geoffrey Hewitt.2014-11-20 With production from unconventional rigs continuing to escalate and refineries grappling with the challenges of shale and heavier oil feedstocks, petroleum engineers and refinery managers must ensure that equipment used with today's crude oil is protected from fouling deposits Crude Oil Fouling addresses this overarching challenge for the petroleum community with clear explanations on what causes fouling, current models and new approaches to evaluate and study the formation of deposits, and how today's models could be applied from lab experiment to onsite field usability for not just the refinery, but for the rig, platform, or pipeline. Crude Oil Fouling is a must-have reference for every petroleum engineer's library that gives the basic framework needed to analyze, model, and integrate the best fouling strategies and operations for crude oil systems. Defines the most critical variables and events that cause fouling Explains the consequences of fouling and its impact on operations, safety, and economics Provides the technical models available to better predict and eliminate the potential for fouling in any crude system

Advances in Refining Catalysis Deniz Uner.2017-03-16 To meet changing market demands that have stringent emission standards and to ensure proper performance in refinery units, evaluation of novel catalyst designs and results from material characterization and testing of catalysts are of crucial importance for refiners as well as for catalyst manufacturers. This book highlights recent developments in the application of refinery catalysts in selected units such as fluid catalytic cracking (FCC), hydrogen production for hydroprocessing units, hydrotreating, hydrocracking, and sustainable processing of biomass into biofuels.

Recent Advances in Sustainable Process Design and Optimization .

A User Guide on Process Integration for the Efficient Use of Energy Bodo Linnhoff,Institution of Chemical Engineers (Great Britain).1982

Fourth European Symposium on Computer Aided Process Engineering, ESCAPE 4 F. A. Perris.1994 The ESCAPE symposia address the

applications of computer aids to all aspects of process engineering. The primary objective is the interchange of information on industrial needs, new technology developments and research opportunities. With industrialists and academia contributing from all over the world, this set of proceedings provides an overview of current international computer-aided process engineering (CAPE). This book is intended for chemical and process engineers, design engineers and computer-aided specialists.

19th European Symposium on Computer Aided Process Engineering Jacek Jezowski, Jan Thullie. 2009-06-12 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)

Model-Based Optimization for Petroleum Refinery Configuration Design Cheng Seong Khor. 2024-03-25 An accessible, easy-to-read introduction to the methods of mixed-integer optimization, with practical applications, real-world operational data, and case studies Interest in model-based approaches for optimizing the design of petroleum refineries has increased throughout the industry in recent years. Mathematical optimization based on mixed-integer programming has brought about the superstructure optimization method for synthesizing petroleum refinery configurations from multiple topological alternatives. Model-Based Optimization for Petroleum Refinery Configuration Design presents a detailed introduction to the use of mathematical optimization to solve both linear and nonlinear problems in the refining industry. The book opens with an overview of petroleum refining processes, basic concepts in mathematical programming, and applications of mathematical programming for refinery optimization. Subsequent chapters address superstructure representations of topological alternatives, mathematical formulation, solution strategies, and various modeling frameworks. Practical case studies demonstrate refinery configuration design, refinery retrofitting, and real-world issues and considerations. Presents linear, nonlinear, and mixed-integer programming approaches applicable to both new and existing petroleum refineries Highlights the benefits of model-based solutions to refinery configuration design problems Features detailed case studies of the development and implementation of optimization models Discusses economic considerations of heavy oil processing, including cash flow analysis of refinery costs and return on capital Includes numerical examples based on real-world operational data and various commercial technologies Model-Based Optimization for Petroleum Refinery Configuration Design is an invaluable resource for researchers, chemical engineers, process and energy engineers, other refining professionals, and advanced chemical engineering students.

Optimization in the Energy Industry Josef Kallrath, Panos M. Pardalos, Steffen Rebennack, Max Scheidt. 2008-12-25 This book offers a broad, in-depth overview that reflects the requirements, possibilities and limits of mathematical optimization and, especially, stochastic optimization in the energy industry.

Petroleum Refinery Process Modeling Y. A. Liu, Ai-Fu Chang, Kiran Pashikanti. 2018-02-09 A comprehensive review of the theory and practice of the simulation and optimization of the petroleum refining processes Petroleum Refinery Process Modeling offers a thorough review of how to quantitatively model key refinery reaction and fractionation processes. The text introduces the basics of dealing with the thermodynamics and physical property predictions of hydrocarbon components in the context of process modeling. The authors - three experts on the topic - outline the procedures and include the key data required for building reaction and fractionation models with commercial software. The text shows how to filter through the extensive data available at the refinery and using plant data to begin calibrating available models and extend the models to include key

fractionation sub-models. It provides a sound and informed basis to understand and exploit plant phenomena to improve yield, consistency, and performance. In addition, the authors offer information on applying models in an overall refinery context through refinery planning based on linear programming. This important resource: -Offers the basic information of thermodynamics and physical property predictions of hydrocarbon components in the context of process modeling -Uses the key concepts of fractionation lumps and physical properties to develop detailed models and workflows for atmospheric (CDU) and vacuum (VDU) distillation units -Discusses modeling FCC, catalytic reforming and hydroprocessing units Written for chemical engineers, process engineers, and engineers for measurement and control, this resource explores the advanced simulation tools and techniques that are available to support experienced and aid new operators and engineers.

11th International Symposium on Process Systems Engineering - PSE2012 .2012-12-31 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

Chemical Process Design, Simulation and Optimization Jean-Pierre Corriou, Jean-Claude Assaf.2021-02-19 The book presents a series of articles devoted to modeling, simulation, and optimization of processes, mainly chemical. General methods for process modeling and numerical simulation are described with flowsheeting. Population balances are addressed in detail with application to crystal production; energy saving is frequently optimized, including exergy analysis. The coupling between process simulation and computational fluid dynamics is studied for air classification and bubble columns. Pressure swing adsorption, reactive distillation, and nanofiltration are explained in general and applied to particular processes. The synthesis of carbon dots is solved by the design of experiments method. A safety study addresses the consequences of gas explosion.

Kirk-Othmer Encyclopedia of Chemical Technology, Volume 20 Kirk-Othmer.2006-04-07 The fifth edition of the Kirk-Othmer Encyclopedia of Chemical Technology builds upon the solid foundation of the previous editions, which have proven to be a mainstay for chemists, biochemists, and engineers at academic, industrial, and government institutions since publication of the first edition in 1949. The new edition includes necessary adjustments and modernisation of the content to reflect changes and developments in chemical technology. Presenting a wide scope of articles on chemical substances, properties, manufacturing, and uses; on industrial processes, unit operations in chemical engineering; and on fundamentals and scientific subjects related to the field. The Encyclopedia describes established technology along with cutting edge topics of interest in the wide field of chemical technology, whilst uniquely providing the necessary perspective and insight into pertinent aspects, rather than merely presenting information. * Set began publication in January 2004 * Over 1,000 articles * More than 600 new or updated articles 27 volumes

Energy Research Abstracts .1989

Integrated Design and Simulation of Chemical Processes Alexandre C. Dimian.2003-05-13 This title aims to teach how to invent optimal and sustainable chemical processes by making use of systematic conceptual methods and computer simulation techniques. The material covers five

sections: process simulation; thermodynamic methods; process synthesis; process integration; and design project including case studies. It is primarily intended as a teaching support for undergraduate and postgraduate students following various process design courses and projects, but will also be of great value to professional engineers interested in the newest design methods. Provides an introduction to the newest design methods. Of great value to undergraduate and postgraduate students as well as professional engineers. Numerous examples illustrate theoretical principles and design issues.

27th European Symposium on Computer Aided Process Engineering .2017-09-21 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

Strategy for Energy Conservation in India Pradeep Chaturvedi, Shalini Joshi.1996

Advances in Energy Systems Engineering Georgios M. Kopanos, Pei Liu, Michael C. Georgiadis.2016-10-17 This book provides a scientific framework for integrated solutions to complex energy problems. It adopts a holistic, systems-based approach to demonstrate the potential of an energy systems engineering approach to systematically quantify different options at various levels of complexity (technology, plant, energy supply chain, mega-system). Utilizing modeling, simulation and optimization-based frameworks, along with a number of real-life applications, it focuses on advanced energy systems including energy supply chains, integrated biorefineries, energy planning and scheduling approaches and urban energy systems. Featuring contributions from leading researchers in the field, this work is useful for academics, researchers, industry practitioners in energy systems engineering, and all those who are involved in model-based energy systems.

Renewable and Alternative Energy: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources.2016-10-19 As the human population expands and natural resources become depleted, it becomes necessary to explore other sources for energy consumption and usage. *Renewable and Alternative Energy: Concepts, Methodologies, Tools, and Applications* provides a comprehensive overview of emerging perspectives and innovations for alternative energy sources. Highlighting relevant concepts on energy efficiency, current technologies, and ongoing industry trends, this is an ideal reference source for academics, practitioners, professionals, and upper-level students interested in the latest research on renewable energy.

Hydrotreatment and Hydrocracking of Oil Fractions B. Delmon, P. Grange, G.F. Froment.1999-11-03 The 2nd International Symposium on Hydrotreatment and Hydrocracking of Oil Fractions, which is also the 7th in the series of European Workshops on Hydrotreatment, took place in Antwerpen, Belgium from November 14 to 17. The Symposium emphasized how oil refining faces increasingly severe environmental regulations. These and the increasing application of heavier crudes containing more S-, N- and metal components call for more efficient hydrotreatment and hydrocracking processes. It is clear from the keynote lectures, the oral contributions and the posters of this meeting that adapting the operating conditions will not suffice. Adequate catalysts need to be developed, with different composition and structure. Surface science techniques and molecular modeling are now well established tools for such a development. They should be of help in widely different aspects, like the role of precursors in the preparation or the modifications undergone by the catalyst under reaction conditions. The improvement of hydrotreatment and hydrocracking also needs accurate modeling of the chemical reactor. This requires more representative hydrodynamics and kinetic models whose validity extends to the very low S- and N-contents. These areas should be vigorously developed.

Handbook of Process Integration (PI) Jiří Jaromír Klemeš.2022-11-09 Handbook of Process Integration (PI): Minimisation of Energy and Water Use, Waste and Emissions, Second Edition provides an up-to-date guide on the latest PI research and applications. Since the first edition published, methodologies and sustainability targets have developed considerably. Each chapter has been fully updated, with six new chapters added in this release, covering emissions, transport, water scarcity, reliability and maintenance, environmental impact and circular economy. This version also now includes worked examples and simulations to deepen the reader's understanding. With its distinguished editor and international team of expert contributors, this book is an important reference work for managers and researchers in all energy and sustainability industries, as well as academics and students in Energy, Chemical, Process, and Environmental Engineering. Provides a fully updated handbook with six new chapters that reflect the latest research and applications on process integration Reviews a wide range of process design and integration topics, ranging from heat and utility systems to water, recycling, waste and hydrogen systems Covers equipment design and operability issues, with a strong extension to environmental engineering and suitability issues

Energy and Process Optimization for the Process Industries Frank (Xin X.) Zhu.2013-11-25 Exploring methods and techniques to optimize processing energy efficiency in process plants, Energy and Process Optimization for the Process Industries provides a holistic approach that considers optimizing process conditions, changing process flowschemes, modifying equipment internals, and upgrading process technology that has already been used in a process plant with success. Field tested by numerous operating plants, the book describes technical solutions to reduce energy consumption leading to significant returns on capital and includes an 8-point Guidelines for Success. The book provides managers, chemical and mechanical engineers, and plant operators with methods and tools for continuous energy and process improvements.

Kirk-Othmer Chemical Technology and the Environment, 2 Volume Set Wiley.2007-05-21 The two-volume reference work Chemical Technology and the Environment provides readers with knowledge on contemporary issues in environmental pollution, prevention and control, as well as regulatory, health and safety issues as related to chemical technology. It introduces and expands the knowledge on emerging green materials and processes and greener energy technology, as well as more general concepts and methodology including sustainable development and chemistry and green chemistry. Based on Wiley's renowned, Kirk-Othmer Encyclopedia of Chemical Technology, this compact reference features the same breadth and quality of coverage and clarity of presentation found in the original.

Refinery Engineering Ai-Fu Chang,Kiran Pashikanti,Y. A. Liu.2013-03-01 A pioneering and comprehensive introduction to the complex subject of integrated refinery process simulation, using many of the tools and techniques currently employed in modern refineries. Adopting a systematic and practical approach, the authors include the theory, case studies and hands-on workshops, explaining how to work with real data. As a result, senior-level undergraduate and graduate students, as well as industrial engineers learn how to develop and use the latest computer models for the predictive modeling and optimization of integrated refinery processes. Additional material is available online providing relevant spreadsheets and simulation files for all the models and examples presented in the book.

The Enigmatic Realm of **Optimisation Of Existing Heat Integrated Refinery**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing short of extraordinary. Within the captivating pages of

Optimisation Of Existing Heat Integrated Refinery a literary masterpiece penned with a renowned author, readers embark on a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book's core themes, assess its distinct writing style, and delve into its lasting affect the hearts and minds of those that partake in its reading experience.

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