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Fluidization Engineering The CRC Handbook of Mechanical Engineering, Second Edition Combustion Engineering, Second Edition Introduction to Software for Chemical Engineers, Second Edition Fluidization Engineering Fluidization Concepts of Chemical Engineering for Chemists (Second Edition) Fluid Bed Technology in Materials Processing Progress in Biomass and Bioenergy Production Industrial Catalytic Processes for Fine and Specialty Chemicals Computational Methods in Multiphase Flow V Chemical Reactor Design and Technology Heat Analysis and Thermodynamic Effects Fluidization - Proceedings of the Second (1978) Engineering Foundation Conference, Trinity College, Cambridge, England, April 2 - 6 1978 Advances in Fluid Mechanics IX Fluidization Dynamics Substitute Natural Gas from Waste Fluidization Engineering 22nd European Symposium on Computer Aided Process Engineering Engineering Flow and Heat Exchange Progress in Scale Modeling, Volume II Light Metals 2013 Advances in Fluidization Engineering Plastics to Energy Fundamentals of Fluidized-Bed Chemical Processes Fluidization Proceedings of Second International Conference on Fluidized-bed Combustion Fluidized Bed Combustion Handbook of Fluidization and Fluid-Particle Systems Computational Fluid Dynamics and the Theory of Fluidization Gas-

liquid-solid Fluidization Engineering Slurry Flow Large Particle Fluidization--a Photographic Study of a Two Dimensional Fluidized Bed Mixing in the Process Industries Essentials of Fluidization Technology Chemical Reaction Engineering and Reactor Technology, Second Edition Fluidization IX Lees' Loss Prevention in the Process Industries ERDA. Fluidized Bed Boilers

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Combustion Engineering, Second Edition maintains the same goal as the original: to present the fundamentals of combustion science with application to today's energy challenges. Using combustion applications to reinforce the fundamentals of combustion science, this text provides a uniquely accessible introduction to combustion for undergraduate students, first-year graduate students, and professionals in the workplace. Combustion is a critical issue impacting energy utilization, sustainability, and climate change. The challenge is to design safe and efficient combustion systems for many types of fuels in a way that protects the environment and enables sustainable lifestyles. Emphasizing the use of combustion fundamentals in the engineering and design of combustion systems, this text provides detailed coverage of gaseous, liquid and solid fuel combustion, including focused coverage of biomass combustion, which will be invaluable to new entrants to the field. Eight chapters address the fundamentals of combustion, including fuels, thermodynamics, chemical kinetics, flames, detonations, sprays, and solid fuel combustion mechanisms. Eight additional chapters apply these fundamentals to furnaces, spark ignition and diesel engines, gas turbines, and suspension burning, fixed bed combustion, and fluidized bed combustion of solid fuels. Presenting a renewed emphasis on fundamentals and updated applications to illustrate the latest trends relevant to combustion engineering, the authors provide a number of pedagogic features, including:

Numerous tables with practical data and formulae that link combustion fundamentals to engineering practice  
Concise presentation of mathematical methods with qualitative descriptions of their use  
Coverage of alternative and renewable fuel topics throughout the text  
Extensive example problems, chapter-end problems, and references  
These features and the overall fundamentals-to-practice nature of this book make it an ideal resource for undergraduate, first level graduate, or professional training classes. Students and practitioners will find that it is an excellent introduction to meeting the crucial challenge of engineering sustainable combustion systems in a cost-effective manner. A solutions manual and additional teaching resources are available with qualifying course adoption.

Fluid Bed Technology in Materials Processing comprehensively covers the various aspects of fluidization engineering and presents an elaborate examination of the applications in a multitude of materials processing techniques. This singular resource discusses: All the basic aspects of fluidization essential to understand and learn about various techniques  
The range of industrial applications  
Several examples in extraction and process metallurgy  
Fluidization in nuclear engineering and nuclear fuel cycle with numerous examples  
Innovative techniques and several advanced concepts of fluidization engineering, including use and applications in materials processing as well as environmental and bio-engineering  
Pros and cons of various fluidization equipment and specialty of their applications, including several examples  
Design aspects and modeling  
Topics related to distributors effects and flow regimes  
A separate chapter outlines the importance of fluidization engineering in high temperature processing, including an analysis of the fundamental concepts and applications of high temperature fluidized bed furnaces for several advanced materials processing techniques. Presenting information usually not available in a single source, Fluid Bed Technology in Materials Processing serves Fluidization engineers  
Practicing engineers in process metallurgy, mineral engineering, and chemical metallurgy  
Researchers in the field of chemical, metallurgical, nuclear, biological, environmental engineering  
Energy engineering professionals  
High temperature scientists and engineers  
Students and professionals who adopt modeling of fluidization in their

venture for design and scale up Fluidization Dynamics has been written for students and engineers who find themselves involved with problems concerning the fluidized state. It presents an analysis that focuses directly on the problem of predicting the fluid dynamic behaviour of a proposed fluidized system for which empirical data is limited or unavailable. The second objective is to provide a treatment of fluidization dynamics that is readily accessible to the non-specialist. The linear approach adopted in this book, starting with the formulation of predictive expressions for the basic forces that act on a fluidized particle, offers a clear way into the theory. The incorporation of the force terms into the conservation equations for mass and momentum and subsequent applications are presented in a manner that requires only the haziest recollection of elementary fluid-dynamics theory. The analyses presented in this book represent a body of research that has appeared in numerous publications over the last 20 years. L.G. Gibilaro has taken the opportunity to reorder much of the material in the light of subsequent knowledge, to correct minor errors and inconsistencies and to add detail and clarification where necessary. This material helps to form the basis for university course modules in engineering and applied science at undergraduate and graduate level, as well as focused, post-experienced courses for the process, and allied industries.

- Bridges the gulf between observed behaviour and fluid-dynamic theory
- Clear account of basic theory of fluidization
- Accessible treatment of fluidization analysis

The heat transfer and analysis on heat pipe and exchanger, and thermal stress are significant issues in a design of wide range of industrial processes and devices. This book includes 17 advanced and revised contributions, and it covers mainly (1) thermodynamic effects and thermal stress, (2) heat pipe and exchanger, (3) gas flow and oxidation, and (4) heat analysis. The first section introduces spontaneous heat flow, thermodynamic effect of groundwater, stress on vertical cylindrical vessel, transient temperature fields, principles of thermoelectric conversion, and transformer performances. The second section covers thermosyphon heat pipe, shell and tube heat exchangers, heat transfer in bundles of transversely-finned tubes, fired heaters for petroleum refineries, and heat exchangers of irreversible power cycles. The third section

includes gas flow over a cylinder, gas-solid flow applications, oxidation exposure, effects of buoyancy, and application of energy and thermal performance index on energy efficiency. The fourth section presents integral transform and Green function methods, micro capillary pumped loop, influence of polyisobutylene additions, synthesis of novel materials, and materials for electromagnetic launchers. The advanced ideas and information described here will be fruitful for the readers to find a sustainable solution in an industrialized society. A concise and clear treatment of the fundamentals of fluidization, with a view to its applications in the process and energy industries. This volume of the AIChE symposium series includes 14 papers presented at the Annual Meeting held in San Francisco (November 5-10, 1989). These papers cover a wide spectrum of fundamental and application topics in fluidization and fluid particle systems, such as hydrodynamics and heat transfer in a The role of the chemical reactor is crucial for the industrial conversion of raw materials into products and numerous factors must be considered when selecting an appropriate and efficient chemical reactor. *Chemical Reaction Engineering and Reactor Technology* defines the qualitative aspects that affect the selection of an industrial chemical reactor and couples various reactor models to case-specific kinetic expressions for chemical processes. Thoroughly revised and updated, this much-anticipated Second Edition addresses the rapid academic and industrial development of chemical reaction engineering. Offering a systematic development of the chemical reaction engineering concept, this volume explores: essential stoichiometric, kinetic, and thermodynamic terms needed in the analysis of chemical reactors homogeneous and heterogeneous reactors reactor optimization aspects residence time distributions and non-ideal flow conditions in industrial reactors solutions of algebraic and ordinary differential equation systems gas- and liquid-phase diffusion coefficients and gas-film coefficients correlations for gas-liquid systems solubilities of gases in liquids guidelines for laboratory reactors and the estimation of kinetic parameters The authors pay special attention to the exact formulations and derivations of mass energy balances and their numerical solutions. Richly illustrated and containing exercises and solutions covering a number of processes, from oil

refining to the development of specialty and fine chemicals, the text provides a clear understanding of chemical reactor analysis and design. Nothing provided Slurry Flow: Principles and Practice describes the basic concepts and methods for understanding and designing slurry flow systems, in-plant installations, and long-distance transportation systems. The goal of this book is to enable the design or plant engineer to derive the maximum benefit from a limited amount of test data and to generalize operating experience to new situations. Design procedures are described in detail and are accompanied by illustrative examples needed by engineers with little or no previous experience in slurry transport. The technical literature in this field is extensive: this book facilitates its use by surveying current research results and providing explanations of mechanistic flow models. This discussion of background scientific principles helps the practitioner to better interpret test data, select pumps, specify materials of construction, and choose measuring devices for slurry transport systems. The extensive range of topics covered in Slurry Flow: Principles and practice includes slurry rheology, homogeneous and heterogeneous slurry flow principles, wear mechanisms, pumping equipment, instrumentation, and operating aspects. 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 development: 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 Industrial Catalytic Processes for Fine and Specialty Chemicals provides a comprehensive methodology and state-of-the art toolbox for industrial catalysis. The book begins by introducing the reader to the interesting, challenging, and important field of catalysis and catalytic



processes. The fundamentals of catalysis and catalytic processes are fully covered before delving into the important industrial applications of catalysis and catalytic processes, with an emphasis on green and sustainable technologies. Several case studies illustrate new and sustainable ways of designing catalysts and catalytic processes. The intended audience of the book includes researchers in academia and industry, as well as chemical engineers, process development chemists, and technologists working in chemical industries and industrial research laboratories. Discusses the fundamentals of catalytic processes, catalyst preparation and characterization, and reaction engineering Outlines the homogeneous catalytic processes as they apply to specialty chemicals Introduces industrial catalysis and catalytic processes for fine chemicals Includes a number of case studies to demonstrate the various processes and methods for designing green catalysts Fluidized Bed Boilers: Design and Application attempts to address the need for a single source of information covering all major areas of fluidized bed boiler design and operation. It is based on the International Workshop on Design and Operation of Atmospheric Pressure Fluidized Bed Boilers, organized by the Center for Energy Studies, Technical University of Nova Scotia in Halifax on 24-45 June 1983. The volume begins by presenting a simplified approach to the design of a fluidized bed boiler and an overview of problems in fluidized-bed combustion (FBC). These are followed by separate chapters on the equations and concepts needed to estimate key hydrodynamic parameters; the key factors and terms to be considered in selecting FBC for specific applications; and principles in the design of air distributors for a fluidized bed boiler. Subsequent chapters discuss heat transfer to surfaces in fluidized beds; the pollution control of fluidized bed combustion of solid fuels; and materials selection in atmospheric fluidized bed combustion systems. The final two chapters are devoted to applications. These include the operational and performance results of TVA's 20-MW Atmospheric Fluidized Bed Combustion (AFBC) Pilot Plant in Kentucky; and the performance of Canada's first commercial FBC boiler plant, located at CFB Summerside, PEI. Alternative energy sources have become a hot topic in recent years. The supply of fossil fuel, which provides about 95

percent of total energy demand today, will eventually run out in a few decades. By contrast, biomass and biofuel have the potential to become one of the major global primary energy source along with other alternate energy sources in the years to come. A wide variety of biomass conversion options with different performance characteristics exists. The goal of this book is to provide the readers with current state of art about biomass and bioenergy production and some other environmental technologies such as Wastewater treatment, Biosorption and Bio-economics. Organized around providing recent methodology, current state of modelling and techniques of parameter estimation in gasification process are presented at length. As such, this volume can be used by undergraduate and graduate students as a reference book and by the researchers and environmental engineers for reviewing the current state of knowledge on biomass and bioenergy production, biosorption and wastewater treatment. Today's frustrations and anxieties resulting from two energy crises in only one decade, show us the problems and fragility of a world built on high energy consumption, accustomed to the use of cheap non-renewable energy and to the acceptance of eXisting imbalances between the resources and demands of countries. Despite all these stressing factors, our world is still hesitating about the urgency of undertaking new and decisive research that could stabilize our future, Could this trend change in the near future? In our view, two different scenarios are possible. A renewed energy tension could take place with an unpredictable timing mostly related to political and economic factors, This could bring again scientists and technologists to a new state of shock and awaken our talents, A second interesting and beneficial scenario could result from the positive influence of a new generation of researchers that with or without immediate crisis, acting both in industry and academia, will face the challenge of developing technologies and processes to pave the way to a less vulnerable society, Because Chemical Reactor Design and Technology activities are at the heart of these required new technologies the timeliness of the NATO-Advanced Study Institute at the University of Western Ontario, London, was very appropriate. Together with turbulence, multiphase flow remains one of the most challenging areas of

computational mechanics and experimental methods and numerous problems remain unsolved to date. Multiphase flows are found in all areas of technology, at all length scales and flow regimes. The fluids involved can be compressible or incompressible, linear or nonlinear. Because of the complexity of the problems, it is often essential to utilize advanced computational and experimental methods to solve the complex equations that describe them. Challenges in these simulations include modelling and tracking interfaces, dealing with multiple length scales, modelling nonlinear fluids, treating drop breakup and coalescence, characterizing phase structures, and many others. Experimental techniques, although expensive and difficult to perform, are essential to validate models. This book contains papers presented at the Fifth International Conference on Computational Methods in Multiphase Flow, which are grouped into the following topics: Multiphase Flow Simulation; Interaction of Gas, Liquids and Solids; Turbulent Flow; Environmental Multiphase Flow; Bubble and Drop Dynamics; Flow in Porous Media; Heat Transfer; Image Processing; Interfacial Behaviour. Safety in the process industries is critical for those who work with chemicals and hazardous substances or processes. The field of loss prevention is, and continues to be, of supreme importance to countless companies, municipalities and governments around the world, and Lees' is a detailed reference to defending against hazards. Recognized as the standard work for chemical and process engineering safety professionals, it provides the most complete collection of information on the theory, practice, design elements, equipment, regulations and laws covering the field of process safety. An entire library of alternative books (and cross-referencing systems) would be needed to replace or improve upon it, but everything of importance to safety professionals, engineers and managers can be found in this all-encompassing three volume reference instead. The process safety encyclopedia, trusted worldwide for over 30 years Now available in print and online, to aid searchability and portability Over 3,600 print pages cover the full scope of process safety and loss prevention, compiling theory, practice, standards, legislation, case studies and lessons learned in one resource as opposed to multiple sources This reference details particle

characterization, dynamics, manufacturing, handling, and processing for the employment of multiphase reactors, as well as procedures in reactor scale-up and design for applications in the chemical, mineral, petroleum, power, cement and pharmaceuticals industries. The authors discuss flow through fixed beds, elutriati This book provides a comprehensive mechanistic interpretation of the transport phenomena involved in various basic modes of gas-liquid-solid fluidization. These modes include, for example, those for three-phase fluidized beds, slurry columns, turbulent contact absorbers, and three-phase fluidized beds, slurry columns, turbulent contact absorbers, and three-phase transport. It summarizes the empirical correlations useful for predicting transport properties for each mode of operation. Gas-Liquid-Solid Fluidization Engineering provides a comprehensive account of the state-of-the-art applications of the three-phase fluidization systems that are important in both small-and large-scale operations. These applications include fermentation, biological wastewater treatment, flue gas desulfurization and particulates removal, and resid hydrotreating. This book highlights the industrial implications of these applications. In addition, it discusses information gaps and future directions for research in this field. This book discusses the basic formulations of fluid mechanics and their computer modelling, as well as the relationship between experimental and analytical results. Containing papers from the Ninth International Conference on Advances in Fluid Mechanics, this book discusses the basic formulations of fluid mechanics and their computer modelling, as well as the relationship between experimental and analytical results. Scientists, engineers, and other professionals interested in the latest developments in theoretical and computational fluid mechanics will find the book a useful addition to the literature. The book covers a wide range of topics, with emphasis on new applications and research currently in progress, including: Computational Methods in Fluid Mechanics, Environmental Fluid Mechanics; Experimental Versus Simulation Methods; Multiphase Flow; Hydraulics and Hydrodynamics; Heat and Mass Transfer; Industrial Applications; Wave Studies; Biofluids; Fluid Structure Interaction. Substitute Natural Gas from Waste: Technical Assessment and Industrial Applications

of Biochemical and Thermochemical Processes provides an overview of the science and technology of anaerobic digestion and thermal gasification for the treatment of biomass and unrecyclable waste residues. The book provides both the theoretical and practical basis for the clean and high-efficiency utilization of waste and biomass to produce Bio-Substitute Natural Gas (SNG). It examines different routes to produce bio-SNG from waste feedstocks, detailing solutions to unique problems, such as scale up issues and process integration. Final sections review waste sourcing and processing. This book is an ideal and practical reference for those developing, designing, scaling and managing bio-SNG production and utilization systems. Engineering students will find this to be a comprehensive resource on the application of fundamental concepts of bio-SNG production that are illustrated through innovative, recent case studies. Presents detailed scientific and technical information Describes up-to-date concepts, processes and plants for efficient anaerobic digestion and gasification of wastes and syngas utilization Compares gasification with anaerobic digestion for different situations Proposes alternative strategies to increase efficiency and overcome energy balance limitations Includes benchmarking data and industrial real-life examples to demonstrate the main process features and implementation pathways of bio-SNG systems from dry and wet waste, both in developed and developing countries This book is for engineers and students to solve issues concerning the fluidized bed systems. It presents an analysis that focuses directly on the problem of predicting the fluid dynamic behavior which empirical data is limited or unavailable. The second objective is to provide a treatment of computational fluidization dynamics that is readily accessible to the non-specialist. The approach adopted in this book, starting with the formulation of predictive expressions for the basic conservation equations for mass and momentum using kinetic theory of granular flow. The analyses presented in this book represent a body of simulations and experiments research that has appeared in numerous publications over the last 20 years. This material helps to form the basis for university course modules in engineering and applied science at undergraduate and graduate level, as well as focused, post-

experienced courses for the process, and allied industries. The Light Metals series is widely recognized as the definitive source of information on new developments in aluminum production technology. This new volume presents proceedings from 2013's Light Metal Symposia, covering the latest research and technologies on such areas as alumina and bauxite, aluminum reduction technology, electrode technology for aluminum production, cast shop for aluminum production, aluminum processing aluminum alloys, and cost affordable titanium IV. It also includes papers from a keynote presentation session discussing impurities in the aluminum supply chain are also included. A realization of recent clean energy initiatives, fluidized bed combustion (FBC) has quickly won industry preference due to its ability to burn materials as diverse as low-grade coals, biomass, and industrial and municipal waste. Fluidized Bed Combustion catalogs the fundamental physical and chemical processes required of bubbling fluidized beds before launching into application-centered coverage of hot-gas generator, incinerator, and boiler concepts and design, calculations for regime parameters and dimensions, and all aspects of FBC operation. It enumerates the environmental consequences of fluidized bed processes and proposes measures to reduce the formation of harmful emissions. Focuses on the major research developments which are pertinent to engineers concerned with predictive methods and design of fluidization beds. This volume is a valuable reference work for the student and the practising engineer in the chemical, pharmaceutical, minerals, food, plastics, paper and metallurgical industries. The second edition of this successful text has been thoroughly rewritten and updated. Based on the long running post-experience course produced by the University of Bradford, in association with the Institution of Chemical Engineers, it covers all aspects of mixing, from fundamentals through to design procedures in single and multi-phase systems. Experts from both industry and academia have contributed to this work giving both a theoretical practical approach. It covers dry and wet powders, single and two-phase liquids, solid/liquid and gas/liquid systems. The range of mixers available for such diverse duties is dealt with, including tumbler mixers for powders, mechanically agitated vessels, in-line continuous mixers and jet

mixers. Coverage is given of the range of mixing objectives, varying from achieving product uniformity to obtaining optimum conditions for mass transfer and chemical reactions. This volume is a valuable reference work for the student and the practising engineer in the chemical, pharmaceutical, minerals, food, plastics, paper and metallurgical industries. The second edition of this successful text has been thoroughly rewritten and updated. Based on the long running post-experience course produced by the University of Bradford, in association with the Institution of Chemical Engineers, it covers all aspects of mixing, from fundamentals through to design procedures in single and multi-phase systems. Experts from both industry and academia have contributed to this work giving both a theoretical practical approach. It covers dry and wet powders, single and two-phase liquids, solid/liquid and gas/liquid systems. The range of mixers available for such diverse duties is dealt with, including tumbler mixers for powders, mechanically agitated vessels, in-line continuous mixers and jet mixers. Coverage is given of the range of mixing objectives, varying from achieving product uniformity to obtaining optimum conditions for mass transfer and chemical reactions.

Plastics to Energy: Fuel, Chemicals, and Sustainability Implications covers important trends in the science and technology of polymer recovery, such as the thermo-chemical treatment of plastics, the impact of environmental degradation on mechanical recycling, incineration and thermal unit design, and new options in biodegradable plastics. The book also introduces product development opportunities from waste materials and discusses the main processes and pathways of the conversion of polymeric materials to energy, fuel and chemicals. A particular focus is placed on industrial case studies and academic reviews, providing a practical emphasis that enables plastics practitioners involved in end-of-life aspects to employ these processes. Final sections examine lifecycle and cost analysis of different plastic waste management processes, exploring the potential of various techniques in modelling, optimization and simulation of waste management options. Introduces new pathways for the end-of-life treatment of plastics and polymers, including conversion to energy, fuel and other chemicals Compares different options to assist materials scientists, engineers and

waste management practitioners to choose the most effective and sustainable option Covers the latest trends in the science and technology of polymer energy recovery During the past 20 years, the field of mechanical engineering has undergone enormous changes. These changes have been driven by many factors, including: the development of computer technology worldwide competition in industry improvements in the flow of information satellite communication real time monitoring increased energy efficiency robotics automatic control increased sensitivity to environmental impacts of human activities advances in design and manufacturing methods These developments have put more stress on mechanical engineering education, making it increasingly difficult to cover all the topics that a professional engineer will need in his or her career. As a result of these developments, there has been a growing need for a handbook that can serve the professional community by providing relevant background and current information in the field of mechanical engineering. The CRC Handbook of Mechanical Engineering serves the needs of the professional engineer as a resource of information into the next century. This volume thoroughly covers scale modeling and serves as the definitive source of information on scale modeling as a powerful simplifying and clarifying tool used by scientists and engineers across many disciplines. The book elucidates techniques used when it would be too expensive, or too difficult, to test a system of interest in the field. Topics addressed in the current edition include scale modeling to study weather systems, diffusion of pollution in air or water, chemical process in 3-D turbulent flow, multiphase combustion, flame propagation, biological systems, behavior of materials at nano- and micro-scales, and many more. This is an ideal book for students, both graduate and undergraduate, as well as engineers and scientists interested in the latest developments in scale modeling. This book also: Enables readers to evaluate essential and salient aspects of profoundly complex systems, mechanisms, and phenomena at scale Offers engineers and designers a new point of view, liberating creative and innovative ideas and solutions Serves the widest range of readers across the engineering disciplines and in science and medicine Professor Levenspiel's text remains the most practical volume available on the design of heat



transfer equipment - an excellent introduction to real-world applications for advanced undergraduates and an indispensable reference for professionals. Each chapter includes illustrative examples and problems.

Fundamentals of Fluidized-bed Chemical Processes presents a survey of the design, operation, and chemical processes of fluidized-bed reactors. The book is composed of five chapters. The first chapter examines the basic physics of gas-solid fluidization. The second chapter shows how the physics of gas-solid fluidization may be combined with chemical kinetics to generate models of fluidized-bed reactors. Chapters 3 and 4 deal with two major applications of gas-solid fluidization, the Fluidized Catalytic Cracking process and the combustion and gasification of coal. The final chapter analyzes other processes used in the production of chemicals such as phthalic anhydride, acrylonitrile, and compounds of uranium. Undergraduate and postgraduate students of chemical engineering, engineers, chemists, and scientists will find this text useful.

The field of Chemical Engineering and its link to computer science is in constant evolution and new engineers have a variety of tools at their disposal to tackle their everyday problems. Introduction to Software for Chemical Engineers, Second Edition provides a quick guide to the use of various computer packages for chemical engineering applications. It covers a range of software applications from Excel and general mathematical packages such as MATLAB and MathCAD to process simulators, CHEMCAD and ASPEN, equation-based modeling languages, gProms, optimization software such as GAMS and AIMS, and specialized software like CFD or DEM codes. The different packages are introduced and applied to solve typical problems in fluid mechanics, heat and mass transfer, mass and energy balances, unit operations, reactor engineering, process and equipment design and control. This new edition offers a wider view of packages including open source software such as R, Python and Julia. It also includes complete examples in ASPEN Plus, adds ANSYS Fluent to CFD codes, Lingo to the optimization packages, and discusses Engineering Equation Solver. It offers a global idea of the capabilities of the software used in the chemical engineering field and provides examples for solving real-world problems. Written by leading experts, this

book is a must-have reference for chemical engineers looking to grow in their careers through the use of new and improving computer software. Its user-friendly approach to simulation and optimization as well as its example-based presentation of the software, makes it a perfect teaching tool for both undergraduate and master levels.

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