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Proceedings SPE Annual Technical Conference and Exhibition
Computational Techniques and Applications, CTACHydrocyclones
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Modeling and Simulation of Mineral Processing Systems

Experimental Methods and Instrumentation for Chemical Engineers, Second Edition, touches many aspects of engineering practice, research, and statistics. The principles of unit operations, transport phenomena, and plant design constitute the focus of chemical engineering in the latter years of the curricula. Experimental methods and instrumentation is the precursor to these subjects. This resource integrates these concepts with statistics and uncertainty analysis to define what is necessary to measure and to control, how precisely and how often. The completely updated second edition is divided into several themes related to data: metrology, notions of statistics, and design of experiments. The book then covers basic principles of sensing devices, with a brand new chapter covering force and mass, followed by pressure, temperature, flow rate, and physico-chemical properties. It continues with chapters that describe how to measure gas and liquid concentrations, how to characterize solids, and finally a new chapter on spectroscopic techniques such as UV/Vis, IR, XRD, XPS, NMR, and XAS. Throughout the book, the author integrates the concepts of uncertainty, along with a historical context and practical examples. A problem solutions manual is available from the author upon request. Includes the basics for 1st and 2nd year chemical engineers, providing a foundation for unit operations and transport phenomena
Features many practical examples
Offers exercises for students at the end of each chapter
Includes up-to-date detailed drawings and photos of equipment

Economic Study of the Plastic Recycling Process Based on Hydrocyclone Technology

Sampling Source Book

Starch is both a major component of plant foods and an important ingredient for the food industry. Starch in food reviews starch structure and functionality and the growing range of starch ingredients used to improve the nutritional and sensory quality of food. Part one illustrates how plant starch can be analysed and modified, with chapters on plant starch synthesis, starch bioengineering and starch-acting enzymes. Part two examines the sources of starch, from wheat and potato to rice, corn and tropical supplies. The third part of the book looks at starch as an ingredient and how it is used in the food industry. There are chapters on modified starches and the stability of frozen foods, starch-lipid interactions and starch-based microencapsulation. Part four covers starch as a functional food, investigating the impact of starch on physical and mental performance, detecting nutritional starch fractions and analysing starch digestion. Starch in food is a standard reference book for those working in the food industry. Reviews starch structure and functionality Extensive coverage of the growing range of starch ingredients Examines how starch ingredients are used to improve the nutritional and sensory quality of food

Bulk Solids Handling

This book has been conceived to provide guidance on the theory and design of cyclone systems. For those new to the topic, a cyclone is, in its most basic form, a stationary mechanical device that utilizes centrifugal force to separate solid or liquid particles from a carrier gas. Gas enters near the top via a tangential or vaned inlet, which gives rise to an axially descending spiral of gas and a centrifugal force field that causes the incoming particles to concentrate along, and spiral down, the inner walls of the separator. The thus-segregated particulate phase is allowed to exit out an underflow pipe while the gas phase constricts, and - in most separators - reverses its axial direction of flow and exits out a separate overflow pipe. Cyclones are applied in both heavy and light industrial applications and may be designed as either classifiers or separators. Their applications are as plentiful as they are varied. Examples include their use in the separation or classification of powder coatings, plastic fines, sawdust, wood chips, sand, sintered/powdered metal, plastic and metal pellets, rock and mineral screenings, carbon fines, grain products, pulverized coal, chalk, coal and coal ash, catalyst and petroleum coke fines, mist entrained off of various processing units and liquid components from scrubbing and drilling operations. They have even been applied to separate foam into its component gas and liquid phases in recent years.

Principles of Powder Technology

Current Awareness in Particle Technology

This book offers a comprehensive coverage of process simulation and flowsheeting, useful for undergraduate students of Chemical Engineering and Process Engineering as theoretical and practical support in Process Design, Process Simulation, Process Engineering, Plant Design, and Process Control courses. The

main concepts related to process simulation and application tools are presented and discussed in the framework of typical problems found in engineering design. The topics presented in the chapters are organized in an inductive way, starting from the more simplistic simulations up to some complex problems.

Separation of Light Dispersions in Long Hydrocyclones

Covers a Host of Groundbreaking Techniques Thermal processing is known to effectively control microbial populations in food, but the procedure also has a downside—it can break down the biochemical composition of foods, resulting in a marked loss of sensory and nutritional quality. *Processing Effects on Safety and Quality of Foods* delineates three decades of advances made in processing techniques that produce microbiologically safe foods, while maintaining their sensory and nutritive properties. Addresses the Entire Food Processing Industry With an international team of more than 35 renowned contributors, this book presents evaluation techniques that yield reliable estimations of microbiological, physicochemical, nutritive, and sensory characteristics. Each chapter discusses the processing effects of relevant technologies and includes the basics of microbial kinetics, sensory evaluation, and the perception of food quality. A sampling of the techniques covered: Hermetically sealed containers Acrylamide formation Dried foods Irradiated foods Pressure-assisted thermal processing Pulsed electric field processing *Processing Effects on Safety and Quality of Foods* addresses the entire food processing industry, including food modeling, optimization, and proper design of manufacturing plants. It is the first of its kind—a single, sound reference that explores all of the different aspects involved in evaluating processing effects in food safety and quality.

Quality in Non-ferrous Pyrometallurgy

Solid-Liquid Separation, Third Edition reviews the equipment and principles involved in the separation of solids and liquids from a suspension. Some important aspects of solid-liquid separation such as washing, flotation, membrane separation, and magnetic separation are discussed. This book is comprised of 23 chapters and begins with an overview of solid-liquid separation processes and the principles involved, including flotation, gravity sedimentation, cake filtration, and deep bed filtration. The following chapters focus on the characterization of particles suspended in liquids; the efficiency of separation of particles from fluids; coagulation and flocculation; gravity thickening; and the operating characteristics, optimum design criteria, and applications of hydrocyclones. The reader is also introduced to various solid-liquid separation processes such as centrifugal sedimentation, screening, and filtration, along with the use of filter aids. Countercurrent washing of solids and problems associated with fine particle recycling are also considered. The final chapter is devoted to the thermodynamics of particle-fluid interaction. This monograph will be useful to chemical engineers and process engineers, particularly those in plant operation, plant design, or equipment testing and commissioning. It can also be used as a textbook for both undergraduate and postgraduate students.

Solid-Liquid Separation in the Mining Industry

Reference work for chemical and process engineers. Newest developments, advances, achievements and methods in various fields.

Process Analysis and Simulation in Chemical Engineering

This book covers virtually all of the engineering science and technological aspects of separating water from particulate solids in the mining industry. It starts with an introduction to the field of mineral processing and the importance of water in mineral concentrators. The consumption of water in the various stages of concentration is discussed, as is the necessity of recovering the majority of that water for recycling. The book presents the fundamentals under which processes of solid-liquid separation are studied, approaching mixtures of discrete finely divided solid particles in water as a basis for dealing with sedimentation in particulate systems. Suspensions, treated as continuous media, provide the basis of sedimentation, flows through porous media and filtration. The book also considers particle aggregations, and thickening is analyzed in depth. Lastly, two chapters cover the fundamentals and application of rheology and the transport of suspensions. This work is suitable for researchers and professionals in laboratories and plants, and can also serve as additional reading for graduate courses on solid liquid separation as well as for advanced undergraduate and graduate level students for courses of fluid mechanics, solid-liquid separation, thickening, filtration and transport of suspensions in tubes and channels.

Starch in Food

Particle technology is a term used to refer to the science and technology related to the handling and processing of particles and powders. The production of particulate materials, with controlled properties tailored to subsequent processing and applications, is of major interest to a wide range of industries, including chemical and process, food, pharmaceuticals, minerals and metals companies and the handling of particles in gas and liquid solutions is a key technological step in chemical engineering. This textbook provides an excellent introduction to particle technology with worked examples and exercises. Based on feedback from students and practitioners worldwide, it has been newly edited and contains new chapters on slurry transport, colloids and fine particles, size enlargement and the health effects of fine powders. Topics covered include: Characterization (Size Analysis) Processing (Granulation, Fluidization) Particle Formation (Granulation, Size Reduction) Storage and Transport (Hopper Design, Pneumatic Conveying, Standpipes, Slurry Flow) Separation (Filtration, Settling, Cyclones) Safety (Fire and Explosion Hazards, Health Hazards) Engineering the Properties of Particulate Systems (Colloids, Respirable Drugs, Slurry Rheology) This book is essential reading for undergraduate students of chemical engineering on particle technology courses. It is also valuable supplementary reading for students in other branches of engineering, applied chemistry, physics, pharmaceuticals, mineral processing and metallurgy. Practitioners in industries in which powders are handled and processed may find it a useful starting point for gaining an understanding of the behavior of particles and powders. Review of the First Edition taken from High Temperatures - High pressures 1999 31 243 - 251 ". This is a modern textbook that presents clear-cut knowledge. It can be successfully used both for teaching particle technology at universities and for individual study of engineering problems in powder

processing."

Solid/ Liquid Separation

The previous volume of Hydrocyclones published in 1984 has been the leading teaching text on Hydrocyclones for almost three decades. Hydrocyclones Volume II takes account of further developments and research, and once again is based on short courses now attended by over 1000 participants. The two volumes together represent a comprehensive and up-to-date reference and teaching text firmly grounded in industrial practice.

Particle Size Analysis 1985

Written by a highly regarded author with industrial and academic experience, this new edition of an established bestselling book provides practical guidance for students, researchers, and those in chemical engineering. The book includes a new section on sustainable energy, with sections on carbon capture and sequestration, as a result of increasing environmental awareness; and a companion website that includes problems, worked solutions, and Excel spreadsheets to enable students to carry out complex calculations.

Proceedings of the Fourth Meeting of the Southern Hemisphere on Mineral Technology, and III Latin-American Congress on Froth Flotation

Chemical Engineering Fluid Mechanics

Crystallization Process Systems gives a clear, concise, balanced and up to date presentation of crystallization and solid-liquid separation of the crystalline product. The information is presented in a coherent, concise and logical sequence based on the fundamentals of particulate crystallization processes as systems. By emphasising the analysis, design and operation of particulate crystallization processes as systems, the reader will be able to make a better judgement about the best, cheapest and most effective production method to use. Crystallization Process Systems gives a wider view and an overview of the subject of crystallization as a whole. It provides an ideal lead-in to more specialized works such as Crystallization and Solid-Liquid Separation - also published by BH. Presents a coherent, concise and logical sequence based on the fundamentals of particulate crystallization processes as systems. Emphasis on the design and optimization of the crystallization processing system

APCOM '98

Numerical Methods in Multiphase Flows

Crystallization Process Systems

Powder processing. Characterizing the single particle. Characterization of powder. mixing and segregation in powders. the storage and flow of powders. Gas fluidization. Pneumatic conveying. Solid-gas separation. Size enlargement. Size reduction. Explosion and fire hazards of powders. health risks of fine powders. Flow of liquid-solid suspensions. Solid-liquid separation.

International Books in Print

Solid-Liquid Separation

Papermaking is a fascinating art and technology. The second edition of this successful 2 volume handbook provides a comprehensive view on the technical, economic, ecologic and social background of paper and board. It has been updated, revised and largely extended in depth and width including the further use of paper and board in converting and printing. A wide knowledge basis is a prerequisite in evaluating and optimizing the whole process chain to ensure efficient paper and board production. The same is true in their application and end use. The book covers a wide range of topics: * Raw materials required for paper and board manufacturing such as fibers, chemical additives and fillers * Processes and machinery applied to prepare the stock and to produce the various paper and board grades including automation and trouble shooting * Paper converting and printing processes, book preservation * The different paper and board grades as well as testing and analysing fiber suspensions, paper and board products, and converted or printed matters * Environmental and energy factors as well as safety aspects. The handbook will provide professionals in the field, e. g. papermakers as well as converters and printers, laymen, students, politicians and other interested people with the most up-to-date and comprehensive information on the state-of-the-art techniques and aspects involved in paper making, converting and printing.

Indoor Air Quality Engineering

Introduction to Particle Technology

Hydrocyclones

The Hydrocyclone reviews data on the theoretical, design, and performance aspects of the liquid cyclone, hydraulic cyclone, or hydrocyclone. The book aims to be a source of reference to those who are in industries employing the use and application of the hydrocyclone. The text covers the historical development of the cyclone; flow pattern and distribution of velocities within the cyclone body; operational characteristics and areas of application in different phase separations; and the operating and design variables affecting the performance of the hydrocyclone. Categories of cyclone; commercially available cyclone equipment; and the specific industrial applications of the hydrocyclone are also surveyed. The

text will be of practical use to industrial engineers, mechanical engineers, plant operators, miners, and researchers.

Comminution 1994

Comminution Practices

Proceedings SPE Annual Technical Conference and Exhibition

Solid Liquid Separation includes important industrial processes used for recovery and processing of solids or purification of liquids. Most of the process industries in which particulate slurries are handled use some form of solid-liquid separation and yet the subject is not adequately covered in most higher education courses. This book is designed to bring the readers up-to-date on the principles and industrial practices of solid-liquid separation and washing technology. Particular attention is given to hardware and to its evaluation, application and selection. Whilst not exclusively concerned with filtration and sedimentation, these operations will be dealt with in depth. Important variations in the available equipment will be discussed throughout the book with emphasis on basic engineering concepts, equipment selection and evaluation, solids washing, methods of pre-treatment, filter aids and other practical aspects of mechanical separation. This book is intended for engineers and scientists of graduate status who are engaged in design, production for research and development. This book is designed to bring the readers up-to-date on the principles and industrial practices of solid-liquid separation and washing technology. Particular attention is given to hardware and to its evaluation, application and selection. Whilst not exclusively concerned with filtration and sedimentation, these operations are dealt with in depth. Important variations in the available equipment are discussed throughout the book with emphasis on basic engineering concepts, equipment selection and evaluation, solids washing, methods of pre-treatment, filter aids and other practical aspects of mechanical separation. This book is intended for engineers and scientists of graduate status who are engaged in design, production for research and development. Author is the top of his field, and knows well all the latest advances in his subject area Fourth edition of a title which is respected and admired in the world of Chemical Engineering Updated and revised to match the developments in the industry

Computational Techniques and Applications, CTAC

Hydrocyclones

Mineral Processing Design and Operation

Dr. R. Peter King covers the field of quantitative modeling of mineral processing equipment and the use of these models to simulate the actual behavior of ore

dressings and coal washing as they are configured to work in industrial practice. The material is presented in a pedagogical style that is particularly suitable for readers who wish to learn the wide variety of modeling methods that have evolved in this field. The models vary widely from one unit type to another. As a result each model is described in some detail. Wherever possible model structure is related to the underlying physical processes that govern the behaviour of particulate material in the processing equipment. Predictive models are emphasised throughout so that, when combined, they can be used to simulate the operation of complex mineral processing flowsheets. The development of successful simulation techniques is a major objective of the work that is covered in the text. Covers all aspects of modeling and simulation Provides all necessary tools to put the theory into practice

JPT : Journal of Petroleum Technology

Experimental Methods and Instrumentation for Chemical Engineers

Solid/fluid separation is a major element in the processes performed in pharmaceutical, food, beverage, water, pulp and paper industries. Several books now exist on the more esoteric aspects of the techniques, but accounts of the fundamental principles involved are few. Written by two well-known chemical engineers, this book reviews the scientific and engineering bases for solid/fluid separation processes in an approachable style. Coverage focuses on fluid dynamics, gravity, centrifugal and membrane separations, filter cake formation, de-liquoring and washing. Complete with an extensive bibliography to allow readers to pursue topics in greater depth. This book will *Help readers to understand how filtration processes work *Facilitate the application of knowledge to start-up and existing processes, helping readers to improve process performance *Help ensure your equipment is appropriate for its purpose and is working optimally, saving time and money Another volume currently available from the set is: Wakeman & Tarleton: Solid/ Fluid Separation Processes: Equipment Scale-up for Liquid Filtration ISBN: 185617 4204 This book will *Help readers to understand how filtration processes work *Facilitate the application of knowledge to start-up and existing processes, helping readers to improve process performance *Help ensure your equipment is appropriate for its purpose and is working optimally, saving time and money

Chemical Process Design and Integration

Gas Cyclones and Swirl Tubes

Processing Effects on Safety and Quality of Foods

This publication is the result of the 8th European Conference on Comminution. Containing many significant contributions concerning the topic of Comminution, the book gives the reader a vital insight into the subject.

Coal Abstracts

It is with great pleasure and satisfaction that we introduce this volume which comprises the papers accepted for the 4th International Conference on Hydrocyclones held in Southampton from 23rd to 25th September 1992. As the name implies, this is the fourth Conference in the series, with the previous ones held in Cambridge in 1980, Bath in 1984 and Oxford in 1987. The papers cover a wide span of activities, from fundamental research to advances in industrial practice and, as in the earlier volumes, make a significant contribution of lasting value to the technical literature on hydrocyclones. Hydrocyclones continue to widen their appeal to engineers; besides their traditional role in mineral processing they now attract a lot of attention in chemical engineering, the oil and gas industry, power generation, the food industry, textiles, metal working, waste water treatment, pharmaceuticals, biotechnology and other industries. The reason for this continuously increasing attention is, as David Parkinson (General Manager of Conoco (UK)) said recently, that "a hydrocyclone is an engineering dream, a machine with no moving parts." Yet as this Volume clearly shows, the hydrocyclone can do so many things and do them well, whether the application is in solid-liquid, liquid-liquid or liquid-gas separation.

Perry's Chemical Engineers' Handbook

The Sampling Source Book is an invaluable guide to the world's literature on sampling and provides a timely and much needed focus on what is a diverse and important subject. Based on an exhaustive search of the world's literature, this index contains bibliographic references to journal articles, patents, conference proceedings, books, technical reports and standards. Details of databases searched and outlines are provided as to how the searches were conducted to facilitate update of the data by users of the index. The material contained in this source book has been assessed by specialists in sampling operations; assuring relevance of the material included. Comprehensive lists of suppliers of sampling equipment, consultants and professional bodies with expertise and interests in sampling are also presented.

Journal of the South African Institute of Mining and Metallurgy

Indoor Air Quality Engineering covers a wide range of indoor air quality engineering principles and applications, providing guidelines for identifying and analyzing indoor air quality problems as well as designing a system to mitigate these problems. Structured into three sections - properties and behavior of airborne pollutants, measurement and sampling efficiency, and air quality enhancement technologies - this book uses real-life examples, design problems, and solutions to illustrate engineering principles. Professionals and students in engineering, environmental sciences, public health, and industrial hygiene concerned with indoor air quality control will find Indoor Air Quality Engineering provides effective methods, technologies, and principles not traditionally covered in other texts.

The Hydrocyclone

This book provides readers with the most current, accurate, and practical fluid mechanics related applications that the practicing BS level engineer needs today in the chemical and related industries, in addition to a fundamental understanding of these applications based upon sound fundamental basic scientific principles. The emphasis remains on problem solving, and the new edition includes many more examples.

Handbook of Paper and Board

Solid-Liquid Separation

Mineral Processing Design and Operations is expected to be of use to the design engineers engaged in the design and operation of mineral processing plants and including those process engineers who are engaged in flow-sheets development. Provides an orthodox statistical approach that helps in the understanding of the designing of unit processes. The subject of mineral processing has been treated on the basis of unit processes that are subsequently developed and integrated to form a complete strategy for mineral beneficiation. Unit processes of crushing, grinding, solid-liquid separation, flotation are therefore described in some detail so that a student at graduate level and operators at plants will find this book useful. Mineral Processing Design and Operations describes the strategy of mathematical modeling as a tool for more effective controlling of operations, looking at both steady state and dynamic state models. * Containing 18 chapters that have several worked out examples to clarify process operations * Filling a gap in the market by providing up-to-date research on mineral processing * Describes alternative approaches to design calculation, using example calculations and problem exercises

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