

Handbook Of Pulping And Papermaking Second Edition

Biermann's Handbook of Pulp and Paper, Third Edition: Paper and Board Making features updated material on kraft pulping and bleaching, mechanical pulping, chemical recovery, secondary fiber recovery and utilization and papermaking. This new edition includes sections on the properties of wood, cellulose products, chemicals from wood, raw material preparation, production of dissolving grade pulp, pulp cleaning, screening and fractionation, alternative chemical recovery processes, system closure, integrated forest biorefinery, coating, finishing water circuits, paper and board grades and their properties, and more. The book includes hundreds of illustrations, charts and tables that help the reader grasp the concepts being presented. This new edition is split in to two volumes, with the second volume covering the environmental impact of papermaking industries and the chemistry of pulp. Readers will find a comprehensive reference for industry and academia that covers the entire gamut of pulp and paper mill technology. The book offers a concise, yet thorough, introduction to the process of papermaking, from the production of wood chips, to the final testing and use of the paper products. Provides comprehensive coverage on all aspects of papermaking Covers the latest science and technology in papermaking Includes traditional and biotechnological methods, a unique feature of this book Presents the environmental impact of papermaking industries Sets itself apart as a valuable reference that every pulp and papermaker/engineer/chemist will find extremely useful

Cellulose represents the most widely spread organic polymer found in nature and it was used for a long time as a raw material for paper, textiles, film and flexible packing material. Due to its accessibility in huge amounts by photosynthesis process as a renewable material, cellulose is considered at present the answer to many problems connected with sustainable development. This explains the great scientific interest for this compound along with a lot of preoccupations to systematize the accumulated information in reviews and books. This book will present the aspects of cellulose obtaining in the correlation with its integration in a new concept of biorefining. Thus usual technological steps of pulp manufacture (pulping, bleaching) will be continued with chemistry characteristics of by-products and their utilization, fiber characterization for paper obtaining, cellulose derivatives and special products resulted in cellulose processing (beads and microspheres, micro-and nano-structures, fibers production, their antibacterial properties, optical functional film, and hydrogen). This extensive book should prove to be a very useful tool for scientists, students and postgraduates working in the field of pulp, paper and cellulose derivatives aiming at opening a new era for renewable resources processed by biorefining.

This book makes it easy for you to find what effect environment has on the corrosion of metals and alloys. However, this volume offers information on additional environments including concrete, soil, groundwater, distilled water, sodium acetate and more. ThereAs also updated and expanded coverage of previously discussed environments as well as information on environments which deal with the dairy, food, brewing, aerospace, petrochemical and building industries. The environments are listed alphabetically. Each listing includes a general description of the conditions, a comment on the corrosion characteristics of various

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alloys in such a situation, a bibliography of recent articles specific to the environment, tables consolidating and comparing corrosion rates at various temperatures and concentrations for various alloys, and graphical information. Also included are summaries on the general corrosion characteristics of major metals and alloys.

Nonwood Plant Fibers for Pulp and Paper examines the use of nonwood plant fibers for pulp and paper, worldwide pulping capacity of nonwood fibers, categories of non-wood raw materials, problems associated with the utilization of non-wood fibers, pulping, bleaching, chemical recovery and papermaking of nonwood raw materials, the use of nonwood plant fibers in specific paper and paperboard grades, and the advantages and drawbacks of using nonwood fiber for papermaking and future prospects. This book gives professionals in the field the most up-to-date and comprehensive information on the state-of-the-art techniques and aspects involved in pulp and paper making from nonwood plant fibers. Provides comprehensive coverage on all aspects of pulping and papermaking of non-wood fibers Covers the latest science and technology in pulping and papermaking of non-wood fibers Focuses on biotechnological methods, a distinguishing feature of this book and its main attraction Presents valuable references related to the pulp and papermaking industry

This book is primarily a general text covering the whole sweep of the forest industries. The over-riding emphasis is on a clear, simple interpretation of the underlying science, demonstrating how such principles apply to processing operations. The book considers the broad question "what is wood?" by looking at the biology, chemistry and physics of wood structure. Wood quality is examined, and explanations are offered on how and why wood quality varies and the implications for processing. Finally, various "industrial processes" are reviewed and interpreted. All chapters have been written by specialists, but the presentation targets a generalist audience.

The production of forestry products is based on a complex chain of knowledge in which the biological material wood with all its natural variability is converted into a variety of fiber-based products, each one with its detailed and specific quality requirements. This four volume set covers the entire spectrum of pulp and paper chemistry and technology from starting material to processes and products including market demands. Supported by a grant from the Ljungberg Foundation, the Editors at the Royal Institute of Technology, Stockholm, Sweden coordinated over 30 authors from university and industry to create this comprehensive overview. This work is essential for all students of wood science and a useful reference for those working in the pulp and paper industry or on the chemistry of renewable resources.

This multi-authored handbook is a unique cross-industry resource for formulators and compounders, and an invaluable reference for the producers of formulated commodities and industrial minerals. Monographs on each of the common functional industrial minerals—*asbestos, barite, calcium carbonate, diatomite, feldspar, gypsum, hormite, kaolin, mica, nepheline syenite, perlite, pyrophyllite, silica, smectite, talc, vermiculite, wollastonite, and zeolite*—include an overview of natural and commercial varieties, market size, and application areas. These are supported by descriptions of mineral structures and the wedding of minerals and chemicals through mineral surface modification. This orientation to the minerals and their uses forms the foundation for chapters

where they are presented in the context of the overall technology of various consuming industries. Each of these industry-specific presentations covers both the chemical and mineral raw materials used by the formulator, how these are combined, and relevant test methods. These chapters serve a dual purpose. Each clarifies for technologists the function and value of the mineral constituents of their products. Equally important, they provide a primer on the technology of industries other than their own, so that raw material, formulation, processing and testing considerations can be compared and contrasted. The book concludes with a formulary demonstrating how specific mineral and chemical ingredients are actually compounded in major application areas, and technical data on scores of commercial mineral products.

This book gives emphasis to wood fiber raw materials, alternative sources of fibers for paper production, environmental issues, paper quality improvement and cost of paper production. Varieties of non-wood raw materials, including kenaf, rice straw, empty fruit bunches of palm trees, bamboo, bagasse, etc., are considered in this book. The process of fiber treatment also varied to meet paper quality improvement. Different organosolv processes of fiber treatment are discussed. Considering contemporary issues, one particular chapter analyzes the environmentally friendly way of processing non-wood fibers for paper production. The book also contains a chapter on the by-product raw materials of paper production and their profitable applications.

This book provides the most up-to-date information available on various biotechnological processes useful in the pulp and paper industry. Each of the twenty chapters covers a specific biotechnological process or technique, discussing the advantages, limitations, and future prospects of the most important and popular processes used in the industry. Topics covered include tree improvement, pulping, bleaching, deinking, fiber modification, biosolids management, and biorefining.

The book provides the most up-to-date information available on various biotechnological processes useful in the pulp and paper industry. The first edition was published in 2011, covering a specific biotechnological process or technique, discussing the advantages, limitations, and prospects of the most important and popular processes used in the industry. Many new developments have taken place in the last five years, warranting a second edition on this topic. The new edition contains about 35% new material covering topics in Laccase application in fibreboard; biotechnology in forestry; pectinases in papermaking; stickies control with pectinase; products from hemicelluloses; value added products from biorefinery lignin; use of enzymes in mechanical pulping.

The pulp and paper industry continues to expand at a phenomenal rate and it has an important role to play on the Indian economy. This imposes a difficult problem of selection. Since the amount of material that can be included in a single volume is obviously limited. Careful thought has been given to the selection with the purpose of presenting that material

which will be of the greatest interest to the greatest numbers. Paper is one of the major components of urban solid waste (household and commercial waste) and has a potential resource value when collected and reused. Recycling of the waste paper has been a practice that has prevailed in the paper industry since its inception and therefore continues. The preservation of forests and increasing environmental awareness has focussed research on exploration of new fibrous resources and less toxic pulping and bleaching processes. The use of non woody already account for 9.1% of total world papermaking capacity. A variety of non woody plant fibres are used for papermaking. Paper converting refers to the processing of raw paper to produce improved grade of paper or a finished paper article. There are two types of paper converting; wet converting and dry converting. The Indian paper industry has close linkages with economic growth as higher industrial output leads to increased demand for industrial paper for packaging, increased marketing spend benefits the newsprint and value added segments, and increased education and office activities increase demand for writing and printing paper. It is estimated that there is an economic growth of 8.5% for India which will benefit the demand for paper. This book basically comprises of bio refiner mechanical pulping of bast type fibres, use of trichromatic colourimetry for measurement of brightness and yellowness of bleached pulps, finishing and converting, coating equipment, chemical and additives in papermaking, mixed pulping of jute stick and other agricultural residues etc. This book also comprises of the list of manufacturers, suppliers of plant & machinery and allied products, list of manufacturers and suppliers of raw materials, imported pulp manufacturers & suppliers imported pulp, Indian agents for imported pulp etc. This informative book will be helpful for paper technologist, paper chemists and scientists related to paper field.

Biermann's Handbook of Pulp and Paper: Paper and Board Making, Third Edition provides a thorough introduction to paper and board making, providing paper technologists recent information. The book emphasizes principles and concepts behind papermaking, detailing both the physical and chemical processes. It has been updated, revised and extended. Several new chapters have been added. Papermaking chemistry has found an adequate scope covering this important area by basics and practical application. Scientific and technical advances in refining, including the latest developments have been presented. The process of stock preparation describes the unit processes. An exhaustive overview of Chemical additives in Pulp and Paper Industry is included. Paper and pulp processing and additive chemicals are an integral part of the total papermaking process from pulp slurry, through sheet formation, to effluent disposal. Water circuits with loop designs and circuit closure are presented. The chapter on paper and board manufacture covers the different sections in the paper machine and also fabrics, rolls and roll covers, and describes the different types of machines producing the various paper and board grades. Coating is dealt with in a separate chapter covering color formulation and preparation and also coating application. Paper finishing gives an insight into what happens at roll slitting

and handling. The chapter on environmental impact includes waste water treatment and handling, air emissions, utilization and solid residue generation and mitigation . The major paper and board grades and their properties, are described. Biotechnological methods for paper processing are also presented. This handbook is essential reading for Applied Chemists, Foresters, Chemical Engineers, Wood Scientists, and Pulp and Paper technologist/ Engineers, and anyone else interested or involved in the pulp and paper industry. Provides comprehensive coverage on all aspects of papermaking Covers the latest science and technology in papermaking Includes traditional and biotechnological methods, a unique feature of this book Presents the environmental impact of papermaking industries Sets itself apart as a valuable reference that every pulp and papermaker/engineer/chemist will find extremely useful

Paper and pulp chemicals represent more than a \$10 billion a year global industry. This new publication describes more than 7500 paper and pulp chemicals used in every aspect of paper and pulp manufacture. This reference profiles trade name and generic chemical additives that serve the following functions in all aspects of the manufacturing process: Binders; Biocides/Slimicides; Bleaching agents; Coagulants; Coating polymers; Creping aids; Defoamers; Deinking agents; Dispersants; Drainage/Retention aids; Dry-strength additives; Dyes/Pigments; Effluent treatment aids; Fillers; Flocculants; Fluorochemicals; Formation aids; Grease/Oil repellents; Optical brighteners; Pitch and Deposit control agents; Pulping specialties; Release agents; Resins; Sizing agents; Water repellents; Wet-web strength additives.

To achieve full utilization of each harvested tree, interest centers on use of all of the tree components. The objective of the study is to determine the influence of the morphological characteristics of pulp fiber from 12 western U.S. softwood species, representative of a wide range of fiber. The effect of the morphology of the wood pulp fiber as distinguished from that of the wood fiber is emphasized because differences in performance of fiber-based products are traced to the pulp fiber. Interrelationships of fiber morphology and pulp sheet properties are discussed. The results indicate that it is not possible to fully characterize the performance of a pulp by a single morphological characteristic and that the morphological characteristics significantly influence strength properties of sheets.

Handbook of Chemical Vapor Deposition: Principles, Technology and Applications provides information pertinent to the fundamental aspects of chemical vapor deposition. This book discusses the applications of chemical vapor deposition, which is a relatively flexible technology that can accommodate many variations. Organized into 12 chapters, this book begins with an overview of the theoretical examination of the chemical vapor deposition process. This text then describes the major chemical reactions and reviews the chemical vapor deposition systems and equipment used in research and production. Other chapters consider the materials deposited by chemical vapor deposition. This book discusses as well the potential applications of chemical vapor deposition in semiconductors and electronics. The final chapter deals with ion implantation as a major process in the

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fabrication of semiconductors. This book is a valuable resource for scientists, engineers, and students. Production and marketing managers and suppliers of equipment, materials, and services will also find this book useful.

Although the title of this book is Paper Chemistry, it should be considered as a text about the chemistry of the formation of paper from aqueous suspensions of fibre and other additives, rather than as a book about the chemistry of the raw material itself. It is the subject of what papermakers call wet-end chemistry. There are many other excellent texts on the chemistry of cellulose and apart from one chapter on the accessibility of cellulose, the subject is not addressed here. Neither does the book deal with the chemistry of pulp preparation (from wood, from other plant sources or from recycled fibres), for there are also many excellent texts on this subject. The first edition of this book was a great success and soon became established as one of the Bibles of the industry. Its achievement then was to collect the considerable advances in understanding which had been made in the chemistry of papermaking in previous years, and provide, for the first time, a sound physico chemical basis of the subject. This new edition has been thoroughly updated with much new material added. The formation of paper is a continuous filtration process in which cellulosic fibres are formed into a network which is then pressed and dried. The important chemistry involved in this process is firstly the retention of colloidal material during filtration and secondly the modification of fibre and sheet properties so as to widen the scope for the use of paper and board products.

A comprehensive reference book for those with interest in, or need to know, how operations in the world's factories work, and how common products, components, and materials are made.

Presenting effective, practicable strategies modeled from ultramodern technologies and framed by the critical insights of 78 field experts, this vastly expanded Second Edition offers 32 chapters of industry- and waste-specific analyses and treatment methods for industrial and hazardous waste materials-from explosive wastes to landfill leachate to w

Designed to serve as a new educational tool for pulp and paper science courses and as an extensive resource for industry professionals. Rather than focus on the many types of equipment in use, this book emphasizes the principles of pulp and paper processes.

Part I: Process design -- Introduction to design -- Process flowsheet development -- Utilities and energy efficient design -- Process simulation -- Instrumentation and process control -- Materials of construction -- Capital cost estimating -- Estimating revenues and production costs -- Economic evaluation of projects -- Safety and loss prevention -- General site considerations -- Optimization in design -- Part II: Plant design -- Equipment selection, specification and design -- Design of pressure vessels -- Design of reactors and mixers -- Separation of fluids -- Separation columns (distillation, absorption and extraction) -- Specification and design of solids-handling equipment -- Heat transfer equipment -- Transport and storage of fluids.

Everyone involved in paper making knows Asten as a world class manufacturer of paper machine clothing. Perhaps less well known is that Asten started in this industry more than 120 years ago. Since then the company has taken advantage of modern manufacturing techniques to produce innovative products needed by the growing paper making industry. That is why Asten

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commissioned Dr. Sabit Adanur to write this book - to continue spreading sophisticated papermaking knowledge throughout the global paper industry. This book discusses how the latest technological innovations help produce quality paper products. It also covers the use of TQM and computers in the papermaking process as basic paper structure and properties.

This book will focus on lignocellulosic fibres as a raw material for several applications. It will start with wood chemistry and morphology. Then, some fibre isolation processes will be given, before moving to composites, panel and paper manufacturing, characterization and aging. Paper recycling in an increasingly environmentally conscious world is gaining importance. Increased recycling activities are being driven by robust overseas markets as well as domestic demand. Recycled fibers play a very important role today in the global paper industry as a substitute for virgin pulps. Paper recovery rates continue to increase year after year. Recycling technologies have been improved in recent years by advances in pulping, flotation deinking and cleaning/screening, resulting in the quality of paper made from secondary fibres approaching that of virgin paper. The process is a lot more eco-friendly than the virgin-papermaking process, using less energy and natural resources, produce less solid waste and fewer atmospheric emissions, and helps to preserve natural resources and landfill space. Currently more than half of the paper is produced from recovered papers. Most of them are used to produce brown grades paper and board but for the last two decades, there is a substantial increase in the use of recovered papers to produce, through deinking, white grades such as newsprint, tissue, market pulp. By using recycled paper, companies can take a significant step toward reducing their overall environmental impacts. This study deals with the scientific and technical advances in recycling and deinking including new developments. Covers in great depth all the aspects of recycling technologies. Covers the latest science and technology in recycling. Provides up-to-date, authoritative information and cites many mills experiences and pertinent research. Includes the use of biotech methods for deinking, refining, and improving drainage.

The Handbook of Thin Film Deposition Techniques: Principles, Methods, Equipment and Applications, Second Edition explores the technology behind the spectacular growth in the silicon semiconductor industry and the continued trend in miniaturization over the last 20 years. This growth has been fueled in large part by improved thin film deposition techniques and the development of highly specialized equipment to enable this deposition. This second edition explains the growth of sophisticated, automatic tools capable of measuring thickness and spacing of submicron dimensions. The book covers PVD, laser and E-beam assisted deposition, MBE, and ion beam methods to bring together all of the physical vapor deposition techniques. The book also includes coverage of chemical mechanical polishing that helps attain the flatness that is required by modern lithography methods and new materials used for interconnect dielectric materials, specifically organic polyimide materials.

Biermann's Handbook of Pulp and Paper: Raw Material and Pulp Making, Third Edition is a comprehensive reference for industry and academia covering the entire gamut of pulping technology. This book provides a thorough introduction to the entire technology of pulp manufacture; features chapters covering all aspects of pulping from wood handling at the mill site through pulping and bleaching and pulp drying. It also includes a discussion on bleaching chemicals, recovery of pulping spent liquors and regeneration of chemicals used and the manufacture of side products. The secondary fiber recovery and utilization and current advances like organosolv pulping and attempts to close the cycle in bleaching plants are also included. Hundreds of illustrations, charts, and tables help the reader grasp the concepts being presented. This book will provide professionals in the field with the most up-to-date and comprehensive information on the state-of-the-art.

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techniques and aspects involved in pulp making. It has been updated, revised and extended. Alongside the traditional aspects of pulping and papermaking processes, this book also focuses on biotechnological methods, which is the distinguishing feature of this book. It includes wood-based products and chemicals, production of dissolving pulp, hexenuronic acid removal, alternative chemical recovery processes, forest products biorefinery. The most significant changes in the areas of raw material preparation and handling, pulping and recycled fiber have been included. A total of 11 new chapters have been added. This handbook is essential reading for all chemists and engineers in the paper and pulp industry. Provides comprehensive coverage on all aspects of pulp making Covers the latest science and technology in pulp making Includes traditional and biotechnological methods, a unique feature of this book Presents the environmental impact of pulp and papermaking industries Sets itself apart as a valuable reference that every pulp and papermaker/engineer/chemist will find extremely useful

In its Second Edition, Handbook of Pulping and Papermaking is a comprehensive reference for industry and academia. The book offers a concise yet thorough introduction to the process of papermaking from the production of wood chips to the final testing and use of the paper product. The author has updated the extensive bibliography, providing the reader with easy access to the pulp and paper literature. The book emphasizes principles and concepts behind papermaking, detailing both the physical and chemical processes. A comprehensive introduction to the physical and chemical processes in pulping and papermaking Contains an extensive annotated bibliography Includes 12 pages of color plates

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.

In its broadest sense, and according to the traditional conception, wood chemistry is a comprehensive discipline, ranging from fundamental studies to practical applications. The manifold constituents, located in different morphological regions in the wood, results in an extreme complexity of wood chemistry. Ever more sophisticated endeavors needing fundamental studies and advanced analytical methods are necessary in order to delve deeper into various problems in pulping and papermaking. Gradually, new, improved analytical methods, originally developed for research purposes, are currently replacing many of the old "routine" methods in practical applications. Because of the expanse of the subject, an attempt to write a book of this size about analytical methods seems, perhaps, too ambitious. Of course, a whole book series of several volumes would be necessary to cover this topic completely. However, there is undoubtedly a need for a more condensed presentation which does not go into experimental details, but is limited to the basic principles of the analytical methods and illustrates their applications. The emphasis is on more advanced and potential methods, and particularly on those based on different types of

spectroscopy and chromatography.

Pulp and Paper Industry: Chemical Recovery examines the scientific and technical advances that have been made in chemical recovery, including the very latest developments. It looks at general aspects of the chemical recovery process and its significance, black liquor evaporation, black liquor combustion, white liquor preparation, and lime reburning. The book also describes the technologies for chemical recovery of nonwood black liquor, as well as direct alkali regeneration systems in small pulp mills. In addition, it includes a discussion of alternative chemical recovery processes, i.e. alternative causticization and gasification processes, and the progress being made in the recovery of filler, coating color, and pigments. Furthermore, it discusses the utilization of new value streams (fuels and chemicals) from residuals and spent pulping liquor, including related environmental challenges. Offers thorough and in-depth coverage of scientific and technical advances in chemical recovery in pulp making
Discusses alternative chemical recovery processes, i.e., alternative causticization and gasification processes
Covers the progress being made in the recovery of filler, coating color, and pigments
Examines utilization of new value streams (fuels and chemicals) from residuals and spent pulping liquor
Discusses environmental challenges (air emissions, mill closure)
Presents ways in which the economics, energy efficiency, and environmental protection associated with the recovery process can be improved
This book covers all aspects of physical vapor deposition (PVD) process technology from the characterizing and preparing the substrate material, through deposition processing and film characterization, to post-deposition processing. The emphasis of the book is on the aspects of the process flow that are critical to economical deposition of films that can meet the required performance specifications. The book covers subjects seldom treated in the literature: substrate characterization, adhesion, cleaning and the processing. The book also covers the widely discussed subjects of vacuum technology and the fundamentals of individual deposition processes. However, the author uniquely relates these topics to the practical issues that arise in PVD processing, such as contamination control and film growth effects, which are also rarely discussed in the literature. In bringing these subjects together in one book, the reader can understand the interrelationship between various aspects of the film deposition processing and the resulting film properties. The author draws upon his long experience with developing PVD processes and troubleshooting the processes in the manufacturing environment, to provide useful hints for not only avoiding problems, but also for solving problems when they arise. He uses actual experiences, called "war stories", to emphasize certain points. Special formatting of the text allows a reader who is already knowledgeable in the subject to scan through a section and find discussions that are of particular interest. The author has tried to make the subject index as useful as possible so that the reader can rapidly go to sections of particular interest. Extensive references allow the reader to pursue subjects in greater detail if desired. The book is intended to be both an introduction for those who are new to the field and a valuable resource to those already in the field. The discussion of transferring technology between R&D and manufacturing provided in Appendix 1, will be of special interest to the manager or engineer responsible for moving a PVD product and process from R&D into production. Appendix 2 has an extensive listing of periodical publications and professional societies that relate to PVD processing. The

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extensive Glossary of Terms and Acronyms provided in Appendix 3 will be of particular use to students and to those not fully conversant with the terminology of PVD processing or with the English language.

The job of any reservoir engineer is to maximize production from a field to obtain the best economic return. To do this, the engineer must study the behavior and characteristics of a petroleum reservoir to determine the course of future development and production that will maximize the profit. Fluid flow, rock properties, water and gas coning, and relative permeability are only a few of the concepts that a reservoir engineer must understand to do the job right, and some of the tools of the trade are water influx calculations, lab tests of reservoir fluids, and oil and gas performance calculations. Two new chapters have been added to the first edition to make this book a complete resource for students and professionals in the petroleum industry: Principles of Waterflooding, Vapor-Liquid Phase Equilibria.

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Implementing Cleaner Production in the pulp and paper industry The large—and still growing—pulp and paper industry is a capital- and resource-intensive industry that contributes to many environmental problems, including global warming, human toxicity, ecotoxicity, photochemical oxidation, acidification, nutrification, and solid wastes. This important reference for professionals in the pulp and paper industry details how to improve manufacturing processes that not only cut down on the emission of pollutants but also increase productivity and decrease costs. Environmentally Friendly Production of Pulp and Paper guides professionals in the pulp and paper industry to implement the internationally recognized process of Cleaner Production (CP). It provides updated information on CP measures in: Raw material storage and preparation Pulping processes (Kraft, Sulphite, and Mechanical) Bleaching, recovery, and papermaking Emission treatment and recycled fiber processing In addition, the book includes a discussion on recent cleaner technologies and their implementation status and benefits in the pulp and paper industry. Covering every aspect of pulping and papermaking essential to the subject of reducing pollution, this is a must-have for paper and bioprocess engineers, environmental engineers, and corporations in the forest products industry.

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