

## **By Pratima Bajpai Black Liquor Gasification 1st Frist Edition Paperback**

Handbook of Pulping and Papermaking  
Biotechnology for Pulp and Paper Processing  
Biotechnology for Environmental Protection in the Pulp and Paper Industry  
Studies in Jaina History and Culture  
Carbon Fibre from Lignin  
Biermann's Handbook of Pulp and Paper  
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Green Chemistry and Sustainability in Pulp and Paper Industry  
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Appita Journal  
Optimization and Applicability of Bioprocesses  
Essentials of Pulping and Papermaking  
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Advanced Materials for Agriculture, Food, and Environmental Safety  
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Biotechnology in the Chemical Industry  
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Pulp and Paper Mill Waste Heavy Oil Recovery and Upgrading Pretreatment of  
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Coastal Vulnerability Recent Advancement in White Biotechnology Through Fungi

## **Handbook of Pulping and Papermaking**

Xenobiotic compounds including pesticides, nitrophenols, pyridine, polycyclic aromatic compounds and polychlorinated biphenyls are widely spread in environment due to anthropogenic activities. Most of them are highly toxic to living beings due to their mutagenic and carcinogenic properties. Therefore, the removal of these compounds from environment is an essential step for environmental sustainability. Microbial remediation has emerged as an effective technology for degradation of these xenobiotic compounds as microorganisms have unique ability to utilize these compounds as their sole source of carbon and energy. The primary goal of this book is to provide detailed information of microbial degradation of many xenobiotic compounds in various microorganisms.

## **Biotechnology for Pulp and Paper Processing**

## **Biotechnology for Environmental Protection in the Pulp and**

## **Paper Industry**

Black Liquor Gasification (BLG) is a first of its kind to guide chemical engineers, students, operators of paper plants, technocrats, and entrepreneurs on practical guidelines and a holistic techno-enviro-economic perspective applicable to their future or existing projects based on the treatment of black liquor for energy production. BLG describes the gasification process as a more efficient alternative to current processes for the conversion of black liquor biomass into energy. BLG operates largely in sync with other methods to improve pulp-making efficiency. This book explains how BLG offers a way to generate electricity and to reclaim pulping chemicals from black liquor, and why BLG would replace the Tomlinson recovery boiler for the recovery of spent chemicals and energy. Describes the utilization of black liquor as a source of energy Provides a detailed account of black liquor gasification processes for the production of energy and chemicals from black liquor Provides guidelines to chemical engineers for the treatment of black liquor

## **Studies in Jaina History and Culture**

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

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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

### **Carbon Fibre from Lignin**

Biomass to Energy Conversion Technologies: The Road to Commercialization examines biomass production, biomass types, properties and characterization, and energy conversion technologies with an emphasis on the production of a gaseous fuel to supplement the gas derived from the landfilling of organic wastes (landfill gas) and used in gas engines to produce electricity. The book discusses the integration of both fermentation and anaerobic digestion in a biorefinery concept that allows the production of ethanol—along with biogas—to be used to produce heat and electricity, thus improving overall energy balance. Included case studies

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based on worldwide projects discuss both risks and challenges. The main studies on the combination of both bioethanol and biogas production processes are reviewed and the strength and weakness of the integrated treatment for industrial application are highlighted. The book also considers gasification technologies and their potential for biomass gasification and lists the advantages and disadvantages of using of biomass as a source of energy, the path of commercialization of the various processes, energy related environmental issues. Highlights commercialization and technological risks Discusses challenges, limitations and future prospects of third- and fourth generation biofuels Includes integration of both fermentation and anaerobic digestion in a biorefinery concept Discusses energy related environment issues (Greenhouse effect, acid rain, air pollution)

### **Biermann's Handbook of Pulp and Paper**

This book provides researchers and advanced students associated with plant and pharmaceutical sciences with comprehensive information on medicinal trees, including their identification, morphological characteristics, traditional and economic uses, along with the latest research on their medicinal compounds. The text covers the ecological distribution of over 150 trees, which are characterized mainly on the basis of their unique properties and phytochemicals of medicinal importance (i.e., anti-allergic, anti-diabetic, anti-carcinogenic, anti-microbial, and possible anti-HIV compounds). Due to the incredibly large diversity of medicinal

trees, it is not possible to cover all within one publication, so trees with unique medicinal properties that are relatively more common in many countries are discussed here in order to make it most informative for a global audience. With over 100 illustrations taken at different stages of plant development, this reference work serves as a tool for tree identification and provides morphological explanations. It includes the latest botanical research, including biochemical advancements in phytochemistry techniques such as chromatographic and spectrometric techniques. In addition, the end of each chapter presents the most up-to-date references for further sources of exploration.

## **Fuel Flexible Energy Generation**

The book focuses on the role of advanced materials in the food, water and environmental applications. The monitoring of harmful organisms and toxicants in water, food and beverages is mainly discussed in the respective chapters. The senior contributors write on the following topics: Layered double hydroxides and environment Corrosion resistance of aluminium alloys of silanes New generation material for the removal of arsenic from water Prediction and optimization of heavy clay products quality Enhancement of physical and mechanical properties of fiber Environment friendly acrylates latices Nanoparticles for trace analysis of toxins Recent development on gold nanomaterial as catalyst Nanosized metal oxide based adsorbents for heavy metal removal Phytosynthesized transition metal

nanoparticles- novel functional agents for textiles Kinetics and equilibrium modeling Magnetic nanoparticles for heavy metal removal Potential applications of nanoparticles as antipathogens Gas barrier properties of biopolymer based nanocomposites: Application in food packing Application of zero-valent iron nanoparticles for environmental clean up Environmental application of novel TiO<sub>2</sub> nanoparticles

## **Gasification for Synthetic Fuel Production**

This book focuses on bioconversion of lignocellulosic residues into single-cell protein, which offers an alternative to conventional proteins (such as soybean meal, egg protein or meat protein in animal feed) that is not affected by the climate. It provides an overview of the general uses of lignocellulosic residues and their bioconversion into single-cell protein using microorganisms, as well as the recovery of the valuable by-products. It also explores the benefits and potential drawbacks of single-cell protein, with an emphasis on the economic advantages of such processes. Given its multidisciplinary scope, the book represents a valuable resource for academics and industry practitioners interested in the production of single-cell protein from lignocellulosic residues.

## **Microbial Metabolism of Xenobiotic Compounds**

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This book presents detailed information on the production and properties of carbon fibers derived from lignin precursors. Focusing on future directions in the carbon fiber industry, it also introduces a novel process for obtaining high-purity lignin, a key aspect in the manufacture of high-quality carbon fiber. Carbon fiber is currently the most preferred lightweight manufacturing material and is rapidly becoming the material of choice for manufacturers around the world. Although more than 80% of commercial carbon fiber is estimated to use PAN (polyacrylonitrile) as a precursor, carbon fiber manufactured from PAN is expensive and therefore its application is limited to high-performance structural materials. Lignin is the second most abundant biopolymer in nature after cellulose and offers a carbon-rich, renewable resource. As a byproduct of the pulp and paper industry and the production of cellulosic ethanol, lignin is also available at low cost, making it an economically attractive alternative to PAN for the production of carbon fibers, as highlighted in this book. The information presented will be of interest to all those involved in the investigation of carbon fiber materials, carbon fiber manufacturers and carbon fiber users.

### **Green Chemistry and Sustainability in Pulp and Paper Industry**

The traditional pulp and paper producers are facing new competitors in tropical and subtropical regions who use the latest and largest installed technologies, and also have wood and labor cost advantages. Due to the increasing global

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competition, the forest products prices will continue to decrease. To remain viable, the traditional producers need to increase revenue by producing bioenergy and biomaterials in addition to wood, pulp, and paper products. In this so-called Integrated Products Biorefinery, all product lines are highly integrated and energy efficient. Integrated Products Biorefineries present the forest products industry with a unique opportunity to increase revenues and improve environmental sustainability. Integrated Products Biorefinery technologies will allow industry to manufacture high-value chemicals, fuels, and/or electric power while continuing to produce traditional wood, pulp, and paper products. The industry already controls much of the raw material and infrastructure necessary to create Integrated Products Biorefineries, and Agenda 2020 partnerships are speeding development of the key enabling technologies. Once fully developed and commercialized, these technologies will produce enormous energy and environmental benefits for the industry and the nation. Biorefinery in the Pulp and Paper Industry presents the biorefining concept, the opportunities for the pulp and paper industry, and describes and discusses emerging biorefinery process options. This book also highlights the environmental impact and the complex and ambiguous decision-making challenges that mills will face when considering implementing the biorefinery. Provides up-to-date and authoritative information, citing pertinent research, on this timely and important topic Covers in great depth the biorefining concept, opportunities for the pulp and paper industry, and emerging biorefinery process options Highlights the environmental impact and the complex and

ambiguous decision-making challenges that mills will face when considering implementing the biorefinery

## **Reviews of Environmental Contamination and Toxicology**

This book discusses the latest developments in plant-mediated fabrication of metal and metal-oxide nanoparticles, and their characterization by using a variety of modern techniques. It explores in detail the application of nanoparticles in drug delivery, cancer treatment, catalysis, and as antimicrobial agent, antioxidant and the promoter of plant production and protection. Application of these nanoparticles in plant systems has started only recently and information is still scanty about their possible effects on plant growth and development. Accumulation and translocation of nanoparticles in plants, and the consequent growth response and stress modulation are not well understood. Plants exposed to these particles exhibit both positive and negative effects, depending on the concentration, size, and shape of the nanoparticles. The impact on plant growth and yield is often positive at lower concentrations and negative at higher ones. Exposure to some nanoparticles may improve the free-radical scavenging potential and antioxidant enzymatic activities in plants and alter the micro-RNAs expression that regulate the different morphological, physiological and metabolic processes in plant system, leading to improved plant growth and yields. The nanoparticles also carry out genetic reforms by efficient transfer of DNA or complete plastid genome into the respective plant

genome due to their miniscule size and improved site-specific penetration. Moreover, controlled application of nanomaterials in the form of nanofertilizer offers a more synchronized nutrient fluidity with the uptake by the plant exposed, ensuring an increased nutrient availability. This book addresses these issues and many more. It covers fabrication of different/specific nanomaterials and their wide-range application in agriculture sector, encompassing the controlled release of nutrients, nutrient-use efficiency, genetic exchange, production of secondary metabolites, defense mechanisms, and the growth and productivity of plants exposed to different manufactured nanomaterials. The role of nanofertilizers and nano-biosensors for improving plant production and protection and the possible toxicities caused by certain nanomaterials, the aspects that are little explored by now, have also been generously elucidated.

## **Bleach Plant Effluents from the Pulp and Paper Industry**

Heavy Oil Recovery and Upgrading covers properties, factors, methods and all current and upcoming processes, giving engineers, new and experienced, the full spectrum of recovery choices, including SAGD, horizontal well technology, and hybrid approaches. Moving on to the upgrading and refining of the product, the book also includes information on in situ upgrading, refining options, and hydrogen production. Rounding out with environmental effects, management methods on refinery waste, and the possible future configurations within the refinery, this book

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provides engineers with a single source to make decisions and manage the full range of challenges. Presents the properties, mechanisms, screening criteria and field applications for heavy oil enhanced recovery projects Includes current upgrading options and future methods for refining heavy oil development Fills in the gaps between literature and practical application for everyday industry reference

### **Biomass to Energy Conversion Technologies**

The last ten years have seen interest in Jainism increasing, with this previously little-known Indian religion assuming a significant place in religious studies. *Studies in Jaina History and Culture* breaks new ground by investigating the doctrinal differences and debates amongst the Jains rather than presenting Jainism as a seamless whole whose doctrinal core has remained virtually unchanged throughout its long history. The focus of the book is the discourse concerning orthodoxy and heresy in the Jaina tradition, the question of omniscience and Jaina logic, role models for women and female identity, Jaina schools and sects, religious property, law and ethics. The internal diversity of the Jaina tradition and Jain techniques of living with diversity are explored from an interdisciplinary point of view by fifteen leading scholars in Jaina studies. The contributors focus on the principal social units of the tradition: the schools, movements, sects and orders, rather than Jain religious culture in abstract. Peter Flügel provides a representative

snapshot of the current state of Jaina studies that will interest students and academics involved in the study of religion or South Asian cultures.

## **Lignin Chemistry and Applications**

This book features in-depth and thorough coverage of Minimum Impact Mill Technologies which can meet the environmental challenges of the pulp and paper industry and also discusses Mills and Fiberlines that encompass “State-of-the-Art” technology and management practices. The minimum impact mill does not mean "zero effluent", nor is it exclusive to one bleaching concept. It is a much bigger concept which means that significant progress must be made in the following areas: Water Management, Internal Chemical Management, Energy Management, Control and Discharge of Non-Process Elements and Removal of Hazardous Pollutants. At the moment, there is no bleached kraft pulp mill operating with zero effluent. With the rise in environmental awareness due to the lobbying by environmental organizations and with increased government regulation there is now a trend towards sustainability in the pulp and paper industry. Sustainable pulp and paper manufacturing requires a holistic view of the manufacturing process. During the last decade, there have been revolutionary technical developments in pulping, bleaching and chemical recovery technology. These developments have made it possible to further reduce loads in effluents and airborne emissions. Thus, there has been a strong progress towards minimum impact mills in the pulp and

paper industry. The minimum-impact mill is a holistic manufacturing concept that encompasses environmental management systems, compliance with environmental laws and regulations and manufacturing technologies.

## **Steam Generation from Biomass**

Gasification involves the conversion of carbon sources without combustion to syngas, which can be used as a fuel itself or further processed to synthetic fuels. The technology provides a potentially more efficient means of energy generation than direct combustion. This book provides an overview of gasification science and engineering and the production of synthetic fuels by gasification from a variety of feedstocks. Part one introduces gasification, reviewing the scientific basis of the process and gasification engineering. Part two then addresses gasification and synthetic fuel production processes. Finally, chapters in part three outline the different applications of gasification, with chapters on the conversion of different types of feedstock. Examines the design of gasifiers, the preparation of feedstocks, and the economic, environmental and policy issues related to gasification Reviews gasification processes for liquid fuel production Outlines the different applications of gasification technology

## **Journal of Biotechnology**

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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 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

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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

### **Bioconversion Processes**

Pulp and Paper Industry: Energy Conservation presents a number of energy-efficient technologies and practices that are cost-effective and available for implementation today. Emerging energy-efficient technologies and future prospects in this field are also dealt with. Qualitative and quantitative results/data on energy savings for various steps of pulp and paper making process are presented. There is no specific book on this topic. This will be a comprehensive reference in the field. Thorough and in-depth coverage of energy-efficient technologies and practices in paper and pulp industry Presents cost-effective and available for implementation today technologies Discusses Biotechnological processes, especially enzymatic processes in the pulp and paper industry to reduce the energy consumption and improve the product quality Presents qualitative and quantitative results/data on energy savings for various steps of pulp and paper making process

## **Environmentally Friendly Production of Pulp and Paper**

Lignin Chemistry and Application systematically discusses the structure, physical and chemical modification of lignin, along with its application in the field of chemicals and materials. It presents the history of lignin chemistry and lignin-modified materials, describes recent progresses, applications and studies, and prospects the development direction of high value applications of lignin in the field of material science. In addition to covering the basic theories and technologies relating to the research and application of lignin in polymer chemistry and materials science, the book also summarizes the latest applications in rubber, engineering plastics, adhesives, films and hydrogels. Systematically discusses the structure, physical and chemical modification of lignin and its application in materials Presents the latest research results in the field of lignin Indicates the development direction of high value applications of lignin in a range of fields, including petrochemicals, household applications, medicine, agriculture, and more

## **Appita Journal**

## **Optimization and Applicability of Bioprocesses**

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Fuel Flexible Energy Generation: Solid, Liquid and Gaseous Fuels provides updated information on flexible fuel energy generation, the process by which one or more fuels can be combusted in the same boiler or turbine to generate power. By adapting or building boilers and turbines to accept multiple fuel sources, they can be co-fired with biomass and waste derived fuels, allowing a reduction in carbon output, thus providing cleaner energy. Fuel flexibility is becoming more important in a world of diminishing fossil fuel stocks. Many countries are investing in the development of more efficient fuel flexible boilers and turbines, and their use is becoming more prevalent in industry as well. This book provides comprehensive coverage of flexible fuel energy generation across all potential fuel types, and was written by a selection of experts in the field who discuss the types of fuels which can be used in fuel flexible energy generation, from solid fuels to biomass fuels, the preparation of fuels to be used in fuel flexible operations, that includes their handling and transport, and combustion and conversion technologies with chapters ranging from large-scale coal gasification to technology options and plant design issues. Focuses on fuel flexibility across all potential fuel types Includes thorough treatment of the technology being developed to allow for fuel flexibility Written by leading experts in the field Provides an essential text for R&D managers in firms which produce boilers or turbines, those who work in the fuel industry, and academics working in engineering departments on energy generation

## **Essentials of Pulping and Papermaking**

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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

## **Biological Odour Treatment**

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.

## **Advanced Materials for Agriculture, Food, and Environmental Safety**

Pigeonpea (*Cajanus cajan*) is a crop of small land holding farmers in arid and semi-arid regions of the world. It has a number of usages starting from protein rich food to vegetarian families; fuel wood; nitrogen supplier to soil; recycling minerals in soil to animal feed etc. Pigeonpea has been considered to be originated and domesticated in central India from where it travelled to different parts of the world

such as Africa and Latin America. In ongoing scenario of climate change, biotic and especially abiotic stresses will make the conditions more challenging for entire agriculture. This volume focusing on the pigeonpea genome will collate the information on the genome sequencing and its utilization in genomics activities, with a focus on the current findings, advanced tools and strategies deployed in pigeonpea genome sequencing and analysis, and how this information is leading to direct outcomes for plant breeders and subsequently to farmers.

## **Nanomaterials and Plant Potential**

This work discusses the generation and environmental impact of organochlorine compounds and the various approaches used to minimize their generation both at the source and end-of pipe.

## **Medicinally Important Trees**

White biotechnology is industrial biotechnology dealing with various biotech products through applications of microbes. The main application of white biotechnology is commercial production of various useful organic substances, such as acetic acid, citric acid, acetone, glycerine, etc., and antibiotics like penicillin, streptomycin, mitomycin, etc., and value added product through the use of

microorganisms especially fungi and bacteria. The value-added products included bioactive compounds, secondary metabolites, pigments and industrially important enzymes for potential applications in agriculture, pharmaceuticals, medicine and allied sectors for human welfare. In the 21st century, techniques were developed to harness fungi to protect human health (through antibiotics, antimicrobial, immunosuppressive agents, value-added products etc.), which led to industrial scale production of enzymes, alkaloids, detergents, acids, biosurfactants. The first large-scale industrial applications of modern biotechnology have been made in the areas of food and animal feed production (agricultural/green biotechnology) and pharmaceuticals (medical/red biotechnology). In contrast, the production of bioactive compounds through fermentation or enzymatic conversion is known industrial or white biotechnology. The beneficial fungal strains may play important role in agriculture, industry and the medical sectors. The beneficial fungi play a significance role in plant growth promotion, and soil fertility using both, direct (solubilization of phosphorus, potassium and zinc; production of indole acetic acid, gibberellic acid, cytokinin and siderophores) and indirect (production of hydrolytic enzymes, siderophores, ammonia, hydrogen cyanides and antibiotics) mechanisms of plant growth promotion for sustainable agriculture. The fungal strains and their products (enzymes, bio-active compounds and secondary metabolites) are very useful for industry. The discovery of antibiotics is a milestone in the development of white biotechnology. Since then, white biotechnology has steadily developed and now plays a key role in several industrial sectors, providing both high valued

nutraceuticals and pharmaceutical products. The fungal strains and bio-active compounds also play important role in the environmental cleaning. This volume covers the latest research developments related to value-added products in white biotechnology through fungi.

## **Biotechnology in the Chemical Industry**

Biotechnology in the Chemical Industry: Towards a Green and Sustainable Future focuses on achievements and prospects for biotechnology in sustainable production of goods and services, especially those that are derived at present mostly from the traditional chemical industry. It considers the future impact of industrial biotechnology and lays out the major research areas which must be addressed to move from a flourishing set of scientific disciplines to a major contributor to a successful future knowledge-based economy. The book focuses on the research needed to underpin three broad topics: biomass, bio-processes and bio-products, including bio-energy. Readers, including advanced students, researchers, industry professionals, academics, analysts, consultants, and anyone else interested, or involved in biotechnology will find this book very informative. Offers a comprehensive introduction to the subject for researchers interested in the biotechnological applications in chemical industry Provides a state-of-the art update on the field Presents the economic and ecological advantages of industrial biotechnology Discusses efforts made by developing countries towards industrial

biotechnology Describes new biotechnological applications Includes the major challenges facing industrial biotechnology

## **Biorefinery in the Pulp and Paper Industry**

Reviews of Environmental Contamination and Toxicology attempts to provide concise, critical reviews of timely advances, philosophy and significant areas of accomplished or needed endeavor in the total field of xenobiotics, in any segment of the environment, as well as toxicological implications.

## **The Pigeonpea Genome**

This book argues that the sustainable management of resources requires a systematic approach that primarily involves the integration of green innovative biotechnological strategies and eco-engineering. It discusses how microbial community intelligence can be used for waste management and bio-remediation and explains how biological processes can be optimized by integrating genomics tools to provide perspectives on sustainable development. The book describes the application of modern molecular techniques such as fluorescence in situ hybridization (FISH), highly sensitive catalyzed reporter deposition (CARD)-FISH, in situ DNA-hybridization chain reaction (HCR) and methods for detecting mRNA

and/or functional genes to optimize bioprocessess. These techniques, supplemented with metagenomic analysis, reveal that a large proportion of micro-organisms still remain to be identified and also that they play a vital role in establishing bioprocesses.

## **Single Cell Protein Production from Lignocellulosic Biomass**

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.

## **Black Liquor Gasification**

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.

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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.

### **Environmentally Benign Approaches for Pulp Bleaching**

Pulp and paper production has increased globally and will continue to increase in the near future. Approximately 155 millions tons of wood pulp is produced worldwide and about 260 millions is projected for 2010. To cope with the increasing demand, an increase in production and improved environmental performance is needed as the industry is under constant pressure to reduce environmental emissions to air and water. This book gives updated information on environmentally benign approaches for pulp bleaching, which can help solve the problems associated with conventional bleaching technologies. \* Main focus is on

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the environmentally friendly technologies that can help solve some of the problems associated with conventional bleaching technologies \* Information given is up-to-date, authoritative and cites the experiences of many mills and pertinent research, which is of interest to those working in the industry or intending to do so \* Covers in great depth all the aspects of various bleaching processes including environmental issues

### **Pulp and Paper Industry**

Steam Generation from Biomass: Construction and Design of Large Boilers provides in-depth coverage of steam generator engineering for biomass combustion. It presents the design process and the necessary information needed for an understanding of not only the function of different components of a steam generator, but also what design choices have been made. Professor Vakkilainen explores each particular aspect of steam generator design from the point-of-view of pressure part design, mechanical design, layout design, process design, performance optimization, and cost optimization. Topics such as fuels and their emissions, steam-water circulation, auxiliary equipment, availability and reliability, measurements and control, manufacture, erection, and inspection are covered. Special attention is given to recovery boilers and fluidized bed boilers, and automated design and dimensioning calculation spreadsheets are available for download at the book's companion website. This book is intended for both design

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engineers and steam boiler operators, as well as those involved in plant management and equipment purchasing. Provides a complete overview of biomass steam boilers, including processes, phenomena, and nomenclature Presents a clear view of how biomass boilers differ from fossil fuel boilers Covers the most used types of large-scale biomass boilers, including recovery boilers, fluidized bed boilers, and auxiliary equipment Includes a companion website with spreadsheets, calculation examples, and automatic calculation tools for design and dimensioning

### **Pulp and Paper Industry**

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

## **Nonwood Plant Fibers for Pulp and Paper**

The book describes the pretreatment of lignocellulosic biomass for biomass-to-biofuel conversion processes, which is an important step in increasing ethanol production for biofuels. It also highlights the main challenges and suggests possible ways to make these technologies feasible for the biofuel industry. The biological conversion of cellulosic biomass into bioethanol is based on the chemical and biological breakdown of biomass into aqueous sugars, for example using hydrolytic enzymes. The fermentable sugars can then be further processed into ethanol or other advanced biofuels. Pretreatment is required to break down the lignin structure and disrupt the crystalline structure of cellulose so that the acids or enzymes can easily access and hydrolyze the cellulose. Pre-treatment can be the most expensive process in converting biomass to fuel, but there is great potential for improving the efficiency and lowering costs through further research and development. This book is aimed at academics and industrial practitioners who are interested in the higher production of ethanol for biofuels.

## **Organochlorine Compounds in Bleach Plant Effluents**

Pulp and paper production has increased globally and will continue to increase in the near future. Approximately 155 million tons of wood pulp is produced

worldwide and about 260 million is projected for the year 2010. To be able to cope with increasing demand, an increase in productivity and improved environmental performance is needed as the industry is also under constant pressure to reduce and modify environmental emissions to air and water. The authors give updated information on various biotechnological processes useful in the pulp and paper industry which could help in reducing the environmental pollution problem, in addition to other benefits. Various chapters deal with the latest developments in such areas as raw material preparation, pulping, bleaching, water management, waste treatment and utilization. The book also covers the environmental regulations in various parts of the world as well as the role of biotechnology in reducing environmental problems.

## **Management of Pulp and Paper Mill Waste**

This book covers bleach plant effluents, that most polluting effluent from the pulp and paper industry. Disappearance of benthic invertebrates, a high incidence of fish diseases, and mutagenic effects on the aquatic fauna are some of the consequences of the disposal of bleach effluents into surface waters. This book describes environmental impact of bleach plant effluents, environmental regulations, and measures to reduce the pollution load by internal process modification and external treatment of bleach plant effluents.

## **Heavy Oil Recovery and Upgrading**

Pulp and paper mill industries are always associated with the disposal problem of highly contaminated sludge or bio-solids. The development of innovative systems to maximize recovery of useful materials and/or energy in a sustainable way has become necessary. The management of wastes, in particular of industrial waste, in an economically and environmentally acceptable manner is one of the most critical issues facing modern industry, mainly due to the increased difficulties in properly locating disposal works and complying with even more stringent environmental quality requirements imposed by legislation. This book presents a general Introduction on waste management in the pulp and paper industry and contains topics on the generation of waste in pulp and paper mills, waste composition, methods of sludge pre-treatment, processes and technologies for conversion of pulp and paper mill waste into valuable products, waste reduction techniques employed in the pulp and paper Industry worldwide and future trends.

## **Pretreatment of Lignocellulosic Biomass for Biofuel Production**

This book is a printed edition of the Special Issue "Bioconversion Processes" that was published in Fermentation

## **Climate Change and Island and Coastal Vulnerability**

"Climate Change and Island and Coastal Vulnerability" is the outcome of a selection of peer reviewed edited papers presented at the International Workshop on Climate Change and Island Vulnerability (IWCCI) held at Kadmat Island, Lakshadweep, India in October 2010. Marine and coastal biodiversity, sea level rise vulnerability, fisheries, climate change impact on livelihood options, water and sanitation in island ecosystem and mitigation, adaptation and governance are the focal themes. The basic concept conveyed in the book is that biodiversity of islands is to be protected as a natural mechanism to mitigate climate change. Probability recurrence of mass coral bleaching and the management of coral reefs and their future protection are discussed in this book. Marine productivity and climate change for the last ten thousand years in the Arabian Sea have been examined with core records. Green technology is suggested as an important tool for mitigation and adaptation programmes in climate change. Measures taken to project biomass utilisation of islands as an energy source is delineated. Climate change may pose a potential threat on human health. Improved sanitation packages and models that are cost effective and environment-friendly for islands are uniquely presented in this book.

## **Recent Advancement in White Biotechnology Through Fungi**

## File Type PDF By Pratima Bajpai Black Liquor Gasification 1st Frist Edition Paperback

Showcasing the very latest technologies for neutralising the unpleasant—and sometimes dangerous—odours from industrial and waste management processes, this Springer Brief in Environmental Sciences covers physical, chemical and biological methods. The volume includes modern biotechnological approaches now making it cost-effective to tackle malodorous chemicals at very small concentrations. The book reflects the fact that odour affects us in several ways, which range from compromising our quality of life to causing respiratory and other unpleasant conditions and from depressing property values to severe health problems caused by the toxic stimulants of odours. Innumerable industrial processes release malodourous and harmful vapours. The human sense of smell can detect some noxious chemicals, such as the sulphurous by-products of paper manufacturing, at concentrations of one part per billion. This e-book shows what has been achieved in combating offensive and harmful odours. While conventional air pollution control technologies can treat a wide variety of pollutants at higher concentrations, the chapters cover the more refined biological methods used to deal with odours and volatile organic compounds in low concentrations. These include bio scrubbers and bio trickling filters. Standing alongside its detailed discussion of the health impacts of total reduced sulphur compounds, and the composition of paper pulp industry emissions, this publication offers comprehensive and in-depth treatment of some of the most potent anti-odour technologies yet devised.

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