



DEVELOPMENT OF
PULP ENVIRONMENTAL MANAGEMENT

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ENVIRONMENTALLY BENIGN APPROACHES FOR PULP BLEACHING

By
DR. PRATIMA GUPTA



Environmentally Benign Approaches For Pulp Bleaching

Pratima Bajpai



Environmentally Benign Approaches For Pulp Bleaching:

Environmentally Benign Approaches for Pulp Bleaching Pratima Bajpai, P. Bajpai, 2005-08-05 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 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

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Pratima Bajpai, 2012-12-31 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 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 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

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Environmentally Benign Pulping Pratima Bajpai, 2023-02-05 This book provides the most up to date and comprehensive information on the

state of the art techniques and aspects involved in environment friendly pulping technologies Traditional chemical and semi chemical pulping processes are not environmentally friendly Therefore it has become important to look for alternative approaches to mitigate wastewater emissions in the paper industry by making more stringent regulations to improve environmental conservation In response to this problem new raw materials need to be explored to replace traditional choices and also new pulping processes need to be developed based on less polluting more easily recovered reagents This book presents new and emerging deep eutectic solvents for lignocellulosic biomass pretreatment and discusses the effects of deep eutectic solvents on biomass pretreatment and the production of value added products It also introduces biotechnological methods of pulping Biotechnological processes help to make manufacturing processes cleaner and more efficient by reducing toxic chemical pollution and greenhouse gas emissions Given its scope this book is of interest to applied chemists foresters chemical engineers wood scientists along with engineers and researchers involved in the pulp and paper industry as a valuable reference

Pulping and Papermaking of Nonwood Plant Fibers Z.M.A. Ainun,S. M. Sapuan,R.A.

Ilyas,2023-04-01 Pulping and Papermaking of Non wood Plant Fibres presents the latest technologies associated with the papermaking process With chapters specific to each non wood species the book provides step by step guidance on processes such as pulping bleaching blending and beating Non wood fibers are practical for pulp and paper production due to their chemical content of cellulose hemicellulose and lignin percentages Beginning with a general overview of non wood fibers in the papermaking process chapters then take a deep dive into different raw materials and their processes including bamboo corn stalk pineapple leaves and sugarcane This book is an essential resource for researchers scientists and industry specialists Provides comprehensive coverage of the processes involved in pulp and papermaking technology for each species of non wood raw materials Written by the leading research and industrial experts in the field of pulping bleaching blending beating and papermaking processes Includes step by step processes and methodologies

Environmentally Friendly Production of Pulp and Paper Pratima Bajpai,2011-03-21 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 **Bleach Plant Effluents from the Pulp and Paper Industry** Pratima Bajpai,2013-06-22 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 **Bioremediation for Environmental Pollutants** Inamuddin,2023-04-26 Increased industrial and agricultural activity has led to the contamination of the earth s soil and groundwater resources with hazardous chemicals The presence of heavy metals dyes fluorides dissolved solids and many other pollutants used in industry and agriculture are responsible for hazardous levels of water pollution The removal of these pollutants in water resources is challenging Bioremediation is a new technique that employs living organisms usually bacteria and fungi to remove pollutants from soil and water preferably in situ This approach is more cost effective than traditional techniques such as incineration of soils and carbon filtration of water It requires understanding how organisms consume and transform polluting chemicals survive in polluted environments and how they should be employed in the field Bioremediation for Environmental Pollutants discusses the latest research in green chemistry and practices and principles involved in quality improvement of water by remediation It covers different aspects of environmental problems and their remedies with up to date developments in the field of bioremediation of industrial environmental pollutants Volume 1 focuses on the bioremediation of heavy metals pesticides textile dyes removal petroleum hydrocarbon microplastics and plastics This book is invaluable for researchers and scientists in environmental science environmental microbiology and waste management It also serves as a learning resource for graduate and undergraduate students in environmental science microbiology limnology freshwater ecology and microbial biotechnology **Plastics: Just a Load of Rubbish?** Alicia Chrysostomou,2023-10-05 Are plastics really the enemy in our fight to save the planet *Pulp and Paper Industry* Pratima Bajpai,2017-02-25 Pulp and Paper Industry Emerging Waste Water Treatment Technologies is the first book which comprehensively reviews this topic Over the past decade pulp and paper companies have continued to focus on minimizing fresh water use and effluent discharges as part of their move towards sustainable operating practices Three stages basic conservation water reuse and water recycling provide a systematic approach to water resource management Implementing these stages requires increased financial investment and better utilization of water resources The ultimate goal for pulp and paper companies is to have effluent free factories with no negative environmental impact The traditional water treatment technologies that are used in paper mills are not able to remove recalcitrant contaminants Therefore advanced water treatment technologies are being included in industrial wastewater treatment chains aiming to either improve water

biodegradability or its final quality This book discusses various measures being adopted by the pulp and paper industry to reduce water consumption and treatment techniques to treat wastewater to recover it for reuse The book also examines the emerging technologies for treatment of effluents and presents examples of full scale installations Provides thorough and in depth coverage of advanced treatment technologies which will benefit the industry personnel pulp manufacturers researchers and advanced students Presents new treatment strategies to improve water reuse and fulfill the legislation in force regarding wastewater discharge Presents viable solutions for pulp and paper manufacturers in terms of wastewater treatment Presents examples of full scale installations to help motivate mill personnel to incorporate new technologies

Agro-Industrial Wastes as Feedstock for Enzyme Production Gurpreet S. Dhillon, Surinder Kaur, 2016-08-25 Agro industrial Wastes as Feedstock for Enzyme Production Apply and Exploit the Emerging and Valuable Use Options of Waste Biomass explores the current state of the art bioprocesses in enzyme production using agro industrial wastes with respect to their generation current methods of disposal the problems faced in terms of waste and regulation and potential value added protocols for these wastes It surveys areas ripe for further inquiry as well as future trends in the field Under each section the individual chapters present up to date and in depth information on bioprospecting of agro industrial wastes to obtain enzymes of economic importance This book covers research gaps including valorization of fruit and vegetable by product a key contribution toward sustainability that makes the utmost use of agricultural produce while employing low energy and cost efficient bioprocesses Written by experts in the field of enzyme technology the book provides valuable information for academic researchers graduate students and industry scientists working in industrial food microbiology biotechnology bioprocess technology post harvest technology agriculture waste management and the food industry Addresses key opportunities and challenges in the emerging field of enzyme technology with an emphasis on energy and bio based industrial applications Explores the current state of the art bioprocesses in enzyme production using fruit and vegetable wastes with respect to their generation current methods of disposal and problems faced in terms of waste and regulation Presents in depth information on bioprospecting of fruit and vegetable to obtain enzymes of economic importance Delves into environmental concerns and economic considerations related to fruit and vegetable processing by products Biermann's Handbook of Pulp and Paper Pratima Bajpai, 2018-05-17 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 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

Nonwood Plant Fibers for Pulp and Paper

Pratima Bajpai, 2021-01-09 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

Chemistry for Biomass Utilization Raimo Alén, 2023-12-04 Much interest has been directed to the versatile possibilities of using lignocellulosic biomass resources i e renewable raw materials for the full scale production of various chemicals and other bioproducts together with solid liquid and gaseous fuels Introduces modern aspects and various technologies of lignocellulosic biomass conversion for producing chemicals biofuels and other products in a reader friendly way Starting with fundamentals of biorefi nery the author further describes chemical biochemical and thermal conversion approaches In addition the properties and biorefining principles of non wood biomass feedstock

Encyclopedia of Microbiology, 2009-01-14 Available as an exclusive product with a limited print run Encyclopedia of Microbiology 3e is a comprehensive survey of microbiology edited by world class researchers Each article is written by an expert in that specific domain and includes a glossary list of abbreviations defining statement introduction further reading and cross references to other related encyclopedia articles Written at a level suitable for university undergraduates the breadth and depth of coverage will appeal

beyond undergraduates to professionals and academics in related fields 16 separate areas of microbiology covered for breadth and depth of content Extensive use of figures tables and color illustrations and photographs Language is accessible for undergraduates depth appropriate for scientists Links to original journal articles via Crossref 30% NEW articles and 4 color throughout NEW *Green Chemistry and Sustainability in Pulp and Paper Industry* Pratima Bajpai, 2015-06-23 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 *Microbial Enzymes and Biotechniques* Pratyosh Shukla, 2020-10-09 This book compiles the latest research on the multifarious roles of microbial enzymes and provides an overview of microbial enzymes and biotechnologies It discusses the use of microbial enzymes in innovative areas like nanomedicine and synthetic biotechnology as well as the use of starch digesting enzymes and bioactive proteins as biotherapeutics all of which have applications in modern drug discovery processes The book also examines the concept of microbial biotransformation and protein engineering and covers topics such as the immobilization of therapeutic enzymes bioengineering of enzymes for bioactive compounds the production of hydrolytic and oxidative enzymes from plant raw materials and prebiotics and probiotics Given its multidisciplinary scope this book will appeal to researchers and industry experts in the fields of microbiology biotechnology and molecular medicine *Chemistry Beyond Chlorine* Pietro Tundo, Liang-Nian He, Ekaterina Lokteva, Claudio Mota, 2016-09-17 Since the industrial revolution chlorine remains an iconic molecule even though its production by the electrolysis of sodium chloride is extremely energy intensive The rationale behind this book is to present useful and industrially relevant examples for alternatives to chlorine in synthesis This multi authored volume presents numerous contributions from an international spectrum of authors that demonstrate how to facilitate the development of industrially relevant and implementable breakthrough technologies This volume will interest

individuals working in organic synthesis in industry and academia who are working in Green Chemistry and Sustainable Technologies **Recycling and Deinking of Recovered Paper** Pratima Bajpai, 2024-06-26 Recycling and Deinking of Recovered Paper Second Edition covers recent advances in recycling technologies This second edition examines this new process which is more eco friendly than the virgin papermaking process and which uses less energy and natural resources produces less solid waste and fewer atmospheric emissions and helps to preserve natural resources and landfill space In addition the most recent information about the recycling of fibers into various grades of paper and board the control of stickies and the effects of recycled fiber on paper machines are also covered Recycling technologies have been improved in recent years due to advances in pulping flotation deinking and cleaning screening resulting in the quality of paper made from secondary fibers remarkably approaching that of virgin paper Covers all aspects of recycling technologies in great depth Offers up to date authoritative information and cites many mills experiences and pertinent research Examines the use of biotech methods for deinking refining improving drainage and stickies control Includes new case studies on paper recycling

Organic Solid Waste Management Mayur Shirish Jain, Jiwan Singh, Ajay Kalamdhad, 2025-04-18 This book offers a comprehensive examination of the rotary drum composter as an effective solution for managing organic waste With a focus on decentralized systems it emphasizes the benefits of on site composting to reduce waste transportation s environmental and economic costs The book explores the underlying science and engineering principles behind the rotary drum composter highlighting its ability to create high quality compost in a controlled environment Various studies are presented detailing its successful application in handling municipal solid waste sewage sludge agricultural residues and weeds Additionally the text delves into key factors such as temperature control aeration and microbial dynamics that influence the composting process Real world case studies from premier Indian institutions including the IITs and NITs illustrate rotary drum composters technological advancements and operational efficiencies The book is an essential resource for researchers environmental engineers and practitioners interested in sustainable waste management techniques It demonstrates the efficacy of rotary drum composters in diverse scenarios and underscores the need to optimize design and cost efficiency to promote broader adoption

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