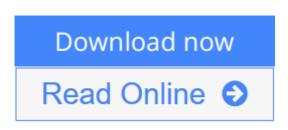


# Environmentally Benign Approaches for Pulp Bleaching, Second Edition

By Pratima Bajpai



# **Environmentally Benign Approaches for Pulp Bleaching, Second Edition** By Pratima Bajpai

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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#### **Editorial Review**

Review

"Bajpai provides a second edition of his comprehensive book on environmentally benign methods for pulp bleaching and related new and emerging technologies... The book includes extensive end-of-chapter references and a list of abbreviations. While technical, it is clearly written."--Reference and Research Book News, August 2013

#### From the Back Cover

Pulp and paper production continues to increase globally, now totalling some 380 million tonnes. Growth is the most rapid in Asia, due mainly to the rapid expansion of industry in China. Asia accounts for well over a third of total world paper and paperboard production. In North America, by contrast, production is contracting. Asia accounts for almost 40% of global consumption, while the EU and North America account for about 25% each.

The industry is very capital-intensive with small profit margins, which tends to limit experimentation, development, and incorporation of new technologies into the mills. Improved environmental performance is needed as the industry is also under constant pressure to reduce environmental emissions to air and water. During the past decade, no segment of the pulping and papermaking process has received as much attention as the bleach plant. In the mid-1980s it was discovered that US chemical pulp mills using elemental chlorine and/or sodium hypochlorite as their primary bleaching agent were discharging unusually high levels of carcinogenic dioxins and furans in their effluent streams. The industry undertook a very rapid process aboutface. The pace increased when further studies definitively tied the presence of these carcinogens to the use of elemental chlorine. As a result most of the bleached chemical pulp mills around the world rapidly instituted process changes away from elemental chlorine and towards combinations of chlorine dioxide, oxygen, hydrogen peroxide, ozone, peroxy acids and enzyme technologies. The focus of attention in bleaching research continues to be on the development of alternatives to chlorine-containing compounds. Most efforts have centered on the oxygen families of chemicals. Metals management development is aimed at increasing the effectiveness or selectivity of expensive chemicals.

The continuing pressure to further reduce air and water emissions is driving the development of technology to capture all mills effluents and return them to the process. Controlling the concentration and build-up of impurities in the liquor cycle is of paramount importance as more bleach plant effluents are collected for evaporation and burning. This book examines environmentally benign approaches for pulp bleaching and explores new and emerging bleaching technologies that are moving the industry towards effluent closure. \* Covers environmentally friendly technologies that can help solve some of the problems associated with conventional bleaching technologies. \* Information is up-to-date, authoritative and based on practical experience and pertinent research \* In depth coverage of various bleaching processes, including environmental issues.

#### About the Author

Dr. Pratima Bajpai is currently working as a Consultant in the field of Paper and Pulp. She has a vast 36 years of experience in this field. She has worked at National Sugar Institute Kanpur (India), University of

Saskatchewan (Canada), University of Western Ontario (Canada), and Thapar Center for Industrial Research and Development (India). Dr. Bajpai's main areas of expertise are industrial biotechnology, pulp and paper, and environmental biotechnology. She has contributed immensely to the field of industrial biotechnology and is a recognized expert in the field. Dr. Bajpai has written several advanced level technical books on environmental and biotechnological aspects of pulp and paper which have been published by leading publishers in the USA and Europe. She has also contributed chapters to a number of books and encyclopedia, obtained 11 patents, written several technical reports, and has implemented several processes in Indian Paper mills. Dr. Bajpai is an active member of the American Society of Microbiologists and is a reviewer of many international research journals. She has also handled several Sponsored Research Projects from industry and government agencies. She is an active member of the New York Academy of Science, American Society for Microbiology, and many more.

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