

Preface

The pulp and paper industry is considered to be one of the most polluting in the world. The production process consists of two main steps: pulping and bleaching. These processes are very energy and water intensive.

Of the different wastewaters generated by the pulp and paper industry, bleach plant effluents are considered to be the most polluting. Pollutants such as chlorinated phenolics and dioxins are toxic, non-biodegradable, and have a tendency to contaminate food chains through bioaccumulation. Dioxins are known for their extreme toxicity and are believed to be carcinogenic. Bleach effluents are colored. They contain chlorinated and non-chlorinated products of lignin and extractives of wood. Because of the color, productivity of aquatic ecosystems gets affected when these effluents are discharged into the water bodies. Color also affects the downstream uses (municipal and industrial) of water. It makes water treatment difficult and costly. "The chlorinated organic compounds and the lignin derivatives of the bleach effluents are recalcitrant and get bioaccumulated in food chains of aquatic ecosystems. The low molecular weight fraction of bleach effluent contains potentially problematic (toxic) compounds. These have the ability to penetrate cell membranes and a tendency to bioaccumulate. Low molecular weight chlorinated organic compounds significantly affect the biology of aquatic ecosystems. Disappearance of benthic invertebrates, 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" Bajpai (2012). The growing public awareness of the fate of these pollutants and stringent regulations established by various governmental authorities such as provincial and federal agencies are forcing the industry to treat effluents to the required compliance level before discharging them into the environment. Many studies have been conducted so far on this sector regarding the impact of as well as the control of pollutants. This book describes the environmental impact of the bleach plant effluents, environmental regulations, and strategies used for reducing the generation of pollutants. Both internal process modification and external treatment are discussed and the performance of the effluent treatment measures in use are compared.

Bleach Plant Effluents from the Pulp and Paper Industry

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