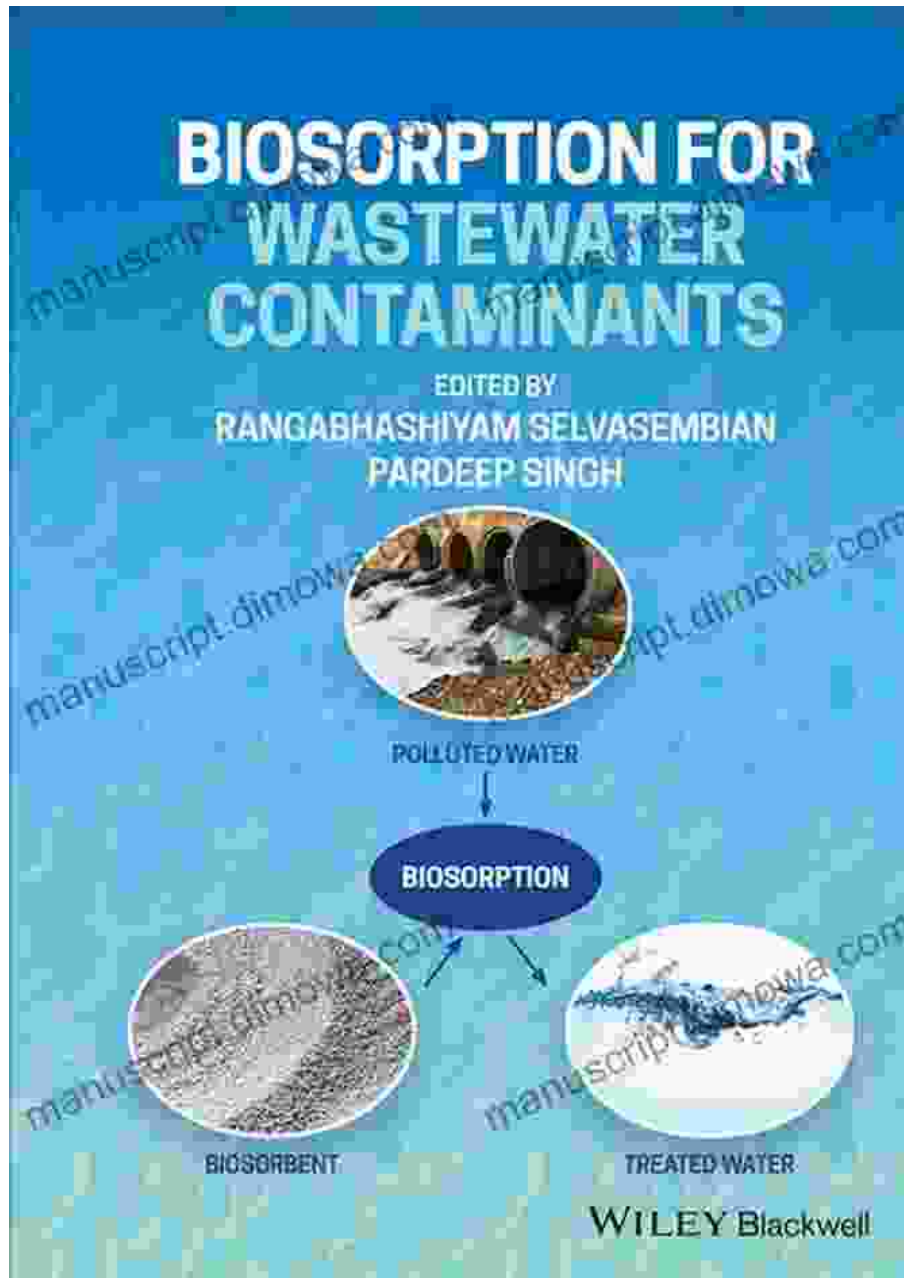


Biosorption for Wastewater Contaminants: A Comprehensive Guide



Water scarcity and pollution are pressing global issues that demand innovative and sustainable solutions. Biosorption, a process that utilizes biological materials to remove contaminants from wastewater, has emerged

as a promising technology in this regard. Pardeep Singh's groundbreaking book, "Biosorption for Wastewater Contaminants," provides a comprehensive and in-depth exploration of this field, offering a comprehensive guide to the principles, applications, and advancements in biosorption technology.



Biosorption for Wastewater Contaminants by Pardeep Singh

★★★★☆ 4.6 out of 5

Language : English
File size : 10331 KB
Text-to-Speech : Enabled
Enhanced typesetting : Enabled
Lending : Enabled
Screen Reader : Supported
Print length : 304 pages



Chapter 1: Fundamentals of Biosorption

The book begins by delving into the fundamental principles of biosorption. It explains the various mechanisms involved in contaminant removal, including electrostatic interactions, ion exchange, complexation, and precipitation. The chapter also discusses the different types of biosorbents, such as bacteria, fungi, algae, and plant biomass, and their specific properties and applications.

Chapter 2: Characterization and Modification of Biosorbents

Understanding the characteristics of biosorbents is crucial for optimizing their performance in biosorption processes. Chapter 2 explores various characterization techniques, including surface area analysis, pore size

distribution, and chemical composition. It also discusses methods for modifying biosorbents to enhance their adsorption capacity and selectivity, such as chemical treatment, thermal activation, and genetic engineering.

Chapter 3: Types of Wastewater Contaminants and Their Removal

Wastewater can contain a wide range of contaminants, including heavy metals, organic pollutants, and emerging contaminants. Chapter 3 provides a detailed overview of the different types of contaminants and their sources. It discusses the specific mechanisms of biosorption for each type of contaminant and presents case studies of biosorption applications in various wastewater treatment scenarios.

Chapter 4: Biosorption Process Optimization

Optimizing the biosorption process is essential for maximizing its efficiency and cost-effectiveness. Chapter 4 explores the different parameters that influence biosorption, including pH, temperature, contact time, and biosorbent dosage. It provides guidelines for optimizing these parameters based on the specific wastewater characteristics and the desired removal efficiency.

Chapter 5: Biosorption Systems and Applications

Chapter 5 discusses the different types of biosorption systems, including batch, column, and fluidized bed systems. It also presents a comprehensive overview of the applications of biosorption technology for the removal of contaminants from various wastewater sources, such as industrial effluents, agricultural runoff, and domestic wastewater.

Chapter 6: Emerging Advancements in Biosorption

The field of biosorption is constantly evolving, with new advancements and innovations emerging. Chapter 6 explores the latest advancements in biosorption research, including the use of nanomaterials, genetic engineering, and artificial intelligence. It discusses the potential of these advancements to further enhance the efficiency and versatility of biosorption technology.

Chapter 7: Case Studies and Real-World Applications

To provide practical insights, Chapter 7 presents case studies of successful biosorption applications in real-world wastewater treatment facilities. These case studies demonstrate the effectiveness of biosorption in removing contaminants from a variety of wastewater sources and provide valuable lessons learned for the implementation of biosorption technology.

"Biosorption for Wastewater Contaminants" is an indispensable resource for researchers, practitioners, and policymakers in the field of wastewater treatment. Pardeep Singh's comprehensive and well-written book provides a thorough understanding of the principles, applications, and advancements in biosorption technology, empowering readers to harness its potential for sustainable and cost-effective wastewater treatment solutions. By utilizing the knowledge and insights gained from this book, we can make significant strides towards addressing water scarcity and pollution, ensuring a cleaner and healthier future for our planet.



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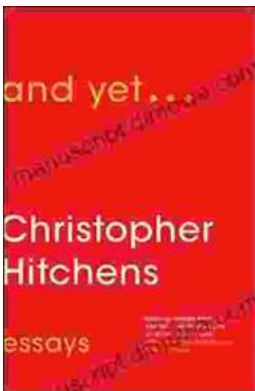
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