Biosorption for Wastewater Contaminants

Editor(s): Rangabhashiyam Selvasembian, Pardeep Singh

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About this book

Pollution due to various anthropogenic activities continues to increase. In terms of water pollutants, organic and inorganic pollutants are the most problematic. Although several measures have been proposed and implemented to prevent or reduce contamination, their increased concentration in water bodies has created serious concerns. Over the years, the problem has been aggravated by industrialization, urbanization and the exploitation of natural resources. The direct ... Show all

Chapter 5

Recent Approaches in the Preparation of Various Biosorbents

Rajarathinam Nithya, Arunachalam Thirunavukkarasu

Book Editor(s):Rangabhashiyam Selvasembian, Pardeep Singh

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Summary

Biosorbents are biomass-based materials that are capable of translocating adsorbate molecules from the bulk liquid phase to their surfaces by means of preferential adsorption. These biosorbents are ample, biodegradable, and inexpensive; they generate minimal or no sludge; they have simple pretreatment methods and are easy to operate; and they have highly versatile or manipulable surface functional groups and constructive surface-related properties. Thus they have been identified as promising candidates for removing contaminants from wastewater. The physicochemical properties of these sorbents are usually dependent on the phytochemistry of the biomass and their

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Summary

Biosorption is a separation process driven by the concentration gradient in which solute molecules are diffused into a biosorbent at the solid-liquid interface until equilibrium is attained. Among the conventional water treatment techniques, biosorption is highly efficient and cost-effective, as most of biosorbents are versatile and derived from recycled biomasses. The presence of specified functional groups and the ease of tailor-made modifications to the surface of the sorbents have attracted scientific researchers to exploit their potential for removing heavy metals and a wide range of organic compounds in batch- and continuous-mode operations. This chapter critically reviews the reported dynamic biosorption studies of the removal of various pollutants from wastewater. Further, it focuses on the influence of various operational parameters that significantly affect the breakthrough curves and thus the efficacy of the fixed-bed column

Biosorption for Wastewater Contaminants

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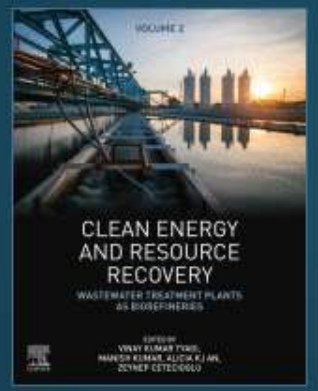

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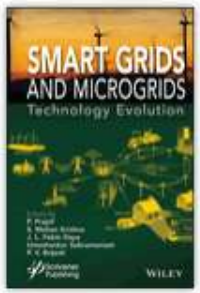
Abstract

The effect on climate change of greenhouse gases from fossil fuel combustion has increased the need for clean and renewable biological energies necessary for the future. A substitution for fossil-based fuels may be renewable biofuel biogas from wastewater (WW), which has the tremendous potential to meet energy demand and minimize greenhouse gas emissions. In green energy production technology, WW is wildly attracted to biogas recovery because it has environmental and economic benefits from domestic to industrial sectors. Owing to the growth of human lifestyles, urbanization, construction of WW treatment plants, and environmental legislation, the discharge of WW with high organic strength has



Smart Grids and Microgrids: Technology Evolution

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SMART GRIDS AND MICROGRIDS

Written and edited by a team of experts in the field, this is the most comprehensive and up-to-date study of smart grids and microgrids for engineers, scientists, students, and other professionals.

The power supply is one of the most important issues of our time. In every country, all over the world

Chapter 1

A Comprehensive Analysis of Numerical Techniques for Estimation of Solar PV Parameters Under Dynamic Environmental Condition

M Balasubramonian, Rajeswari Ramachandran, Veerapandiyan Veerasamy, Paul Arunkumar C P Albert, Noor Izzri Abdul Wahab

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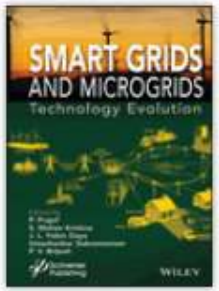
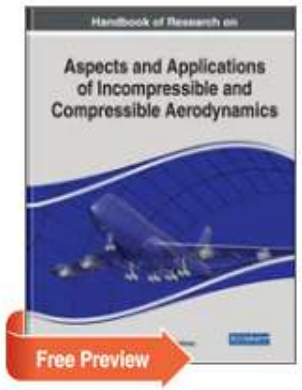
Summary

The ampleness and non-polluting nature of power generation from solar photovoltaic (SPV) is used worldwide to meet the ever-increasing load demand.In order to operate SPV efficiently, an accurate modeling and control is required prior to the installation. Therefore, this chapter presents the Single Diode Model(SDM) of SPV module through





Handbook of Research on Aspects and Applications of Incompressible and Compressible Aerodynamics

Sathish K. Kumar, Naren Shankar Radhakrishnan

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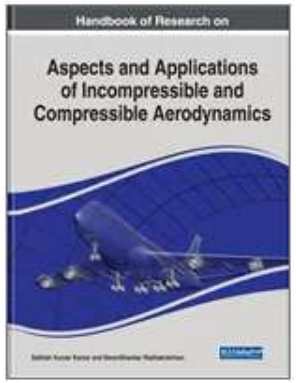

Aerodynamic Force Measurements Using Blower Balance Tunnel at Low Reynolds Number

Suresh Chinnasamy, Paramaguru Venugopal, Ramesh Kasimani

Source Title: Handbook of Research on Aspects and Applications of Incompressible and Compressible Aerodynamics
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Abstract

This chapter describes the basic concepts of aerodynamics, evolution of lift and drag, types of drag, reduction of wing tip vortices, non-planar wing concepts for increased aerodynamic efficiency, various methods for determination of aerodynamic forces of an airplane, classification of wind tunnels, blower balance tunnels, and a case study report on aerodynamic force measurement of the non-planar wing systems. To increase the aerodynamic efficiency of the monoplane configuration, the 'C-wing' configuration is presented in this chapter. The aim is to prove, at all angles of attack, C-wing produces a higher (L/D) ratio than straight wing for the same wetted surface area. The aerodynamic characteristics of three different wing models with NACA-64215 aerofoil such as straight wing, C-wing, and inverted C-wing at different angles of attack and low Reynolds number are shown. The inverted C-wing created more lift but produced more vibration, which may lead to lesser structural integrity.

Chapter Preview

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Introduction