

Adsorption Technology For Air And Water Pollution Control

Adsorption promises to play an integral role in several futureenergy and environmental technologies, including hydrogen storage,CO removal for fuel cell technology, desulfurization oftransportation fuels, and technologies for meeting higher standardson air and water pollutants. Ralph Yang’s Adsorbents provides asingle and comprehensive source of knowledge for all commercial andnew sorbent materials, presenting the fundamental principles fortheir syntheses, their adsorption properties, and their present andpotential applications for separation and purification. Chaptertopics in this authoritative, forward-looking volume include: - Formulas for calculating the basic forces or potentials foradsorption - Calculation of pore-size distribution from a single adsorptionisotherm - Rules for sorbent selection - Fundamental principles for syntheses/preparation, adsorptionproperties, and applications of commercially availablesorbents - Mesoporous molecular sieves and zeolites -,-complexation sorbents and their applications - Carbon nanotubes, pillared clays, and polymeric resins Yang covers the explosion in the development of new nanoporousmaterials thoroughly, as the adsorption properties of some of thesematerials have remained largely unexplored. The whole of this bookbenefits from the new adsorbent designs made possible by theirincrease in desktop computing and molecular simulation, makingAdsorbents useful to both practicing laboratories and graduateprograms. Ralph Yang’s comprehensive study contributessignificantly to the resolution of separation and purificationproblems by adsorption technologies.

This practical book is valuable for a diversity of applications in both air and water pollution. Adsorption Technology usually deals with control of organic compounds, such as VOCs, pesticides, phenolics, and complex synthetic organics. However, it is also used to control certain inorganic compounds such as heavy metals, reduced sulfur gases, and chlorine. Much original work, including original figures.

Bachelor Thesis from the year 2008 in the subject Engineering - Chemical Engineering, grade: A, Bahir Dar University (Engineering Faculty), course: Chemical Engineering, language: English, abstract: Abstract Main problem in air drying unit is the adsorption and regeneration time. In a dryer adsorption continues for eight hours, after which the desiccant becomes saturated and cannot adsorb further moisture. In this study different types of desiccants are used. Instead of silica gel, activated alumina, zeolite, molecular sieves, activated carbon were used. Membrane dryer are used to solve our regeneration problem. Therefore membrane air dryer is more optimum for commercial processes than the other different dryers.

Membrane dryer can be used for 24 hours for one week, so there is no need to standby this equipment. The construction and operation cost of membrane dryer is too simple and can also be used in hazardous condition.
Keywords: Adsorption time, Regeneration time, Activated carbon, Membrane dryer

In the debate over pollution control, the price of pollution is a key issue. But which is more costly: clean up or prevention? From regulations to technology selection to equipment design, Air Pollution Control Technology Handbook serves as a single source of information on commonly used air pollution control technology. It covers environmental regulations and their history, process design, the cost of air pollution control equipment, and methods of designing equipment for control of gaseous pollutants and particulate matter. This book covers how to: Review alternative design methods Select methods for control Evaluate the costs of control equipment Examine equipment proposals from vendors With its comprehensive coverage of air pollution control processes, the Air Pollution Control Technology Handbook is a detailed reference for the practicing engineer who prepares the basic process engineering and cost estimation required for the design of an air pollution control system. It discusses the topics in depth so that you can apply the methods and equations presented and proceed with equipment design.

Integrated Air Quality Management

Asian Case Studies

Design of Operations and Environmental Applications

Air Pollution and Greenhouse Gases

Adsorption Technology and Design

Methodologies, Mechanisms and Effect of Key Parameters

This handbook provides information for professionals attempting to reduce and eliminate air pollution problems. It contains information on all aspects of air pollution, and also examines the technical aspects of air pollution control equipment. Many practical applications are provided, and the text is referenced to assist the reader in further research. The major scientific areas of air pollution are brought together with practical engineering solutions, and will help air quality and pollution control managers to reduce maintenance costs and prevent deterioration of installations.

This book discusses the need for the development of sustainable environmental protection technologies to reduce the impact of environmental contaminants. Three levels of sustainable technologies are addressed. The first level involves the concept of sustainable technologies as natural technologies, or ecotechnologies, whereby contamination level is assessed based on the contamination footprint through the use of biogeochemical barriers (e.g. methods utilizing the bioaccumulation properties of plants). The second level concerns the use of sustainable natural materials, such as biochar, in environmental engineering systems, an approach that is used for analyzing the processes of adsorption and biofiltration, as well as immobilization of contaminants in soil. The third level discusses the optimal components necessary to achieve sustainability in environmental engineering systems, including system operation principles, structural solutions, and the synergies between various system components such as microorganisms. The book will be of interest to specialists of industrial enterprises engaged in environmental protection, as well as environmental system designers, stakeholders from environmental protection ministries and institutions, researchers, doctoral students and masters and bachelors of science in the field of environmental engineering.

This book comprises select proceedings of the International Conference on Smart Technologies for Energy, Environment, and Sustainable Development (ICSTEEED 2018). The chapters are broadly divided into three focus areas, viz. energy, environment, and sustainable development, and discusses the relevance and applications of smart technologies in these fields. A wide variety of topics such as renewable energy, energy conservation and management, energy policy and planning, environmental management, marine environment, green building, smart cities, smart transportation are covered in this book. Researchers and professionals from varied engineering backgrounds contribute chapters with an aim to provide economically viable solutions to sustainable development challenges. The book will prove useful for academics, professionals, and policy makers interested in sustainable development.

The aim of this book is to provide all those involved in designing and running adsorption processes with a guide to adsorption technology and design.

Advances in Air Conditioning Technologies

Dehydration of Air by Adsorption and Absorption

Air Ventilated Heating and Cooling Based on Zeolite Technology

Air Pollution Control with Photocatalytic Adsorption-integrated-reaction Technology

Adsorption: Science and Technology

The steady growth in the number of vehicles on the road, heavy reliance on coal, use of dirty fuels for residential combustion, and extensive open burning are some of the major factors leading to the progressive deterioration of air quality in developing countries in Asia. And despite efforts to establish and implement air quality measurement systems, the development of infrastructure, environmental technology, and management practices continues to lag behind the rate of emission increase. Based on ten years of coordinated research, Integrated Air Quality Management: Asian Case Studies discusses technical and policy tools for the integrated air quality management of developing countries in Asia. The book begins with an overview of major issues of air quality management practices in developing Asia and potential approaches to reduce pollution, including opportunities for integration of air quality improvement and climate migration strategies. It covers the methodology and results of fine particulate matter monitoring using traditional filter-based and satellite monitoring techniques. It examines the applications of a 3D dispersion modeling tool for urban and regional air quality management focusing on surface ozone, fine particulate matter, and acid deposition. The final chapters discuss innovative control technologies for gaseous air pollutants and illustrate the integrated air quality management in developing Asia through case studies for target source categories including agricultural residue field burning, vehicle emissions, brick kilns, and industrial VOC emission. Illustrated with case studies, this book presents an integrated air quality management methodology that employs technical and policy tools to achieve air quality goals. It includes technical information and policy recommendations based on the outcomes of several multi-year air quality research programs coordinated by the Asian Institute of Technology. The text combines fundamental information and advanced knowledge useful to large audiences dealing with subjects of integrated air quality management.

This textbook discusses engineering principles relating to air pollution and greenhouse gases (GHGs); it focuses on engineering principles and designs of related devices and equipment for air emission control for a variety of industries such as energy, chemical, and transportation industries. The book aims primarily at senior undergraduate and graduate students in mechanical, chemical and/or environmental engineering departments; it can also be used as a reference book by technical staff and design engineers who are interested in and need to have technical knowledge in air pollution and GHGs. The book is motivated by recent rapid advances in air pollution and greenhouse gas emissions and their control technologies. In addition to classic topics related to air pollution, this book is also featured with emerging topics related to air pollution and GHGs. It covers recent advances in engineering approaches to the reduction of GHG emissions including, but are not limited to, green energy technologies and carbon sequestration and storage. It also introduces an emerging topic in air pollution, which is referred to as Nano Air Pollution. It is a growing concern in air pollution, but largely missing in similar books, likely because of recent rapid advances in nanotechnology has outpaced the advances in nano air pollution control.

To achieve goals for climate and economic growth, "negative emissions technologies" (NETs) that remove and sequester carbon dioxide from the air will need to play a significant role in mitigating climate change. Unlike carbon capture and storage technologies that remove carbon dioxide emissions directly from large point sources such as coal power plants, NETs remove carbon dioxide directly from the atmosphere or enhance natural carbon sinks. Storing the carbon dioxide from NETs has the same impact on the atmosphere and climate as simultaneously preventing an equal amount of carbon dioxide from being emitted. Recent analyses found that deploying NETs may be less expensive and less disruptive than reducing some emissions, such as a substantial portion of agricultural and land-use emissions and some transportation emissions. In 2015, the National Academies published Climate Intervention: Carbon Dioxide Removal and Reliable Sequestration, which described and initially assessed NETs and sequestration technologies. This report acknowledged the relative paucity of research on NETs and recommended development of a research agenda that covers all aspects of NETs from fundamental science to full-scale deployment. To address this need, Negative Emissions Technologies and Reliable Sequestration: A Research Agenda assesses the benefits, risks, and "sustainable scale potential" for NETs and sequestration. This report also defines the essential components of a research and development program, including its estimated costs and potential impact. Green Technologies for the Defluoridation of Water focuses on the application of green technologies for the defluoridation of water using adsorption processes and nanoadsorbents. Chapters cover the environmental and health effects of fluoride presence in ambient air, food, water, soil and vegetation, focus on approaches for analytical methods to determine the presence of fluoride in water, review various types of conventional and advanced techniques used for removal, focus on adsorption as a green technology, review various types of adsorbents, and emphasize a techno-economic assessment with respect to conventional and non-conventional technologies. This book provides readers with comprehensive methods and applications, while also presenting the global impacts of fluoride ion on the environment, including in drinking water, food, air, soil and vegetables. The authors compare different defluoridation technologies in detail, providing researchers in environmental science and nanotechnology fields with the information they need to create solutions on how to safely remove fluoride from water in a sustainable and cost-effective way. Presents the application of green technology for the defluoridation of water using adsorption processes and nanoadsorbents Includes methods for effectively removing fluoride ions from potable water and water bodies Provides techniques that are eco-friendly, without toxic chemicals, and with lower cost options

Sustainable Air Conditioning Systems

Green Technologies for the Defluoridation of Water

Adsorption Technology for Air and Water Pollution Control

Air Pollution Control Equipment

Adsorbents

Membrane Systems for Air Drying Unit

Novel Materials for Environmental Remediation Applications: Adsorption and Beyond presents detailed, comprehensive coverage of novel and advanced materials that can be applied to address the growing global concern of the pollution of natural resources in water, the air, and in soil. The book provides up-to-date knowledge of state-of-the-art materials and treatment processes, as well as details of applications, including adsorptive remediation and catalytic remediation. Chapters include the characteristics of materials, basic and important physicochemical features for environmental remediation applications, routes of synthesis, recent advances as remediation medias and future perspectives. This book offers an interdisciplinary and practical examination of novel materials and processes for environmental remediation that will be valuable to environmental scientists, materials scientists, environmental chemists, and environmental engineers alike. Highlights a wide range of synthetic methodologies, physicochemical and engineered features of novel materials, and composites/hybrids for environmental purposes Presents applications of adsorbents or catalysts for water/wastewater treatment and air purification technologies such as advanced oxidation processes, adsorption, photocatalysis, coagulation, flotation, membrane separation, filtration, and others Provides comprehensive, consolidated coverage of novel materials for environmental remediation applications for researchers in environmental science, materials science, and industry to identify in-depth solutions to pollution

A promising technology identified and ready to be used for a man mowed micro-climatization system (MiCS) is the zeolite vacuum-adsorption technology. This technology uses the non-hazardous, non-explosive, non-toxic and environmental friendly working pair zeolite and water. Zeolites are crystalline, porous aluminum-silicates with well-defined pore structures. The most important property of the zeolite is its ability for adsorption of water in a reversible process. The adsorption/desorption technology inherently provides for storage of energy, to be used either for heating and cooling. Besides moving the air flow heat is the only energy input. The core module of the MiCS is a conditioning unit consisting of the zeolite-sorber and the water reservoir interconnected by a control valve. Sorber and reservoir are designed as heat exchangers to provide either cooling or heating to the climate air flow. The technology has been successfully used by U.S. Navy within the HAILSS Program with its APACS (Advanced Portable Air Conditioning System). The recent flight model configuration provides a cooling power of about 50 Watts for more than 2.5 hours to the conditioned air flow. The heating performance of such a system is in the same power range. The zeolite/water adsorption technology offers manifold applications in various domains of cooling, heating, and dehumidification.

Air and water pollution occurs when toxic pollutants of varying kinds (organic, inorganic, radioactive and so on) are directly or indirectly discharged into the environment without adequate treatment to remove these potential pollutants. There are a total of 13 book chapters in three sections contributed by significant number of expert authors around the world, aiming to provide scientific knowledge and up-to-date development of various solid wastes based cost-effective adsorbent materials and its sustainable application in the removal of contaminates/pollutants from air, gas and water. This book is useful for the professions, practicing engineers, scientists, researchers, academics and undergraduate and post-graduate students’ interest on this specific area. Key Features:
• Exclusive compilation of information on use of industrial and agricultural waste based adsorbents for air and water pollution abatement.
• Explores utilization of industrial solid wastes in adsorptive purification and agricultural and agricultural by-products in separation and purification.
• Discusses cost-effective solid wastes based emerging adsorbents.
• Alternative adsorbents in the removal of a wide range of contaminants and pollutants from water is proposed.
• Includes performance of unit operations in waste effluents treatment.

This book presents the latest research on adsorption science and technology. It serves as an excellent reference for research in areas such as fundamentals of adsorption and ion exchange (equilibria and kinetics), new materials, adsorption characterization, novel processes, energy and environmental processes. Contents:Adsorption Equilibria of Sub-Critical and Super-Critical Fluids in Carbonaceous Materials (D D Do & H D Do)Freezing/Melting in Porous Carbons (F R Hung et al.)Measurement of Diffusion in Microporous Solids (D M Ruthven)Ordered Mesoporous Carbons with New Opportunities for Adsorption Studies (R Ryoo & S H Joo)Quantum Micropore Filling and Its Application Possibility (T Tanaka et al.)Adsorption in Microporous Materials: Analytical Equations for TYPE I Isotherms at High Pressure (A L Myers)New Sorbents for Desulfurization of Transportation Fuels (R T Yang et al.)Optimization of Continuous Chromatography Separations (Z Y Zhang et al.)Adsorption Technology for Gas Separation (S Sircar)Carbon Composite Membranes (M Suzuki et al.)On the Dominant Role of Adsorption Effects in Heterogeneous Catalysis (J F Denayer et al.)Pressure-Dependent Models for Adsorption Kinetics on a CMS (Y-S Bae et al.)and other papers
Readership: Engineers and researchers in adsorption and separation science; research students in chemical engineering and physical chemistry.

Keywords:Adsorption;Adsorbent;Equilibria;Kinetics;Characterization;Adsorption Process

Adsorption Refrigeration Technology

Adsorption, Ion Exchange and Catalysis

Demonstration of Carbon Adsorption Technology for Petroleum Dry Cleaning Plants

A Research Agenda

Improving Energy Efficiency

Membrane Systems for Adsorption and Regeneration Cycle Problems in Air Drying Unit

Fundamentals of Adsorption contains 2 plenary lectures and 96 selected papers from the IVth International Conference, Kyoto, May, 1992. The topics cover a wide range of studies from fundamentals to applications: characterization of porous adsorbents, molecular simulation, adsorption isotherms, diffusion in adsorbents, breakthrough detection, chromatography, pressure swing operation, etc. Model studies on adsorption, surface characterization, microporosimetry, molecular simulations of equilibrium and diffusion, computer simulation of adsorption beds, and many theoretical studies are also included. Special attention is given to: bulk gas separation and purification, solvent recovery, bioproduct separation, environmental pollution control, methane storage, adsorption cooling and resources recovery.

Water and Wastewater Treatment Technologies theme is a component of Encyclopedia of Water Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. The Theme on Water and Wastewater Treatment Technologies deals, in three volumes, and covers several topics, with several issues of great relevance to our world such as: Urban Wastewater Treatment; Characteristics of Effluent Organic Matter in Wastewater; Filtration Technologies in wastewater treatment; Air Stripping in Industrial Wastewater Treatment; Dissolved air flotation in industrial wastewater treatment; Membrane Technology for Organic Removal in Wastewater; Adsorption and Biological Filtration in Wastewater Treatment; Physico-chemical processes for Organic removal from wastewater effluent; Deep Bed Filtration: Modelling Theory And Practice ; Specific options in biological wastewater treatment for reclamation and reuse ; Biological Phosphorus Removal Processes For Wastewater Treatment ; Sequencing Batch Reactors: Principles, Design/Operation And Case Studies ; Wastewater stabilization ponds (WSP)for wastewater treatment; Treatment of industrial wastewater by membrane bioreactors; Stormwater treatment technologies; Sludge Treatment Technologies ; Wastewater Treatment Technology For Tanning

Industry; Palm Oil And Palm Waste Potential In Indonesia ; Recirculating Aquaculture Systems - A Review ; Upflow anaerobic sludge blanket (UASB)reactor in wastewater treatment; Applied Technologies In Municipal Solid Waste Landfill Leachate Treatment; Water Mining: Planning and Implementation Issues for a successful project; Assessment methodologies for water reuse scheme and technology; Nanotechnology for Wastewater Treatment. These three volumes are aimed at the following five major target audiences: **University and College students Educators, Professional practitioners, Research personnel and Policy analysts, Managers, and Decision makers and NGOs W Gives readers a detailed understanding of adsorption refrigeration technology, with a focus on practical applications and environmental concerns Systematically covering the technology of adsorption refrigeration, this book provides readers with a technical understanding of the topic as well as detailed information on the state-of-the-art from leading researchers in the field. Introducing readers to background on the development of adsorption refrigeration, the authors also cover the development of adsorbents, various thermodynamic theories, the design of adsorption systems and adsorption refrigeration cycles. The book guides readers through the research process, covering key aspects such as: the principle of adsorption refrigeration; choosing adsorbents according to different characteristics; thermodynamic equations; methods for the design of heat exchangers for adsorbers; and the advanced adsorption cycles needed. It is also valuable as a reference for professionals working in these areas. Covers state-of-the art of adsorption research and technologies for relevant applications, working from adsorption working pairs through to the application of adsorption refrigeration technology for low grade heat recovery Assesses sustainable alternatives to traditional refrigeration methods, such as the application of adsorption refrigeration systems for solar energy and waste heat Includes a key chapter on the design of adsorption refrigeration systems as a tutorial for readers new to the topic; the calculation models for different components and working processes are also included Takes real-world examples giving an insight into existing products and installations and enabling readers to apply the knowledge to their own work Academics researching low grade energy utilization and refrigeration; Graduate students of refrigeration and low grade energy utilization; Experienced engineers wanting to renew knowledge of adsorption technology,Engineers working at companies developing adsorption chillers; Graduate students working on thermally driven systems; Advanced undergraduates for the Refrigeration Principle as a part of thermal driven refrigeration technology.**

This book has arisen directly from a course on Air and Water Pollution Control delivered by the first named author at the Technical University of Berlin. Extractions of this course have been presented in Brazil, Turkey and India. It was at the Indian Institute of Technology of Madras where the first named author got in contact with Professor Varma, who turned out to be a suggestive, cooperative coauthor. This book is addressed primarily to chemical, environmental and mechanical engineers, engaged in the design and operation of equipment for air pollution control. But it will certainly be helpful to chemists and physicists confronted with the solution of environmental problems. Furthermore it is intended as a text book for engineering courses on environmental protection. The goal of the book is the presentation of knowledge on design and operation of equipment applicable to the abatement of harmful emissions into air. The technology of air pollution control is of relatively young age, but it has already achieved a high degree of performance, due to the research and develop ment work invested in the last decades in this field.

**Theory and Application
Pollution Control Technologies
Adsorption and Beyond**

**Control Technology for Toxic and Hazardous Air Pollutants
Novel Materials for Environmental Remediation Applications
Negative Emissions Technologies and Reliable Sequestration**

Activated Carbon Surfaces in Environmental Remediation provides a comprehensive summary of the environmental applications of activated carbons. In order to understand the removal of contaminants and pollutants on activated carbons, the theoretical bases of adsorption phenomena are discussed. The effects of pore structure and surface chemistry are also addressed from both science and engineering perspectives. Each chapter provides examples of real applications with an emphasis on the role of the carbon surface in adsorption or reactive adsorption. The practical aspects addressed in this book cover the broad spectrum of applications from air and water clean and energy storage to warfare gas removal and biomedical applications. This book can serve as a handbook or reference book for graduate students, researchers and practitioners with an interest in filtration, water treatment, adsorbents and air cleaning, in addition to environmental policies and regulations. Addresses fundamental carbon science and how it relates to applications of carbon surfaces Describes the broad spectrum of activated carbon applications in environmental remediation Serves as a handbook or reference book for graduate students, researchers and practitioners in the field

Carbon Capture and Storage, Second Edition, provides a thorough, non-specialist introduction to technologies aimed at reducing greenhouse gas emissions from burning fossil fuels during power generation and other energy-intensive industrial processes, such as steelmaking. Extensively revised and updated, this second edition provides detailed coverage of key carbon dioxide capture methods along with an examination of the most promising techniques for carbon storage. The book opens with an introductory section that provides background regarding the need to reduce greenhouse gas emissions, an overview of carbon capture and storage (CCS) technologies, and a primer in the fundamentals of power generation. The next chapters focus on key carbon capture technologies, including absorption, adsorption, and membrane-based systems, addressing their applications in both the power and non-power sectors. New for the second edition, a dedicated section on geological storage of carbon dioxide follows, with chapters addressing the relevant features, events, and processes (FEP) associated with this scenario. Non-geological storage methods such as ocean storage and storage in terrestrial ecosystems are the subject of the final group of chapters. A chapter on carbon dioxide transportation is also included. This extensively revised and expanded second edition will be a valuable resource for power plant engineers, chemical engineers, geological engineers, environmental engineers, and industrial engineers seeking a concise, yet authoritative one-volume overview of this field. Researchers, consultants, and policy makers entering this discipline also will benefit from this reference. Provides all-inclusive and authoritative coverage of the major technologies under consideration for carbon capture and storage Presents information in an approachable format, for those with a scientific or engineering background, as well as non-specialists Includes a new Part III dedicated to geological storage of carbon dioxide, covering this topic in much more depth (9 chapters compared to 1 in the first edition) Features revisions and updates to all chapters Includes new sections or expanded content on: chemical looping/calcium looping; life-cycle GHG assessment of CCS technologies; non-power industries (e.g. including pulp/paper alongside ones already covered); carbon negative technologies (e.g. BECCS); gas-fired power plants; biomass and waste co-firing; and hydrate-based capture

This book highlights key recent developments in air conditioning technologies for cooling and dehumidification with the specific objectives to improve energy efficiency and to minimize environmental impact. Today, air conditioning, comprising cooling and dehumidification, is a necessity in commercial and residential buildings and even in many industrial processes. This book provides key update on recent developments in air conditioning systems, cooling cycles and innovative cooling/dehumidification technologies. Key technologies related to cooling include heat-driven absorption and adsorption cooling and water-based dew point evaporative cooling. Technologies connected with dehumidification involve new generations of adsorbent–desiccant dehumidifiers, liquid-based desiccants and membranes that sieve out water vapor from air. Losses in cooling cycles and thermo-economic analysis for a sustainable economy are also judiciously documented.

Hybrid and Combined Processes for Air Pollution Control: Methodologies, Mechanisms and Effect of Key Parameters provides an exhaustive inventory of hybrid and combined processes in the field of air treatment. The book covers principles, the effect of key parameters, technologies and reactors of the processes and their implementation, from lab-scale to industrial scale, also identifying future trends. Sections discuss effects on the environment and living beings, identify novel techniques and innovations, and offer a thorough assessment of the strengths and weaknesses of each. In this well-structured book, chapters are linked to the type of treatment, with a significant part dealing with treatment by transfer processes: (absorption and adsorption) and on destruction treatments, such as advanced oxidation processes. Helps readers select the most appropriate process for air pollution treatment and control Provides a comprehensive overview of process performance under real conditions, from lab to industrial scale Identifies future trends in industrial developments and innovation

Handbook of Air Pollution Technology

Air Pollution

Current Status and Future Prospects

Activated Carbon Surfaces in Environmental Remediation

Air, Gas, and Water Pollution Control Using Industrial and Agricultural Solid Wastes Adsorbents

Evaluation of Adsorption Refrigeration Technology as a Potential Source for Automobile Air Conditioning

pe=""" This monograph is based on pollution control technologies available to deal with water and air pollution. It includes removal of variety of pollutants including arsenic, chromium, uranium, pesticides and arsenic from water using adsorption technique. In addition, this book deals with the sampling and removal of microplastics using various techniques. The contents also focus on the role of membrane technology in water and wastewater treatment, and particulate matter air pollution and its control techniques. This volume will be a useful guide for researchers, academics and scientists. ^

Air conditioning system is one of the major consumers of electrical energy in many parts of the world today. It represents between 40 and 70% of the energy consumption in commercial buildings. The demand of energy for air conditioning systems is expected to increase further in the next decades due to the population growth, the new economic boom, and the urbanization development. The rapid growth of air conditioning and electricity consumption will contribute further to climate change if fossil and nonrenewable resources are used. More energy-efficient and renewable energy-based air conditioning systems to accomplish space cooling are needed. This book intends to provide the reader with a comprehensive overview of the current state of the art in sustainable air conditioning technologies and focus on the most recent research and development on green air conditioning systems including energy-efficient and renewable energy-based air conditioning systems.

Proceedings of the NATO Advanced Study Institute, Vimeiro, Portugal, July 17-29, 1988

Adsorption, Ion Exchange and Catalysis is essentially a mixture of environmental science and chemical reactor engineering. More specifically, three important heterogeneous processes, namely, adsorption, ion exchange and catalysis, are analysed, from fundamental kinetics to reactor design with emphasis on their environmental applications. In Chapter 1, the subject of air and water pollution is dealt with. Data about pollutants and emission sources are given and the treatment methods are shortly presented. In Chapter 2, the very basics and historical development of adsorption, ion exchange and catalysis are presented as well as their environmental applications. Chapter 3 is devoted to heterogeneous processes and reactor analysis. All types of reactors are described in depth and reactor modelling, hydraulics and mass/heat transfer phenomena are examined for each type of reactor. Chapters 4 and 5 are dedicated to adsorption & ion exchange and catalysis, respectively. The basic principles are presented including kinetics, equilibrium, mass/heat transfer phenomena as well as the analytical solutions of the reactor models presented in Chapter 3. In the sixth chapter, the subject of scale up is approached. The two Annexes at the end of the book contain physical properties of substances of environmental interest as well as unit conversion tables. Finally, nearly all the examples contained are based on real experimental data found in literature with environmental interest. Most of the examples consider all aspects of operation design – kinetics, hydraulics and mass transfer. * Provides basic knowledge of major environmental problems and connects them to chemical engineering

Select Proceedings of ICSTEEED 2018

Dehumidification of Air by Adsorption and Absorption Methods

Hybrid and Combined Processes for Air Pollution Control

Sustainable Environmental Protection Technologies

Handbook of Air Pollution Control Engineering and Technology

Contaminant Biofiltration, Adsorption and Stabilization

*Adsorption Technology for Air and Water Pollution Control*CRC Press

A practical, up-to-date handbook presenting the essential principles, design methods, examples, useful data, and guides to more information on air pollution and its control. Comprehensive in scope, it will aid engineers in the design of cost-effective air pollution control systems. Contributors provide a clear account of what can be done to solve a problem, and what the limitations are.

Whether considered a threat to the health of humans in particular or of the ecosystem in general, the problem of air pollution affects us all. In addition to the 189 chemicals listed in the air toxins category of the 1990 Clean Air Act Amendments, smog, acid rain, ozone depletion, and global warming all arise from air pollution. You can debate the prime causes óacid rain, excessive lumbering or changes in the weather ó but the diminishing rainforest and the spreading desert speak for themselves. Air Pollution addresses the sources and results of these problems, and how they influence the environment. It surveys all aspects of management, including dispersion modeling, emission measurements, air quality and continuous emission monitoring, remote sensing, and stack sampling. In addition, the book explores methods of reduction and control, with particular attention to gaseous emission controls and odor control. This stellar resource addresses the prevention of pollution created by existing technology, and the design of future zero-emissions technology. A useful guide for engineers, students or anyone working for environmental protection, Air Pollution provides a solid foundation and presents a sound environmental philosophy. Béla G. Lipták speaks on Post-Oil Energy Technology on the AT&T Tech Channel.

A detailed reference for the practicing engineer, Air Pollution Control Technology Handbook, Second Edition focuses on air pollution control systems and outlines the basic process engineering and cost estimation required for its design. Written by seasoned experts in the field, this book offers a fundamental understanding of the factors resulting in air pollution and covers the techniques and equations used for air pollution control. Anyone with an engineering or science background can effectively select techniques for control, review alternative design methods and equipment proposals from vendors, and initiate cost studies of control equipment using this book. This second edition of a bestseller includes new methods for designing control equipment, enhanced material on air pollution science, updates on major advances in the field, and explains the importance of a strategy for identifying the most cost-effective design. The book also covers: New legislation and updates on air regulation New advances in process integration design techniques The atmospheric and health effects of air pollution Air Pollution Control Technology Handbook, Second Edition helps combat the solution problem with extensive coverage of air pollution control processes. Fully updated with new legislation, air regulations, and extensive reviews of the design of control equipment, this book serves as an ideal reference for industry professionals or anyone with an engineering or science background needing a basic introduction to air pollution control equipment design.

Air Pollution Control Technology Handbook

Smart Technologies for Energy, Environment and Sustainable Development

Adsorption Capabilities of Adsorbents for Selected Toxic Air Pollutants

Carbon Capture and Storage

Fundamentals and Applications

Hydrogen and Syngas Production and Purification Technologies

Covers the timely topic of fuel cells and hydrogen-based energy from its fundamentals to practical applications Serves as a resource for practicing researchers and as a text in graduate-level programs Tackles crucial aspects in light of the new directions in the energy industry, in particular how to integrate fuel processing into contemporary systems like nuclear and gas power plants Includes homework-style problems

Waste Water Treatment Technologies - Volume I

Adsorption Science and Technology

Fundamentals of Adsorption

From Basic Concepts to Engineering Applications for Air Emission Control