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LDHABT - ROWE COMPTON

This book presents recent advances in inorganic nanomaterials for healthcare, with focus on the synthesis, medical applications and toxicity of metals, metal oxides and metal sulfides. Major applications include diagnosis, bioimaging, biosensing, healing and therapy in cancer, diabetes, cardiovascular diseases, obesity, metabolic syndrome, dentistry and antimicrobials.

As we know, rapid industrialization is a serious concern in the context of a healthy environment and public health due to the generation of huge volumes of toxic wastewater. Although various physico-chemical and biological approaches are available for the treatment of this wastewater, many of them are not effective. Now, there a number of emerging ecofriendly, cost-effective approaches utilizing microorganisms (bacterial/fungi/algae), green plants or their enzymes, and constructed wetland treatment systems in the treatment of wastewaters containing pollutants such as endocrine disrupting chemicals, toxic metals, pesticides, dyes, petroleum hydrocarbons and phenolic compounds. This book provides a much-needed, comprehensive overview of the various types of wastewater and their ecotoxicological effects on the environment, humans, animals and plants as well as various emerging and eco-friendly approaches for their treatment. It provides insights into the ecological problems and challenges in the treatment and management of wastewaters generated by various sources.

This book provides the fundamental aspects of the diverse ranges of nanostructured materials (0D, 1D, 2D and 3D) for energy and environmental applications in a comprehensive manner written by specialists who are at the forefront of research in the field of energy and environmental science. Experimental studies of nanomaterials for aforementioned applications are discussed along with their design, fabrication and their applications, with a specific focus on catalysis, energy storage and conversion systems. This work also emphasizes the challenges of past developments and directions for further research. It also looks at details pertaining to the current ground – breaking of nanotechnology and future perspectives with a multidisciplinary approach to energy and environmental science and informs readers about an efficient utilization of nanomaterials to deliver solutions for the public.

This book in two volumes, and with a foreword by the renowned Professor M.A.J. Williams, draws on evidence from coastal and inland regions, including desert dunes, wind-blown dust, river and lake sediments, glacial moraines, plant and animal fossils, isotope geochemistry, soils and prehistoric archaeology to better understand the genesis and development of dunes systems in selected northern hemisphere sand dunes from Asia, Africa and the Middle East regions. The collection of research papers and case studies that are presented in this book provide the reader with a wealth of information about the distribution and types of sand dunes and an insight into the complexity of sand dune formation, migration and management. Research in many countries across the northern hemisphere shows that dunes, whether coastal or inland, are under pressure around the world. Much of the pressure comes from human activities, and the anthropogenic disturbance, when coupled with global warming and alterations to the amount, frequency and temporal distribution of precipitation could lead to more serious management challenges in the future. There is much that we still need to find out about the origin, genesis and development of sand dunes so that they can be managed better. The difficult and complex questions being repeatedly raised can be answered only by interdisciplinary endeavours. Geomorphologists, geologists, palaeontologists, climatologists, ecologists, and others, can work together on research projects that better define the origin, evolution and development of dunes, both inland and along the coasts. Many chapters in this book attempt to reconstruct past climatic changes in deserts and their margins at a variety of scales in space and time in the expectation that such information might assist in preparing us for future global warming and drying.

The growing market penetration of Internet mapping, satellite imaging and personal navigation has opened up great research and business opportunities to geospatial communities. Multi-platform and multi-sensor integrated mapping technology has clearly established a trend towards fast geospatial data acquisition. Sensors can be mounted on various pla Corrosion Protection at the Nanoscale explores fundamental concepts on how metals can be protected at the nanoscale by using both nanomaterials-based solutions, including nanoalloys, noninhibitors and nanocoatings. It is an important reference resource for both materials scientists and engineers wanting to find ways to create an efficient corrosion prevention strategy. Nanostructure materials have been widely used in many products, such as print electronics, contact, interconnection, implant, nanosensors and display units to lessen the impact of corrosion. Traditional methods for protection of metals include various techniques, such as coatings, inhibitors, electrochemical methods (anodic and cathodic protections), metallurgical design are covered in this book. Nanomaterials-based protective methods can offer many advantages over their traditional counterparts, such as protection for early-stage, higher corrosion resistance, better corrosion control. This book also outlines these advantages and discusses the challenges of implementing nanomaterials as corrosion protection agents on a wide scale.

The book presents the recent advances on testing and experimentation in civil engineering, especially in the branches of geotechnics, transportation, hydraulics, and natural resources. It includes advances in physical modelling, monitoring techniques, data acquisition and analysis, and provides an invaluable contribution for the installation of new civil engineering experimental facilities. The first part of the book covers the latest advances in testing and experimentation in key domains of geotechnics: soil mechanics and geotechnical engineering, rock mechanics and rock engineering, and engineering geology. Some of the topics covered include new developments in topographic survey acquisition for applied mapping and in situ geotechnical investigations; laboratory and in situ tests to estimate the relevant parameters needed to model the behaviour of rock masses and land structures; monitoring and inspection techniques designed for offshore wind foundations. The second part of the book highlights the relevance of testing and monitoring in transportation. Full-scale accelerated pavement testing, and instrumentation becomes even more important nowadays when, for sustainability purposes, non-traditional materials are used in road and airfield pavements. Innovation in testing and monitoring pavements and railway tracks is also developed in this part of the book. Intelligent traffic systems are the new traffic management paradigm, and an overview of new solutions is addressed here. Finally, in the third part of the book, trends in the field and laboratory measurements and corresponding data analysis are presented according to the different hydraulic domains addressed in this publication, namely maritime hydraulics, surface water and river hydraulics and urban water.

This volume is a collection of informative chapters on various subjects. It provides information on the effects of pesticides on avian fauna, the impact of microbial ecosystems to solve environmental problems, a detailed review on issues in membrane distillations process, microbial sensor for detection of pollutants, microbial biosurfactants, biotechnological applications of immobilised microalgae as well as a review on Biochar production. Most importantly, this book contains a critical review on microbial degradation of plastic wastes and highlights the Biodegradation and Bioremediation of Herbicides.

Learn more about phytoremediation technology with this state-of-the-art resource from an internationally recognized editor and leader in his field The Handbook of Assisted and Amendment-Enhanced Sustainable Remediation Technology discusses sustainable approaches to the removal of contaminants from the environment or the reduction of their toxicity. The distinguished editor has included resources from an internationally recognized group of academics who discuss strategies to increase the effectiveness of phytoremediation. Special attention is paid to the use of organic

amendments to facilitate soil cleanup and the growth of phytoremediation plants. The book includes discussions of new remediation technologies, global trends in the environmental remediation industry, and the future challenges and opportunities likely to arise in the short and long term. The Handbook of Assisted and Amendment-Enhanced Sustainable Remediation Technology provides a compelling case for the cost-effectiveness, aesthetics, and minimal environmental disturbance of phytoremediation. Topics covered include: A discussion of activated carbon from lignin, particularly its use as a sorbent for in situ remediation of contaminated sediments An exploration of fresh and mature organic amendments for phytoremediation of technosols contaminated with high concentrations of trace elements An examination of the revitalization of metal-contaminated, EDTA-washed soil by addition of unpolluted soil, compost, and biochar A treatment of wheat straw biochar amendments on the removal of polycyclic aromatic hydrocarbons (PAHs) in contaminated soil Perfect for environmental engineers, environmental scientists, geologists, chemical engineers, and landscape engineers, Handbook of Assisted and Amendment-Enhanced Sustainable Remediation Technology is also an indispensable reference for scientists working in the green chemistry and technology industries, biochemical engineers, environmental regulators, and policy makers. Solid waste management issues, technologies and challenges are dynamic. More so, in developing and transitory nations in Asia. This book, written by Asian experts in solid waste management, explores the current situation in Asian countries including Pacific Islands. There are not many technical books of this kind, especially dedicated to this region of the world. The chapters form a comprehensive, coherent investigation in municipal solid waste (MSW) management, including, definitions used, generation, sustainable waste management system, legal framework and impacts on global warming. Several case studies from Asian nations are included to exemplify the real situation experienced. Discussions on MSW policy in these countries and their impacts on waste management and minimization (if any) are indeed an eye-opener. Undoubtedly, this book would be a pioneer in revealing the latest situation in the Asian region, which includes two of the world's most dynamic nations in the economic growth. It is greatly envisaged to form an excellent source of reference in MSW management in Asia and Pacific Islands. This book will bridge the wide gap in available information between the developed and transitory/developing nations.

Welcome to the International Conference on Inter Disciplinary Research in Engineering and Technology (ICIDRET) 2015 in DSIIDC, Government of NCT, New Delhi, India, Asia on 29 - 30 April, 2015. If this is your first time to New Delhi, you need to look on more objects which you could never forget in your lifetime. There is much to see and experience at The National Capital of Republic of India. The concept of Inter Disciplinary research was a topic of focus by various departments across the Engineering and Technology area. Flushing with major areas, this ICIDRET '15 has addressed the E&T areas like Mechanical Engineering, Civil Engineering, Electrical Engineering, Bio-Technology, Bio-Engineering, Bio-Medical, Computer Science, Electronics & Communication Engineering, Management and Textile Engineering. This focus has brought a new insight on the learning methodologies and the terminology of accepting the cross definition of engineering and the research into it. We invite you to join us in this inspiring conversation. I am pretty sure that this conference would indulge the information from the various parts of the world and could coin as a global research gathering. With more and more researchers coming into ICIDRET, this event would be as an annual event. This conference is sure that, this edition and the future edition will serve as a wise platform for the people to come with better research methodologies integrating each and every social component globally. If there would have been a thought of not integrating the RJ45 and few pieces of metal / plastic along with a PCB, today we could haven't used the telephones and mobile phones. With an ear-mark inspiration and constant support from the Global President Dr. S. Prithiv Rajan, ASDF International President Dr. P. Anbuoli, this publication stands in front of your eyes, without them this would haven't been possible in a very shortest span. Finally, I thank my

family, friends, students and colleagues for their constant encouragement and support for making this type of conference. -- Kokula Krishna Hari K Editor-in-Chief www.kokulakrishnaharik.in

In the past, facilities considered to be at the end of their useful life were demolished and replaced with new ones that better met the functional requirements of modern society, including new safety standards. Humankind has recently recognised the threats to the environment and to our limited natural resources due to our relentless determination to destroy the old and build anew. With the awareness of these constraints and the emphasis on sustainability, in future the majority of old structures will be retrofitted to extend their service life as long as feasible. In keeping with this new approach, the EU's Construction Products Regulation 305/2011, which is the basis of the Eurocodes, included the sustainable use of resources as an "Essential Requirement" for construction. So, the forthcoming second generation of EN-Eurocodes will cover not only the design of new structures, but the rehabilitation of existing ones as well. Most of the existing building stock and civil infrastructures are seismically deficient. When the time comes for a decision to prolong their service life with the help of structural and architectural upgrading, seismic retrofitting may be needed. Further, it is often decided to enhance the earthquake resistance of facilities that still meet their functional requirements and fulfil their purpose, if they are not earthquake-safe. In order to decide how badly a structure needs seismic upgrading or to prioritise it in a population of structures, a seismic evaluation is needed, which also serves as a guide for the extent and type of strengthening. Seismic codes do not sufficiently cover the delicate phase of seismic evaluation nor the many potential technical options for seismic upgrading; therefore research is on-going and the state-of-the-art is constantly evolving. All the more so as seismic evaluation and rehabilitation demand considerable expertise, to make best use of the available safety margins in the existing structure, to adapt the engineering capabilities and techniques at hand to the particularities of a project, to minimise disruption of use, etc. Further, as old structures are very diverse in terms of their materials and layout, seismic retrofitting does not lend itself to straightforward codified procedures or cook-book approaches. As such, seismic evaluation and rehabilitation need the best that the current state-of-the-art can offer on all aspects of earthquake engineering. This volume serves this need, as it gathers the most recent research of top seismic experts from around the world on seismic evaluation, retrofitting and closely related subjects.

This Special Issue presents the latest advances in agriculture, aquaculture, food technology and environmental protection and engineering, discussing, among others, the following issues: new technologies in water, stormwater and wastewater treatment; water saving, lake restoration; new sludge and waste management systems; biodiesel production from animal fat waste; the microbiological quality of compound fish feeds for aquaculture; the role of technological processes to improve food quality and safety; new trends in the analysis of food and food components including in vitro, in vivo, and in silico analyses; and functional and structural aspects of bioactivities of food molecules.

Water saving is an important aspect civil engineering and building design around the world. Alternative water sources as well as water saving appliances have been studied by many researchers in order to maximize water savings in buildings and promote building design that favours water savings. This volume explores topics related to water savings: rainwater tank sizing and modelling, wastewater treatment and reuse, relationships between user behaviour and water savings, health issues related to water savings and environmental analysis of rainwater and grey water use in buildings. Water Savings in Buildings is a handy resource for researchers, post-graduate students, undergraduate students and engineers working in water utilities, environment agencies and associated industries interested in understanding the basics of implementing systems to achieve water savings in buildings.

Sustainable and Circular Management of Resources and Waste Towards a Green Deal highlights the importance of resource recovery, phosphorus management, climate action, clean energy transition, and a circular economy. The world is facing significant challenges, including climate disruption, environmental changes, pollution, and population explosion. Sustainable management of finite natural resources within the carrying capacity of the bio-geo-hydrosphere is the crux of transforming the global economy for a sustainable future. Moreover, keeping raw materials in circulation as long as possible and minimizing the amount of waste generated has grown in significance as a part of transitioning to a circular economy (CE) model. Introduces innovative solutions in green energy transition Provides case studies as examples of a circular economy implementation in selected sectors of the economy, including water and wastewater, raw materials, and construction Suggests actions to counteract climate change and its consequences for people and the planet

This book presents concepts, methods and applications of inorganic nanomaterials for energy applications such as fuel cells and batteries, for environmental applications such as water purification, and for medicinal applications such as cancer treatments. The founding father of nanotechnology, Eric Drexler, always communicated a unique vision in exploring new materials and creating advancements in molecular nanotechnology. He emphasized the potential advantages of smaller size, higher efficiency and less needed resources for applications in energy, environment and medicine. A higher surface to volume ratio of inorganic nanomaterials is a key property.

This work, on 'Environmental Engineering Laboratory Practice', aims at facilitating the teaching-learning community of Civil Engineering and associated fields. Contents are presented in a self-explanatory and coherent way. Experiments are designed for three hours duration within the scope of the syllabus.

This book presents a unified approach to fracture behavior of natural and synthetic fiber-reinforced polymer composites on the basis of fiber orientation, the addition of fillers, characterization, properties and applications. In addition, the book contains an extensive survey of recent improvements in the research and development of fracture analysis of FRP composites that are used to make higher fracture toughness composites in various applications. The FRP composites are an emerging area in polymer science with many structural applications. The rise in materials failure by fracture has forced scientists and researchers to develop new higher strength materials for obtaining higher fracture toughness. Therefore, further knowledge and insight into the different modes of fracture behavior of FRP composites are critical to expanding the range of their application.

Food Waste to Valuable Resources: Applications and Management compiles current information pertaining to food waste, placing particular emphasis on the themes of food waste management, biorefineries, valuable specialty products and technoeconomic analysis. Following its introduction, this book explores new valuable resource technologies, the bioeconomy, the technoeconomic evaluation of food-waste-based biorefineries, and the policies and regulations related to a food-waste-based economy. It is an ideal reference for researchers and industry professionals working in the areas of food waste valorization, food science and technology, food producers, policymakers and NGOs, environmental technologists, environmental engineers, and students studying environmental engineering, food science, and more. Presents recent advances, trends and challenges related to food waste valorization Contains invaluable knowledge on of food waste management, biorefineries, valuable specialty products and technoeconomic analysis Highlights modern advances and applications of food waste bioresources in various products' recovery

WSC2008Chair's Welcome Message Dear Colleague, The World Soft Computing (WSC) conference is an annual international online conference on applied and theoretical soft computing technology. This WSC 2008 is the thirteenth conference in this series and it has been a great success. We received a lot of excellent paper submissions which were peer-reviewed by an international team of experts. Only60 papers out of111 submissions were selected for online publication. This assured a high quality standard for this online conference. The corresponding online statistics are a proof of the great world-wide interest in the WSC 2008 conference. The conference website had a total of33,367different human user accessesfrom43 countries with around100 visitors every day,151 people signed up to WSC to discuss their scienti?c disciplines in our chat rooms and the forum. Also audio and slide presentations allowed a detailed discussion of the papers. The submissions and discussions showed that there is a wide range of soft computing applications to date. The topics covered by the conference range from applied to theoretical aspects of fuzzy, neuro-fuzzy and rough sets over to neural networks to single and multi-objective optimisation. Contributions aboutparticleswarmoptimisation, geneexpressionprogramming, clustering, classification, supportvector-machines, quantum evolution and agents systems have also been received. One whole session was devoted to soft computing techniques in computer graphics, imaging, vision and signal processing.

Volume A of Handbook of Polymer Nanocomposites deals with Layered Silicates. In some 20 chapters the preparation, architecture, characterisation, properties and application of polymer nanocomposites are discussed by experts in their respective fields

Geosynthetics in Civil and Environmental Engineering presents contributions from the 4th Asian Regional Conference on Geosynthetics held in Shanghai, China. The book covers a broad range of topics, such as: fundamental principles and properties of geosynthetics, testing and standards, reinforcement, soil improvement and ground improvement, filter and drainage, landfill engineering, geosystem, transport, geosynthetics-pile support system and geocell, hydraulic application, and ecological techniques. Special case studies as well as selected government-sponsored projects

such as the Three Gorges Dam, Qinghai-Tibet Railway, and Changi Land reclamation project are also discussed. The book will be an invaluable reference in this field.

This book examines bioremediation technologies as a tool for environmental protection and management. It provides global perspectives on recent advances in the bioremediation of various environmental pollutants. Topics covered include comparative analysis of bio-gas electrification from anaerobic digesters, mathematical modeling in bioremediation, the evaluation of next-generation sequencing technologies for environmental monitoring in wastewater abatement; and the impact of diverse wastewater remediation techniques such as the use of nanofibers, microbes and genetically modified organisms; bioelectrochemical treatment; phytoremediation; and biosorption strategies. The book is targeted at scientists and researchers working in the field of bioremediation.

This manual introduces the application of basic chemistry and chemical calculations to measure physical, chemical, and bacteriological parameters like turbidity and colour, dissolved oxygen, hardness, pH, alkalinity, organic content, Sulphates, Fluorides, Iron, Total Settle able solids, chloride, Suspended and Dissolved Solids, Ammonical Nitrogen, Bacteriological Analysis, chemical and biochemical oxygen demand of water and wastewater. Laboratory methods and interpretation of results with regard to environmental engineering applications such as design and operation of water and wastewater treatment processes, and to the control of the quality of natural waters are also explored. As a result of these tests, various remedies can be suggested to reduce the environmental pollution. The purpose of this laboratory manual is to make the people aware of the dangerous effects of environmental pollution

Today synthetic dyes are used extensively in the textile dyeing, paper printing, color photography, pharmaceuticals, food and drink, cosmetic and leather industries. As of now, over 100,000 different dyes are available, with an annual production of over 700,000 metric tons. These industries discharge an enormous amount of colored effluents into natural water bodies, with or without treatment. The textile industry alone discharges 280,000 tons of dyes every year, making it the largest contributor to colored effluent discharge. Although a variety of treatment technologies are available, including adsorption, chemical oxidation, precipitation, coagulation, filtration electrolysis and photodegradation, biological and microbiological methods employing activated sludge, pure cultures, microbial consortia and degradative enzymes are economically viable, effective and environmentally responsible options. As such, this book gathers review articles from international experts working on the microbial degradation of synthetic dyes, offering readers the latest information on the subject. It is intended as a quick reference guide for academics, scientists and industrialists around the world.

This book reviews health hazards associated with wastewater use and water pollutants. Chapters present applications of green materials made of agricultural waste, activated carbon and magnetic materials for wastewater treatment. The removal of toxic metals using algal biomass and the removal of toxic dyes using chitosan composite materials are also discussed. The book includes reviews on the removal of phenols, pesticides, and on the use of ionic liquid-modified activated carbon for the treatment of textile wastewater.

The increasing demand for energy and the related environmental concerns are the main drivers for the strong interest in Biomass Fermentation towards usage in Fuel Cells. The integration of Biomass Fermentation (BF) and Fuel Cells (FC) technology creates a new and interdisciplinary research area. Due to their high efficiency Fuel Cells are therefore considered as a strategic technology for future energy supply systems. The fact that biomass is a renewable source of energy in combination with the most efficient energy conversion system (FC) makes this combination unique and advantageous. This book has a clear orientation towards making products of our waste. Biofuels for Fuel Cells comes at a time when this field is rapidly developing and there is a need for a synthesising book. The holistic and multidisciplinary description of this topic, including discussion of technological, socio-economic, system analysis and policy and regulatory aspects, make this book the definitive work for this market. Biofuels for Fuel Cells will cross-link scientists of all fields concerned with Biomass Fermentation, Fuel Upgrading and Fuel Cells at European and World level.

This book discusses major technological advances in the treatment and re-use of wastewater. Its focus is on both novel treatment strategies and the modifications and adaptations of conventional processes to optimize the treatment of a complex variety of pollutants, including organic matter, chemicals and micropollutants in different water resources, as well as the integration of water treatment with bioelectricity production. Written by leading researchers in the field, it will be of interest to a wide range of researchers in both industry and academia.

This volume includes 15 papers from the National Academy of Engineering's 2006 U.S. Frontiers of Engineering (USFOE) Symposium held in September 2006. USFOE meetings bring together 100 outstanding engineers (ages 30 to 45) to exchange information about leading-edge technologies in a range of engineering fields. The 2006 symposium covered four topic areas: intelligent software systems and machines, the nano/bio interface, engineering personal mobility for the 21st century, and supply chain management. A paper by dinner speaker Dr. W. Dale Compton, Lillian M. Gilbreth Distinguished Professor of Industrial Engineering, Emeritus, is also included. The papers describe leading-edge research on commercializing auditory neuroscience, future developments in bionanotechnology, sustainable urban transportation, and managing disruptions to supply chains, among other topics. Appendixes include information about contributors, the symposium program, and a list of meeting participants. This is the twelfth volume in the USFOE series.

Biomass, Biofuels, Biochemicals encompasses the potential of microbial electrochemical technologies, delineating their role in developing a technology for abating environmental crisis and enabling transformation to a sustainable future. The book provides new and futuristic methods for bioelectrogenesis, multiple product synthesis, waste remediation strategies, and electromicrobiology generation which are widely essential to individuals from industry, marketing, activists, writers, etc. In addition, it provides essential knowledge transfer to researchers, students and science enthusiasts on Microbial Electrochemical Technologies, detailing the functional mechanisms employed, various operational configurations, influencing factors governing the reaction progress and integration strategies. With these key topics and features, the book generates interest among a wide range of people related to renewable energy generation and sustainable environmental research. Depicts the holistic view of the multiple applications of Microbial Electrochemical Technologies (METs) in a unified comprehensible manner Provides strategic integrations of MET with various bioprocesses that are essential in establishing a circular biorefinery Widens the scope of the existing technologies, giving up-to date, state-of-the-art information and knowledge on research and commercialization Contains topics that are lucid, providing interdisciplinary knowledge on the environment, molecular biology, engineering, biotechnology, microbiology and economic aspects Includes more than 75 illustrations, figures, diagrams, flow charts, and tables for further study

People live in indoor environment about 90% of lifetime and an adult inhales about 15 kg air each day, over 75% of the human body's daily mass intake (air, food, water). Therefore, indoor air quality (IAQ) is very important to human health. This book provides the basic knowledge of IAQ and highlights the research achievements in the past two decades. It covers the following 12 sections: introduction, indoor air chemicals, indoor air particles, measurement and evaluation, source/sink characteristics, indoor chemistry, human exposure to indoor pollutants, health effects and health risk assessment, IAQ and cognitive performance, standards and guidelines, IAQ control, and air quality in various indoor environments. It provides a combination of an introduction to various aspects on IAQ studies, the current state-of-knowledge, various advances and the perspective of IAQ studies. It will be very helpful for the researchers and technicians in the IAQ and the related fields. It is also useful for experts in other fields and general readers who want to obtain a basic understanding of and research advances in the field of IAQ. A group of experts in IAQ research have been recruited to write the chapters. Their research interests and experience cover the scope of the book. In addition, some experienced experts in IAQ field have been invited as advisors or reviewers

to give their comments, suggestions and revisions on the handbook framework and the chapter details. Their contribution guarantees the quality of the book. We are very grateful to them. Last but not least, we express our heartfelt thanks to Prof. Spengler, Harvard University, for writing the foreword of the current Handbook of Indoor Air Quality both as a pioneer scientist who contributed greatly to indoor air science and as an Editor-in-chief of Handbook of Indoor Air Quality 2001, 1st ed. New York: McGraw-Hill. In addition to hard copies, the book is also published online and will be updated by the authors as needed to keep it aligned with current knowledge. These salient features can make the handbook fresh with the research development.

This book examines the potential applications of nanoscience and nanotechnology to promote eco-friendly processes and techniques for energy and environment sustainability. Covering various aspects of both the synthesis and applications of nanoparticles and nanofluids for energy and environmental engineering, its goal is to promote eco-friendly processes and techniques. Accordingly, the book elaborates on the development of reliable, economical, eco-friendly processes through advanced nanoscience and technological research and innovations. Gathering contributions by researchers actively engaged in various domains of nanoscience and technology, it addresses topics such as nanoparticle synthesis (both top-down and bottom-up approaches); applications of nanomaterials, nanosensors and plasma discharge in pollution control; environmental monitoring; agriculture; energy recovery; production enhancement; energy conservation and storage; surface modification of materials for energy storage; fuel cells; pollution mitigation; and CO₂ capture and sequestration. Given its scope, the book will be of interest to academics and researchers whose work involves nanotechnology or nanomaterials, especially as applied to energy and/or environmental sustainability engineering. Graduate students in the same areas will also find it a valuable resource.

This book gathers the proceedings of the plenary sessions, invited lectures, and papers presented at the International Conference on Recent Trends in Materials Science and Applications (ICRTM-SA-2016). It also features revealing presentations on various aspects of Materials Science, such as nanomaterials, photonic crystal fibers, quantum dots, thin film techniques, crystal growth, spectroscopic procedures, fabrication and characterisation of new materials / compounds with enhanced features, and potential applications in nonlinear optical and electro-optic devices, solar cell device, chemical sensing, biomedical imaging, diagnosis and treatment of cancer, energy storage device etc. This book will be of great interest to beginning and seasoned researchers alike.

Once pollutants are released into the atmosphere, they cannot be removed easily nor can the reaction with atmospheric constituents be ceased. However, through enhancing our understanding of control technology, further addition of pollution can be forestalled. Through better understanding of innovations in the field of air pollutant control technology and modelling, better cost-effective control equipment can be designed to achieve a clean biosphere for sustainable life in the near future. Global Perspectives on Air Pollution Prevention and Control System Design is a pivotal reference source that provides vital research on the understanding of the basic concepts of air pollution, modeling concepts, development of various models for source-specific pollutants, and dispersion. While highlighting topics such as climate change, fossil fuels, and motor vehicle emissions, this publication explores the links between the global impact on climate change and modeling concepts of indoor air pollutants. This book is ideally designed for professors, students, researchers,

environmental agencies, environmentalists, policymakers, and government officials, seeking current research on future solutions in critical fields of air pollution.

Modern optimization approaches have attracted an increasing number of scientists, decision makers, and researchers. As new issues in this field emerge, different optimization methodologies must be developed and implemented. The Handbook of Research on Emergent Applications of Optimization Algorithms is an authoritative reference source for the latest scholarly research on modern optimization techniques for solving complex problems of global optimization and their applications in economics and engineering. Featuring coverage on a broad range of topics and perspectives such as hybrid systems, non-cooperative games, and cryptography, this publication is ideally designed for students, researchers, and engineers interested in emerging developments in optimization algorithms.

With its unique focus on specifically addressing the problems for societies and economies associated with corrosion and their solution, this book provides an up-to-date overview of the progress in corrosion chemistry and engineering. International experts actively involved in research and development place particular emphasis on how to counter the economic and environmental consequences of corrosion with the help of science and technology, making this a valuable resource for researchers as well as decision makers in industry and politics. Further major parts of the book are devoted to corrosion prevention in the naval and energy sector as well as to corrosion monitoring and waste management.

Sustainable agriculture is a rapidly growing field aiming at producing food and energy in a sustainable way for our children. This discipline addresses current issues such as climate change, increasing food and fuel prices, starvation, obesity, water pollution, soil erosion, fertility loss, pest control and biodiversity depletion. Novel solutions are proposed based on integrated knowledge from agronomy, soil science, molecular biology, chemistry, toxicology, ecology, economy, philosophy and social sciences. As actual society issues are now intertwined, sustainable agriculture will bring solutions to build a safer world. This book series analyzes current agricultural issues and proposes alternative solutions, consequently helping all scientists, decision-makers, professors, farmers and politicians wishing to build safe agriculture, energy and food systems for future generations.

Current Developments in Biotechnology and Bioengineering: Resource Recovery from Wastes includes the latest and innovative research and technological developments in the biotechnology and bioengineering pertaining to various resource(s) recovery from wastes. The contents are organized into two broader sections covering resource recovery from industrial wastewater and resource recovery from solid wastes. Sections cover energy, bioproducts, nutrients, municipal food wastes, electronic wastes, agricultural waste and others. The state-of-the-art situation, potential advantages and limitations are also provided, along with strategies to overcome limitations. This book is a useful guide into research demands in solid and liquid waste treatment and management for environmental/economic sustainability. Provides state-of-art information and applications on microbiological and biotechnological interventions for resource recovery Covers municipal food wastes, electronic wastes and agricultural wastes Reviews current information relating to bioremediation Contains recent information, clearly illustrated with tables, figures and pictures Outlines different technological and biological aspects of resource recovery from industrial waste and effluents