

Ram Prasad For Chemical Engineering E Book

Approaches in Bioremediation
 Dielectric Polymer Nanocomposites
 Application of Microbes in Environmental and Microbial Biotechnology
 Basic Principles and Calculations in Chemical Engineering
 Eastern Philosophy
 Elements of Petroleum Refinery Engineering
 Rules of Thumb for Chemical Engineers
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Approaches in Bioremediation PHI Learning Pvt. Ltd.

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 discharge of wastewater contaminants and their geographical mobilization have caused an increase in concentration in ground, surface, fluvial and residual waters. Extensive information about detection and disposal methods is needed in order to develop technological solutions for a variety of environments, both urban and rural. This book provides up-to-date information on wastewater contaminants, aimed at researchers, engineers and technologists working in this field. Conventional physicochemical techniques used to remove contaminants from wastewater include ion exchange, precipitation, degradation, coagulation, coating, membrane processes and adsorption. However, these applications have technological and economic limitations, and involve the release of large amounts of chemical reagents and by-products that are themselves difficult to remove. Biosorption - the use of organically generated material as an adsorbent - is attracting new research and scholarship. Thermally-treated calcined biomaterials may be treated to remove heavy metals from wastewater. To ensure the elimination of these contaminants, existing solutions must be integrated with intelligent biosorption functions. Biosorption for Wastewater Contaminants will find an appreciative audience among academics and postgraduates working in the fields of environmental biotechnology, environmental engineering, wastewater treatment technology and environmental chemistry.

Dielectric Polymer Nanocomposites PHI Learning Pvt. Ltd.

Ferroelectricity in Doped Hafnium Oxide: Materials, Properties and Devices covers all aspects relating to the structural and electrical properties of HfO₂ and its implementation into semiconductor devices, including a comparison to standard ferroelectric materials. The ferroelectric and field-induced ferroelectric properties of HfO₂-based films are considered promising for various applications, including non-volatile memories, negative capacitance field-effect-transistors, energy storage, harvesting, and solid-state cooling. Fundamentals of ferroelectric and piezoelectric properties, HfO₂ processes, and the impact of dopants on ferroelectric properties are also extensively discussed in the book, along with phase transition, switching kinetics, epitaxial growth, thickness scaling, and more. Additional chapters consider the modeling of ferroelectric phase transformation, structural characterization, and the differences and similarities between HFO₂ and standard ferroelectric materials. Finally, HfO₂ based devices are summarized. Explores all aspects of the structural and electrical properties of HfO₂, including processes, modelling and implementation into semiconductor devices Considers potential applications including FeCaps, FeFETs, NCFETs, FTJs and more Provides comparison of an emerging ferroelectric material to conventional ferroelectric materials with insights to the problems of downscaling that conventional ferroelectrics face

Application of Microbes in Environmental and Microbial Biotechnology Springer
 Computational Quantum Chemistry, Second Edition, is an extremely useful tool for teaching and research alike. It stipulates information in an accessible manner for scientific investigators, researchers and entrepreneurs. The book supplies an overview of the field and explains the fundamental underlying principles. It also gives the knowledge of numerous comparisons of different methods. The book consists of a wider range of applications in each chapter. It also provides a number of references which will be useful for academic and industrial researchers. It includes a large number of worked-out examples and unsolved problems for enhancing the computational skill of the users. Features Includes comprehensive coverage of most essential basic concepts Achieves greater

clarity with improved planning of topics and is reader-friendly Deals with the mathematical techniques which will help readers to more efficient problem solving Explains a structured approach for mathematical derivations A reference book for academicians and scientific investigators Ram Yatan Prasad, PhD, DSc (India), DSc (hc) Colombo, is a Professor of Chemistry and former Vice Chancellor of S.K.M University, Jharkhand, India. Pranita, PhD, DSc (hc) Sri Lanka, FICS, is an Assistant Professor of Chemistry at Vinoba Bhave University, India.

Basic Principles and Calculations in Chemical Engineering MIT Press

Microbial biosurfactant compounds are a group of structurally diverse molecules produced by microorganisms, and are mainly categorized according to their chemical structure. The diversity of microbial biosurfactants makes them versatile and means that they offer a range of capabilities, while at the same time being economically sustainable. As such, they have potential applications in environmental processes, as well as in food, biomedicine and other industries. This book discusses innovative approaches and cutting-edge research that utilize the various properties of biosurfactants. Drawing on research from around the globe, it provides an up-to-date review of biosurfactant applications and their importance in fields such as medicine, gene therapy, immunotherapy, antimicrobial bioremediation and agriculture. It also discusses their anti-adhesive properties. The book will appeal to academics and researchers in the field of microbiology, as well as policymakers. It also serves as additional reading material for undergraduate and graduate students of agriculture, ecology, soil science, and environmental sciences.

Eastern Philosophy Weidenfeld & Nicolson

Dielectric Polymer Nanocomposites provides the first in-depth discussion of nano-dielectrics, an emerging and fast moving topic in electrical insulation. The text begins with an overview of the background, principles and promise of nanodielectrics, followed by a discussion of the processing of nanocomposites and then proceeds with special considerations of clay based processes, mechanical, thermal and electric properties and surface properties as well as erosion resistance. Carbon nanotubes are discussed as a means of creation of non linear conductivity, the text concludes with a industrial applications perspective.

Elements of Petroleum Refinery Engineering CRC Press

This comprehensive edited book on microbial prospective discusses the innovative approaches and investigation strategies, as well as provides a broad spectrum of the cutting-edge research on the processing, properties and technological developments of microbial products and their applications. Microbes finds very important applications in our lives including industries and food processing. They are widely used in the fermentation of beverages, processing of dairy products, production of pharmaceuticals, chemicals, enzymes, proteins and biomaterials; conversion of biomass into fuel, fuel cell technology, health and environmental sectors. Some of these products are produced commercially, while others are potentially valuable in biotechnology. Microorganisms are considered invaluable in research as model organisms. This is a useful compilation for students and researchers in microbiology, biotechnology and chemical industries.

Rules of Thumb for Chemical Engineers John Wiley & Sons

The present textbook is written for undergraduate students of chemical engineering as per the syllabus framed by AICTE curriculum. It explains the basic chemical process principles in a lucid manner. SI units, chemical stoichiometry and measures of composition, behaviour of gases, vapour pressure of pure substances, and humidity and saturation are covered in detail. In addition, mass and energy balances of chemical processes have also been described. Chemical processes without chemical reactions include fluid flow, mixing, evaporation distillation, absorption and stripping, liquid-liquid extraction, leaching and washing, adsorption, drying, crystallization and membrane separation process. SALIENT FEATURES • Description of all concepts and principles with a rich pedagogy for easy understanding • Correct use of SI units • Over 270 solved examples for understanding the basic concepts • Answers to all chapter-end numerical problems for checking the accuracy of calculations TARGET AUDIENCE • BE/B.Tech (Chemical Engineering)

CRC Press

The most complete guide of its kind, this is the standard handbook for chemical and process engineers. All new material on fluid flow, long pipe, fractionators, separators and accumulators, cooling towers, gas treating, blending, troubleshooting field cases, gas solubility, and density of irregular solids. This substantial addition of material will also include conversion tables and a new appendix, "Shortcut Equipment Design Methods." This convenient volume helps solve field engineering problems with its hundreds of common sense techniques, shortcuts, and calculations. Here, in a compact, easy-to-use format, are practical tips, handy formulas, correlations, curves, charts, tables, and shortcut methods that will save engineers valuable time and effort. Hundreds of common sense techniques and calculations help users quickly and accurately solve day-to-day design, operations, and equipment problems.

Evaluating Strategies for Commercialization and Sustainability PHI Learning Pvt. Ltd.

A magisterial overview of the philosophies of the East. 'The time has come for global philosophy to move beyond the model where the West is at the centre of radiating spokes of comparison.' Challenging the notion that Western philosophy is the best or only yardstick against which to judge the so-called 'non-Western' philosophies, Chakravarthi Ram-Prasad sets up a lively debate in which the great thought systems of the East are engaged very much in their own terms. The author's impressive sweep takes him through South Asia east to China and Japan, encompassing 3000 years of philosophy and including the ancient philosophies of India, Jainism, Buddhism, Daoism and Confucianism. At the same time, Ram-Prasad dispels the romantic illusion that there is some common mystical 'wisdom tradition' that binds together the cultures of the East. His aim is to give a sense of the diversity and depth of these philosophical cultures, as well as their sophistication and originality; and to make comparisons between them to illuminate their varied yet potentially universal appeal.

Ferroelectricity in Doped Hafnium Oxide FT Press

This textbook covers the entire gamut of project scoping, identification, development and appraisal and is primarily designed to meet the requirements of postgraduate students of management and engineering education. Researchers, consultants, policy makers and professionals in project management will find it a good body of knowledge as a reference source. The objective of the book is to provide a multidisciplinary grounding to the readers so that they can develop all the skills and competencies required to view or manage the entire project management process as an integrated whole. The book has been written in an easy-to-understand style and uses live case studies of renewable energy projects to illustrate the concepts, so that the students/readers understand them in the context of the real world. Though based on renewable energy projects, majority of the concepts explained in the book are applicable to other industrial projects equally – detailed guidance and notes on this aspect is given appropriately in the book.

Volume 2 John Wiley & Sons

Research on biomedical applications of nanomaterials has exhibited the rapidly evolving field of biomedical sciences by showing how effective they are in treatment. These particles hold considerable potential for biomedical applications. Work is ongoing, and the results suggest a possibility for a sustainable future for nanomaterials in both therapeutic and biomedical fields. This book highlights current and emerging applications, taking global research findings into consideration. We believe the focus on the identification and role of nanomaterial applications in therapeutic and biomedical sciences can lead to novel solutions in the fields. The chapters of this book are disseminated in a manner that can be readily adopted as sources for new and further study. The editors integrate advanced texts in their research that help graduate students, researchers and professors. Additionally, we believe that international readers will be able to make use of this book for reference purposes.

Separation Technologies for the Industries of the Future IGI Global

How MIT's first nine presidents helped transform the Institute from a small technical school into a major research university. MIT was founded in 1861 as a polytechnic institute in Boston's Back Bay, overshadowed by its neighbor across the Charles River, Harvard University. Harvard offered a classical education to young men of America's ruling class; the early MIT trained men (and a few women) from all parts of society as engineers for the nation's burgeoning industries. Over the years, MIT expanded its mission and ventured into other fields—pure science, social science, the humanities—and established itself in Cambridge as Harvard's enduring rival. In *A Widening Sphere*, Philip Alexander traces MIT's evolution from polytechnic to major research institution through the lives of its first nine presidents, exploring how the ideas, outlook, approach, and personality of each shaped the school's intellectual and social cultures. Alexander describes, among other things, the political skill and entrepreneurial spirit of founder and first president, William Rogers; institutional growing pains under John Runkle; Francis Walker's campaign to broaden the curriculum, especially in the social sciences, and to recruit first-rate faculty; James Crafts, whose heart lay in research, not administration; Henry Pritchett's thwarted effort to merge with Harvard (after which he decamped to the Carnegie Foundation for the Advancement of Teaching); Richard Maclaurin's successful strategy to move the institute to Cambridge, after considering other sites (including a golfclub in Brighton); the brilliant, progressive Ernest Nichols, who succumbed to chronic illness and barely held office; Samuel Stratton's push towards a global perspective; and Karl Compton's vision for a new kind of Institute—a university polarized around science and technology. Through these interlocking yet independent portraits, Alexander reveals the inner workings of a complex and dynamic community of innovators.

Volume 36 - Phosphorus to Pipeline Failure: Subsidence Strains Amer Inst of Chemical Engineers

The establishment of clean, safe water is one of the major challenges facing societies around the globe. The continued urbanization of human populations, the increasing manipulation of natural resources, and the resulting pollution are driving remarkable burden on water resources. Increasing demands for food, energy, and natural resources are expected to continue to accelerate in the near future in response to the demands of these changing human populations. In addition, the complexity of human activities is leading to a diversity of new chemical contaminants in the environment that represent a major concern for water managers. This will create increased pressure on both water quantity and quality, making it increasingly difficult to provide a sustainable supply of water for human welfare and activities. Although protection of water resources is the best long-term solution, we will also need innovative novel approaches and technologies to water treatment to ensure an adequate superior quality resource to meet these needs. Solving tomorrow's water issues will require unique approaches that incorporate emerging new technologies. Great advances have been made in the area of nanotechnology. Due to their unique physical and chemical properties, nanomaterials are extensively used in antibacterial medical products, membrane filters, electronics, catalysts, and biosensors. Nanoparticles can have distinctly different properties from their bulk counterparts, creating the opportunity for new materials with a diversity of applications. Recent developments related to water treatment include the potential use of carbon nanotubes, nanocompositae, nanospheres, nanofibers, and nanowires for the removal of a diversity of chemical pollutants. By exploiting the assets and structure of these new materials, such as increased surface area, high reactivity, and photocatalytic action, it will be possible to create technologies that can be very efficient at removing and degrading environmental pollutants. Understanding and using these

unique properties should lead to innovative, cost-effective applications for addressing the complexities of emerging needs for water treatment and protection. Although still in the early stages, research into the application of nanotechnology shows great promise for solving some of these major global water issues. This comprehensive text describes the latest research and application methods in this rapidly advancing field.

A Widening Sphere Springer Nature

Bioremediation refers to the clean-up of pollution in soil, groundwater, surface water, and air using typically microbiological processes. It uses naturally occurring bacteria and fungi or plants to degrade, transform or detoxify hazardous substances to human health or the environment. For bioremediation to be effective, microorganisms must enzymatically attack the pollutants and convert them to harmless products. As bioremediation can be effective only where environmental conditions permit microbial growth and action, its application often involves the management of ecological factors to allow microbial growth and degradation to continue at a faster rate. Like other technologies, bioremediation has its limitations. Some contaminants, such as chlorinated organic or high aromatic hydrocarbons, are resistant to microbial attack. They are degraded either gradually or not at all, hence, it is not easy to envisage the rates of clean-up for bioremediation implementation. Bioremediation represents a field of great expansion due to the important development of new technologies. Among them, several decades on metagenomics expansion has led to the detection of autochthonous microbiota that plays a key role during transformation. Transcriptomic guides us to know the expression of key genes and proteomics allow the characterization of proteins that conduct specific reactions. In this book we show specific technologies applied in bioremediation of main interest for research in the field, with special attention on fungi, which have been poorly studied microorganisms. Finally, new approaches in the field, such as CRISPR-CAS9, are also discussed. Lastly, it introduces management strategies, such as bioremediation application for managing affected environment and bioremediation approaches. Examples of successful bioremediation applications are illustrated in radionuclide entrapment and retardation, soil stabilization and remediation of polycyclic aromatic hydrocarbons, phenols, plastics or fluorinated compounds. Other emerging bioremediation methods include electro bioremediation, microbe-availed phytoremediation, genetic recombinant technologies in enhancing plants in accumulation of inorganic metals, and metalloids as well as degradation of organic pollutants, protein-metabolic engineering to increase bioremediation efficiency, including nanotechnology applications are also discussed.

Volume 1, Advances in the Understanding of Nanomaterials Research and Applications Springer

Fungal nanobionics has great prospects for developing new products with industrial, agriculture, medicine and consumer applications in a wide range of sectors. The fields of chemical engineering, agri-food, biochemical, pharmaceuticals, diagnostics and medical device development all employ fungal products, with fungal nanomaterials currently used in a wide range of applications, ranging from drug development to food industry and agricultural sector. The fungal agents emerge as an environmentally friendly, clean, non-toxic agent for the biogenic metal nanoparticles and employs both intracellular and extracellular methods. The simplicity of scaling up and downstream processing and the presence of fungal mycelia affording an increased surface area provide key advantages. In addition, the larger spectrum of synthesized nanoparticle morphologies and the substantially faster biosynthesis rate in cell-free filtrate (due to the higher amount of proteins secreted in fungi) make this a particularly enticing route. Understanding the diversity of fungi in assorted ecosystems, as well as their interactions with other microorganisms, animals and plants, is essential to underpin real and innovative technological developments and the applications of metal nanoparticles in many disciplines including agriculture, catalysis, and biomedical biosensors. Importantly, biogenic fungal nanoparticles show significant synergistic characteristics when combined with antibiotics and fungicides to offer substantially greater resistance to microbial growth and applications in nanomedicine ranging from topical ointments and bandages for wound healing to coated stents.

Engineered Nanomaterials for Innovative Therapies and Biomedicine Springer Nature

An improved understanding of the interactions between nanoparticles and plant retorts, including their uptake, localization, and activity, could revolutionize crop production through increased disease resistance, nutrient utilization, and crop yield. This may further impact other agricultural and industrial processes that are based on plant crops. This two-volume book analyses the key processes involved in the nanoparticle delivery to plants and details the interactions between plants and nanomaterials. Potential plant nanotechnology applications for enhanced nutrient uptake, increased crop productivity and plant disease management are evaluated with careful consideration regarding safe use, social acceptance and ecological impact of these technologies. *Plant Nanobionics: Volume 1, Advances in the Understanding of Nanomaterials Research and Applications* begins the discussion of nanotechnology applications in plants with the characterization and nanosynthesis of various microbes and covers the mechanisms and etiology of nanostructure function in microbial cells. It focuses on the potential alteration of plant production systems through the controlled release of agrochemicals and targeted delivery of biomolecules. Industrial and medical applications are included. *Volume 2* continues this discussion with a focus on biosynthesis and toxicity.

Advanced Research in Nanosciences for Water Technology Springer

Keeping the importance of basic tools of process calculations—material balance and energy balance—in mind, the text prepares the students to formulate material and energy balance theory on chemical process systems. It also demonstrates how to solve the main process-related problems that crop up in chemical engineering practice. The chapters are organized in a way that enables the students to acquire an in-depth understanding of the subject. The emphasis is given to the units and conversions, basic concepts of calculations, material balance with/without chemical reactions, and combustion of fuels and energy balances. Apart from numerous illustrations, the book contains numerous solved problems and exercises which bridge the gap between theoretical learning and practical implementation. All the numerical problems are solved with block diagrams to reinforce the understanding of the concepts. Primarily intended as a text for the undergraduate students of chemical engineering, it will also be useful for other allied branches of chemical engineering such as polymer science and engineering and petroleum engineering. **KEY FEATURES** • Methods of calculation for stoichiometric proportions with practical examples from the Industry • Simplified method of solving numerical problems under material balance with and without chemical reactions • Conversions of chemical engineering equations from one unit to another • Solution of fuel and combustion, and energy balance problems using tabular column

Computational Quantum Chemistry Springer

The text begins by reviewing, in a simple and precise manner, the physical principles of three pillars of Refrigeration and Air Conditioning, namely thermodynamics, heat transfer, and fluid mechanics. Following an overview of the history of refrigeration, subsequent chapters provide exhaustive coverage of the principles, applications and design of several types of refrigeration systems and their associated components such as compressors, condensers, evaporators, and expansion devices. Refrigerants too, are studied elaboratively in an exclusive chapter. The second part of the book, beginning with the historical background of air conditioning in Chapter 15, discusses the subject of psychrometrics being at the heart of understanding the design and implementation of air conditioning processes and systems, which are subsequently dealt with in Chapters 16 to 23. It also

explains the design practices followed for cooling and heating load calculations. Each chapter contains several worked-out examples that clarify the material discussed and illustrate the use of basic principles in engineering applications. Each chapter also ends with a set of few review questions to serve as revision of the material learned.

Bioenergy Research Springer Nature

This book presents the select proceedings of Congress on Advances in Materials Science and Engineering (CAMSE 2020). It focuses on the state-of-the-art research, development, and commercial prospective of recent advances in mechanical engineering. The book covers various synthesis and fabrication routes of functional and smart materials for applications in mechanical engineering, manufacturing, physics, chemical and biological sciences, metrology, optimization and artificial intelligence among others. This book will be a useful resource for researchers, academicians

as well as professionals interested in the highly interdisciplinary field of materials science and mechanical engineering.

Encyclopedia of Chemical Processing and Design Woodhead Publishing

This book is targeted to benefit the diploma in engineering students. Degree in engineering students (B.Tech-Chemical Engineering, Petroleum Engineering, Petrochemical Engineering, Aeronautical Engg., AMIE, AMIICHE, students etc. M. Tech students of various disciplines pursuing courses on petroleum refining. Faculty members/ teaching staff of engineering college/IIT's/NIT's etc. Practicing petroleum engineers/consultants/refiners in various private sector/public sector undertakings, state/central government departments, NGO's etc. Students of foreign universities of developing countries pursuing diploma/degree/postgraduate courses in various engineering disciplines having a paper in petroleum refinery engineering.

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