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Industrial Applications of Nanocrystals
Industrial Applications of Machine Learning
Industrial Applications of Nanocellulose and Its Nanocomposites
Industrial Applications of Renewable Plastics
Fundamentals and Industrial Applications of Magnetic Nanoparticles
Industrial Applications of Lasers
Technological and Industrial Applications Associated With Industry 4.0
Industrial Applications of Surfactants IV
Industrial Enzyme Applications
Handbook of Polymer Nanocomposites for Industrial Applications
Microencapsulation
Emerging Trends in Energy Storage Systems and Industrial Applications
Textiles for Industrial Applications
Microfabrication for Industrial Applications
Green Nanomaterials for Industrial Applications
Handbook of Nanomaterials for Industrial Applications
Industrial Applications of Nanomaterials
Business Intelligence and Performance Management
Thermodynamic Models for Industrial Applications
Industrial Process Control: Advances and Applications
RF Linear Accelerators for Medical and Industrial Applications
Laser Processing of Engineering Materials
Aluminum and Its Alloys
New Challenges and Industrial Applications for Corrosion Prevention and Control
Homogeneous Catalysis Modelling and Industrial Application of Flow Through Two-dimensional Porous Media
Industrial Applications of Batteries
Microbial Extremozymes
Industrial High Pressure Applications
Biopolymers and Their Industrial Applications
Defoaming
Soft Computing and Industry
RF Power for Industrial Applications
Advances in Applications of Industrial Biomaterials
The Industrial Application of Color Difference
Green IT Engineering: Social, Business and Industrial Applications
Handbook of Biological Dyes and Stains
Industrial Applications of Power Electronics
Artificial Intelligence in Industrial Applications
Industrial Applications of Biosurfactants and Microorganisms

This book presents recent advances in the development of biomaterials for industrial applications, and discusses the potential for substituting environmentally hazardous substances with environmentally friendly and degradable components. Focusing on both the material development and production technologies, it reviews different materials, as well as new production technologies and application areas. It also highlights the importance of incorporating organic materials into different composites to enable consumption of otherwise waste materials. Further it addresses biopolymers for the food industry, e.g. edible films and coatings in food production and biodegradable materials; the automotive industry; bio fuels, such as biodiesel based on organic constituents; and green

composites in marine applications. Environmental protection aspects related to the protection of cultural heritage, and new nanoparticles, such as nano zerovalent iron, are also reviewed. Aimed at young researchers, professionals, chemical engineers and marine engineers, the book is the result of the joint efforts of different academic and research institutions participating in the WIMB Tempus project, 543898-TEMPUS-1-2013-1-ES-TEMPUS-JPHES, "Development of Sustainable Interrelations between Education, Research and Innovation at WBC Universities in Nanotechnologies and Advanced Materials where Innovation Means Business", co-funded by the European Union Tempus Program. Microfabrication for Industrial Applications focuses on the industrial perspective for micro- and nanofabrication methods including large-scale manufacturing, transfer of concepts from lab to factory, process tolerance, yield, robustness, and cost. It gives a history of miniaturization, micro- and nanofabrication, and surveys industrial fields of application, illustrating fabrication processes of relevant micro and nano devices. Concerning sub-micron feature manufacture, the book explains: the philosophy of micro/ nanofabrication for integrated circuit industry; thin film deposition; (waveguide, plastic, semiconductor) material processing; packaging; interconnects; stress (e.g., thin film residual); economic; and environmental aspects. Micro/nanomechanical sensors and actuators are explained in depth with information on applications, materials (incl. functional polymers), methods, testing, fabrication, integration, reliability, magnetic microstructures, etc. Shows engineers & students how to evaluate the potential value of current and near future manufacturing processes for miniaturized systems in industrial environments Explains the top-down and bottom up approaches to nanotechnology, nanostructures fabricated with beams, nano imprinting methods, nanoparticle manufacturing (and their health aspects), nanostructure analysis, and connecting nano to micro to macro Discusses issues for practical application cases; possibilities of dimension precision; large volume manufacturing of micro- & nanostructures (machines, materials, costs) Explains applications of Microsystems for information technology, e.g.: data recording (camera, microphone), storage (memories, CDs), communication; computing; and displays (beamers, LCD, TFT) Case studies are given for sensors, resonators, probes, transdermal medical systems, micro- pumps & valves, inkjets, DNA-analysis, lab-on-a-chip, & micro-cooling This book describes the implementation of green IT in various human and industrial domains. Consisting of four sections: "Development and Optimization of Green IT", "Modelling and Experiments with Green IT

Systems", "Industry and Transport Green IT Systems", "Social, Educational and Business Aspects of Green IT", it presents results in two areas - the green components, networks, cloud and IoT systems and infrastructures; and the industry, business, social and education domains. It discusses hot topics such as programmable embedded and mobile systems, sustainable software and data centers, Internet servicing and cyber social computing, assurance cases and lightweight cryptography in context of green IT. Intended for university students, lecturers and researchers who are interested in power saving and sustainable computing, the book also appeals to engineers and managers of companies that develop and implement energy efficient IT applications. Over the last decade, the area of homogeneous catalysis with transition metal has grown in great scientific interest and technological promise, with research in this area earning three Nobel Prizes and filing thousands of patents relating to metallocene and non-metallocene single site catalysts, asymmetric catalysis, carbon-carbon bond forming metathesis and cross coupling reactions. This text explains these new developments in a unified, cogent, and comprehensible manner while also detailing earlier discoveries and the fundamentals of homogeneous catalysis. Serving as a self-study guide for students and all chemists seeking to gain entry into this field, it can also be used by experienced researchers from both academia and industry for referring to leading state of the art review articles and patents, and also as a quick self-study manual in an area that is outside their immediate expertise. The book features: • Topics including renewable feed stocks (biofuel, glycerol), carbon dioxide based processes (polycarbonates), fluorinated solvents, ionic liquid, hydroformylation, polymerization, oxidation, asymmetric catalysis, and more • Basic principles of organometallic chemistry, homogeneous catalysis, and relevant technological issues • Problems and answers, industrial applications (case studies), and examples from proven industrial processes with clear discussions on environmental and techno-commercial issues • Extensive references to cutting edge research with application potential and leading patents • Tables and illustrations to help explain difficult concepts A practical book with a variety of uses, this book can help applications engineers spark problem-solving techniques through the use of lasers. Industrial Application of Lasers, Second Edition takes the reader through laser fundamentals, unusual properties of laser light, types of practical lasers available, and commonly used accessory equipment. The book also applies this information to existing and developing applications. Current uses of lasers, including

laser welding and cutting, electronic fabrication techniques, lightwave communications, laser-based applications in alignment, surveying, and metrology are all covered as well as discussing the potential for future applications such as all-optical computers, remote environmental monitoring, and laser-assisted thermonuclear fusion. Explains basic laser fundamentals as well as emphasizing how lasers are used for real applications in industry. Describes the importance of laser safety. Discusses potentially important future applications such as remote environmental monitoring. Includes rare expert lore and opinion. Industrial Applications of Machine Learning shows how machine learning can be applied to address real-world problems in the fourth industrial revolution, and provides the required knowledge and tools to empower readers to build their own solutions based on theory and practice. The book introduces the fourth industrial revolution and its current impact on organizations and society. It explores machine learning fundamentals, and includes four case studies that address a real-world problem in the manufacturing or logistics domains, and approaches machine learning solutions from an application-oriented point of view. The book should be of special interest to researchers interested in real-world industrial problems. Features Describes the opportunities, challenges, issues, and trends offered by the fourth industrial revolution. Provides a user-friendly introduction to machine learning with examples of cutting-edge applications in different industrial sectors. Includes four case studies addressing real-world industrial problems solved with machine learning techniques. A dedicated website for the book contains the datasets of the case studies for the reader's reproduction, enabling the groundwork for future problem-solving. Uses of three of the most widespread software and programming languages within the engineering and data science communities, namely R, Python, and Weka. Metals are used at an extremely high rate in the industrial and manufacturing fields. Exemplary properties including strength and ductility have made this material highly dynamic; however, the risk of corrosion remains a vital issue. The study of corrosion prevention has attracted interest from researchers and professionals as new technologies are emerging that can assist in the prevention of material destruction. However, research is lacking on the application of these protective technologies within specific fields. New Challenges and Industrial Applications for Corrosion Prevention and Control provides emerging research exploring the theoretical and practical aspects of protective methods against corrosion and the implementation of these techniques within a wide span of professional disciplines. Featuring coverage on a broad range of topics such as molecular modeling, surface treatments, and biomaterials, this book is ideally designed for engineers, industrial chemists, material scientists, researchers, engineers, academicians, practitioners, and students seeking current research on the technological advancements in corrosion protection in various professional scopes. The complete guide to understanding and using lasers in material processing! Lasers are now an integral part of modern society, providing extraordinary opportunities for

innovation in an ever-widening range of material processing and manufacturing applications. The study of laser material processing is a core element of many materials and manufacturing courses at undergraduate and postgraduate level. As a consequence, there is now a vast amount of research on the theory and application of lasers to be absorbed by students, industrial researchers, practising engineers and production managers. Written by an acknowledged expert in the field with over twenty years' experience in laser processing, John Ion distils cutting-edge information and research into a single key text. Essential for anyone studying or working with lasers, *Laser Processing of Engineering Materials* provides a clear explanation of the underlying principles, including physics, chemistry and materials science, along with a framework of available laser processes and their distinguishing features and variables. This book delivers the knowledge needed to understand and apply lasers to the processing of engineering materials, and is highly recommended as a valuable guide to this revolutionary manufacturing technology. The first single volume text that treats this core engineering subject in a systematic manner. Covers the principles, practice and application of lasers in all contemporary industrial processes; packed with examples, materials data and analysis, and modelling techniques. This reference is a "must-read": It explains how an effective and economically viable enzymatic process in industry is developed and presents numerous successful examples which underline the efficiency of biocatalysis. *Industrial Applications of Batteries* looks at both the applications and the batteries and covers the relevant scientific and technological features. Presenting large batteries for stationary applications, e.g. energy storage, and also batteries for hybrid vehicles or different tools. The important aerospace field is covered both in connection with satellites and space missions. Examples of applications include, telecommunications, uninterruptible power supplies, systems for safety/alarms, car accessories, toll collection, asset tracking systems, medical equipment, and oil drilling. The first chapter on applications deals with electric and hybrid vehicles. Four chapters are devoted to stationary applications, i.e. energy storage (from the electric grid or solar/wind energy), load levelling, telecommunications, uninterruptible power supplies, back-up for safety/alarms. Battery management by intelligent systems and prediction of battery life are dealt with in a dedicated chapter. The topic of used battery collection and recycling, with the description of specific treatments for the different systems, is also extensively treated in view of its environmental relevance. Finally, the world market of these batteries is presented, with detailed figures for the various applications. * Updated and full overview of the power sources for industries * Written by leading scientists in their fields * Well balanced in terms of scientific and technical information. An evolution is currently underway in the textile industry and *Textile for Industrial Applications* is the guidebook for its growth. This industry can be classified into three categories-clothing, home textile, and industrial textile. Industrial textiles, also known as

technical textiles, are a part of the industry that is thriving and showing great. This book includes chapters related to the analysis of cultural differences as a tool to enrich tacit knowledge and make processes more efficient, the factors that influence job satisfaction and the value of social capital as a competitive strategy to achieve productivity and competitiveness of organizations, in addition to research of the utmost importance to discover the facets of the diamond with respect to the symbolic capital of the organizations where Generation Z will work and how it will discover the best time to establish an innovation ecosystem that will influence its work trajectory. Industry 4.0 requires a major paradigm shift, since human capital is a source of competitive advantage. Being competitive enables to a company, a region, a society or a country the power to advance in different areas, contributing to the benefit of a social group, therefore, and organizations need to make efforts that lead to adding value and generate a competitive advantage. Industrial applications based on artificial intelligence can change our lives in just one generation. The chapters in this book show progress and challenges related to real-world applications, as well as the need to strengthen human capital to achieve systemic and comprehensive competitiveness required in the XXI century. *Fundamentals and Industrial Applications of Magnetic Nanomaterials* highlights industrial applications of magnetic nanoparticles, reviews their rapidly emerging applications, and discusses future research directions. The book emphasizes the structure-property-functionality of magnetic nanoparticles for the most relevant industry applications. After reviewing the fundamentals, industry applications in the biomedical, pharma, environmental, cosmetics and energy industries are explored. Cross-cutting barriers to commercialization are then discussed, along with legal, health and safety implications. Finally, opportunities for enabling a more sustainable future are covered. This book is suitable for researchers and practitioners in academia and industry in materials science and engineering, chemistry and chemical engineering. Reveals fundamental concepts of magnetic nanoparticles for modern industries and perspectives. Establishes routes for the utilization of magnetic nanoparticles in commercial-scale manufacturing. Discusses opportunities for magnetic nanoparticles to help enable sustainable applications. Using an applications perspective. *Thermodynamic Models for Industrial Applications* provides a unified framework for the development of various thermodynamic models, ranging from the classical models to some of the most advanced ones. Among these are the Cubic Plus Association Equation of State (CPA EoS) and the Perturbed Chain Statistical Association Fluid Theory (PC-SAFT). These two advanced models are already in widespread use in industry and academia, especially within the oil and gas, chemical and polymer industries. Presenting both classical models such as the Cubic Equations of State and more advanced models such as the CPA, this book provides the critical starting point for choosing the most appropriate calculation method for accurate process simulations. Written by two of the developers of these models, *Thermodynamic*

Models for Industrial Applications emphasizes model selection and model development and includes a useful "which model for which application" guide. It also covers industrial requirements as well as discusses the challenges of thermodynamics in the 21st Century. Industrial Applications of Nanocrystals provides an overview of the properties and industrial applications of nanocrystalline materials. Nanocrystals are a major driver of technology and business in this century and hold the promise of high-performance materials that will significantly affect all aspects of society. Likewise, nanocrystals are driving development and innovation in numerous manufacturing sectors. However, complications keep nanocrystals from making a greater impact on manufacturing. The lack of information as well as the possibility of adverse influences on the environment, human health, safety, and sustainability are still major challenges. This book addresses these challenges for the use of nanomaterials in major manufacturing sectors. The aim of this book is to deliver advances in the use of nanocrystals across various industrial sectors. Chapter topics include approaches to the synthesis and green synthesis of nanocrystals, and the applications of nanocrystals in the pharmaceutical, biomedical, environmental, catalysis, electrochemical energy storage device, and emerging industries. Outlines major properties and industrial applications of nanocrystals for a variety of industrial sectors Describes the major processing techniques for nanocrystals Assesses the major challenges to manufacturing nanocrystals on an industrial scale Industrial high pressure processes open the door to many reactions that are not possible under 'normal' conditions. These are to be found in such different areas as polymerization, catalytic reactions, separations, oil and gas recovery, food processing, biocatalysis and more. The most famous high pressure process is the so-called Haber-Bosch process used for fertilizers and which was awarded a Nobel prize. Following an introduction on historical development, the current state, and future trends, this timely and comprehensive publication goes on to describe different industrial processes, including methanol and other catalytic syntheses, polymerization and renewable energy processes, before covering safety and equipment issues. With its excellent choice of industrial contributions, this handbook offers high quality information not found elsewhere, making it invaluable reading for a broad and interdisciplinary audience. Industrial Process Control: Advances and Applications is a comprehensive, practical, easy-to-read book on process control, covering some of the most important topics in the petrochemical process industry, including Fieldbus, Multiphase Flow Metering, and other recently developed control systems. Drawing from his own experience and successes at such high-profile companies as Brown and Root and Honeywell spanning more than 20 years, the author explains the practical applications of some of the most intricate and complicated control systems that have ever been developed. Compilation of all the best instrumentation and control techniques used in industry today Interesting theoretical content as well as practical topics on planning, integration and

application Includes the latest on Fieldbus, Profibus and Multiphase Flow Metering This book highlights the analytics and optimization issues in industry, to propose new approaches, and to present applications of innovative approaches in real facilities. In the past few decades there has been an exponential rise in the application of artificial intelligence for solving complex and intricate problems arising in industrial domain. The versatility of these techniques have made them a favorite among scientists and researchers working in diverse areas. The book is edited to serve a broad readership, including computer scientists, medical professionals, and mathematicians interested in studying computational intelligence and their applications. It will also be helpful for researchers, graduate and undergraduate students with an interest in the fields of Artificial Intelligence and Industrial problems. This book will be a useful resource for researchers, academicians as well as professionals interested in the highly interdisciplinary field of Artificial Intelligence. Environmental considerations are increasingly shaping the development of many industries. This is an overview of surfactants and the environment. It goes on to look at new surfactants derived from renewable, "natural" resources such as sucrose, seaweed and starch. Other chapters review a decade of change in the surfactant industry and assess future market trends. Some of the developments in surfactant technology are presented, including "gemini" twin-chained surfactants, sulfobetaines, alkyl phosphates and the use of alkyl alkoxylates and alkyl glucosides in highly alkaline solutions. The volume takes a practical approach throughout. Industrial Applications of Renewable Plastics: Environmental, Technological, and Economic Advances provides practical information to help engineers and materials scientists deploy renewable plastics in the plastics market. It explores the uses, possibilities, and problems of renewable plastics and composites to assist in material selection and rejection. The designer's main problems are examined, along with basic reminders that deal with structures and processing methods that can help those who are generally familiar with metals understand the unique properties of plastic materials. The book offers a candid overview of main issues, including conservation of fossil resources, geopolitical considerations, greenhouse effects, competition with food crops, deforestation, pollution, and disposal of renewable plastics. In addition, an overview of some tools related to sustainability (Life cycle assessments, CO2 emissions, carbon footprint, and more) is provided. The book is an essential resource for engineers and materials scientists involved in material selection, design, manufacturing, molding, fabrication, and other links in the supply chain of plastics. The material contained is of great relevance to many major industries, including automotive and transport, packaging, aeronautics, shipbuilding, industrial and military equipment, electrical and electronics, energy, and more. Provides key, enabling information for engineers and materials scientists looking to increase the use of renewable plastic materials in their work Presents practical guidance to assist in materials selection, processing methods, and

applications development, particularly for designers more familiar with other materials, such as metals Includes a candid discussion of the pros and cons of using renewable plastics, considering the technical, economic, legal, and environmental aspects This book, the only one of its kind on the market, focuses on RF (Radio Frequency) power for use in semiconductor manufacturing equipment that generate a plasma for processing wafers. The concepts, equipment, and techniques covered in this book emphasize industrial applications, but are also applicable to most radio communications equipment. Topics covered in this unique book are: signal sources, RF power amplifier fundamentals, high power RF amplifiers, impedance matching, transmission lines, smith charts, power measurement and control, troubleshooting and maintenance of RF power systems, and industrial applications of RF power. This book is useful for engineers and technicians who install, operate, maintain, service, and repair RF power generating equipment. It is also useful for continuing education courses in company training programs, industrial training courses, or seminars and workshops. Presenting breakthrough research pertinent to scientists in a wide range of disciplines-from medicine and biotechnology to cosmetics and pharmacy-this Second Edition provides practical approaches to complex formulation problems encountered in the development of particulate delivery systems at the micro- and nano-size level. Completely revised and e A COMPLETE, UP-TO-DATE RESOURCE OF INFORMATION ON MORE THAN 200 DYES AND STAINS Handbook of Biological Dyes and Stains is the most comprehensive volume available on the subject, covering all the available dyes and stains known to date in the literature for use in biology and medicine. Top dye expert Dr. Ram Sabnis organizes the compounds alphabetically by the most commonly used chemical name. He presents an easy-to-use reference complete with novel ideas for breakthrough research in medical, biological, chemical, and related fields. This is the first book to give the CAS registry number, chemical structure, Chemical Abstracts index name, all other chemical names, Merck Index number, chemical/dye class, molecular formula, molecular weight, physical form, solubility, melting point, boiling point, pH range, color change at pH, pKa, absorption, and emission maxima of dyes and stains, as well as to provide access to synthesis procedures (lab scale and industrial scale) of dyes and stains. This user-friendly handbook also features references on safety, toxicity, and adverse effects of dyes and stains on humans, animals, and the environment, including: acute/chronic toxicity aquatic toxicity carcinogenicity cytotoxicity ecotoxicity genotoxicity hepatotoxicity marine toxicity mutagenicity nephrotoxicity neurotoxicity oral toxicity phototoxicity phytotoxicity The use of biological dyes and stains has extremely high potential in today's business environment. This makes Handbook of Biological Dyes and Stains a convenient, must-have reference. Its staining, biological, and industrial applications make it a vital resource for industrial and academic researchers; the book also serves as a valuable desktop reference for medical professionals, biologists, chemists, chemical/optical

engineers, physicists, materials scientists, intellectual property professionals, students, and professors. This unique resource offers you a clear overview of medical and industrial accelerators. Using minimal mathematics, this book focuses on offering thorough explanations of basic concepts surrounding the operation of accelerators. You find well illustrated discussions designed to help you use accelerator-based systems in a safer, more productive, and more reliable manner. This practical book details the manufacturing process for producing accelerators for medical and industrial applications. You become knowledgeable about the commonly encountered real-world manufacturing issues and potential sources of defects which help you avoid costly production problems. From principles of operation and the role of accelerators in cancer radiation therapy, to manufacturing techniques and future trends in accelerator design and applications, this easy-to-comprehend volume quickly brings you up-to-speed with the critical concepts you need to understand for your work in the field. *Green Nanomaterials for Industrial Applications* explores the applications of nanomaterials for a variety of industry sectors, along with their environmental impacts, lifecycle analysis, safety and sustainability. This book brings together the industrial applications of nanomaterials, covering new trends and challenges. Significant properties, safety and sustainability and environmental impacts of synthesis routes are also explored, as are major industrial applications, including agriculture, medicine, communications, construction, energy, and in the military. This book is an important information source for those in research and development who want to gain a greater understanding of how nanotechnology is being used to create cheaper, more efficient products. Green nanomaterials have significant advantages including low cost, high efficiency, neutral environmental impact, and stability. *Green Nanomaterials for Industrial Applications* provides comprehensive information about green nanomaterials, their types, and methods for generation, characterization as well as their properties. Furthermore, this book also provides coverage of industrial scale fabrication methods for green nanomaterials and their applications for various industrial sectors at both experimental and theoretical models scales. This book is an important reference source for materials scientists, engineers and environmental scientists who want to learn more about how sustainable nanomaterials are being used in a range of industrial applications. Explores industrial scale fabrication of green nanomaterials Assesses environmental, legal, health and safety aspects Discusses how green nanomaterials can be manufactured on an industrial scale Nanocellulose is a versatile material that has received much attention from scientists working in a broad range of application fields, such as automotive, composites, adsorbents, paints, coatings, medical implants, electronics, cosmetics, pulp and paper, tissue engineering, medical, packaging, and aerogels. *Industrial Applications of Nanocellulose and Its Nanocomposites* provides an extensive, up-to-date review of this fast-moving research field.

The chapters cover a wide range of aspects, including synthesis, surface modification, and improvement of properties toward target applications. The main objectives of the book are to reflect on recent advancements in the design and fabrication of advanced nanocellulose and discuss important requirements for each application, as well as the challenges that might be faced. The book also includes an overview of the current economic perspectives and safety issues, as well as future directions for nanocellulose-based materials. It will serve as a valuable reference resource for academic and industrial researchers, environmental chemists, nanotechnologists, chemical engineers, polymer chemists, materials scientists, and all those working in the manufacturing industries. *Comprehensively covers a broad range of industrial applications. Includes case studies on economic perspectives, safety issues, and advanced development of nanocellulose-based products. Discusses nanocellulose production from biological waste. Industrial Applications of Biosurfactants: Green Technology Avenues from Lab to Commercialization* covers a variety of current biosurfactant research advancements and progresses providing insight into the most recent academic advances, major applications, and implementation studies from across the world. It focuses entirely within the scope of biochemistry and biotechnology research and demonstrates the application of biosurfactants in cell mobility, cell communication, nutrient acquisition, and plant and animal disease. Biosurfactants have antibacterial, antifungal, and antiviral properties, as well as adhesive properties and are used in vaccinations, gene therapy, and the enhancement of microbial biocontrol systems. *Industrial Applications of Biosurfactants: Green Technology Avenues from Lab to Commercialization* is designed for a broad audience working in the fields of biochemistry, surface science, colloid and interface science and is an invaluable reference for university libraries and industrial institutions, government and independent institutes, individual research groups, and scientists working in the field of surface science systems. *Biopolymers and Their Industrial Applications: From Plant, Animal, and Marine Sources to Functional Products* is a detailed guide to the use of biopolymers for advanced applications across a range of key industries. In terms of processing and cost, bio-based polymers are becoming increasingly viable for an ever-broadening range of novel industrial applications. The book begins with an overview of biopolymers, explaining resources, demands, sustainability, life cycle assessment (LCA) modeling and simulation, and classifications. Further in-depth chapters explore the latest techniques and methodologies for isolation and physicochemical characterization, materials selection, and processing for blends and composites. Chapters 6 to 14 each focus on the preparation and applications of biopolymers in a specific industrial area, including food science and nutraceuticals, medicine and pharmaceuticals, textiles, cosmeceutical, packaging, adhesives and automotive, 3D printing, super capacitor and energy storage devices, and environmental applications. The final chapter compares and analyzes

biopolymers alongside synthetic polymers, also offering valuable insight into social, economic, and environmental aspects. This is an essential resource for those seeking to understand, research, or utilize biopolymers in industrial applications. This includes researchers, scientists, and advanced students working in biopolymers, polymer science, polymer chemistry, biomaterials, materials science, nanotechnology, composites, and biotechnology. This is a highly valuable book for scientists, R&D professionals, designers, and engineers across multiple industries and disciplines, who are looking to utilize biopolymers for components and products. *Introduces a broad range of industrial application areas, including food, medicine, textiles, cosmetics, packaging, automotive, 3D printing, energy, and more Offers an industry-oriented approach, addressing challenges and explaining the preparation and application of biopolymers for functional products and parts Considers important factors such as resources, classification, sustainability, and life cycle assessment (LCA) modeling and simulation Compares and analyzes biopolymers alongside synthetic polymers, also offering valuable insight into social, economic, and environmental aspects* *Microbial Extremozymes: Novel Sources and Industrial Applications* is a unique resource of practical research information on the latest novel sources and technologies regarding extremozymes in bioremediation, waste management, valorization of industrial by-products, biotransformation of natural polymers, nutrition, food safety and diagnosis of disease. The book's broad knowledge and varying applications are useful to the food industry, dairy industry, fruit and vegetable processing, and baking and beverages industries, as well as the pharmaceutical and biomedical industries. This is a concise, all-encompassing resource for a range of scientists needing knowledge of extremozymes to enhance and research. Furthermore, it provides an updated knowledge of microbial enzymes isolated from extreme environments (temperatures, etc.) and their biotechnological applications. It will be useful to researchers, scientists and students in enzyme research. In addition, users from the dairy and baking industries will benefit from the presented content. Explores recent scientific research on extremophiles and extremozymes technologies that help innovate novel ideas Provides innovative technologies for enzyme production from extremophilic microbes Includes cutting-edge research for applications in various industries where extreme temperature conditions exist Presents novel microorganisms and their enzymes from extreme environments (Thermophilic, Psychrophilic, Acidophilic, Alkaliphilic, Anaerobic, Halophilic, Barophilic, Metallotolerant, Radioresistant, etc.) In recent years, power electronics have been intensely contributing to the development and evolution of new structures for the processing of energy. They can be used in a wide range of applications ranging from power systems and electrical machines to electric vehicles and robot arm drives. In conjunction with the evolution of microprocessors and advanced control theories, power electronics are playing an increasingly essential role in our society.

Thus, in order to cope with the obstacles lying ahead, this book presents a collection of original studies and modeling methods which were developed and published in the field of electrical energy conditioning and control by using circuits and electronic devices, with an emphasis on power applications and industrial control. Researchers have contributed 19 selected and peer-reviewed papers covering a wide range of topics by addressing a wide variety of themes, such as motor drives, AC-DC and DC-DC converters, multilevel converters, varistors, and electromagnetic compatibility, among others. The overall result is a book that represents a cohesive collection of inter-/multidisciplinary works regarding the industrial applications of power electronics. Energy storage plays an important role in supporting power-hungry devices and achieving stable power supply by optimally balancing supply and demand with ever-increasing requirement for computing power and the intermittent nature of renewable resources. Emerging Trends in Energy Storage Systems and Industrial Applications focuses on emerging trends in energy storage systems, applicable to various types of applications including heat and power generation, electrical and hybrid transportation. With performance limitations in current energy storage devices, such as limited energy density, power density, and cycle life, major challenges in the complex and dynamic environments of energy storage applications are examined in this reference. High-performance components, proper system configuration, effective modelling and control are keys to achieving seamlessly integrated and functional energy storage systems are also addressed, in order to provide guidance to achieving more reliable and efficient systems. Outcomes from this book serve as a resource for industrialists, academia and researchers working in the domain of advance energy storage technologies and their applications, giving them an overview of energy storage options, availability and technological trends enabling them to make longer-term, safe storage system decisions. Presents a better understanding of the smart energy storage technologies: system, management, and implementation Explores all energy storage system: integration, power quality, and operation Offers an interdisciplinary look across electrical, electronics, energy, mechanical, civil, and chemical engineering aspects of energy storage Handbook of Polymer Nanocomposites for Industrial Applications summarizes the properties of polymer nanocomposites, discusses their industrial scale fabrication methods, and presents their applications for various industrial sectors at both experimental and theoretical models scales. The book also addresses existing challenges for the use of polymer nanocomposites in major industrial sectors. Overall, the aim of this book is to summarize

the recent advancements in the use of PNCs in a variety of industry sectors. Particular attention is paid to those approaches that enable green and sustainable industrial developments. The legal, economical and toxicity aspects of polymer nanocomposite are also presented in detail. Comprehensively explores how polymer nanocomposites are being used to create more efficient products and devices in a variety of industry sectors Explores the environmental, legal, health and safety issues of using polymer nanocomposites in an industrial context Develops a roadmap to the wider commercial utilization of polymer nanocomposites Emphasizes the use of polymer nanocomposites in green and sustainable technologies Reviews all known antifoam mechanisms, and discusses the appropriate practical approaches for solving foam control problems in a variety of industrial contexts. These range from crude oil production to detergent formulation. During the 21st century business environments have become more complex and dynamic than ever before. Companies operate in a world of change influenced by globalisation, volatile markets, legal changes and technical progress. As a result, they have to handle growing volumes of data and therefore require fast storage, reliable data access, intelligent retrieval of information and automated decision-making mechanisms, all provided at the highest level of service quality. Successful enterprises are aware of these challenges and efficiently respond to the dynamic environment in which their business operates. Business Intelligence (BI) and Performance Management (PM) offer solutions to these challenges and provide techniques to enable effective business change. The important aspects of both topics are discussed within this state-of-the-art volume. It covers the strategic support, business applications, methodologies and technologies from the field, and explores the benefits, issues and challenges of each. Issues are analysed from many different perspectives, ranging from strategic management to data technologies, and the different subjects are complimented and illustrated by numerous examples of industrial applications. Contributions are authored by leading academics and practitioners representing various universities, research centres and companies worldwide. Their experience covers multiple disciplines and industries, including finance, construction, logistics, and public services, amongst others. Business Intelligence and Performance Management is a valuable source of reference for graduates approaching MSc or PhD programs and for professionals in industry researching in the fields of BI and PM for industrial application. Handbook of Nanomaterials for Industrial Applications explores the use of novel nanomaterials in the industrial arena. The book covers nanomaterials and the techniques that can play vital roles in many industrial procedures, such

as increasing sensitivity, magnifying precision and improving production limits. In addition, the book stresses that these approaches tend to provide green, sustainable solutions for industrial developments. Finally, the legal, economical and toxicity aspects of nanomaterials are covered in detail, making this is a comprehensive, important resource for anyone wanting to learn more about how nanomaterials are changing the way we create products in modern industry. Demonstrates how cutting-edge developments in nanomaterials translate into real-world innovations in a range of industry sectors Explores how using nanomaterials can help engineers to create innovative consumer products Discusses the legal, economical and toxicity issues arising from the industrial applications of nanomaterials Industrial Applications of Nanomaterials explains the industry based applications of nanomaterials, along with their environmental impacts, lifecycle analysis, safety and sustainability. This book brings together the industrial applications of nanomaterials with the incorporation of various technologies and areas, covering new trends and challenges. Significant properties, safety and sustainability and environmental impacts of synthesis routes are also explored, as are major industrial applications, including agriculture, medicine, communication, construction, energy, and in the military. This book is an important information source for those in research and development who want to gain a greater understanding of how nanotechnology is being used to create cheaper, more efficient products. Explains how different classes of nanomaterials are being used to create cheaper, more efficient products Explores the environmental impacts of using a variety of nanomaterials Discusses the challenges faced by engineers looking to integrate nanotechnology in new product development Soft computing embraces various methodologies for the development of intelligent systems that have been successfully applied to a large number of real-world problems. Soft Computing in Industry contains a collection of papers that were presented at the 6th On-line World Conference on Soft Computing in Industrial Applications that was held in September 2001. It provides a comprehensive overview of recent theoretical developments in soft computing as well as of successful industrial applications. It is divided into seven parts covering material on: keynote papers on various subjects ranging from computing with autopoietic systems to the effects of the Internet on education; intelligent control; classification, clustering and optimization; image and signal processing; agents, multimedia and Internet; theoretical advances; prediction, design and diagnosis. The book is aimed at researchers and professional engineers who develop and apply intelligent systems in computer engineering.