

## 2017 07 Carbon Fiber Mc Manfrotto

***This book presents synthesis methods, characterization techniques, properties and applications of hybrid conducting polymers. Special emphasis is given to the applications of hybrid conductive polymers, with chapters ranging from electronic devices, environmental remediation, and sensors, to medical applications.***

***In the automotive industry, the need to reduce vehicle weight has given rise to extensive research efforts to develop aluminum and magnesium alloys for structural car body parts. In aerospace, the move toward composite airframe structures urged an increased use of formable titanium alloys. In steel research, there are ongoing efforts to design novel damage-controlled forming processes for a new generation of efficient and reliable lightweight steel components. All these materials, and more, constitute today's research mission for lightweight structures. They provide a fertile materials science research field aiming to achieve a better understanding of the interplay between industrial processing, microstructure development, and the resulting material properties. The Handbook of Research on Advancements in the Processing, Characterization, and Application of Lightweight Materials provides the recent advancements in the lightweight materials processing, manufacturing, and characterization. This book identifies the need for modern tools and techniques for designing lightweight materials and addresses multidisciplinary approaches for applying their use. Covering topics such as numerical optimization, fatigue characterization, and process evaluation, this text is an essential resource for materials engineers, manufacturers, practitioners, engineers, academicians, chief research officers, researchers, students, and vice presidents of research in government, industry, and academia.***

***This book is part of a two-volume work that offers a unique blend of information on realistic evaluations of catalyst-based synthesis processes using green chemistry principles and the environmental sustainability applications of such processes for biomass conversion, refining, and petrochemical production. The volumes provide a comprehensive resource of state-of-the-art technologies and green chemistry methodologies from researchers, academics, and chemical and manufacturing industrial scientists. The work will be of interest to professors, researchers, and practitioners in clean energy catalysis, green chemistry, chemical engineering and manufacturing, and environmental sustainability. This volume focuses on the potentials, recent advances, and future prospects of catalysis for biomass conversion and value-added chemicals production via green catalytic routes. Readers are presented with a mechanistic framework assessing the development of product selective catalytic processes for biomass and biomass-derived feedstock conversion. The book offers a unique combination of contributions from experts working on both lab-scale and industrial catalytic processes and provides insight into the use of various catalytic materials (e.g., mineral acids, heteropolyacid, metal***

***catalysts, zeolites, metal oxides) for clean energy production and environmental sustainability.***

***Materials Development and Processing for Biomedical Applications focuses on various methods of manufacturing, surface modifications, and advancements in biomedical applications. This book examines in detail about five different aspects including, materials properties, development, processing, surface coatings, future perspectives and fabrication of advanced biomedical devices. Fundamental aspects are discussed to better understand the processing of various biomedical materials such as metals, ceramics, polymers, composites, etc. A wide range of surface treatments are covered in this book that will be helpful for the readers to understand the importance of surface treatments and their future perspectives. Additional Features Include: Examines various properties of biomedical materials at the beginning in several chapters which will enrich the fundamental knowledge of the readers. Discusses advancements in various fields of biomedical applications. Provides a glimpse of characterization techniques for the evaluation of material properties. Addresses biocompatibility, biocorrosion, and tribocorrosion. This book explores new and novel strategies for the development of materials and their biomedical applications. It will serve as a comprehensive resource for both students and scientists working in materials and biomedical sciences.***

***Fundamentals and Applications***

***Innovative Computing***

***Carbon Nanomaterial Filled Polymer Composites for Functional Applications: Processing, Structure, and Property Relationship***

***Commemoration for Nobel Laureate Professor Suzuki Special Symposium at IUMRS-ICAM2017***

***Carbon Allotropes: Metal-Complex Chemistry, Properties and Applications***

This book provides a detailed description of metal-complex functionalized carbon allotrope forms, including classic (such as graphite), rare (such as M- or T-carbon), and nanoforms (such as carbon nanotubes, nanodiamonds, etc.). Filling a void in the nanotechnology literature, the book presents chapters generalizing the synthesis, structure, properties, and applications of all known carbon allotropes. Metal-complex composites of carbons are described, along with several examples of their preparation and characterization, soluble metal-complex carbon composites, cost-benefit data, metal complexes as precursors of carbon allotropes, and applications. A lab manual on the synthesis and characterization of carbon allotropes and their metal-complex composites is included. Provides a complete description of all carbon allotropes, both classic and rare, as well as carbon nanostructures and their metal-complex composites; Contains a laboratory manual of experiments on the synthesis and characterization of metal-complex carbon

composites; Discusses applications in diverse fields, such as catalysis on supporting materials, water treatment, sensors, drug delivery, and devices.

The field of polymer nanocomposites has become essential for engineering and military industries over the last few decades as it applies to computing, sensors, biomedical microelectronics, hard coating, and many other domains. Due to their outstanding mechanical and thermal features, polymer nanocomposite materials have recently been developed and now have a wide range of applications. *Polymer Nanocomposites for Advanced Engineering and Military Applications* provides emerging research on recent advances in the fabrication methods, properties, and applications of various nano-fillers including surface-modification methods and chemical functionalization. Featuring coverage on a broad range of topics such as barrier properties, biomedical microelectronics, and matrix processing, this book is ideally designed for engineers, industrialists, chemists, government officials, military professionals, practitioners, academicians, researchers, and students.

This book commemorates the "Nobel Laureate Professor Suzuki Special Symposium" at the International Union of Material Research Society-International Conference on Advanced Materials (IUMRS-ICAM2017), which was held at Kyoto University, Japan, in 2017. The book begins with a foreword by Professor Akira Suzuki. Subsequently, many authors who attended the special symposium describe the latest scientific advances in the field of carbon materials and carbon nanomaterials including polymers, carbon nanocomposites, and graphene. Carbon-based materials have recently been the focus of considerable attention, given their wide range of potential applications. Fittingly, the chapters in this book cover both experimental and theoretical approaches in several categories of carbon-related materials.

Written by a world-renowned author team and drawing together key theories and perspectives using Peter Buckley's Global Factory framework, *International Business* is the most coherent and engaging text for international business available.

*Process-Structure-Properties in Polymer Additive Manufacturing*  
Select Proceedings of ICMEchD 2019

*Carbon Fibers and Their Composite Materials*

*Photovoltaic and Solar Energy*

*Green Analytical Chemistry*

Select Proceedings of FLAME 2020

***Electrochemistry for Bioanalysis provides a comprehensive understanding of the benefits and challenges of the application of electrochemical and electroanalytical techniques for measurement in biological samples. The book presents detailed information on measurement in a host of various***

*biological samples from single cells, tissues and in vivo. Sections cover real insights surrounding key experimental design and measurement within multiple complex biological environments. Finally, users will find discussions on emerging topics such as electrogenerated chemiluminescence and the use of additive manufacturing for biosensor fabrication. Continuous learning reinforcement throughout the book, including problems for self-assessment, make this an ideal resource. Balances the fundamentals of electrochemical and neurochemical methods with current advances in the field of bioanalysis Includes self-assessment scenarios on experimental design and validation to teach readers key factors and considerations in measurement Highlights applications (such as sensors and biosensors) and key points within each chapter*

*The book focuses on aerogels for biomedical applications, thermal insulation, energy storage, fuel cells, batteries and environmental remediation. Keywords: Aerogels, Biomedical Applications, Implantable Devices, Tissue Engineering, Bone Regeneration, Biosensing, Pharmacological Applications, Catalysts, Water Purification, Pesticides, Thermal Insulation, Energy Storage, Fuel Cells, Batteries, Environmental Remediation, Polymer Aerogels, Bioaerogels, Carbon-based Aerogels.*

*This book discusses the methods synthesizing various carbon materials, like graphite, carbon blacks, carbon fibers, carbon nanotubes, and graphene. It also details different functionalization and modification processes used to improve the properties of these materials and composites. From a geometrical-structural point of view, it examines different properties of the composites, such as mechanical, electrical, dielectric, thermal, rheological, morphological, spectroscopic, electronic, optical, and toxic, and describes the effects of carbon types and their geometrical structure on the properties and applications of composites.*

*Filling the urgent need for a professional book that specifies the applications of nanoelectrochemistry for the monitoring of persistent toxic substances, this monograph clearly describes the design concept, construction strategies and practical applications of PTS sensing interfaces based on nanoelectrochemical methods. The comprehensive and systematic information not only provides readers with the fundamentals, but also inspires them to develop PTS monitoring sensors based on functional nanostructures and nanomaterials. Of interest to chemists, electrochemistry researchers, materials researchers, environmental scientists, and companies dealing with electrochemical treatment and environment.*

*AeroMech 2019, 20-21 November 2019, Universiti Sains Malaysia, Malaysia*

*Advances in Glass Science and Technology*

*Hydrothermal Behavior of Fiber- and Nanomaterial-Reinforced Polymer Composites*

*Materials, Processes and Applications*

*Proceedings of International Conference of Aerospace and Mechanical Engineering 2019*

*Catalysis for Clean Energy and Environmental Sustainability*

***This book covers the recent research on nanomaterials and nanotechnology based on the hybridization of graphene with other nanoparticles. With their simple synthesis, nanoscale dimensions, high aspect ratio, mechanical, electrical and thermal properties, graphene and its hybridized materials have witnessed a great interest, and the chapters in this book cover the spectrum of research from the preparation and synthesis of novel nanocomposites to their potential use in aeronautic, automotive, energy and environmental applications. Written by respected researchers from both industry and academia, this book is of interest to researchers and students working on nanomaterials.***

***This book presents selected papers from the International Conference of Aerospace and Mechanical Engineering 2019 (AeroMech 2019), held at the Universiti Sains Malaysia's School of Aerospace Engineering. Sharing new innovations and discoveries concerning the Fourth Industrial Revolution (4IR), with a focus on 3D printing, big data analytics, Internet of Things, advanced human-machine interfaces, smart sensors and location detection technologies, it will appeal to mechanical and aerospace engineers.***

***This book presents select proceedings of the International Conference on Future Learning Aspects of Mechanical Engineering (FLAME 2020). This book, in particular, focuses on characterizing materials using novel techniques. It covers a variety of advanced materials, viz. composites, coatings, nanomaterials, materials for fuel cells, biomaterials among others. The book also discusses advanced characterization techniques like X-ray photoelectron, UV spectroscopy, scanning electron, atomic power, transmission electron and laser confocal scanning fluorescence microscopy, and gel electrophoresis chromatography. This book gives the readers an insight into advanced material processes and characterizations with special emphasis on nanotechnology. Sustainable Resource Recovery and Zero Waste Approaches covers waste reduction, biological, thermal and recycling methods of waste recovery, and their conversion into a variety of products. In addition, the social, economic and environmental aspects are also explored, making this a useful textbook for environmental courses and a reference book for both universities and companies. Provides a novel approach on how to achieve zero wastes in a society Shows the roadmap on***

**achieving Sustainable Development Goals Considers critical aspects of municipal waste management Covers recent developments in waste biorefinery, thermal processes, anaerobic digestion, material recycling and landfill mining Constituents, Compatibility, Perspectives and Applications Carbon-Containing Polymer Composites Advances in Pathogenesis, Diagnosis, and Treatments Advances in Engineering Materials Biobased Products and Industries Materials for Potential EMI Shielding Applications**

*The electrospinning method has the unique ability to produce structured polymeric fibers on the micro or nano scale and to generate novel materials for food and healthcare purposes. The potential of electrospun nanofibers for human healthcare applications is promising, for example, in tissue/organ repair and regeneration, in medical diagnostics and instrumentation, and as vectors to deliver drugs and therapeutics, as biocompatible and biodegradable medical implant devices, as protective fabrics against environmental and infectious agents in hospitals and general surroundings. Furthermore, considerable effort has been directed toward developing scaffolds using biodegradable and biocompatible synthetic, natural polymers or renewable materials that enhance in vitro cell growth, while killing pathogenic bacteria cells. This Special Issue "Electrospun Polymer Nanofibers for Food and Health Applications" will cover the latest research of electrospun nanofibres in this field including shape-memory electrospun fibre meshes with programmable cell orientation, water-absorbing nanofibres for efficient removal of excess water from kidney failure patients, and hydrogel nanofibers which can be used as a drug carrier for methylene blue.*

*The subject of optimum composite structures is a rapidly evolving field and intensive research and development have taken place in the last few decades. Therefore, this book aims to provide an up-to-date comprehensive overview of the current status in this field to the research community. The contributing authors combine structural analysis, design and optimization basis of composites with a description of the implemented mathematical approaches. Within this framework, each author has dealt with the individual subject as he/she thought appropriate. Each chapter offers detailed information on the related subject of its research with the main objectives of the works carried out as well as providing a comprehensive list of references that should provide a rich platform of research to the field of optimum composite structures.*

*Green Biocomposites for Biomedical Engineering: Design, Properties, and Applications combines emergent research outcomes with fundamental theoretical concepts relevant to processing, properties and applications of advanced green composites in the field of biomedical engineering. The book outlines the design elements and characterization of biocomposites, highlighting each class of biocomposite separately. A broad range of biomedical applications for biocomposites is then covered, with a final section discussing the ethics and safety regulations associated with manufacturing and the use of biocomposites. With contributions from eminent editors and recognized authors around the world, this book is a vital reference for researchers in biomedical engineering, materials science and environmental science, both in industry and academia. Provides comprehensive information regarding current advances in the interdisciplinary field of eco-friendly green composite materials for biomedical applications Offers coverage of state-of-the-art physics-based advanced models used in composites Lists a broad range of characterization techniques and biomedical applications*

*Nanostructured Materials for Next-Generation Energy Storage and Conversion: Photovoltaic and Solar Energy, is volume 4 of a 4-volume series on sustainable energy. Photovoltaic and Solar Energy while being a comprehensive reference work, is written with minimal jargon related to various aspects of solar energy and energy policies. It is authored by leading experts in the field, and lays out theory,*

*practice, and simulation studies related to solar energy and allied applications including policy, economic and technological challenges. Topics covered include: introduction to solar energy, fundamentals of solar radiation, heat transfer, thermal collection and conversion, solar economy, heating, cooling, dehumidification systems, power and process heat, solar power conversion, policy and applications pertinent to solar energy as viable alternatives to fossil fuels. The aim of the book is to present all the information necessary for the design and analysis of solar energy systems for engineers, material scientists, economics, policy analysts, graduate students, senior undergraduates, solar energy practitioner, as well as policy or lawmakers in the field of energy policy, international energy trade, and libraries which house technical handbooks related to energy, energy policy and applications.*

*International Business 2E P*

*Handbook of Research on Advancements in the Processing, Characterization, and Application of Lightweight Materials*

*Electrospun Polymer Nanofibers for Food and Health Applications*

*Electrochemistry for Bioanalysis*

*Biomass Conversion and Green Chemistry - Volume 1*

*Nanostructured Materials for Next-Generation Energy Storage and Conversion*

*Covering the latest technologies, Nanotechnology in eco-efficient construction provides an authoritative guide to the role of nanotechnology in the development of eco-efficient construction materials and sustainable construction. The book contains a special focus on applications concerning concrete and cement, as nanotechnology is driving significant development in concrete technologies. The new edition has 14 new chapters, including 3 new parts: Mortars and concrete related applications; Applications for pavements and other structural materials; and Toxicity, safety handling and environmental impacts. Civil engineers requiring an understanding of eco-efficient construction materials, as well as researchers and architects within any field of nanotechnology, eco-efficient materials or the construction industry will find this updated reference to be highly valuable. Addresses issues such as toxicity and LCA aspects*  
*New chapters covering safety handling on occupational exposure of nanoparticles and the assessment of personal exposure to airborne nanomaterials Discusses the effects of adding nano-particles on the durability and on the properties of geopolymers*

*Challenges in Mechanics of Time-Dependent Materials, Volume 2 of the Proceedings of the 2020 SEM Annual Conference & Exposition on Experimental and Applied Mechanics, the second volume of seven from the Conference, brings together contributions to this important area of research and engineering. The collection presents early findings and case studies on fundamental and applied aspects of Experimental*

*Mechanics, including papers in the following general technical research areas: Characterization Across Length Scales Extreme Environments & Environmental Effects Soft Materials Damage, fatigue and Fracture Inhomogeneities & Interfaces Viscoelasticity Research in Progress Sustainable Lignin for Carbon Fibers: Principles, Techniques, and Applications Springer*

*Molecular Imprinting for Nanosensors and Other Sensing Applications provides fundamental knowledge on molecular imprinting, including types, preparation methods, properties and characterization techniques. The book also covers the state-of-the-art technological developments of sensors that incorporate with microfluidic systems, lab-on-a-chip-tools, and other techniques. Sections discuss the integration of molecularly imprinted polymers with current top-notch tools and platforms that facilitate their potential applications in the realms of medicine, pharmaceuticals and environmental monitoring. Topics of note include molecularly imprinted polymer-based sensor models, their functionalization methodologies, prominent characteristics, and their characterization tools. Covers, in an in-depth manner, molecular imprinting as it relates to nanosensors Provides an appropriate resource on the various applications of imprinted sensors, such as their use in the environment, medicine and food industry Includes future outlooks and expectations for sensor technology*

*Structures Strengthened with Bonded Composites*

*Advances in Hybrid Conducting Polymer Technology*

*Molecular Imprinting for Nanosensors and Other Sensing Applications*

*Aerogels II*

*Materials Development and Processing for Biomedical Applications*

*Conducting Polymer-Based Nanocomposites*

In this book, some recent advances in glass science and technology are collected. In the first part, the structure and crystallization of innovative glass compositions are analysed. In the second part, innovative applications are described from the use of glass in optical devices and lasers to fibres in composites, micropatterned components in sensors and microdevices, beads in building walls and sealing in solid oxide fuel cells.

This book provides essential information on recent advances in molecular genetics, epidemiology, translational research, and the latest results of clinical trials on mesothelioma. Significant progress has been made in understanding



mesothelioma biology, and in developing new therapies for this refractory tumor, malignant pleural mesothelioma (MPM). Not only does this volume summarize the latest research-based data on the disease; it also shares insights into future research directions. The book consists of 5 themed sections on: epidemiology, pathogenesis, screening and early detection, molecular genetics, and clinical aspects and management. Several chapters focus on new trends in the field, e.g. immune therapy and identification of biomarkers, molecular oncogenesis including genetic susceptibility, and molecular diagnostic pathology. The book also highlights new cancer treatment approaches, such as immunotherapy based on immune checkpoint inhibitors, which has meant a paradigm shift in other types of cancer, and given some hope to MPM patients. In turn, it discusses recent molecular pathological studies on mesothelioma, which claim to offer more accurate classifications than traditional morphology and immunohistochemistry-based approaches. All of these cutting-edge analyses provide the basis for a closing discussion on future developments and research directions. *Malignant Pleural Mesothelioma - Advances in Pathogenesis, Diagnosis, and Treatments* has been edited and authored by respected researchers and will be of interest to medical, surgical and radiation oncologists; pulmonologists; pathologists and basic researchers alike. Since the disease represents a significant diagnostic and therapeutic challenge, scientists and clinicians from learners to experts, as well as fellows in training in these subspecialties, will value this book.

Polymer-based fibre-reinforced composites (FRCs) have now come out as a major class of structural materials being used or regarded as substituent for metals in several critical components in space, automotive and other industries (marine, and sports goods) owing to their low density, strength-weight ratio, and fatigue strength. FRCs have several commercial as well as industrial applications ranging from aircraft, space, automotive, sporting goods, marine, and infrastructure. The above-mentioned applications of FRCs clearly reveal that FRCs have the potential to be used in a broad range of different engineering fields with the added advantages of low density, and resistance to corrosion compared to conventional metallic and ceramic composites. However, for scientists/researchers/R&D to fabricate FRCs with such potential there should be careful and precise design followed by suitable process development based on properties like mechanical, physical, and thermal that are unique to each application. Hence the last few decades have witnessed considerable research on fibre reinforced composites. *Fibre Reinforced Composites: Constituents, Compatibility, Perspectives and Applications* presents a widespread all-inclusive review on fibre-reinforced composites ranging from the different types of processing techniques to chemical modification of the fibre surface to enhance the interfacial adhesion between the matrix and fibre and the structure-property relationship. It illustrates how high value composites can be produced by efficient and sustainable processing methods by selecting different constituents [fibres and resins]. Researchers in academia working in composites

and accompanying areas [materials characterisation] and industrial manufacturers who need information on composite constituents and how they relate to each other for a certain application will find the book extremely useful when they need to make decisions about materials selection for their products. Focuses on the different types of FRCs that are currently available (e.g. from polymeric matrices to metallic and ceramic matrices, from carbon fibre to different types of natural fibres and from short to long fibre reinforced), their processing techniques, characterization of different properties, and how to improve the interfacial adhesion between an incompatible fibre and matrix and their applications Looks at crisis areas such as how to incorporate incompatible fibres and matrices together (e.g. Non-polar polypropylene matrix is not compatible with that of polar natural fibres and hence suitable surface modifications are required to make them compatible with each other) along with low cost processing methods, low density and high strength Uncovers clarifications to both elementary and practical problems related to the fabrication of FRCs Schematic representations depicting the interaction between different fibre types and matrices will be provided in some chapters

Conducting Polymer-Based Nanocomposites: Fundamentals and Applications delivers an up-to-date overview on cutting-edge advancements in the field of nanocomposites derived from conjugated polymeric matrices. Design of conducting polymers and resultant nanocomposites has instigated significant addition in the field of modern nanoscience and technology. Recently, conducting polymer-based nanocomposites have attracted considerable academic and industrial research interest. The conductivity and physical properties of conjugated polymers have shown dramatic improvement with nanofiller addition. Appropriate fabrication strategies and the choice of a nanoreinforcement, along with a conducting matrix, may lead to enhanced physicochemical features and material performance. Substantial electrical conductivity, optical features, thermal stability, thermal conductivity, mechanical strength, and other physical properties of the conducting polymer-based nanocomposites have led to high-performance materials and high-tech devices and applications. This book begins with a widespread impression of state-of-the-art knowledge in indispensable features and processing of conducting polymer-based nanocomposites. It then discusses essential categories of conducting polymer-based nanocomposites such as polyaniline, polypyrrole, polythiophene, and derived nanomaterials. Subsequent sections of this book are related to the potential impact of conducting polymer-based nanocomposites in various technical fields. Significant application areas have been identified for anti-corrosion, EMI shielding, sensing, and energy device relevance. Finally, the book covers predictable challenges and future opportunities in the field of conjugated nanocomposites. Integrates the fundamentals of conducting polymers and a range of multifunctional applications Describes categories of essential conducting polymer-based nanocomposites for polyaniline, polypyrrole, polythiophene, and derivative materials Assimilates the

significance of multifunctional nanostructured materials of nanocomposite nanofibers Portrays current and future demanding technological applications of conjugated polymer-based nanocomposites, including anti-corrosion coatings, EMI shielding, sensors, and energy production and storage devices

Nanoelectrochemical Methods

Spinel Ferrite Nanostructures for Energy Storage Devices

From Preparation to Applications

Past, Present and Perspectives

Challenges in Mechanics of Time Dependent Materials, Volume 2

Carbon Related Materials

**The book explains the principles and fundamentals of Green Analytical Chemistry (GAC) and highlights the current developments and future potential of the analytical green chemistry-oriented applications of various solutions. The book consists of sixteen chapters, including the history and milestones of GAC; issues related to teaching of green analytical chemistry and greening the university laboratories; evaluation of impact of analytical activities on the environmental and human health, direct techniques of detection, identification and determination of trace constituents; new achievements in the field of extraction of trace analytes from samples characterized by complex composition of the matrix; "green" nature of the derivatization process in analytical chemistry; passive techniques of sampling of analytes; green sorption materials used in analytical procedures; new types of solvents in the field of analytical chemistry. In addition green chromatography and related techniques, fast tests for assessment of the wide spectrum of pollutants in the different types of the medium, remote monitoring of environmental pollutants, qualitative and comparative evaluation, quantitative assessment, and future trends and perspectives are discussed. This book appeals to a wide readership of the academic and industrial researchers. In addition, it can be used in the classroom for undergraduate and graduate Ph.D. students focusing on elaboration of new analytical procedures for organic and inorganic compounds determination in different kinds of samples characterized by complex matrices composition. Jacek Namieśnik was a Professor at the Department of Analytical Chemistry, Gdańsk University of Technology, Poland. Justyna Płotka-Wasyłka is a teacher and researcher at the same department.**

**This book gathers peer-reviewed proceedings of the 3rd International Conference on Innovative Computing (IC 2020). This book aims to provide an open forum for discussing recent advances and emerging trends in information technology, science, and engineering. Themes within the scope of the conference include Communication Networks, Business Intelligence and Knowledge Management, Web Intelligence, and any related fields that depend on the development of information technology. The respective contributions presented here cover a wide range of topics, from databases and data mining, networking and communications, the web and Internet of Things, to embedded systems, soft computing, social network analysis, security and privacy, optical communication, and ubiquitous/pervasive computing. Readers such as students, researchers, and industry professionals in the fields of cloud computing, Internet of Things, machine learning, information security, multimedia systems, and information technology benefit from this comprehensive overview of the latest advances in information technology. The book can also benefit young investigators looking to**

start a new research program.

**Structures Strengthened with Bonded Composites** presents a comprehensive resource on the strengthening of concrete, reinforced and prestressed concrete, masonry, steel and other composite structures using externally-bonded FRP composites. The book emphasizes a systematic and fundamental investigation on bonding and debonding behavior of the FRP-concrete interface and structural performances of FRP-strengthened structures with a combination of experimental, theoretical and numerical studies. This book will appeal to all those concerned with strengthening and retrofitting of existing structures from the effect of additional anticipated loads in the civil sector. Discusses the FRP strengthening of different types of structures, including bridges, tunnels, buildings, historic structures and underwater constructions Establishes a systematic theory on interfacial fracture mechanics and clarifies different debonding mechanisms Describes design methods and makes comparison of design considerations and methods among different countries Presents temperature and fatigue effects and long-term behavior for different strengthening methods

**Biobased Products and Industries** fills the gap between academia and industry by covering all the important aspects of biobased products and their relevant industries in one single reference. Highlighting different perspectives of the bioeconomy, EU relevant projects, as well as the environmental impact of biobased materials and sustainability, the book covers biobased polymers, plastics, nanocomposites, packaging materials, electric devices, biofuels, textiles, consumer goods, and biocatalysis for the decarboxylation and decarboxylation of biobased molecules, including biobased products from alternative sources (algae) and the biobased production of chemicals through metabolic engineering. Focusing on the most recent advances in the field, the book also analyzes the potentiality of already commercialized processes and products. Highlights the important aspects of biobased products as well as their relevant industries in one single reference Focuses on the most recent advances in the field, analyzing the potentiality of already commercialized processes and products Provides an ideal resource for anyone dealing with bioresource technology, biomass valorization and new products development

**Trends in Manufacturing and Engineering Management**

**Optimum Composite Structures**

**Proceedings of the 2020 Annual Conference on Experimental and Applied Mechanics**

**Carbon- and Inorganic-based Nanostructures for Energy Applications**

**Design, Properties, and Applications**

**Graphene and Nanoparticles Hybrid Nanocomposites**

*Carbon fiber is an oft-referenced material that serves as a means to remove mass from large transport infrastructure. Carbon fiber composites, typically plastics reinforced with the carbon fibers, are key materials in the 21st century and have already had a significant impact on reducing CO2 emissions. Though, as with any composite material, the interface where each component meets, in this case the fiber and plastic, is critical to the overall performance. This text summarizes recent efforts to manipulate and optimize the interfacial interaction between these dissimilar materials to improve overall performance.*

**Hydrothermal Behavior of Fiber- and Nanomaterial-Reinforced Polymer**

*Composites provides critical information regarding the in-service environmental damage and degradation studies of nano/fiber reinforced polymer (FRP) composites focusing on hydrothermal degradation. Covering hydrothermal properties of a wide range of polymer composites, the book is aimed at graduate students, researchers, and professionals in material engineering, composite materials, nanomaterials, and related fields.*

*This book comprises select papers presented at the International Conference on Mechanical Engineering Design (ICMechD) 2019. The volume focuses on the different design aspects involved in manufacturing, composite materials processing as well as in engineering management. A wide range of topics such as control and automation, mechatronics, robotics, composite and nanomaterial design, and welding design are covered here. The book also discusses current research in engineering management on topics like products, services and system design, optimization in design, manufacturing planning and control, and sustainable product design. Given the range of the contents, this book will prove useful to students, researchers and practitioners.*

*Materials for Potential EMI Shielding Applications: Processing, Properties and Current Trends extensively and comprehensively reviews materials for EMI shielding applications, ranging from the principles to possible applications and various types of shielding materials. The book provides a thorough introduction to electromagnetic interference, its effect on both the environment and other electronic items, various materials that are used for electromagnetic interference shielding applications, and its properties. It explains the mechanism behind EMI shielding, the methods by which EMI SE of a given material is estimated, and the different fabrication methods currently employed for fabricating EMI shielding materials. Final sections focus on the theoretical background of EMI shielding and shielding mechanisms. This theoretical background is extended to the physics of EMI shielding, wherein the physics behind mechanism of shielding is explained. Focuses on the different types of available EMI shielding, their applications, processing, characterization, and the mechanism behind their shielding Discusses how to incorporate EMI shielding with low cost, low density and high strength Provides an understanding and clarifies both elementary and practical problems relating to EMI shielding materials*

*Sustainable Resource Recovery and Zero Waste Approaches  
IC 2020*

*Preparation, Properties and Applications*

*Persistent Toxic Substance Monitoring*

*Malignant Pleural Mesothelioma*

*Green Biocomposites for Biomedical Engineering*

*Spinal Ferrite Nanostructures for Energy Storage Devices provide up-to-date coverage of ferrite properties and applications, with a particular focus on electrochemical and electrocatalytic energy storage applications. The book covers the basics of ferrites, including*

synthesis methods, structures and properties in the first few chapters, focusing on topics such as the properties of ferrites and the electrochemical and electro catalytic energy storage applications of unitary, binary and mixed ferrite nanostructures. Limitations for using ferrites in these devices are also covered. This book is an important reference source for materials scientists and engineers who want to gain a greater understanding of how ferrites are being used to enhance energy storage devices. Shows how ferrites are being used in a variety of energy storage systems, including electrochemical supercapacitor systems Discusses how ferrites are being used as an abundantly available, cheaper alternative to their materials for energy storage applications Evaluates the challenges and limitations of using ferrites for energy storage applications

This book is designed to provide wide understanding of lignin carbon fiber processes, chemistry, mechanisms, and techniques that will help in further development of lignin carbon fiber for automobile, aerospace, marine, and sports equipment applications. Each step in the processing of lignin carbon fibers is presented as a separate chapter so that issues concerning the processes are exhaustively discussed. Basic scientific principles governing each stage of lignin carbon fiber processing, current state of research and mechanisms behind the processes are illustrated for better understanding. This is the first book to address the entire scope of lignin carbon fiber processing including; extraction, quantification, purification, melt processing, stabilization, carbonization, optimization of processes, and characterization. Presents detailed information on the chemistry, processing, principles and properties of bio-sourced lignin for carbon fiber production; Highlights techniques of recovery and properties of lignin from agricultural waste sources; Addresses applications in automobile, aircraft, marine, and sport industries; Provides insight into the lignin complex macromolecular system, the role of lignin chemistry as it relates to carbon fiber production and the evolution of lignin carbon fiber structure during processing.

Additive manufacturing (AM) methods have grown and evolved rapidly in recent years. AM for polymers is an exciting field and has great potential in transformative and translational research in many fields, such as biomedical, aerospace, and even electronics. Current methods for polymer AM include material extrusion, material jetting, vat polymerisation, and powder bed fusion. With the promise of more applications, detailed understanding of AM—from the processability of the feedstock to the relationship between the process–structure–properties of AM parts—has become more critical. More research work is needed in material development to widen the choice of materials for polymer additive manufacturing. Modelling and simulations of the process will allow the prediction of microstructures and mechanical properties of the fabricated parts while complementing the understanding of the physical phenomena that occurs during the AM processes. In this book, state-of-the-art reviews and current research are collated, which focus on the process–structure–properties relationships in polymer additive manufacturing.

Fiber Reinforced Composites

Sustainable Lignin for Carbon Fibers: Principles, Techniques, and Applications

Nanotechnology in Eco-efficient Construction

Polymer Nanocomposites for Advanced Engineering and Military Applications

Processing, Properties and Current Trends