

## Effects Of Electrospinning Setup And Process Parameters On

Selected, peer reviewed papers from the 2013 International Conference on Bio-Medical Materials and Engineering (ICBME 2013), March 26-27, 2013, Hong Kong

This book presents electrospinning as a processing technique in the field of graphene research. It brings together the current state of the art of processing, properties, and applications in different fields of science and technology of graphene and derived materials. The book not only discusses the various aspects of electrospun graphene but also covers the limitation and drawbacks of graphene owing to some of its intrinsic properties.

Polyesters and polyamides remain the most used group of synthetic fibres. This authoritative book reviews methods of their production, ways of improving their functionality and their wide range of applications. The first part of the book describes raw materials and manufacturing processes, including environmental issues. Part two considers ways of improving the functionality of polyester and polyamide fibres, including blending, weaving, coloration and other finishing techniques as well as new techniques such as nanotechnology. The final part of the book reviews the range of uses of these important fibres, from apparel and sportswear to automotive, medical and civil engineering applications. With its distinguished editors and international team of contributors, Polyesters and polyamides is a standard reference for all those using this important group of fibres. Reviews the chemical and physical properties of each fibre and their manufacture Analyses how the functionality of polyester and polyamides can be improved Provides examples of how the fibres are used in applications

The main focus of this book is on the development of electrospun membranes for advanced biomedical technologies including tissue engineering and drug delivery devices. Serving as a reference book for the beginner this book also provides an in-depth analysis of the challenges to be overcome in the future. Each section of the book covers not only the developments in the various fields of application of the electrospun meshes, but also the advances required for the successful development of new and high-end biomedical applications. Important areas tackled include: Biomedical applications of the technology Specific aspects of equipments and materials Surface characterization and functionalization In vitro testing with electrospun meshes. In all of these areas the main achievements, challenges ahead and expert opinions are given, making this book highly unusual in the level of detail covered.

The book is devoted to kinetics and thermodynamics of the processes with participation of some biological compounds and their synthetic analogues. Aspects of their acting as model enzymes, molecular receptors, photo sensitizers, pharmacophores, and biopharmaceutical compounds are under consideration. Quantitative characteristics of transfer of cations, anions and small organic molecules, fermentative catalysis, diffusion of the drug molecular through biological membranes are found. Mechanisms of the processes are discussed. Biological activity of studied compounds is evaluated. Bio-damages of materials as well as adhesions of microorganisms on materials surface are investigated.

This book reviews the most recent developments in the field of osteochondral tissue engineering (OCTE) and presents challenges and strategies being developed that face not only bone and cartilage regeneration, but also establish osteochondral interface formation in order to translate it into a clinical setting. Topics include nanotechnology approaches and biomaterials advances in osteochondral engineering, advanced processing methodology, as well as scaffolding and surface engineering strategies in OCTE. Hydrogel systems for osteochondral applications are also detailed thoroughly. Osteochondral Tissue Engineering: Nanotechnology, Scaffolding-Related Developments and Translation is an ideal book for biomedical engineering students and a wide range of established researchers and

professionals working in the orthopedic field.

Nanostructured materials have been largely studied in the last few years. They have great potential of applications in different fields such as materials science, physics, chemistry, biology, mechanic and medicine. Synthesis and characterization of nanostructured materials is a subject of great interest involving science, market, politicians, government and society.

Based on results obtained by the authors' research group during the past decade, this book comes to present novel techniques to synthesize nanostructured materials and characterize their properties such as crystallinity and crystallite size, specific surface area, particle size, morphology and catalytic activity. This book is aimed for students, researchers and engineers searching for methodologies to obtain and characterize nanostructures in details.

This is a timely, an informative, an interesting, and a well-managed book. The book not only offers an in-depth review of the current status of the knowledge of electrospinning and its biomedical applications but also discusses the emerging ideas and features, both from the East and West, with a focus on the needless electrospinning for the production of uniform fibers. The book is equally helpful to the experts of this field, who wish to enhance their understanding of the emerging technologies, and to the new comers, who can use this book as a reference.

This books provides a compendium of electrospinning strategies and related technologies for the production of biomaterials for tissue engineering and regenerative medicine applications. It gives a broad overview of the field as well as cutting-edge research on electrospinning and how it is applied to engineer biomaterials. This is an ideal book for biomaterials scientists, engineers, students, and researchers. This book also: Presents cutting-edge research performed in the area of electrospinning with applications in tissue engineering and regenerative medicine Provides readers from the biomaterials field as well as those new to the field with a broad overview of the multiple applications of electrospun biomaterials Summarizes the latest research from the past ten years on electrospinning and related technologies

There is considerable diversity in polymers extracted from natural sources and much work has been done to classify them according to their physical and chemical properties. In the second part of this book set, readers will find general information about the physicochemical properties of several naturally occurring polysaccharides followed by a section dedicated to their application in different fields of research and medicine. Key topics in this part include: • chitosan (properties modifications and applications) • microbial biopolymers • biopolymers present in Brazilian seeds • protein-plastic foams • biopolymer microencapsulation in the food industry • biomedical gels • collagen biomaterials • biopolymer electrospinning This reference is intended for students of applied chemistry and biochemistry who require information about the properties and applications of polysaccharides (such as chitosan) and other protein-based biopolymers.

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 nano?ber meshes for e?cient removal of excess water from kidney failure patients, and hydrogel

nano?bers which can be used as a drug carrier for methylene blue.

Several promising techniques have been developed to overcome the poor solubility and/or membrane permeability properties of new drug candidates, including different fiber formation methods. Electrospinning is one of the most commonly used spinning techniques for fiber formation, induced by the high voltage applied to the drug-loaded solution. With modifying the characteristics of the solution and the spinning parameters, the functionality-related properties of the formulated fibers can be finely tuned. The fiber properties (i.e., high specific surface area, porosity, and the possibility of controlling the crystalline–amorphous phase transitions of the loaded drugs) enable the improved rate and extent of solubility, causing a rapid onset of absorption. However, the enhanced molecular mobility of the amorphous drugs embedded into the fibers is also responsible for their physical–chemical instability. This Special Issue will address new developments in the area of electrospun nanofibers for drug delivery and wound healing applications, covering recent advantages and future directions in electrospun fiber formulations and scalability. Moreover, it serves to highlight and capture the contemporary progress in electrospinning techniques, with particular attention to the industrial feasibility of developing pharmaceutical dosage forms. All aspects of small molecule or biologics-loaded fibrous dosage forms, focusing on the processability, structures and functions, and stability issues, are included.

This book provides comprehensive coverage of smart biomaterials and their potential applications, a field that is developing at a very rapid pace. Because smart biomaterials are an emerging class of biomaterials that respond to small changes in external stimuli with large discontinuous changes in their physical properties, they have been designed to act as an “on–off” switch for, among others, bio separation, immunoanalysis, drug delivery technologies, gene therapy, diagnostics, bio sensors and artificial muscles. After an introduction to the topic and the history of smart biomaterials, the author gives the reader an in-depth look at the properties, mechanics, and characterization of smart biomaterials including hydrogels, particles, assemblies, surfaces, fibers and conjugates. Information on the wide range of applications for these materials follows, including drug delivery, tissue engineering, diagnostics, biosensors, bio separation and actuators. In addition, recent advances in shape memory biomaterials as active components of medical devices are also presented.

Airborne particles have a large impact on human health and the environment. They can be as small as a few nanometers. Electrospun nanofibrous materials have shown strong potential in filtering airborne nanoparticles for their high efficiency and low energy consumption.

Electrospinning has been investigated for decades. Unlike polymeric fibers, the production of fibers made from non-polymeric materials is limited. Additionally, the effects of single parameters on the fiber size are not well understood. To better understand the effects of electrospinning parameters on nanofiber size, the following tasks have been conducted: 1. Understand electrospinning using polymer-based samples for air filtration 2. Determine a reliable way of producing metal-based fibers, focusing on composition of the electrospinning solution and calcining atmosphere 3. Conduct a parametric study using metal-based fibrous filter samples 4. Conduct dimensionless parametric studies aiming at predicting the size of the fibers produced by electrospinning Before producing metal-based fibers, polymer fibers were produced using an existing apparatus in the lab. CA solutions were prepared by diluting various concentrations of CA in a 2:1 (w:w) ratio of N,N-dimethylacetamide (concentration 10 wt.% to 20 wt.%). The electrospinning voltages ranged from 8 to 12 kV with distances from 10 to 15 cm and deposition times of up to 30 minutes. The produced nanofibrous filter samples were then analyzed in terms of fiber size distribution and filter quality factor using nanosized NaCl particles ranging from 4 to 240 nm in diameter. The maximum filtration efficiency measured was 99.8 % for filter samples obtained with an overall deposition time of 30 minutes. The maximum filter quality factor was 0.14 Pa<sup>-1</sup> for a CA concentration of 20 wt.% and a tip-to-

collector distance of 15 cm. The average fiber diameters of the fibers were between 175 and 890 nm, and CA concentrations below 15 % led to the formation of beads. Then ceria and alumina-based filters were fabricated using the same setup with different operating parameters. Results showed that a solution mix with a ratio of 2:1 ethanol:water with a solid concentration of 15% in a weight ratio of 1:2 w:w metal nitrate:polymer yields the best fibers in terms of size distribution. The average fiber diameter was reduced by calcination due to the loss of polymer. The average diameter of the fibers was as small as 200 nm after calcination. Additionally, the produced metal-based fibers were tested for filtration and the filtration quality was 0.07 Pa<sup>-1</sup>, which is comparable to those of polymeric fibers. The importance of different solution and operating parameters were evaluated. The trial series was planned according to orthogonal two factorial experimental design. Four parameters, each with two levels were chosen for this study. The solution parameter chosen was concentrations of polymer and salt; process parameters included voltage, nozzle size and feed rate of the solution. It was found that the concentration of the precursor solution had a dominant effect on the fiber size, while the effects of electric field strength, flow rate and needle diameter were comparable in their effect on the fiber size. Dimensionless numbers have been developed using the Pi-theorem aiming at the prediction of electrospinnability. The development of the dimensional tables and the identification of suited parameters for the dimensional table show that the processing parameters electric field strength, needle diameter and solution feed rate; the solution parameters, including viscosity, surface tension and solution conductivity, are the most appropriate for characteristic numbers describing the electrospinning process.

Discover new and emerging applications of polymer nanofibers alongside the basic underlying science and technology. With discussions exploring such practical applications as filters, fabrics, sensors, catalysts, scaffolding, drug delivery, and wound dressings, the book provides polymer scientists and engineers with a comprehensive, practical "how-to" reference. Moreover, the author offers an expert assessment of polymer nanofibers' near-term potential for commercialization. Among the highlights of coverage is the book's presentation of the science and technology of electrospinning, including practical information on how to electrospin different polymer systems.

The book, Nanorods and Nanocomposites aims to provide the reader with an overview of the recent advances made on the synthesis of nanorods and nanocomposites and their emerging applications for a better lifestyle. The nanorods are a surprising gift to materials science from the research field of nanoscale materials. Nanorods promise to serve as a building block of the next-generation electronic and optoelectronic devices. Nanocomposite materials are multiphase solid materials that have one organic or inorganic nanoarchitected compound with various nanostructures, such as nanoparticles, nanowires, nanorods, and nano-films, etc., or with multiphase solid materials (metals, oxides, polymers, and carbon). Due to the progressive physical, chemical, electrical, thermal, optical, electrochemical, and catalytic properties of nanocomposites, they exhibit multi-functional characteristics in a variety of engineering applications such as piezoelectrics, thermoresistors, sensors, energy-related technologies, water purification catalysts, electro-photonics, and so on. Despite the wide variety of applications due to their unique nanostructures, the fabrication of nanocomposites and the realization of their applications in different fields remains a challenging task. The focus of this book is to provide a platform for presentation of the latest knowledge and recent progress in synthesis, functionalization, and applications of nanocomposite materials. It is expected that this book presents the most attractive and versatile technological developments in the field of nanorods and nanocomposite materials and their applications that will provide a better understanding of the currently ongoing research in related fields.

This book provides an overview of nanoparticle production methods, scale-up issues drawing attention to industrial applicability, and addresses their successful applications for commercial

use. There is a need for a reference book which will address various aspects of recent progress in the methods of development of nanoparticles with a focus on polymeric and lipid nanoparticles, their scale-up techniques, and challenges in their commercialization. There is no consolidated reference book that discusses the emerging technologies for nanoparticle manufacturing. This book focuses on the following major aspects of emerging technologies for nano particle manufacturing. I. Introduction and Biomedical Applications of Nanoparticles II. Polymeric Nanoparticles III. Lipid Nanoparticles IV. Metallic Nanoparticles V. Quality Control for Nanoparticles VI. Challenges in Scale-Up Production of Nanoparticles VII. Injectable Nanosystems VIII. Future Directions and Challenges Leading scientists are selected as chapter authors who have contributed significantly in this field and they focus more on emerging technologies for nanoparticle manufacturing, future directions, and challenges. . The book presents research that contributes to the development of intelligent dialog systems to simplify diverse aspects of everyday life, such as medical diagnosis and entertainment. Covering major thematic areas: machine learning and artificial neural networks; algorithms and models; and social and biometric data for applications in human–computer interfaces, it discusses processing of audio-visual signals for the detection of user-perceived states, the latest scientific discoveries in processing verbal (lexicon, syntax, and pragmatics), auditory (voice, intonation, vocal expressions) and visual signals (gestures, body language, facial expressions), as well as algorithms for detecting communication disorders, remote health-status monitoring, sentiment and affect analysis, social behaviors and engagement. Further, it examines neural and machine learning algorithms for the implementation of advanced telecommunication systems, communication with people with special needs, emotion modulation by computer contents, advanced sensors for tracking changes in real-life and automatic systems, as well as the development of advanced human–computer interfaces. The book does not focus on solving a particular problem, but instead describes the results of research that has positive effects in different fields and applications.

Advances in 3-Hydroxybutyric Acid Research and Application / 2012 Edition is a ScholarlyBrief™ that delivers timely, authoritative, comprehensive, and specialized information about 3-Hydroxybutyric Acid in a concise format. The editors have built Advances in 3-Hydroxybutyric Acid Research and Application / 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about 3-Hydroxybutyric Acid in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Advances in 3-Hydroxybutyric Acid Research and Application / 2012 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

The aim of this book is to explore the history, fundamentals, manufacturing processes, optimization parameters, and applications of electrospun materials. The book includes various types of electrospun materials such as antimicrobial, smart, bioinspired systems. It focuses on the many application areas for electrospun materials such as energy storage and harvesting, catalysis, biomedical including gene delivery and tissue engineering, separation, adsorption and water treatment technologies, packaging. The book emphasizes the enhanced sustainable properties of electrospun materials, with the challenges and future developments being discussed in detail. The chapters are written by top-class researchers and experts from throughout the world.

"Nanomaterials" is a special topic of recent research and is a milestone of nanoscience and nanotechnology. Nanoscale materials are a series of substances/compounds, in which at least

one dimension has smaller size than 100 nm. Nanomaterials have a broad area of development, which is growing rapidly day by day. Their impact on commercial applications as well as on the respective academia and education is huge. The basic points of this book can be divided into synthesis of nanomaterials and their applications. For example, special mention is about metal-oxide nanostructures, nanocomposites, and polymeric nanomaterials. Also, synthesis, characterizations, various processes, fabrications and some promising applications are also developed and analyzed.

Nanoencapsulation has the potential to improve human health through its capacity to both protect bioactive compounds and release them at a specific time and location into various substances, including food. Numerous nanoencapsulation technologies have emerged in recent years, each with its own advantages and disadvantages. The goal of this Brief is to discuss the various nanoencapsulation technologies, such as emulsification, coacervation, inclusion encapsulation, anti-solvent precipitation, nanoprecipitation, freeze drying, and spray drying, including their limitations. Recent safety and regulatory issues concerning the various nanoencapsulation technologies will also be covered. This edition is intended to provide better understanding of antibacterial drugs and their mechanism, the role of a few metal drug complexes as antibacterials, cross-checking of a few compounds and biomaterials against drug-resistant bacterial strains as well as a few alternative approaches using medicinal plant based formulations in the control of antibiotic-resistant bacteria. The information in this book provides clues for upcoming trends in treating antibiotic resistance problems with which one can explore new approaches in the treatment of common infections with drug-resistant strains.

Biomaterials have had a major impact on the practice of contemporary medicine and patient care. Growing into a major interdisciplinary effort involving chemists, biologists, engineers, and physicians, biomaterials development has enabled the creation of high-quality devices, implants, and drug carriers with greater biocompatibility and biofunctiona

This book focuses on the recent advancements in the process parameters, research, and applications of electrospinning and electrospraying. The first chapter introduces the techniques and the effect of the parameters on the morphology of the nanofiber and nanoparticles and then the subsequent chapters focus on the applications of these techniques in different areas. This book will attract a broad audience including postgraduate students and industrial and academic investigators in sciences and engineering who wish to enhance their understanding of the emerging technologies and use this book as reference. The book covers the basic electrospinning theory, electrospinning technologies that have potential for large scale production of nanofibers, and the functional applications of electrospun nanofibers in different fields. An important needleless electrospinning technique using a rotary fiber generator such as ball, cylinder, disc and wire coil, and the effects of the fiber generator, its shape and dimension, as well as operating parameters on electrospinning performance, fiber morphology and productivity are described. A method to calculate the electric

field and analyze electric field profiles in an electrospinning zone is provided. The influence of the fiber collector on fiber quality is also discussed.

This book offers a comprehensive review of the latest advances in developing functional electrospun nanofibers for energy and environmental applications, which include fuel cells, lithium-ion batteries, solar cells, supercapacitors, energy storage materials, sensors, filtration materials, protective clothing, catalysis, structurally-colored fibers, oil spill cleanup, self-cleaning materials, adsorbents, and electromagnetic shielding. This book is aimed at both newcomers and experienced researchers in the field of nanomaterials, especially those who are interested in addressing energy-related and environmental problems with the help of electrospun nanofibers. Bin Ding, PhD, and Jianyong Yu, PhD, are both Professors at the College of Materials Science and Engineering, Donghua University, China.

Multiscale Fibrous Scaffolds in Regenerative Medicine, by Sowmya Srinivasan, R. Jayakumar, K. P. Chennazhi, Erica J. Levorson, Antonios G. Mikos and Shantikumar V. Nair; Stem Cells and Nanostructures for Advanced Tissue Regeneration, by Molamma P. Prabhakaran, J. Venugopal, Laleh Ghasemi-Mobarakeh, Dan Kai Guorui Jin and Seeram Ramakrishna; Creating Electrospun Nanofiber-Based Biomimetic Scaffolds for Bone Regeneration, by Eleni Katsanevakis, Xuejun Wen and Ning Zhang; Synthetic/Biopolymer Nanofibrous Composites as Dynamic Tissue Engineering Scaffolds, by J. A. Kluge and R. L. Mauck; Electrospun Fibers as Substrates for Peripheral Nerve Regeneration, by Jörg Mey, Gary Brook, Dorothee Hodde and Andreas Kriebel; Highly Aligned Polymer Nanofiber Structures: Fabrication and Applications in Tissue Engineering, by Vince Beachley, Eleni Katsanevakis, Ning Zhang, Xuejun Wen; Electrospinning of Biocompatible Polymers and Their Potentials in Biomedical Applications, by Pitt Supaphol, Orawan Suwantong, Pakakrong Sangsanoh, Sowmya Srinivasan, Rangasamy Jayakumar and Shantikumar V. Nair; Electrospun Nanofibrous Scaffolds-Current Status and Prospects in Drug Delivery, by M. Prabakaran, R. Jayakumar and S. V. Nair.; Biomedical Applications of Polymer/Silver Composite Nanofibers, by R. Jayakumar, M. Prabakaran, K. T. Shalumon, K. P. Chennazhi and S. V. Nair.-

An up-to-date and comprehensive overview summarizing recent achievements, the state of the art, and trends in research into nanocellulose and cellulose nanocomposites. Following an introduction, this ready references discusses the characterization as well surface modification of cellulose nanocomposites before going into details of the manufacturing and the self-assembly of such compounds. After a description of various alternatives, including thermoplastic, thermosetting, rubber, and fully green cellulose nanocomposites, the book continues with their mechanic and thermal properties, as well as crystallization and rheology behavior. A summary of spectroscopic and water sorption properties precedes a look at environmental health and safety of these nanocomposites. With its coverage of a wide variety of materials, important

characterization tools and resulting applications, this is an essential reference for beginners as well as experienced researchers.

**One-Dimensional Nanostructures: Electrospinning Technique and Unique Nanofibers** is a comprehensive book depicting the electrospinning technique and related 1D unique electrospun nanofibers. The first part of the book focuses on electrospinning technique, with chapters describing Electrospinning setup, electrospinning theories, and related working parameter. The second part of the book describes in detail specific topics on how to control the electrospun fiber properties such as how to control the fiber direction, how to control the fiber surface morphology, how to control the fiber structure, and how to construct 3D structures by electrospun fibers. The final part of the book depicts the applications of the electrospun nanofibers, with sections describing in detail specific fields such as electrospun nanofiber reinforcement, filtration, electronic devices, lithium-ion batteries, fuel cells, biomedical field, and so on. **One-Dimensional Nanostructures: Electrospinning Technique and Unique Nanofibers** is designed to bring state-of-the-art on electrospinning together into a single book and will be valuable resource for scientists in the electrospinning field and other scientists involved in biomedical field, mechanical field, materials, and energy field. Dr. Zhenyu Li is an associate professor at the Dept. of Chemistry, Jilin University, Changchun, P. R. China. Currently, he also holds the position in Australian Future Fibres Research & Innovation Centre, Institute for Frontier Materials, Deakin University, Geelong, Victoria, Australia. Dr. Ce Wang is a professor at the Dept. of Chemistry, Jilin University, Changchun, P. R. China. This book focuses on threats, especially contaminants, to drinking water and the supply system, especially in municipalities but also in industrial and even residential settings. The safety, security, and suitability landscape can be described as dynamic and complex stemming from necessity and hence culpability due to the emerging threats and risks, vis-a-vis globalization resulting in new forms of contaminants being used due to new technologies. The book provides knowledge and guidance for engineers, scientists, designers, researchers, and students who are involved in water, sustainability, and study of security issues. This book starts out with basics of water usage, current statistics, and an overview of water resources. The book then introduces different scenarios of safety and security and areas that researchers need to focus. Following that, the book presents different types of contaminants inadvertent, intentional, or incidental. The next section presents different methodologies of contamination sensing/detection and remediation strategies as per guidance and standards set globally. The book then concludes with selected chapters on water management, including critical infrastructure that is critical to maintaining safe water supplies to cities and municipalities. Each chapter includes descriptive information for professionals in their respective fields. The breadth of chapters offers insights into how science (physical, natural, and social) and technology can support new developments to manage the complexity resident within the evolving threat and

risk landscape.

Phosphates—Advances in Research and Application: 2012 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Phosphates. The editors have built Phosphates—Advances in Research and Application: 2012 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Phosphates in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Phosphates—Advances in Research and Application: 2012 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

The research and development of nanofibers has gained much prominence in recent years due to the heightened awareness of its potential applications in the medical, engineering and defense fields. Among the most successful methods for producing nanofibers is the electrospinning process. In this timely book, the areas of electrospinning and nanofibers are covered for the first time in a single volume. The book can be broadly divided into two parts: the first comprises descriptions of the electrospinning process and modeling to obtain nanofibers while the second describes the characteristics and applications of nanofibers. The material is aimed at both newcomers and experienced researchers in the area.

Electrospinning of nanofibers has emerged as a specialized processing technique for the formation of sub-micron fibers, with high specific surface areas. Electrospinning of Nanofibers in Textiles presents important new research in the dynamic and emerging field of electrospinning and covers all aspects of the technology as used to produce nanofibers.

Electrospinning is from the academic as well as technical perspective presently the most versatile technique for the preparation of continuous nanofibers obtained from numerous materials including polymers, metals, and ceramics. Shapes and properties of fibers can be tailored according to the demand of numerous applications including filtration, membranes, textiles, catalysis, reinforcement, or biomedical. This book summarizes the state-of-the art in electrospinning with detailed coverage of the various techniques, material systems and their resulting fiber structures and properties, theoretical aspects and applications. Throughout the book, the current status of knowledge is introduced with a critical view on accomplishments and novel perspectives. An experimental section gives hands-on guidance to beginners and experts alike.

[Copyright: d50c9502abbcf6567d77eeca8e394136](http://www.ScholarlyEditions.com/)