

Development Of Biomedical Applications Of Non Equilibrium

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Cold Plasma MDPI 2021-01-20 Non-equilibrium plasma (or low-temperature plasma, LTP) offers a chemically rich medium without the need for high power and elevated temperatures. This unique characteristic has made LTP very useful for various industrial and biomedical applications where thermal effects are not desirable. In addition, the relative simplicity of the design of sources capable of generating non-equilibrium plasma at atmospheric pressure makes LTP a very attractive technology that can accomplish the same or better results than much more complex and expensive approaches. This book describes various low-temperature plasma sources and some of their environmental and biomedical applications. The plasma sources covered in this book include low-temperature plasma jets which are novel devices that can launch low-power, low-temperature plasma plumes in ambient air. These plasma plumes can accurately and reliably be aimed at a surface to be treated or at a biological target such as cells and tissues. The application of these plasma jets in medicine, including in cancer therapy, are thoroughly discussed in this book. The contents of this book will appeal to engineers, medical experts, academics, and students who work with plasma technology.

Applications of Biophotonics and Nanobiomaterials in Biomedical Engineering Mohammad E. Khosroshahi 2017-10-30 This book provides a link between different disciplines of nanophysics, biophotonics, nanobiomaterials & applications of nanobiophotonics in biomedical research and engineering. The fundamentals of light, matter, nanobiomaterials & nanophysics are discussed

together, and relevant applications in biomedical engineering as well as other related factors influencing the interaction process are explicated. Theoretical and experimental research is combined, emphasizing the influence of crucial common factors on applications.

Nonequilibrium Atmospheric Pressure Plasma Jets XinPei Lu 2019-04-23

Nonequilibrium atmospheric pressure plasma jets (N-APPJs) generate plasma in open space rather than in a confined chamber and can be utilized for applications in medicine. This book provides a complete introduction to this fast-emerging field, from the fundamental physics, to experimental approaches, to plasma and reactive species diagnostics. It provides an overview of the development of a wide range of plasma jet devices and their fundamental mechanisms. The book concludes with a discussion of the exciting application of plasmas for cancer treatment. The book provides details on experimental methods including expert tips and caveats. covers novel devices driven by various power sources and the impact of operating conditions on concentrations and fluxes of the reactive species. discusses the latest advances including theory, modeling, and simulation approaches. gives an introduction, overview and details on state of the art diagnostics of small scale high gradient atmospheric pressure plasmas. covers the use of N-APPJs for cancer applications, including discussion of destruction of cancer cells, mechanisms of action, and selectivity studies. XinPei Lu is a Chair Professor in the School of Electrical and Electronic Engineering at Huazhong University of Science and Technology. Stephan Reuter is currently Visiting Professor at Université Paris-Saclay. In a recent Alexander von Humboldt research fellowship at Princeton University, he performed ultrafast laser spectroscopy on cold plasmas. Mounir Laroussi is Professor of Electrical and Computer Engineering and director of the Plasma Engineering and Medicine Institute at Old Dominion University. He is a Fellow of IEEE and recipient of an IEEE Merit Award. DaWei Liu is Professor in the School of Electrical and Electronic Engineering at Huazhong University of Science and Technology.

Peptides and Peptide-based Biomaterials and their Biomedical Applications

Anwar Sunna 2017-10-26 Solid-binding peptides have been used increasingly as molecular building blocks in nanobiotechnology as they can direct the assembly and functionalisation of a diverse range of materials and have the ability to regulate the synthesis of nanoparticles and complex nanostructures. Nanostructured materials such as β -sheet fibril-forming peptides and α -helical coiled coil systems have displayed many useful properties including stimulus-responsiveness, modularity and multi-functionality, providing potential technological applications in tissue engineering, antimicrobials, drug delivery and nanoscale electronics. The current situation with respect to self-assembling peptides and bioactive matrices for regenerative medicine are reviewed, as well as peptide-target modeling and an examination of future prospects for peptides

in these areas.

Comprehensive Materials Processing 2014-04-07 Comprehensive Materials Processing provides students and professionals with a one-stop resource consolidating and enhancing the literature of the materials processing and manufacturing universe. It provides authoritative analysis of all processes, technologies, and techniques for converting industrial materials from a raw state into finished parts or products. Assisting scientists and engineers in the selection, design, and use of materials, whether in the lab or in industry, it matches the adaptive complexity of emergent materials and processing technologies. Extensive traditional article-level academic discussion of core theories and applications is supplemented by applied case studies and advanced multimedia features. Coverage encompasses the general categories of solidification, powder, deposition, and deformation processing, and includes discussion on plant and tool design, analysis and characterization of processing techniques, high-temperatures studies, and the influence of process scale on component characteristics and behavior. Authored and reviewed by world-class academic and industrial specialists in each subject field Practical tools such as integrated case studies, user-defined process schemata, and multimedia modeling and functionality Maximizes research efficiency by collating the most important and established information in one place with integrated applets linking to relevant outside sources

Advanced Research on Advanced Structure, Materials and Engineering II Helen Zhang 2013-05-27 Selected, peer reviewed papers from the 2013 2nd International Conference on Advanced Structure, Materials and Engineering (ASME 2013), April 13-14, 2013, Guangzhou

Molecular Theory of the Living Cell Sungchul Ji 2012-04-05 The book presents the first comprehensive molecular theory of the living cell ever published since the cell doctrine was formulated in 1838-1839. It introduces into cell biology over thirty key concepts, principles and laws imported from physics, chemistry, computer science, linguistics, semiotics and philosophy. The author formulates physically, chemically and enzymologically realistic molecular mechanisms to account for basic living processes such as ligand-receptor interactions, enzymic catalysis, force-generating mechanisms in molecular motors, chromatin remodelling, and signal transduction. Possible solutions to basic and practical problems facing contemporary biology and biomedical sciences have been suggested, including pharmacotherapeutics and personalized medicine.

The Chemistry of Inorganic Biomaterials Christopher Spicer 2021-08-18 Biomaterials offer the potential to restore and supplement the function of tissues and organs following injury or disease. The use of inorganic materials in the clinic to date has been widespread, in the form of metallic joint replacements and ceramic dental and bone implants. Exciting new medical applications continue to emerge, enabled by innovative materials for neural interfaces and as anti-fouling agents. The Chemistry of Inorganic Biomaterials overviews the underlying

chemistry behind the most common and cutting-edge inorganic materials in current use, or approaching use, in vivo. Framed from the context of the overarching material class/application, it provides a balanced and critical overview of the field by bringing together experts in both the fundamental inorganic and material chemistry, as well as key clinical considerations for biomedical applications. Written in an accessible style, this book will be of interest to advanced undergraduates, postgraduates and researchers in biomaterials, inorganic materials and materials chemistry.

Bioelectrics Hidenori Akiyama 2016-09-19 This book focuses on bioelectrics, a new multidisciplinary field encompassing engineering and biology with applications to the medical, environmental, food, energy, and biotechnological fields. At present, 15 universities and institutes in Japan, the USA and the EU comprise the International Consortium of Bioelectrics, intended to advance this novel and important research field. This book will serve as an introductory resource for young scientists and also as a textbook for use by both undergraduate and graduate students – the world's first such work solely devoted to bioelectrics.

World Congress on Medical Physics and Biomedical Engineering May 26-31, 2012, Beijing, China Mian Long 2013-02-11 The congress's unique structure represents the two dimensions of technology and medicine: 13 themes on science and medical technologies intersect with five challenging main topics of medicine to create a maximum of synergy and integration of aspects on research, development and application. Each of the congress themes was chaired by two leading experts. The themes address specific topics of medicine and technology that provide multiple and excellent opportunities for exchanges.

Biomedical Applications of Nanoparticles Nadine Millot 2020-05-29 This book provides an overview of the design and physico-chemical properties of nanoparticles developed for biomedical applications such as targeting and detection of pathologies, nanovectorization of drugs, radiosensitization, metal detection, and nanocomposite implants. The considerations necessary when developing a new nanomedicine are also developed, including toxicological investigation, biodistribution, and efficacy. This book provides an accurate and current representation of the field by addressing the promises and hurdles of nanomedicine via 20 different pertinent studies. Covering a wide range of areas, this book is an excellent partner for physico-chemists, doctors, pharmacologists, and biochemists working on nanosciences dedicated to medicine, both in industry and in academia.

Fluorine Magnetic Resonance Imaging Ulrich Flogel 2016-10-26 Over the past decade, fluorine (^{19}F) magnetic resonance imaging (MRI) has garnered significant scientific interest in the biomedical research community owing to the unique properties of fluorinated materials and the ^{19}F nucleus. Fluorine has an intrinsically sensitive nucleus for MRI. There is negligible endogenous ^{19}F in the body and thus there is no background signal. Fluorine-containing compounds

are ideal tracer labels for a wide variety of MRI applications. Moreover, the chemical shift and nuclear relaxation rate can be made responsive to physiology via creative molecular design. This book is an interdisciplinary compendium that details cutting-edge science and medical research in the emerging field of ^{19}F MRI. Edited by Ulrich Flögel and Eric Ahrens, two prominent MRI researchers, this book will appeal to investigators involved in MRI, biomedicine, immunology, pharmacology, probe chemistry, and imaging physics.

Development and Application of Biomedical Titanium Alloys Liqiang Wang 2018-04-05 Titanium and its alloys have been widely used as biomedical implant materials due to their low density, good mechanical properties, superior corrosion resistance and biocompatibility when compared with other metallic biomaterials such as Co–Cr alloys and stainless steels. Recently, β -type titanium alloys have been increasingly considered as excellent implant materials because of the remarkable combination of high strength-to-weight ratio, good fatigue resistance, relatively low Young's modulus, good biocompatibility and high corrosion resistance relative to conventional titanium biomaterials. This book covers recent information about biomedical titanium alloy development and 3D printing. Chapters describe the processing, microstructure, mechanical properties and corrosion properties in detail. Information about the surface modification of titanium alloys for biomedical applications, and manufacturing of titanium alloys by new technologies (such as selective laser melting and electron beam melting), is also presented. Readers will learn about the various types of biomedical titanium alloys, their advantages and disadvantages, their fabrication methods and medical applications. This book is a useful handbook for biomedical engineers, metallurgists and biotechnicians seeking information about titanium-based alloys for biomaterials research and development.

Development and Biomedical Applications of an Improved Polycation-sensitive Membrane Electrode Narayanan Ramamurthy 1999

Micro/Nano Technology Systems for Biomedical Applications Chih-Ming Ho 2010-03-25 In daily life, we are accustomed to working with length scales of feet or meters, but the building blocks from which our bodies are constructed are many orders of magnitude smaller. The technologies that are being developed to intervene at these minute scales have the potential to improve human health and significantly enrich our lives. Revolutionary micro/nano technology platforms have led to dramatic advances in sample preparation, analysis and cell culture. From the 1990s through to the very beginning of the twenty-first century, the focus was on the development of manufacturing technologies. Through elegant design and sophisticated fabrication, the micro- to nano-scale manipulation of fluids and particles has become routine. Since then, it has become possible to control molecular interactions at device surfaces, and optical manipulation, imaging and sensing techniques can also be incorporated. Micro/nano technology platforms are already being used to study and direct biological processes at the cellular and sub-cellular level, and to detect disease with

greater sensitivity and specificity. The challenges and excitement in the near future will be in engineering these sophisticated, multifunctional devices to seamlessly interface with complex biological systems. Providing a clear guide that moves from molecules through devices to systems, this book reviews fundamental aspects of microfluidic devices, including fabrication, surface property control, pressure-driven and electrokinetic flow, and functions such as fluid mixing, particle sorting and molecular separations. The integration of optical and plasmonic imaging, optoelectronic tweezers for single particle manipulation, and optical and electrical signal transduction methods for biosensing are shown to provide extraordinary capabilities for bioanalytical and biomedical applications. These represent key areas of research that will lead to the next generation of micro/nano-based systems. Anyone working in this fast-changing field will benefit from this comprehensive review of the latest thinking, while researchers will find much to inspire and direct their work.

Advances in Information Technology Research and Application: 2011 Edition
2012-01-09 Advances in Information Technology Research and Application: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Information Technology. The editors have built Advances in Information Technology Research and Application: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Information Technology 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 Information Technology Research and Application: 2011 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/>.

Surface Tailoring of Inorganic Materials for Biomedical Applications Lia Rimondini 2012-10-18 Inorganic materials have been used for biomedical applications since many decades. They have been utilized successfully because of easy and economic methods for bulk preparation and industrial manufacturing. Surface modifications significantly improve the success of these materials and enable us to exploit their application in many innovative fields such as tissue engineering, dentistry, nanocarriers for drugs, medical diagnosis and antifouling technologies. This e-book provides comprehensive information on technologies for development and characterization of successful functionalized materials for biomedical applications relevant to surface modification. It is a suitable reference for advanced students and researchers interested in biomaterials science and medical applications of inorganic substances.

Plasma Technology in the Preservation and Cleaning of Cultural Heritage Objects

Radko Ti?o 2021-02-19 Scientists have long been looking for alternative methods for the cleaning of historical and cultural museum objects as conventional methods often fail to completely remove surface films, leaving contamination and surface residues behind. Low-temperature plasmas have recently been found to provide a new, efficient and durable approach that maintains the safety of both the materials and personnel. This book is the first to introduce the emerging use of low-temperature plasmas in the cleaning and decontamination of cultural heritage items. It provides a comprehensive exploration of the new possibilities of cleaning objects with plasma, before providing a practice guide to the individual cleaning methods and an overview of the technologies and conditions used in the different cleaning regimes. It is an ideal reference for researchers in plasma physics, in addition to professionals working in the field of historical and cultural conservation. Features: Provides a thorough overview of the cleaning potential of emerging plasma technologies in accessible language for professional restorers and conservators without a scientific background Includes the latest case studies from the field, which have not been published elsewhere yet Authored by a team of experts in the field

Non-equilibrium Processing of Materials C. Suryanarayana 1999-07-22 The rapid technological developments during the later half of the 20th century have demanded materials that are stronger, capable of use at much higher temperatures, more corrosion-resistant, and much less expensive than those currently used. These demands become even more significant on the threshold of the new century and the millennium. Significant improvements in properties can only be achieved by processing the materials under far-from-equilibrium (or non-equilibrium) conditions. Several new processing technologies have been developed during the past few decades including, rapid solidification, spray forming, mechanical alloying, ion mixing, vapor deposition, laser processing and plasma processing. Remarkable advances have been made in recent years in the science and technology of these processes used to synthesize, characterize, and apply these materials processed under non-equilibrium conditions. Some of these techniques have evolved from laboratory curiosity to commercial-scale manufacturing in just a few years. In other cases, industrial necessity prompted development of the technology, and the science followed later. The chapters in this book have been written by people who are world-recognized experts in their respective fields. Each chapter describes the principles, processing techniques, special features of the materials produced, and their applications. An extensive list of references is provided at the end of each chapter that will facilitate location of additional information on specific aspects of any technique.

Metallic Biomaterials Processing and Medical Device Manufacturing Cuie Wen 2020-08-20 Metallic Biomaterials Processing and Medical Device Manufacturing details the principles and practices of the technologies used in biomaterials processing and medical device manufacturing. The book reviews the main categories of metallic biomaterials and the essential considerations in design

and manufacturing of medical devices. It bridges the gap between the designing of biomaterials and manufacturing of medical devices including requirements and standards. Main themes of the book include, manufacturing, coatings and surface modifications of medical devices, metallic biomaterials and their mechanical behaviour, degradation, testing and characterization, and quality controls, standards and FDA regulations of medical devices. The leading experts in the field discuss the requirements, challenges, recent progresses and future research directions in the processing of materials and manufacturing of medical devices. *Metallic Biomaterials Processing and Medical Device Manufacturing* is ideal for those working in the disciplines of materials science, manufacturing, biomedical engineering, and mechanical engineering. Reviews key topics of biomaterials processing for medical device applications including metallic biomaterials and their mechanical behavior, degradation, testing and characterization Bridges the gap between biomaterials design and medical device manufacturing Discusses the quality controls, standards, and FDA requirements for biomaterials and medical devices

Plasma Medicine Alexander Fridman 2012-12-19 This comprehensive text is suitable for researchers and graduate students of a 'hot' new topic in medical physics. Written by the world's leading experts, this book aims to present recent developments in plasma medicine, both technological and scientific, reviewed in a fashion accessible to the highly interdisciplinary audience consisting of doctors, physicists, biologists, chemists and other scientists, university students and professors, engineers and medical practitioners. The book focuses on major topics and covers the physics required to develop novel plasma discharges relevant for medical applications, the medicine to apply the technology not only in-vitro but also in-vivo testing and the biology to understand complicated biochemical processes involved in plasma interaction with living tissues.

Biomedical Applications Polymer Blends 2003-07-01

Advances in Biomaterials Science and Biomedical Applications Rosario Pignatello 2013-03-27 This contribution book is a collection of reviews and original articles from eminent experts working in the multi- and interdisciplinary arena of biomaterials, ranging from their design to novel uses. From their personal experience, the readers can obtain a stimulating foresight on the potentialities of different synthetic and engineered biomaterials. 21 chapters have been organized to illustrate different aspects of biomaterials science. From advanced means for the characterization and toxicological assessment of new materials, through "classical" applications in nanotechnology and tissue engineering, toward novel specific uses of these products, the volume wishes to give readers a view of the wide range of disciplines and methodologies that have been exploited to develop biomaterials with the physical and biological features needed for specific clinical and medical applications.

Smart Nanomaterials in Biomedical Applications Jin-Chul Kim 2021 With the start of 2020, the wrath of pandemic challenged the scientific community to

develop more advanced drug delivery approaches for biomedical applications, endowing conventional drugs with additional therapeutic benefits and minimum side effects. Although significant advancements have been done in the field of drug delivery, there is a need to focus towards strategizing novel and improved drug delivery systems that should be convenient and cost-effective to the patients, and simultaneously they should also provide financial benefits to pharmaceutical companies. Controlled drug delivery technology offers ample opportunities and scope for improvising the therapeutic efficacy of drugs via optimizing the drug release rate and time. For this endeavour, smart nanomaterials have served as remarkable candidates for biomedical applications, owing to their ground-breaking properties and design. The development of such nanomaterials requires a broad knowledge related to their physio-chemical properties, molecular structure, mechanisms by which the nanomaterials interact with the cells, and methods by which drugs are released at the site of action. This knowledge must also be allied with the knowledge of signaling crosstalk mechanisms that are modulated by the nanomaterial-drugs composite. It can be anticipated that these emerging drug delivery technologies can facilitate the world to successfully encounter such pandemic outbursts in the future in a cost-effective and time-effective manner. The chapters in this book deal with the advanced technologies and approaches that can benefit advanced students, researchers, and industry experts in developing smart and intelligent nanomaterials for future biomedical applications, and development, manufacturing, and commercialization for controlled and targeted drug delivery.

Biomedical Applications of Microencapsulation Franklin Lim 2019-06-12
Published in 1984: For this volume the publishers at CRC Press have chosen to present information on just one important area, namely the biomedical field, where much progress in the application of microencapsulation has been made in recent years.

Nanotechnology for Electronics, Photonics, and Renewable Energy Anatoli Korkin 2010-12-14 Tutorial lectures given by world-renowned researchers have become one of the important traditions of the Nano and Giga Challenges (NGC) conference series. 1 Soon after preparations had begun for the first forum, NGC2002, in Moscow, Russia, the organizers realized that publication of the lectures notes would be a valuable legacy of the meeting and a significant educational resource and knowledge base for students, young researchers, and senior experts. Our first book was published by Elsevier and received the same title as the meeting itself—Nano and Giga 2 Challenges in Microelectronics. Our second book, Nanotechnology for Electronic 3 4 Materials and Devices, based on the tutorial lectures at NGC2004 in Krakow, 5 Poland, the third book from NGC2007 in Phoenix, Arizona, and the current book 6 from joint NGC2009 and CSTC2009 meeting in Hamilton, Ontario, have been published in Springer's Nanostructure Science and Technology series. Hosted by McMaster University, the meeting NGC/CSTC 2009 was held as a joint event of two conference

series, Nano and Giga Challenges (Nano & Giga Forum) and Canadian Semiconductor Technology Conferences (CSTC), bringing together the networks and expertise of both professional forums. Informational (electronics and photonics), renewable energy (solar systems, fuel cells, and batteries), and sensor (nano and bio) technologies have reached a new stage in their development in terms of engineering limits to cost-effective improvement of current technological approaches. The latest miniaturization of electronic devices is approaching atomic dimensions.

Plasma Medical Science Shinya Toyokuni 2018-07-06 Plasma Medical Science describes the progress that has been made in the field over the past five years, illustrating what readers must know to be successful. As non-thermal, atmospheric pressure plasma has been applied for a wide variety of medical fields, including wound healing, blood coagulation, and cancer therapy, this book is a timely resource on the topics discussed. Provides a dedicated reference for this emerging topic Discusses the state-of-the-art developments in plasma technology Introduces topics of plasma biophysics and biochemistry that are required to understand the application of the technology for plasma medicine Brings together diverse experience in this field in one reference text Provides a roadmap for future developments in the area

Government-wide Index to Federal Research & Development Reports 1967-12 Applied Mathematics, Modeling and Computer Simulation C.-H. Chen 2022-02-25 The pervasiveness of computers in every field of science, industry and everyday life has meant that applied mathematics, particularly in relation to modeling and simulation, has become ever more important in recent years. This book presents the proceedings of the 2021 International Conference on Applied Mathematics, Modeling and Computer Simulation (AMMCS 2021), hosted in Wuhan, China, and held as a virtual event from 13 to 14 November 2021. The aim of the conference is to foster the knowledge and understanding of recent advances across the broad fields of applied mathematics, modeling and computer simulation, and it provides an annual platform for scholars and researchers to communicate important recent developments in their areas of specialization to colleagues and other scientists in related disciplines. This year more than 150 participants were able to exchange knowledge and discuss recent developments via the conference. The book contains 115 peer-reviewed papers, selected from more than 250 submissions and ranging from the theoretical and conceptual to the strongly pragmatic and all addressing industrial best practice. Topics covered include mathematical modeling and applications, engineering applications and scientific computations, and the simulation of intelligent systems. Providing an overview of recent development and with a mix of practical experiences and enlightening ideas, the book will be of interest to researchers and practitioners everywhere.

Encyclopedia of Plasma Technology - Two Volume Set J. Leon Shohet 2016-12-12 Technical plasmas have a wide range of industrial applications. The

Encyclopedia of Plasma Technology covers all aspects of plasma technology from the fundamentals to a range of applications across a large number of industries and disciplines. Topics covered include nanotechnology, solar cell technology, biomedical and clinical applications, electronic materials, sustainability, and clean technologies. The book bridges materials science, industrial chemistry, physics, and engineering, making it a must have for researchers in industry and academia, as well as those working on application-oriented plasma technologies. Also Available Online This Taylor & Francis encyclopedia is also available through online subscription, offering a variety of extra benefits for researchers, students, and librarians, including: Citation tracking and alerts Active reference linking Saved searches and marked lists HTML and PDF format options Contact Taylor and Francis for more information or to inquire about subscription options and print/online combination packages. US: (Tel) 1.888.318.2367; (E-mail) e-reference@taylorandfrancis.com International: (Tel) +44 (0) 20 7017 6062; (E-mail) online.sales@tandf.co.uk

Electrospun Nanofibers for Biomedical Applications Albino Martins 2020-05-29 Electrospinning is a versatile and effective technique widely used to manufacture nanofibrous structures from a diversity of materials (synthetic, natural or inorganic). The electrospun nanofibrous meshes' composition, morphology, porosity, and surface functionality support the development of advanced solutions for many biomedical applications. The Special Issue on "Electrospun Nanofibers for Biomedical Applications" assembles a set of original and highly-innovative contributions showcasing advanced devices and therapies based on or involving electrospun meshes. It comprises 13 original research papers covering topics that span from biomaterial scaffolds' structure and functionalization, nanocomposites, antibacterial nanofibrous systems, wound dressings, monitoring devices, electrical stimulation, bone tissue engineering to first-in-human clinical trials. This publication also includes four review papers focused on drug delivery and tissue engineering applications.

Plasma Technology for Biomedical Applications Emilio Martines 2020-05-29

There is growing interest in the use of physical plasmas (ionized gases) for biomedical applications, especially in the framework of so-called "plasma medicine", which exploits the action of low-power, atmospheric pressure plasmas for therapeutic purposes. Such plasmas are "cold plasmas", in the sense that only electrons have a high temperature, whereas ions and the neutral gas particles are at or near room temperature. As a consequence, the "plasma flame" can be directly applied to living matter without appreciable thermal load. Reactive chemical species, charged particles, visible and UV radiation, and electric fields are interaction channels of the plasma with pathogens, cells, and tissues, which can trigger a variety of different responses. Possible applications include disinfection, wound healing, cancer treatment, non-thermal blood coagulation, just to mention some. The understanding of the mechanisms of plasma action on living matter requires a strongly interdisciplinary approach, with

competencies ranging from plasma physics and technology to chemistry, to biology and finally to medicine. This book is a collection of work that explores recent advances in this field.

NanoCellBiology Bhanu P. Jena 2014-04-23 This book provides a comprehensive understanding of the discovery of a new cellular structure the "porosome," which is the universal secretory machinery in cells; the protein assembly, biomineralization, and biomolecular interactions; the molecular evolution of protein structure; the use of magnetic nanoparticles for transformative application in medicine and therapy, and the new and novel imaging approach of electrical impedance spectroscopy in biology. It be used for college courses in nanomedicine, nano cell biology, advanced nanotechnology, and biotechnology at the undergraduate and graduate level.

Plasma at the Nanoscale Huaihe Song 2022-08-15 Plasma technology can facilitate the fabrication of nanomaterials and nanoscale structures. On the other hand, nanotechnology could be possibly used in plasma science. Several advanced nanomaterials and nanodevices could be used to fabricate nanoplasma (nanoscale plasma), such as nanoelectrodes, nanoantennae, nanolasers, nanoreactors, nanomagnets, nanosensors, nanobatteries, nanogenerator and supercapacitors. This book provides information on fundamental design concepts and promising applications of nanoplasma. It explains how, for the next generation of electronic devices with high data rate communications, a high-speed operation of electronic switches could be attained using nanoplasma. Similarly, in the field of health and aesthetics, nanoplasma can be used as a non-surgical localized treatments for the face and neck, such as eyelid correction. In addition, various kinds of advanced nanostructures can be fabricated using the plasma technology Outlines the main properties of nanotechnology-enhanced plasma Discusses major applications of plasma technology Assesses the major challenges of manufacturing nanoplasma on an industrial scale

Metallic Biomaterials for Medical Applications Liqiang Wang 2022-01-17

Industry 4.0 Tessaleno Devezas 2017-02-28 This book presents the latest research perspectives on how the Industry 4.0 paradigm is challenging the process of technological and structural change and how the diversification of the economy affects structural transformation. It also explores the impact of fast-growing technologies on the transformation of socioeconomic and environmental systems, and asks whether structural and technological change can generate sustainable economic growth and employment. Further, the book presents the basic innovations (new technologies, materials, energy, etc) and industrial policies that can lead to such a structural change.

The Modelling and Characterization of Dielectric Barrier Discharge-Based Cold Plasma Jets G Divya Deepak 2020-01-15 Non-equilibrium atmospheric pressure plasma jets (APPJs) are of intense interest in current low-temperature plasma research because of their immense potential for material processing and

biomedical applications. Depending on the jet configuration and the electrical excitation, plasma characteristics including heat, charged particle, electric field, and chemically active species may differ significantly. Other important parameters of importance in these studies are the kind of utilized working gas and gas flow rate. This book presents the electrical characterization of DBD-based APPJs for three electrode arrangements: ring electrode, pin electrode and floating helix electrode configurations. The analysis presented here will serve to help in establishing an optimum range of operation for a cold plasma jet without arcing and without any physical damage to the electrodes. Furthermore, the experimental results provided in the book establish the significance of the type of working gas on the power consumption and on the jet length obtained. These developed cold DBD-based APPJs of larger lengths may be useful for diverse biological applications and surface treatments.

Liquid Scintillation Counting Recent Applications and Development Chin-Tzu Peng 2012-12-02 Liquid Scintillation Counting: Recent Applications and Development, Volume II. Sample Preparation and Applications documents the proceedings of the International Conference on Liquid Scintillation Counting, Recent Applications and Development, held on August 21-24, 1979 at the University of California, San Francisco. The conference brought together 180 scientists from 15 countries who share a common interest in promoting a better understanding of liquid scintillation science and technology. Liquid scintillation counting is one branch of nuclear metrology that many scientists of various disciplines use in tracing and quantification in their investigatory studies. The proceedings, consisting of 14 sections, include 76 of the 77 invited and contributed papers presented at the conference. The first volume contains 37 papers mainly dealing with the physical aspects of liquid scintillation science and technology. The present volume contains papers that cover sample preparation, flow counting, and emulsion (solgel) counting. It also includes studies on applications of liquid scintillation counting, such as chemiluminescence and bioluminescence, environmental monitoring, and biomedical and radioimmunoassays.

A Bridge Between Control Science and Technology: Biomedical applications, water resources, environment, energy systems, development, social effects, swiis, education International Federation of Automatic Control. World Congress 1985

Electrochemical Sensors, Biosensors and their Biomedical Applications Xueji Zhang 2011-04-28 This book broadly reviews the modern techniques and significant applications of chemical sensors and biosensors. Chapters are written by experts in the field – including Professor Joseph Wang, the most cited scientist in the world and renowned expert on sensor science who is also co-editor. Each chapter provides technical details beyond the level found in typical journal articles, and explores the application of chemical sensors and biosensors to a significant problem in biomedical science, also providing a prospectus for

the future. This book compiles the expert knowledge of many specialists in the construction and use of chemical sensors and biosensors including nitric oxide sensors, glucose sensors, DNA sensors, hydrogen sulfide sensors, oxygen sensors, superoxide sensors, immuno sensors, lab on chip, implatable microsensors, et al. Emphasis is laid on practical problems, ranging from chemical application to biomedical monitoring and from in vitro to in vivo, from single cell to animal to human measurement. This provides the unique opportunity of exchanging and combining the expertise of otherwise apparently unrelated disciplines of chemistry, biological engineering, and electronic engineering, medical, physiological. Provides user-oriented guidelines for the proper choice and application of new chemical sensors and biosensors Details new methodological advancements related to and correlated with the measurement of interested species in biomedical samples Contains many case studies to illustrate the range of application and importance of the chemical sensors and biosensors