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NanoBiosensing Elsevier
Ultrananocrystalline Diamond: Synthesis, Properties, and Applications is a unique practical reference handbook. Written by the leading experts worldwide it introduces the science of UNCD for both the R&D community and applications developers using UNCD in a diverse range of applications from macro to nanodevices, such as energy-saving ultra-low friction and wear coatings for mechanical pump seals and tools, high-performance MEMS/NEMS-based systems (e.g. in telecommunications), the next generation of high-definition flat panel displays, in-vivo biomedical implants, and biosensors. This work brings together the basic science of nanoscale diamond structures, with detailed information on ultra-nanodiamond synthesis, properties, and applications. The book offers discussion on UNCD in its two forms, as a powder and as a chemical vapor deposited film. Also discussed are the superior mechanical, tribological, transport, electrochemical, and electron emission properties of UNCD for a wide range of applications including MEMS/ NEMS, surface acoustic wave (SAW) devices, electrochemical sensors, coatings for field emission arrays, photonic and RF switching, biosensors, and neural prostheses, etc. Ultrananocrystalline Diamond summarises the most recent developments in the nanodiamond field, and presents them in a way that will be useful to the R&D community in both academic and corporate sectors. Coverage of both nanodiamond particles and films make this a valuable resource for both the nanotechnology community and the field of thin films / vacuum deposition. Written by the world’s leading experts in nanodiamond, this second edition builds on its predecessor’s reputation as the most up-to-date resource in the field.
Thin Films on Glass University of Arkansas Press
This book presents a complete overview of the powerful but often misused technique of Electrochemical Impedance Spectroscopy (EIS). The book presents a systematic and complete overview of EIS. The book carefully describes EIS and its application in studies of electrocatalytic reactions and other electrochemical processes of practical interest. This book is directed towards graduate students and researchers in Electrochemistry. Concepts are illustrated through detailed graphics and numerous examples. The book also includes practice problems. Additional materials and solutions are available online.
Characterization, Properties and Applications Elsevier
This reference text brings together comprehensive reviews of the latest research in the field of bionanomaterials, with a focus on fundamentals and biomedical applications. Detailed coverage of the classification, properties and synthesis of bionanomaterials is provided to enhance readers' understanding. The book combines new ideas to uplift the advancement of bionanomaterials in biomedical research and provides a valuable reference for researchers and advanced students in the fields of biomaterials, bionanotechnology and bioengineering. The major applications covered include nanobiosensing, nanomedicine, diagnostics, therapeutics, tissue engineering and green bionanotechnology. The properties and applications of synthetic bionanomaterials and molecularly-imprinted polymer-based bionanomaterials are also included.
Marine and Industrial Biofouling Monographs on the Physics and

Flow Dynamics and Tissue Engineering of Blood Vessels explores the physical phenomena of vessel compliance and its influence on blood flow dynamics, as well as the modification of flow structures in the presence of diseases within the vessel wall or diseased blood content. This volume also illustrates the progress of tissue engineering for the intervention of re-engineered blood vessels. Blood vessel organoid models, their controlling aspects, and blood vessels based on microfluidic platforms are illustrated following on from the understanding of flow physics of blood on a similar platform. The purpose of this book is to provide an overview of regenerative medicine and fluid mechanics principles for the management of clinically diseased blood vessels. Authors discuss tissue engineering aspects and computational fluid mechanical principles, and how they can be used to understand the state of blood vessels in diseased conditions. Key Features Computational and experimental fluid dynamics principles have been used to explore the modelling of diseased blood vessels Principles of fluid dynamics and tissue engineering are used to propose innovative designs of bioreactors for blood vessel regeneration Offers experimental analytical studies of blood flow in vessels with pathological conditions Controlling aspects of various parameters while developing blood-vessel bioreactors and organoid models are presented critically, and optimization techniques for these parameters are also provided

Modeling Phosphorus in the Environment Wiley-Blackwell

This book, entitled Thin Films on Glass, is one of a series reporting on research and development activities on products and processes conducted by the Schott Group. The scientifically founded development of new products and technical pro cesses has traditionally been of vital importance to Schott and has always been performed on a scale determined by the prospects for application of our special glasses. Since the reconstruction of the Schott Glaswerke in Mainz, the scale has increased enormously. The range of expert knowledge required could never have been supplied by Schott alone. It is also a tradition in our company to cultivate collaboration with customers, universities, and research institutes. Publications in numerous technical journals, which since 1969 we have edited to a regular schedule as Forschungsberichte - 'research reports' - describe the results of these cooperations. They contain up-to-date infor mation on various topics for the expert but are not suited as survey material for those whose standpoint is more remote. This is the point where we would like to place our series, to stimulate the exchange of thoughts, so that we can consider from different points of view the possibilities offered by those incredibly versatile materials, glass and glass ceramics. We would like to share the knowledge won through our research and development at Schott in cooperation with the users of our materials with scientists and engineers, interested customers and friends, and with the employees of our firm.

Biocidal Polymers Springer Science & Business Media

This third volume in the series represents the Proceedings of the 3rd International Nanophotonics Symposium, July 6-8, 2006, Icho-Kaikan, Osaka University, Osaka, Japan. Over a two-day symposium, distinguished scientists from around the world convened to discuss the latest progress in this field and the conclusions have been summarised in Nano Biophotonics: Science and Technology. The contents of this book have been compiled by invited lecturers, research members of the relevant projects/program, and some of general participants. The book has 27 chapters which are classified into 4 parts; nano bio-spectroscopy, nano bio-dynamics, nano bio-processing, and nano bio-devices. * Bridges the gap between conventional photophysics & photochemistry and nanoscience * Continuing the series that focuses on 'hot' areas of photochemistry, optics, material science and bioscience

Controlled and Living Polymerizations Elsevier

Theranostic Bionanomaterials is an invaluable study of recent advances and trends in the development and application of functional bionanomaterials for theranostic applications. This book describes the design and characterization of nanomaterials which exhibit distinctive physical, chemical and biological properties and discusses how these functional nanomaterials enable the precise manipulation of architectural, physical and biochemical cell microenvironments in vitro. In addition, it covers how they can act as the carriers of diagnostic or therapeutic agents, thus providing new pathways or strategies for disease diagnosis and treatment. Specific chapters discuss protein delivery, drug delivery, tissue regeneration, bioimaging, biodetection, and much more. This book will be a critical resource for those involved in cutting-edge research in theranostics bionanomaterial. Focuses on nanofabrication methods of bionanomaterials Reviews the application of bionanomaterials, with a focus on drug delivery and diagnosis Describes the design and characterization of nanomaterials which exhibit distinctive physical, chemical and biological properties

Bionanomaterials Springer Science & Business Media

This book is a compendium of the finest research in nanoplasmonic sensing done around the world in the last decade. It describes basic theoretical considerations of nanoplasmons in the dielectric environment, gives examples of the multitude of applications of nanoplasmonics in biomedical and chemical sensing, and provides an overview of future trends in optical and non-optical nanoplasmonic sensing. Specifically, readers are guided through both the fundamentals and the latest research in the two major fields nanoplasmonic sensing is applied to – bio- and chemo-sensing – then given the state-of-the-art recipes used in nanoplasmonic sensing research.

Ultrananocrystalline Diamond World Health Organization

Biocidal polymers are designed to inhibit or kill microorganisms such as bacteria, fungi and protozoans. This book summarizes recent findings in the synthesis, modification and characterization of various antimicrobial polymers ranging from plastics and elastomers to biomimetic and biodegradable polymers. Modifications with different antimicrobial agents as well as antimicrobial testing methods are described in a comprehensive manner.

Polymer Nanoparticles for Nanomedicines Springer Science & Business Media

This book discusses recent advances in the use of nucleic acid based biosensors and related bioanalytical assays for environmental monitoring.

Glycopolymers Elsevier

1 Y. Tsujii, K. Ohno, S. Yamamoto, A. Goto, T. Fukuda: Structure and Properties of High-Density Polymer Brushes Prepared by Surface-Initiated Living Radical Polymerization.- 2 D.J. Dyer: Photoinitiated Synthesis of Grafted Polymers.- 3 T. Matsuda: Photoiniferter-Driven Precision Surface Graft Microarchitectures for Biomedical Applications.- 4 R. Advincula: Polymer Brushes by Anionic and Cationic Surface Initiated Polymerization.- 5 M.R. Buchmeiser: Metathesis Polymerization From and To Surfaces.-

Pat the Zoo (Pat the Bunny) William Andrew

On a daily basis, our requirements for technology become more innovative and creative and the field of electronics is helping to lead the way to more advanced appliances. This book gathers and evaluates the materials, designs, models, and technologies that enable the fabrication of fully elastic electronic devices that can tolerate high strain. Written by some of the most outstanding scientists in the field, it lays down the undisputed knowledge on how to make electronics withstand stretching. This monograph provides a review of the specific applications that directly benefit from highly compliant electronics, including transistors, photonic devices, and sensors. In addition to stretchable devices, the topic of ultraflexible electronics is treated, highlighting its upcoming significance for the industrial-scale production of electronic goods for the consumer. Divided into four parts covering: * Theory * Materials and Processes * Circuit Boards * Devices and Applications An unprecedented overview of this thriving area of research that nobody in the field - or intending to enter it - can afford to miss.

Handbook of Smart Coatings for Materials Protection Elsevier

This work looks at thin films and self-assembled monolayers of thiols. It is aimed at researchers in chemistry, materials science, electrical engineering, biology and condensed matter physics.

Animal Physiology Springer Science & Business Media

This book provides a definitive account of the theory, practice and applications of atom probe field ion microscopy (APFIM). The APFIM technique provides a unique method for observing and chemically identifying single atoms on solid surfaces. Recent advances in the method,which are largely dueto the present authors, now permit the atomic-scale chemistry of a solid specimen to be recognised in three dimensions. As a result of these developments, new and exciting applications are rapidly emerging in the field of material science, surface science, and catalysis. The book is a state-of-theart account of this important field, and is intended for a graduate-level readership.

Layered Double Hydroxides Smithers Rapra

While only a few cases of intentional contamination of food have been proven, the risk of possible terrorist threats to food should be given serious consideration by public health authorities and the food industry.This document examines means of establishing basic prevention, surveillance and response capacities. Because both unintentionally and deliberately caused outbreaks of foodborne disease may be managed by many of the same mechanisms, the WHO recommendations concentrate on working with national governments on integrating terrorism prevention and response measures into existing national food safety and disease surveillance programmes.Preventive measures by governments and the food industry are discussed. Industry involvement is encouraged from the outset, as the food industry possesses the primary means and greatest ability to minimize food-related risks. Existing food safety management programmes can be enhanced, WHO says, while putting in place appropriate security measures to protect food production and distribution systems. The document provides suggestions for specific measures for consideration by industry.The document provides guidance on strengthening existing communicable disease control systems to ensure that surveillance systems are sufficiently sensitive to meet the threat of any food safety emergency.The guidance document emphasizes the need to strengthen existing emergency alert and response systems by improving links with all relevant agencies and with the food industry. Many developed and most developing countries are not yet adequately prepared to deal with a large-scale food safety emergency. All countries should undertake preparedness and response planning to be able to cope with food safety emergencies regardless of their cause. In this regard, the services of various technical programmes of WHO as well as other organizations that may be of assistance to countries in addressing this newly emerging public health concern are also described in the document.Experts from national agencies in Australia, Germany, Ireland, Japan, Russia, Spain, United Kingdom, and United States of America, and from organizations including the European Commission, the Food and Agriculture Organization of the United Nations and the Industry Council for Development contributed to the development of the document.

Surface-Initiated Polymerization I Springer Science & Business Media

Written by a highly prestigious and knowledgeable team of top scientists in the field, this book provides an overview of the current status of controlled/living polymerization, combining the synthetic, mechanistic and application-oriented aspects. From the contents: * Anionic Vinyl Polymerization * Carbocationic Polymerization * Radical Polymerization * Coordinative Polymerization of Olefins * Ring-Opening Polymerization of Heterocycles * Ring-Opening Metathesis Polymerization * Macromolecular Architectures * Complex Functional Macromolecules * Synthesis of Block and Graft Copolymers * Bulk and Solution Structures of Block Copolymers * Industrial Applications While some of the material is based on chapters taken from the four-volume work "Macromolecular Engineering", it is completely updated and rewritten to reflect the focus of this monograph. Must-have knowledge for polymer and organic chemists, plastics technologists, materials scientists and chemical engineers.

Nano Biophotonics Woodhead Publishing

Despite advances in modeling, such as graphical user interfaces, the use of GIS layers, and databases for developing input files, the approaches to modeling phosphorus (P) have not changed since their initial development in the 1980s. Current understanding of P processes has evolved and this new information needs to be incorporated into the current models. Filling this need, Modeling Phosphorus in the Environment describes basic approaches to modeling P, how the current models implement these approaches, and ways to improve them. The book sets the scene with a review of general approaches to modeling runoff and erosion, P in runoff, leaching of P, stream processes that affect P, and an examination of the important issue of model uncertainty. It describes state-of-the-science watershed-scale P transport models including dynamic semi-disturbed models, models of intermediate complexity, and two lumped models. Phosphorus Indexes (PIs) represent one end of the modeling spectrum and the book takes a comprehensive look at PIs developed in each state, and illustrates some of the problems encountered when incorporating PIs into farm-scale manure management software. The book discusses monitoring data, which is critical for calibrating models, and concludes with suggestions for improving the modeling of P. From researching mechanisms to applying regulations, the uses of phosphorus models have increased as our knowledge of the effects of phosphorus in the environment has increased. Drawing on contributions from experts, the book gives you the tools to select the model that best fits your needs.

Relieving Pain in America Elsevier

Food safety awareness is at an all time high, new and emerging threats to the food supply are being recognized, and consumers are eating more and more meals prepared outside of the home. Accordingly, retail and foodservice establishments, as well as food producers at all levels of the food production chain, have a growing responsibility to ensure that proper food safety and sanitation practices are followed, thereby, safeguarding the health of their guests and customers. Achieving food safety success in this changing environment requires going beyond traditional training, testing, and inspectional approaches to managing risks. It requires a better understanding of organizational culture and the human dimensions of food safety. To improve the food safety performance of a retail or foodservice establishment, an organization with thousands of employees, or a local community, you must change the way people do things. You must change

their behavior. In fact, simply put, food safety equals behavior. When viewed from these lenses, one of the most common contributing causes of food borne disease is unsafe behavior (such as improper hand washing, cross-contamination, or undercooking food). Thus, to improve food safety, we need to better integrate food science with behavioral science and use a systems-based approach to managing food safety risk. The importance of organizational culture, human behavior, and systems thinking is well documented in the occupational safety and health fields. However, significant contributions to the scientific literature on these topics are noticeably absent in the field of food safety.

Nanostructured Biomaterials for Regenerative Medicine Springer Science & Business Media

Chronic pain costs the nation up to $635 billion each year in medical treatment and lost productivity. The 2010 Patient Protection and Affordable Care Act required the Department of Health and Human Services (HHS) to enlist the Institute of Medicine (IOM) in examining pain as a public health problem. In this report, the IOM offers a blueprint for action in transforming prevention, care, education, and research, with the goal of providing relief for people with pain in America. To reach the vast multitude of people with various types of pain, the nation must adopt a population-level prevention and management strategy. The IOM recommends that HHS develop a comprehensive plan with specific goals, actions, and timeframes. Better data are needed to help shape efforts, especially on the groups of people currently underdiagnosed and undertreated, and the IOM encourages federal and state agencies and private organizations to accelerate the collection of data on pain incidence, prevalence, and treatments. Because pain varies from patient to patient, healthcare providers should increasingly aim at tailoring pain care to each person's experience, and self-management of pain should be promoted. In addition, because there are major gaps in knowledge about pain across health care and society alike, the IOM recommends that federal agencies and other stakeholders redesign education programs to bridge these gaps. Pain is a major driver for visits to physicians, a major reason for taking medications, a major cause of disability, and a key factor in quality of life and productivity. Given the burden of pain in human lives, dollars, and social consequences, relieving pain should be a national priority.

Flow Dynamics and Tissue Engineering of Blood Vessels Springer Science & Business Media

Glycopolymers have received considerable interest in recent years due to their increasing potential applications in material science and biomedicine. With better understanding of the role of carbohydrates in biological systems and with recent advances in organic and carbohydrate chemistry, the design and synthesis of glycopolymers have become simpler where significant research efforts have been carried out towards the fabrication of advanced glyco-polymeric architectures for improved performance. This book provides an update on the recent advances on the synthesis of glycopolymers, their characterisations, their biological properties and their applications. The first objective of this book is to provide the readers a detailed overview about the synthesis of glycopolymers via several modern polymerisation techniques. The characterisation of these materials and their solution properties are also discussed. In addition to this, the conjugation of glycopolymers to different types of biomacromolecules are discussed. The second objective of this book is to provide a detailed overview of the applications of glycopolymers. In addition, the biological properties of the glycopolymers as a function of the types of carbohydrates attached, the polymer architectures and compositions are elaborated. This book will provide a quick reference to students and researchers working in both academia and industry.