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Percutaneous Penetration Enhancers Chemical Methods in Penetration Enhancement - Nina Dragicevic 2016-01-05
Percutaneous Penetration Enhancers in a mini-series format comprising five volumes, represents the most comprehensive reference on enhancement methods – both well established and recently introduced – in the field of dermal/transdermal drug delivery. In detail the broad range of both chemical and physical methods used to enhance the skin delivery of drugs is described. All aspects of drug delivery and measurement of penetration are covered and the latest findings are provided on skin structure and function, mathematics in skin permeation and modern analytical techniques adapted to assess and measure penetration. In offering a detailed description of the methods currently in use for penetration enhancement, this book will be of value for researchers, pharmaceutical scientists, practitioners and also students.
Nanobiotechnology Applications in Plant Protection - Kamel A. Abd-Elsalam 2018-08-14
Nanotechnology can target specific agricultural problems related to plant pathology and provide new techniques for crop disease control. Plant breeders and phytopathologists are needed who can apply nanogenomics and develop nanodiagnostic technologies to accurately advance the improvement process and take advantage of the potential of genomics. This book serves as a thorough guide for researchers working with nanotechnology to address plant protection problems. Novel nanobiotechnology methods describe new plant gene transfer tools that improve crop resistance against plant diseases and increase food security. Also, quantum dots (QDs) have emerged as essential tools for fast and accurate detection of particular biological markers. Biosensors, QDs, nanostructured platforms, nanoimaging, and nanopore DNA sequencing tools have the potential to raise sensitivity, specificity, and speed in pathogen detection, thereby facilitating high-throughput analysis and providing high-quality monitoring and crop protection. Also, this book deals with the application of nanotechnology for quicker, more cost-effective, and precise diagnostic procedures of plant diseases and mycotoxins. Applications of nanotechnology in plant pests and disease control, antimicrobial mechanisms, pesticides remediation and nanotoxicity on plant ecosystem and soil microbial communities are discussed in detail. Moreover, the application of specific nanomaterials including silver, copper, carbon- or polymer-based nanomaterials and nanoemulsions are also discussed. Crops treated with safe nanofertilizers and nanopesticides will gain added value because they are free of chemical residues, decay and putative pathogens for human health, sustaining the global demand for high product quality.

An Introduction to Food Grade Nanoemulsions - Nandita Dasgupta 2018-01-03

This book provides authentic and comprehensive information on the concepts, methods, functional details and applications of nano-emulsions. Following an introduction to the applications of nanotechnology in the development of foods, it elaborates on food-grade nano-emulsion and their significance, discusses various techniques and methods for producing food-grade nano-emulsion, and reviews the main ingredient and component of food-grade nano-emulsions. Further, the book includes a critical review of the engineering aspect of fabricating food-grade nano-emulsions and describe recently developed vitamin encapsulated nano-systems. In closing, it discuss the challenges and opportunities of characterizing nano-emulsified systems, the market risks and opportunities of nano-emulsified foods, and packaging techniques and safety issues – including risk identification and risk management – for nano-foods. The book offers a unique guide for scientists and researchers working in this field. It will also help researchers, policymakers, industry personnel, journalists and the general public to understand food nanotechnology in great detail.

Encapsulations - Alexandru Grumezescu 2016-09-08

Encapsulations, a volume in the Nanotechnology in the Agri-Food Industry series,presents key elements in establishing food quality through the improvement of food flavor and aroma. The major benefits of nanoencapsulation for food ingredients include improvement in bioavailability of flavor and aroma ingredients, improvement in solubility of poor water-soluble ingredients, higher ingredient retention during production process, higher activity levels of encapsulated ingredients, improved shelf life, and controlled release of flavor and aroma. This volume discusses main nanoencapsulation processes such as spray drying, melt injection, extrusion, coacervation, and emulsification. The materials used in nanoencapsulation include lipids, proteins, carbohydrates, cellulose, gums, and food grade polymers. Applications and benefits of nanoencapsulation such as controlled release, protections, and taste masking will be explained in detail. Includes the most up-to-date information on nanoencapsulation and nanocontainer-based delivery of antimicrobials Presents nanomaterials for innovation based on scientific advancements in the field Provides control release strategies to enhance bioactivity, including methods and techniques for research and innovation Provides useful tools to improve the delivery of bioactive molecules and living cells into foods

Introduction to Plastics Engineering - Anshuman Shrivastava 2018-05-15

Introduction to Plastics Engineering provides a single reference covering the basics of polymer and plastics materials, and their properties, design, processing and applications in a practical way. The book discusses materials engineering through properties formulation, combining part design and processing to produce final products. This book will be a beneficial guide to materials engineers developing new formulations, processing engineers producing those formulations, and design and product engineers seeking to understand the materials and methods for developing new applications. The book incorporates material properties, engineering, processing, design, applications and sustainable and bio based solutions. Ideal for those just entering the industry, or transitioning between sectors, this is a quick, relevant and informative reference guide to plastics engineering and processing for engineers and plastics practitioners. Provides a single unified reference covering plastics materials, properties, design, processing and applications Offers end-to-end coverage of the industry, from formulation to part design, processing, and the final product Serves as an ideal introductory book for new plastics engineers and students of plastics engineering Provides a convenient reference for more experienced practitioners

Nanoengineered Biomaterials for Advanced Drug Delivery - Masoud Mozafari 2020-06-17

Nanoengineered Biomaterials for Advanced Drug Delivery explores the latest advances in the applications of nanoengineered biomaterials in drug delivery systems. The book covers a wide range of biomaterials and nanotechnology techniques that have been used for the delivery of different biological molecules and drugs in the human body. It is an

important resource for biomaterials scientists and engineers working in biomedicine and those wanting to learn more on how nanoengineered biomaterials are being used to enhance drug delivery for a variety of diseases. Nanoengineered biomaterials have enhanced properties that make them more effective than conventional biomaterials as both drug delivery agents, and in the creation of new drug delivery systems. As nanoengineering becomes more cost-effective, nanoengineered biomaterials have become more widely used within biomedicine. Offers an informed overview on how nanoengineering biomaterials enhance their properties for drug delivery applications Discusses the major applications of nanoengineered biomaterials for drug delivery Outlines the major challenges for successfully implementing nanoengineered biomaterials into existing drug delivery systems

Lipid-Based Nanocarriers for Drug Delivery and Diagnosis - Muhammad Raza Shah 2017-06-07

Lipid-Based Nanocarriers for Drug Delivery and Diagnosis explores the present state of widely used lipid-based nanoparticulate delivery systems, such as solid lipid nanoparticles (SLN), nanostructured lipid carriers (NLC), nanoliposomes, micelles, nanoemulsions, nanosuspensions and lipid nanotubes. The various types of lipids that can be exploited for drug delivery and their chemical composition and physicochemical characteristics are reviewed in detail, along with their characterization aspects and effects of their dimensions on drug delivery systems behavior in-vitro and in-vivo. The book covers the effective utilization of these lipids based systems for controlled and targeted delivery of potential drugs/genes for enhanced clinical efficacy. Provides the present state of widely used lipid-based nanoparticulate delivery systems Explores how lipid-based nanocarriers improve drug delivery safety Describes the nanoformulation design and the preparation methods of lipid-based nanocarriers

Emerging Nanotechnologies in Food Science - Rosa Busquets 2017-02-28

Emerging Nanotechnologies in Food Science presents the current knowledge and latest developments in food nanotechnology, taking a multidisciplinary approach to provide a broad and comprehensive understanding of the field. Food nanotechnology is a newly emergent discipline that is fast-growing and evolving. The discipline continues to benefit from advances in materials and food sciences and has enormous scientific and economic potential. The book presents nano-ingredients and engineered nanoparticles developed to produce technologically improved food from both food science and engineering perspectives. In addition, subsequent chapters offer a review of recent outstanding inventions in food nanotechnology and legal considerations for the protection of intellectual property in this area. With its multidisciplinary team of contributors, this book serves as a reference book for the ever-growing food nanotechnology science. Presents a multidisciplinary approach and broad perspective on nanotechnology applications in food science Contains contributors from various fields, including chapters from a geochemist, a tissue engineer, and a microbiologist, as well as several from food scientists Offers a range of insights relevant to different backgrounds Provides case studies in each chapter that demonstrate how nanotechnology is being used in today's food sector

Handbook of Research on Food Science and Technology - Monica Lizeth Chavez-Gonzalez 2019-01-15

This handbook series consists of three volumes focusing on food technology and chemistry, food biotechnology and microbiology, and functional foods and nutraceuticals. The volumes highlight new research and current trends in food science and technology, looking at the most recent innovations, emerging technologies, and strategies focusing on taking food design to sustainable levels. In particular, the handbooks include relevant information on modernization and improvements in the food industry. In volume 2 of the 3-volume set, the chapters examine bioactive compounds in food biotechnology, potential and risks of pigmented-grain corn, technological advances in the production of phytases, phytochemical molecules from food waste, control of food-borne pathogen bacteria, and more.

Microencapsulation - Fabien Salaün 2019-10-02

This book is intended to provide an overview and review of the latest developments in microencapsulation processes and technologies for

various fields of applications. The general theme and purpose are to provide the reader with a current and general overview of the existing microencapsulation systems and to emphasize various methods of preparation, characterization, evaluation, and potential applications in various fields such as medicine, food, agricultural, and composites. The book targets readers, including researchers in materials science processing and/or formulation and microencapsulation science, engineers in the area of microcapsule development, and students in colleges and universities.

Advanced Materials, Technology and Application - Qingzhou Xu 2016-09-29

The 2016 International Conference on Advanced Materials, Technology and Application (AMTA2016) was held in Changsha, China on March 18–20, 2016. The main objective of the joint conference is to provide a platform for researchers, academics and industrial professionals to present their research findings in the fields of advanced materials and technology. The AMTA2016 received more than 150 submissions, but only 59 articles were selected to be included in this proceedings, which are organized into 7 chapters; covering Chemical Materials, composite and Nano Materials, Polymer and Concrete Materials, Structural Materials, Metal and Alloy Materials, Electrical Materials, and Biomaterials. Contents:Chemical MaterialsComposite and Nano MaterialsPolymer and Concrete MaterialsStructural MaterialsMetal and Alloy MaterialsElectrical MaterialsBiomaterials Readership: Researchers and professionals in materials sciences.

Nanoemulsions - Kai Seng Koh 2019-09-11

Fluidics, an increasingly examined topic in nanoscience and nanotechnology is often discussed with regard to the handling of fluid flow, material processing, and material synthesis in innovative devices ranging from the macroscale to the nanoscale. Nanoemulsions - Properties, Fabrications and Applications reviews key concepts in nanoscale fluid mechanics, its corresponding properties, as well as the latest trends in nanofluidics applications. With attention to the fundamentals as well as advanced applications of fluidics, this book imparts a solid knowledge base and develops skill for future problem-solving and system analysis. This is a vital resource for upper-level engineering students who want to expand their potential career opportunities and familiarize themselves with an increasingly important field.

Emulsion-based Systems for Delivery of Food Active Compounds - Shahin Roohinejad 2018-06-18

A comprehensive text that offers a review of the delivery of food active compounds through emulsion-based systems Emulsion-based Systems for Delivery of Food Active Compounds is a comprehensive recourse that reviews the principles of emulsion-based systems formation, examines their characterization and explores their effective application as carriers for delivery of food active ingredients. The text also includes information on emulsion-based systems in regards to digestibility and health and safety challenges for use in food systems. Each chapter reviews specific emulsion-based systems (Pickering, multiple, multilayered, solid lipid nanoparticles, nanostructured lipid carriers and more) and explains their application for delivery of food active compounds used in food systems. In addition, the authors – noted experts in the field – review the biological fate, bioavailability and the health and safety challenges of using emulsion-based systems as carriers for delivery of food active compounds in food systems. This important resource: Offers a comprehensive text that includes detailed coverage of emulsion-based systems for the delivery of food active compounds Presents the most recent development in emulsion-based systems that are among the most widely-used delivery systems developed to control the release of food active compounds Includes a guide for industrial applications for example food and drug delivery is a key concern for the food and pharmaceutical industries Emulsion-based Systems for Delivery of Food Active Compounds is designed for food scientists as well as those working in the food, nutraceutical and pharmaceutical and beverage industries. The text offers a comprehensive review of the essential elements of emulsion-based systems for delivery of food active compounds.

Bio-Based Nanoemulsions for Agri-Food Applications - Kamel A. Abd-Elsalam 2022-08-15

Recent agricultural, food, and pharmaceutical research focuses attention on the development of delivery systems that can encapsulate, protect, and deliver natural compounds. Nanoemulsions are recognized as the best delivery systems for natural-origin nutraceuticals and phytochemicals, having many agri-food applications. Bio-based Nanoemulsions for Agri-Food Applications provides information on food-grade nanoemulsions and their application in agriculture and the food industry. This book covers concepts, techniques, current advances, and challenges in the formulation of the application of emerging food grade nanoemulsions. Particular attention is placed on food-grade nanoemulsion production methods and components used, such as plant/microbial products, biosurfactants, cosurfactants, emulsifiers, ligand targets, and bioactive/functional ingredients. This is an important reference source for materials scientists, engineers and food scientists who are looking to understand how nanoemulsions are being used in the agri-food sector. Provides an overview of a range of bio-based nanoemulsions used in the agrifood sector Explores how nanotechnology improves the properties of bio-based emulsions Assesses the major challenges of manufacturing nanoemulsions at an industrial scale

Handbook of Research on Nanoemulsion Applications in Agriculture, Food, Health, and Biomedical Sciences - Ramalingam, Karthikeyan 2021-12-03

Nanoemulsions are produced by mixing an oil phase with an aqueous phase under shear pressure. This procedure yields uniform populations of oil droplets ranging in diameter from 200 to 8 nm that are kinetically stable colloidal substances with enhanced properties compared to the conventional emulsion substances. Nanoemulsions have broad potential applications in agriculture, food, health, and biomedical sciences. The Handbook of Research on Nanoemulsion Applications in Agriculture, Food, Health, and Biomedical Sciences focuses on the aspects of nanoemulsion-like synthesis, characterization, and more and examines recent trends in their applications within a variety of relevant fields. Nanoemulsions have broad application in many different fields; without emulsification, process product development would not be possible. Covering topics such as cancer treatment, healthcare applications, and food manufacturing, this book is essential for scientists, doctors, researchers, post-graduate students, medical students, government officials, hospital directors, professors, and academicians.

Systems of Nanovesicular Drug Delivery - Amit Kumar Nayak 2022-07-29

Systems of Nanovesicular Drug Delivery provides a thorough insight into the complete and up-to-date discussions about the preparation, properties and drug delivery applications of various nanovesicles. This volume discusses cubosomes, proniosomes and niosomes, dendrimerosomes and other new and effective approaches for drug delivery. It will be a valuable title and resource for academics and pharmaceutical scientists, including industrial pharmacists, analytical scientists, health care professionals and regulatory scientists actively involved in pharmaceutical products and process development of tailor-made polysaccharides in drug delivery applications. Recently, there have been a number of outstanding nanosystems in nanovesicular carrier-forms (such as nanoemulsions, self-nanoemulsifying systems, nanoliposomes, nanotransferosomes, etc.), that have been researched and developed for efficient drug delivery by many formulators, researchers and scientists. However, no previously published books have covered all these drug delivery nanovesicles collectively in a single resource. Provides thorough insights and up-to-date discussions about the various systems of nanovesicular drug delivery Covers advanced trigger-assisted systems (such as iontophoresis, ultra-sound triggering, etc.) and how they have been used for improved drug delivery by nanovesicles Presents recent advances in drug delivery fields by global leaders and experts from academia, research, industry and regulatory agencies Includes an updated literature review of relevant key topics, good quality illustrations, chemical structures, attractive flow charts and well-organized tables

Nanoscience in Food and Agriculture 5 - Shivendu Ranjan 2017-07-12

This book presents comprehensive reviews on the principles, design and applications of nanomaterials in the food and agriculture sectors. This book is the fifth of several volumes on Nanoscience in Food and Agriculture, published in the series Sustainable Agriculture Reviews.

Nanobiotechnology in Bioformulations - Ram Prasad 2019-07-04

With the recent shift of chemical fertilizers and pesticides to organic agriculture, the employment of microbes that perform significant beneficial functions for plants has been highlighted. This book presents timely discussion and coverage on the use of microbial formulations, which range from powdered or charcoal-based to solution and secondary metabolite-based bioformulations. Bioformulation development of biofertilizers and biopesticides coupled with the advantages of nanobiotechnology propose significant applications in the agricultural section including nanobiosensors, nanoherbicides, and smart transport systems for the regulated release of agrochemical. Moreover, the formulation of secondary metabolites against individual phytopathogens could be used irrespective of geographical positions with higher disease incidences. The prospective advantages and uses of nanobiotechnology generate tremendous interest, as it could augment production of agricultural produce while being cost-effective both energetically and economically. This bioformulation approach is incomparable to existing technology, as the bioformulation would explicitly target the particular pathogen without harming the natural microbiome of the ecosystem. Nanobiotechnology in Bioformulations covers the constraints associated with large-scale development and commercialization of bioinoculant formations. Furthermore, exclusive emphasis is be placed on next-generation efficient bioinoculants having secondary metabolite formulations with longer shelf life and advanced competence against several phytopathogens. Valuable chapters deal with bioformulation strategies that use divergent groups of the microbiome and include detailed diagrammatic and pictorial representation. This book will be highly beneficial for both experts and novices in the fields of microbial bioformulation, nanotechnology, and nano-microbiotechnology. It discusses the prevailing status and applications available for microbial researchers and scientists, agronomists, students, environmentalists, agriculturists, and agribusiness professionals, as well as to anyone devoted to sustaining the ecosystem.

Emulsions - Alexandru Grumezescu 2016-06-13

Emulsions, the third volume of the Nanotechnology in the Food Industry series, is an invaluable resource for anyone in the food industry who needs the most recent information about scientific advances in nanotechnology on this topic. This volume focuses on basic and advanced knowledge about nanoemulsion, and presents an overview of the production methods, materials (solvents, emulsifiers, and functional ingredients), and current analytical techniques that can be used for the identification and characterization of nanoemulsions. The book also discusses the applications of nanoemulsion with special emphasis on systems suitable for utilization within the food industry. This book is useful to a wide audience of food science research professionals and students who are doing research in this field, as well as others interested in recent nanotechnological progress worldwide. Presents fundamentals of nanoemulsions, methods of preparation (high-energy and low-energy techniques), and applications in the food industry Includes research studies of nanoemulsification technology to improve bioavailability of food ingredients and research analysis Offers benefits and methods of risk assessment to ensure food safety Presents cutting-edge encapsulating systems to improve the quality of functional compounds Provides a variety of methods, such as high-shear stirring, high-pressure homogenizers, self-emulsification, phase transitions and phase-inversion, to further research in this field

Herbal Bioactive-Based Drug Delivery Systems - Inderbir Singh Bakshi 2022-03-13

Herbal Bioactive-Based Drug Delivery Systems: Challenges and Opportunities provides a wide-ranging, in-depth resource for herbal bioactives, including detailed discussion of standardization and regulations. The book first explores specific drug delivery systems such as gastrointestinal, ocular, pulmonary, transdermal, and vaginal and rectal. It then discusses novel applications for nano, cosmetics,

nutraceuticals, wound healing and cancer treatment. Finally, there is a section focusing on standardization and regulation which includes an enhancement of properties. This book is an essential resource for pharmacologists, pharmaceutical scientists, material scientists, botanists, and all those interested in natural products and drug delivery systems developments. Explores standardization, regulation and enhancement issues in herbal bioactives Discusses novel developments, herbal cosmetics and toxicity/interaction issues Provides a comprehensive reference on all aspects of herbal bioactives

Nanotechnology for Food, Agriculture, and Environment - Devarajan Thangadurai 2020-02-11

Nanotechnology progresses its concerts and suitability by improving its effectiveness, security and also reducing the impact and risk. Various chapters in this book are written by eminent scientists and prominent researchers in the field of nanotechnology across the world. This book is focused to put emerging techniques forward using nanoparticles for safe and nutritional food production, protecting crops from pests, increasing nutritional value and providing solutions for various environmental issues. The outcome of this book creates a path for wide usage of nanoparticles in food, agriculture and the environment fields. This book has clear and simple illustrations, tables and case studies to understand the content even by non-experts. This book especially deals with the nanotechnology for controlling plant pathogens, food packaging and preservation, agricultural productivity, waste water treatment and bioenergy production. Hence, this book can be adopted and used by many researchers and academicians in the fields of food, agriculture, environment and nanotechnology for catering the needs of sustainable future. The salient features of this book are • Describes nanotechnology as an interdisciplinary and emerging field in life sciences• Useful for researchers in the cutting edge life science related fields of nanoscience, nanobiology and nanotechnology• Deal with various problems in food, agriculture and environmental sector for sustainable solutions through the application of nanotechnology• Supported with illustrations in color, tables and case studies (wherever applicable), and • Contributed and well written by nanotechnology experts from across various disciplines

Application of Nanotechnology in Drug Delivery - Ali Demir Sezer 2014-07-25

This book collects reviews and original articles from eminent experts working in the interdisciplinary arena of nanotechnology use in drug delivery. From their direct and recent experience, the readers can achieve a wide vision on the new and ongoing potentialities of nanotechnology application of drug delivery. Since the advent of analytical techniques and capabilities to measure particle sizes in nanometer ranges, there has been tremendous interest in the use of nanoparticles for more efficient methods of drug delivery. On the other hand, this reference discusses advances in design, optimization, and adaptation of gene delivery systems for the treatment of cancer, cardiovascular, pulmonary, genetic, and infectious diseases, and considers assessment and review procedures involved in the development of gene-based pharmaceuticals.

Sustainable Agriculture Reviews 43 - Ankit Saneja 2020-05-05

This edited book comprises of eight chapters dealing on various aspects of pharmaceutical technology for delivery of natural products. Book chapters deal with the solubility and bioavailability enhancement technologies for natural products. Emphasis has also been given on the significance of delivery strategies for improving the therapeutic efficacy of paclitaxel, galantamine and tea constituents.

Smart Nanocontainers - Phuong Nguyen Tri 2019-11-08

Smart Nanocontainers explores the fundamental concepts and emerging applications of nanocontainers in biomedicine, pharmaceuticals and smart materials. In pharmaceuticals, nanocontainers have advantages over their micro-counterparts, including more efficient drug detoxification, higher intracellular uptake, better stability, less side effects and higher biocompatibility with tissue and cells. In materials science, such as coating technology, they help by making coatings smarter, stronger and more durable. This important reference will help anyone who wants to learn more on how nanocontainers are used to provide the controlled release of active agents, including their

applications in smart coatings, corrosion, drug delivery, diagnosis, agri-food and gas storage. Discusses how the molecular design of nanocarriers can be optimized to increase performance Explores how nanocarriers are being used to produce a new generation of active coatings Explains how nanocarriers are being used to deliver more effective nanoscale drug delivery

Nanoarchitectonics in Biomedicine - Alexandru Mihai Grumezescu 2019-03-20

Nanoarchitectonics in Biomedicine describes this new area of nanoscience that has emerged as a major branch of nanoscience. The book brings together recent applications and discusses the advantages and disadvantages of each process, offering international perspectives on the technologies based on these findings. It offers new insights for nanoarchitectonics, starting with the currently used methods of synthesis and characterization of such materials, along with their biomedical applications. Authored by a wide range of international scientists, this volume shows how nanoarchitectonics is being used to create more efficient medical treatment solutions. Users will find this to be an important research resource for those wanting to learn more on the emerging topic of nanoarchitectonics in biomedical science. Explores how design aspects, smart materials and personalized materials are used in biomedicine today Offers global perspectives on how nanoarchitectonics is used in different regions Presents an important research resource for those wanting to learn more on the emerging topic of nanoarchitectonics in biomedical science

Advancements in Controlled Drug Delivery Systems - Verma, Shekhar 2022-03-25

The many drawbacks of conventional dosage forms and delivery systems are overcome by designing and developing controlled release drug delivery systems, and pharmaceutical and other scientists have carried out extensive and intensive investigations in the field to explore their applications. A controlled-release drug formulation can improve product efficacy and extend patent protection. As controlled drug delivery systems continue to play a vital role in delivering various types of therapeutic agents in a controlled manner, researchers are only just scratching the surface of their full potential. Advancements in Controlled Drug Delivery Systems supplies information on translating the physicochemical properties of drugs into drug delivery systems, explores how drugs are administered via various routes, and discusses recent advancements in the fabrication and development of controlled drug delivery systems. It also underlines the methodology of controlled drug delivery system preparation and the significance, disadvantages, detailed classifications, and relevant examples. Covering topics such as machine learning and oral-controlled drug delivery, this book is ideal for pharmacists, healthcare professionals, researchers, academicians, research centers, health units, students, and pharmaceutical and scientific laboratories.

Natural Bio-active Compounds - Mallappa Kumara Swamy 2019-09-19

Nature has consistently provided human beings with bioactive compounds that can be used directly as drugs or indirectly as drug leads. Some of the major classes of natural bioactive compounds include phenolics, alkaloids, tannins, saponins, lignin, glycosides, terpenoids, and many more. They possess a broad range of biological activities and are primarily useful in the treatment of various health issues. At the same time, the search for new and novel drugs is never-ending and, despite major advances in synthetic chemistry, nature remains an essential resource for drug discovery. Therefore, more and more researchers are interested in understanding the chemistry, clinical pharmacology, and beneficial effects of bioactive compounds in connection with solving human health problems. This book presents a wealth of information on natural metabolites that have been or are currently being used as drugs or leads for the discovery of new drugs. In addition, it highlights the importance of natural products against various human diseases, and their applications in the drug, nutraceuticals, cosmetics and herbal industries. Accordingly, the book offers a valuable resource for all students, educators, and healthcare experts involved in natural product research, phytochemistry, and pharmacological research.

Polymer Nanoparticles for Nanomedicines - Christine Vauthier

2017-01-07

This volume serves as a valuable handbook for the development of nanomedicines made of polymer nanoparticles because it provides researchers, students, and entrepreneurs with all the material necessary to begin their own projects in this field. Readers will find protocols to prepare polymer nanoparticles using different methods, since these are based on the variety of experiences that experts encounter in the field. In addition, complex topics such as, the optimal characterization of polymer nanoparticles is discussed, as well as practical guidelines on how to formulate polymer nanoparticles into nanomedicines, and how to modify the properties of nanoparticles to give them the different functionalities required to become an efficient nanomedicine for different clinical applications. The book also discusses the translation of technology from research to practice, considering aspects related to industrialization of preparation and aspects of regulatory and clinical development.

Emulsion-based Systems for Delivery of Food Active Compounds - Shahin Roohinejad 2018-04-03

A comprehensive text that offers a review of the delivery of food active compounds through emulsion-based systems Emulsion-based Systems for Delivery of Food Active Compounds is a comprehensive recourse that reviews the principles of emulsion-based systems formation, examines their characterization and explores their effective application as carriers for delivery of food active ingredients. The text also includes information on emulsion-based systems in regards to digestibility and health and safety challenges for use in food systems. Each chapter reviews specific emulsion-based systems (Pickering, multiple, multilayered, solid lipid nanoparticles, nanostructured lipid carriers and more) and explains their application for delivery of food active compounds used in food systems. In addition, the authors – noted experts in the field – review the biological fate, bioavailability and the health and safety challenges of using emulsion-based systems as carriers for delivery of food active compounds in food systems. This important resource: Offers a comprehensive text that includes detailed coverage of emulsion-based systems for the delivery of food active compounds Presents the most recent development in emulsion-based systems that are among the most widely-used delivery systems developed to control the release of food active compounds Includes a guide for industrial applications for example food and drug delivery is a key concern for the food and pharmaceutical industries Emulsion-based Systems for Delivery of Food Active Compounds is designed for food scientists as well as those working in the food, nutraceutical and pharmaceutical and beverage industries. The text offers a comprehensive review of the essential elements of emulsion-based systems for delivery of food active compounds.

Characterization and Biology of Nanomaterials for Drug Delivery - Shyam Mohapatra 2018-10-05

Characterization and Biology of Nanomaterials for Drug Delivery: Nanoscience and Nanotechnology in Drug Delivery describes the techniques successfully employed for the application of nanocarriers loaded with the antioxidant enzyme, catalase, and thus targeted to endothelial cells. Methods of nanocarrier synthesis, loading within various systems, and the characterization of nanocarriers for targeting activities are covered, as are their advantages, disadvantages and applications. Reflecting the interdisciplinary nature of the subject matter, this book includes contributions by experts from different fields, all with various backgrounds and expertise. It will appeal to researchers and students from different disciplines, such as materials science, technology and various biomedical fields. Enables readers from different fields to access recent research and protocols across traditional boundaries Focuses on protocols and techniques, as well as the knowledge base of the field, thus enabling those in R&D to learn about, and successfully deploy, cutting-edge techniques Explores both current and emerging classes of nanomaterials, along with their fundamentals and applications

Handbook of Research on Advancements in Cancer Therapeutics - Kumar, Sumit 2020-11-27

The complexity of cancer demands an integrated approach from both a cancer biology standpoint and a pharmaceutical basis to understand the

different anticancer modalities. Current research has been focused on conventional and newer anticancer modalities, recent discoveries in cancer research, and also the advancements in cancer treatment. There is a current need for more research on the advances in cancer therapeutics that bridge the gap between basic research (pharmaceutical drug development processes, regulatory issues, and translational experimentation) and clinical application. Recent promising discoveries such as immunotherapies, promising therapies undergoing clinical trials, synthetic lethality, carbon beam radiation, and other exciting targeted therapies are being studied to improve and advance the studies of modern cancer treatment. The Handbook of Research on Advancements in Cancer Therapeutics serves as a comprehensive guide in modern cancer treatment by combining and merging the knowledge from both cancer biology and the pharmacology of anticancer modalities. The chapters come from multi-disciplinary backgrounds, including scientists and clinicians from both academia and various industries, to discuss nascent personalized therapies and big data-driven cancer treatment. While highlighting topic areas that include cancer prevention, cancer therapeutics, and cancer treatments through the lenses of technology, medicine/drugs, and alternate therapies, this book is ideally intended for oncologists, radiation oncologists, surgical oncologists, and cancer biologists, along with practitioners, stakeholders, researchers, academicians, and students who are interested in understanding the most fundamental aspects of cancer and the available therapeutic opportunities.

Handbook of Industrial Crystallization - Allan Myerson 2002-01-08
Crystallization is an important separation and purification process used in industries ranging from bulk commodity chemicals to specialty chemicals and pharmaceuticals. In recent years, a number of environmental applications have also come to rely on crystallization in waste treatment and recycling processes. The authors provide an introduction to the field of newcomers and a reference to those involved in the various aspects of industrial crystallization. It is a complete volume covering all aspects of industrial crystallization, including material related to both fundamentals and applications. This new edition presents detailed material on crystallization of biomolecules, precipitation, impurity-crystal interactions, solubility, and design. Provides an ideal introduction for industrial crystallization newcomers Serves as a worthwhile reference to anyone involved in the field Covers all aspects of industrial crystallization in a single, complete volume

Nanodispersions for Drug Delivery - Raj K. Keservani 2018-09-24
This volume addresses efforts to overcome the shortcomings of conventional dosage forms by exploiting the principles of nanoscience to deliver drugs for medical treatment. Nanodispersions are an important aspect because they possess globules/particles in sizes usually below 1000 nm in which the drug is dispersed in a continuous medium employing surface-active agents as stabilizers. With chapters written by experienced scientists and researchers in the field, this volume provides an abundance of information on various aspects of nanodispersions for drug delivery. The book is divided into several sections: nanoemulsions, nanosuspensions, and diverse dispersed systems. The chapters detail what nanodispersions have demonstrated in the past and what they are expoected to continue to do in the future as the technology further evolves. Key features: • Provides an overview of nanoemulsions for drug delivery • Introduces the general principles, classification, and methods of preparation of nanoemulsion-based drug delivery systems • Presents information relevant to specific routes of applications of nanoemulsions • Looks at the various aspects of nanosuspensions, including their formulation components, preparation methods, unique features, methods of characterization, and applications in various routes of administration • Explores nanomicellar approaches for drug delivery • Discusses the preparation, applications, and clinical considerations of nanogels for drug delivery

Nanodispersions - Tharwat F. Tadros 2015-12-14
General introduction - Definition of nanodispersions (nanosuspensions, nanoemulsions, swollen micelles or microemulsions, liposomes and vesicles) and their size range. General description of their colloid stability. Main advantages of nanodispersions and their industrial

applications. Preparation of nanosuspensions by top-up process - Nucleation and growth and control of particle size distribution. Factors determining the formation of narrow particle size distribution. Role of surfactants and polymers. Preparation of nano-polymer colloids (lattices) by emulsion and dispersion polymerization. Factors affects the stability of nanosuspensions. Preparation of nanosuspensions by bottom down process - Dispersion of preformed particles in liquids and the need of a wetting agent. Break-up of aggregates and agglomerates by application of high speed stirrers. Reduction of particle size by application of intense energy (microfluidization or bead milling). Maintenance of the colloid stability of the resulting particles. Reduction of Ostwald ripening. Industrial applications of nanosuspensions - Application in pharmacy to enhance bioavailability, Application in sunscreens for UV protection. Application in paints and coatings. Preparation of nanoemulsions by the use of high pressure homogenisers - Principles of emulsion formation and the role of the emulsifier. Selection of emulsifiers. Methods of emulsification and prevention of coalescence during emulsification. Origin of colloid stability of nanoemulsions. Prevention of Ostwald ripening Low energy methods for nanoemulsion preparation - The phase inversion composition method and the role of mixing the surfactant with oil and water. The phase inversion temperature method for preparation of nanoemulsions. Preparation of nanoemulsions by dilution of microemulsions. Practical examples of nanoemulsions and their industrial application - Nanoemulsions based on non-ionic surfactants and the role of the hydrophilic-lipophilic balance. Effect of oil solubility on the stabilityof nanoemulsions. Nanoemulsions based on polymeric surfactants. Applications in pharmacy and cosmetics. Swollen micelles or microemulsionsDefinition of microemulsions and their size range. Thermodynamic definition of microemulstions. Theories of microemulsion formation and stability. Characterisation of microemulsions using scattering, conductivity and NMR rechniques. Formulation of microemulsions and their industrial applications - Distinction between microemulsions and macroemulsions. Formulation of oil/water and water/oil microemulsions. Selection of emulsifiers for microemulsions. Application of microemulsions in tertiary oil recovery. Liposomes and vesicles - Formation of multilamellar lipid layers (liposomes) by dispersion of lipids in water. Formation of unilamellar vesicles by sonication of the liposomes. Factors responsible for stabilisation of liposomes and vesicles. Use of block copolymers to enhance the stability of vesicles. Applications of liposomes and vesicles in pharmacy and cosmetics.

Nanotechnology in Functional Foods - Shakeel Ahmed 2022-07-28 NANOTECHNOLOGY IN FUNCTIONAL FOODS The broad applicability of bioactive delivery systems for improving food quality, safety, and human health will make this book a valuable resource for a wide range of readers in industry, research, and academia. Functional foods is an emerging trend in the food industry, whose potential value is determined by whether they are safe with respect to consumer health. Nanotechnology in Functional Foods was written to help the reader better understand the benefits and concerns associated with these foods. In addition to giving an overview of the current state-of-the-art in functional foods, different aspects of the advanced research being conducted on their extraction, synthesis, analysis, and biological effects are presented. Besides focusing on several synthesis techniques, the book also discusses the application of nanoparticles in nutrient delivery and pharmaceuticals, such as nano-emulsions, solid lipid nanoparticles, and polymeric nanoparticles; their properties and interactions with other food components and their impact on the human body; the consumer acceptance and diversification of these nutrients. Moreover, new trends are discussed concerning the application of artificial intelligence in screening various components of functional foods. Audience The book will be central to food scientists, materials scientists, biotechnologists, medicinal chemists, pharmacists, and medical professionals. Tanima Bhattacharya, PhD, is a formulation scientist, who completed her Doctoral degree in Food Processing & Nutrition Science from the Indian Institute of Engineering Science and Technology, Shibpur, West Bengal, India and gained overseas post-doctoral experience from the College of Chemistry and Chemical Engineering Hubei University of China. She has

published several scientific research articles in international peer-reviewed journals, and her research interests include the fabrication of biocompatible nanostructures and studying their properties and applications in the area of food science, technology, and biomedical sciences. Shakeel Ahmed, PhD, is an assistant professor of Chemistry at the Higher Education Department, Government of Jammu and Kashmir, India. His PhD degree in Chemistry is from Jamia Millia Islamia, A Central University, New Delhi. He has published several research publications in the area of green nanomaterials and biopolymers for various applications including biomedical, packaging, and water treatment. He has published more than 20 books in the area of nanomaterials and green materials.

Nanotechnology Applications in Food - Alexandru Grumezescu 2017-02-22

Nanotechnology Applications in Food: Flavor, Stability, Nutrition, and Safety is an up-to-date, practical, applications-based reference that discusses the advantages and disadvantages of each application to help researchers, scientists, and bioengineers know what and what not to do to improve and facilitate the production of food ingredients and monitor food safety. The book offers a broad spectrum of topics trending in the food industry, such as pharmaceutical, biomedical, and antimicrobial approaches in food, highlighting current concerns regarding safety, regulations, and the restricted use of nanomaterials. Includes how nanobiosensors are useful for the detection of foodborne pathogens Discusses applications of nanotechnology from flavor and nutrition, to stability and safety in packaging Includes nano and microencapsulation, nanoemulsions, nanosensors, and nano delivery systems Identifies practical applications of nanoscience for use in industry today

Nanoemulsions in Food Technology - Javed Ahmad 2021-10-18

As of late, greater efforts are being made in the use of nanoemulsion techniques to encapsulate, protect, and deliver functional compounds for food applications, given their advantages over conventional emulsification techniques. In addition, delivery systems of nano-scale dimensions use low-energy emulsification methods and exclude the need of any solvent, heat, or sophisticated instruments in their production. Divided into three sections, Nanoemulsions in Food Technology: Development, Characterization, and Applications will provide in-depth information and comprehensive discussion over technologies, physical and nanostructural characterization, as well as applicability of the nanoemulsion technique in food sciences. It describes the techniques involved in nanoemulsion characterization, mainly dealing with interfacial and nanostructural characterization of nanoemulsions, different physical characterization techniques, as well as various imaging and separation techniques involved in its characterization. Key Features Provides a detailed discussion about the technology of nanoemulsion Explains how nanoemulsion technique is helpful in using essential oils of different biological sources Presents methods of preparation and recent advancements in manufacturing along with stability perspectives of this technique. Discusses recent advancements in manufacturing and reviews the stability perspectives of nanoemulsion techniques This book contains in-depth information on a technology overview, physical and nanostructural characterization, as well as applicability of the nanoemulsion technique in food sciences. It is a concise body of information that is beneficial to researchers, industries, and students alike. The contributing authors are drawn from a rich blend of experts in various areas of scientific field exploring nanoemulsion techniques for wider applications. Also available in the Food Analysis and Properties Series: Sequencing Technologies in Microbial Food Safety and Quality, edited by Devarajan Thangardurai, Leo M.L. Nollet, Saher Islam, and Jeyabalan Sangeetha (ISBN: 9780367351182) Chiral Organic Pollutants: Monitoring and Characterization in Food and the Environment, edited by Edmond Sanganyado, Basil K. Munjanja, and Leo M.L. Nollet (ISBN: 9780367429232) Analysis of Nanoplastics and Microplastics in Food, edited by Leo. M.L. Nollet and Khwaja Salahuddin Siddiqi (ISBN: 9781138600188)

Nanoemulsions - Seid Mahdi Jafari 2018-02-24

Nanoemulsions: Formulation, Applications, and Characterization provides detailed information on the production, application and

characterization of food nanoemulsion as presented by experts who share a wealth of experience. Those involved in the nutraceutical, pharmaceutical and cosmetic industries will find this a useful reference as it addresses findings related to different preparation and formulation methods of nanoemulsions and their application in different fields and products. As the last decade has seen a major shift from conventional emulsification processes towards nanoemulsions that both increase the efficiency and stability of emulsions and improve targeted drug and nutraceutical delivery, this book is a timely resource. Summarizes general aspects of food nanoemulsions and their formulation Provides detailed information on the production, application, and characterization of food nanoemulsion Reveals the potential of nanoemulsions, as well as their novel applications in functional foods, nutraceutical products, delivery systems, and cosmetic formulations Explains preparation of nanoemulsions by both low- and high-energy methods

Nanotechnology - Bhaskar Mazumder 2019-03-18

Today we find the applications of nanotechnology in all spheres of life. Nanotechnology: Therapeutic, Nutraceutical and Cosmetic Advances discusses recent advances in the field, particularly with therapeutics, nutraceuticals and cosmetic sciences. Therapeutics is an area which has perhaps benefitted the most, although nanoscience and technology have quietly entered the realms of food science and are playing pivotal roles in the efficient utilization of nutraceuticals. Finally, even before therapeutics came cosmetics and companies started marketing unique products embedding the beneficial and advanced properties enabled by the use of nanostructures. This book highlights trends and applications of this wonderful new technology.

Plant Protection - Ravindra Soni 2022-10-24

Phyto-pathogens are one of the dominating components which badly affect crop production. In light of the global food demand, sustainable agricultural plans utilizing agrochemicals became necessary. The role of beneficial microbes in the defense priming of host plants has been well documented. This book details new aspects of microbial-assisted plant protection and their role in agricultural production, economy, and environmental sustainability.