Analytical Characterization And Production Of An

Completely updated in line with the rapid progress made in the field, this new edition of the highly-praised textbook addresses powerful new methods and concepts in biotechnology, such as genome editing, reprogrammed stem cells, and personalized medicine. An introduction to the fundamentals in molecular and cell biology is followed by a description of standard techniques, including purification and analysis of biomolecules, cloning techniques, gene expression systems, genome editing methods, labeling of proteins and in situ-techniques, standard and high resolution microscopy. The third part focuses on key areas in research and application, ranging from functional genomics, proteomics and bioinformatics to drug targeting, recombinant antibodies and systems biology. The final part looks at the biotechnology industry, explaining intellectual property issues, legal frameworks for pharmaceutical products and the interplay between start-up and larger companies. The contents are beautifully illustrated throughout, with hundreds of full color diagrams and photographs. Provides students and professionals in life sciences, pharmacy and biochemistry with everything they need to know about molecular biotechnology.

This up-to-the-minute reference delineates-in a systematic fashion-the appropriate, sequential steps for the formulation of safe, effective, stable, and marketable liquid parenteral biopharmaceutical products-covering fundamentals and essential pathways for each phase as well as its purpose, function, and relation to other stages in the product development process. Written by experts currently involved in state-of-the-art advances in the pharmaceutical drug industry, Development of Biopharmaceutical Parenteral Dosage Forms details

biopharmaceuticals that are licensed or undergoing clinical development, including genetically engineered cell and engineered vectors in the fermentation process describes purification and characterization techniques for rDNA therapeutics, discussing several types of unit operations for isolation, purification, and characterization considers preformulation and formulation requirements, such as physicochemical properties, drug delivery, stability studies programs, deactivation/denaturation routes, selection of compatible excipients, and regulatory compliance elucidates basics of analytical techniques, methods development, separation methods using chromatographic and electrophoretic techniques, and bioactivity methods covering bioassays and immunoassays for quantifying the stability of biological activity shows how to select the appropriate filter for maximizing compatibility and minimizing adsorption and inactivation, examining topics from basic filtration theories to future trends reviews the selection process for compatible elastomeric closures, analyzing physical, chemical, toxicological properties, protein adsorption on elastomeric surfaces, strategies to reduce/eliminate adsorption, and specialized containers for biotechnological applications and more! Furnished with helpful references, tables, and drawings, this practical guide is indispensable for pharmaceutical, medicinal, and protein chemists; molecular biologists; process engineers; purification scientists; biopharmaceutical and pharmaceutical formulators and product developers; quality control, quality assurance, and regulatory compliance personnel; and upper-level undergraduate and graduate students in these disciplines.

Biopharmaceuticals are a unique class of compounds due to their extreme structural complexity. The current text puts together a variety of the state?of?the art approaches that use mass spectrometry to evaluate various aspects of biopharmaceutical products ranging from

monitoring stress?related structural changes to their quantitation in pharmacokinetic studies. An updated overview of the rapidly developing field of green techniques for organic synthesis and medicinal chemistry Green chemistry remains a high priority in modern organic synthesis and pharmaceutical R&D, with important environmental and economic implications. This book presents comprehensive coverage of green chemistry techniques for organic and medicinal chemistry applications, summarizing the available new technologies, analyzing each technique's features and green chemistry characteristics, and providing examples to demonstrate applications for green organic synthesis and medicinal chemistry. The extensively revised edition of Green Techniques for Organic Synthesis and Medicinal Chemistry includes 7 entirely new chapters on topics including green chemistry and innovation, green chemistry metrics, green chemistry and biological drugs, and the business case for green chemistry in the generic pharmaceutical industry. It is divided into 4 parts. The first part introduces readers to the concepts of green chemistry and green engineering, global environmental regulations, green analytical chemistry, green solvents, and green chemistry metrics. The other three sections cover green catalysis, green synthetic techniques, and green techniques and strategies in the pharmaceutical industry. Includes more than 30% new and updated material—plus seven brand new chapters Edited by highly regarded experts in the field (Berkeley Cue is one of the fathers of Green Chemistry in Pharma) with backgrounds in academia and industry Brings together a team of international authors from academia, industry, government agencies, and consultancies (including John Warner, one of the founders of the field of Green Chemistry) Green Techniques for Organic Synthesis and Medicinal Chemistry, Second Edition is an essential resource on green chemistry technologies for

academic researchers, R&D professionals, and students working in organic chemistry and medicinal chemistry.

Basic theory, applications, and recent trends in analytical techniques used in crude oil and related products analysis This book covers the application of different spectroscopic methods to characterize crude oil and related products. Its topics are presented in a pedagogical manner so that those new to the subject can better understand the content. The book begins by familiarizing the reader with the rheological characterization of crude oil and related products. Subsequent chapters are directed towards the current trends of different spectroscopic methods for the characterization of crude oil. Analytical Characterization Methods for Crude Oil and Related Products features chapters on: optical interrogation of petroleum asphaltenes (myths and reality); ESR characterization of organic free radicals in petroleum products; high-field, pulsed, and double resonance studies of crude oils and their derivatives; NMR spectroscopy in bitumen characterization; applications of Raman spectroscopy in crude oil and bitumen characterization; and more. Uses a bottom-up approach—starting from the basic theory of the technique followed by its applications and recent trends in crude oil analysis Includes informative content so as to take a technician to the level of using a particular analytical method Covers relevany information so as to enable a manager in the industry to make purchasing decisions Analytical Characterization Methods for Crude Oil and Related Products is aimed at researchers in academia as well as technicians and developers of new analytical methods in the oil industry and related areas. It will also be of interest to professionals, scientists, and graduate students in analytical sciences dealing with oil and environmental analysis.

This valuable new book, Handbook of Research on Medicinal Chemistry: Innovations and Methodologies, presents some of the latest advancements in the various fields of combinatorial chemistry, drug discovery, biochemical aspects, pharmacology of medicinal agents, current practical problems, and nutraceuticals. The editors keep the drug molecule as the central component of the volume and aim to explain the associated features essential to exhibiting pharmacological activity. With a unique combination of chapters in biology, clinical aspects, biochemistry, synthetic chemistry, medicine and technology, the volume provides broad exposure to the essential aspect of pharmaceuticals. The volume many important aspects of medicinal chemistry, including techniques in drug discovery pharmacological aspects of natural products chemical mediators: druggable targets advances in medicinal chemistry The field of medicinal chemistry is growing at an unprecedented pace, and this volume takes an interdisciplinary approach, covering a range of new research and new practices in the field. The volume takes into account the latest therapeutic guidelines put forward by the World Health Organization and the U.S Food and Drug Administration.. Topics include: drug design drug discovery natural products and supplements and nutraceuticals pharmaceutical approaches to sexual dysfunction drug resistance parasites new natural compounds and identification of new targets stereochemistry aspects in medicinal chemistry common drug interactions in daily practices Handbook of Research on Medicinal Chemistry: Innovations and Methodologies will be a valuable addition to the bookshelves of pharmaceutical scientists and faculty as well as for industry professionals.

Design and Analysis of Integrated Manufacturing Systems is a fresh look at manufacturing from a systems point of view. This collection of papers from a symposium sponsored by the

National Academy of Engineering explores the need for new technologies, the more effective use of new tools of analysis, and the improved integration of all elements of manufacturing operations, including machines, information, and humans. It is one of the few volumes to include detailed proposals for research that match the needs of industry.

Analytical Methods for Biomass Characterization and Conversion is a thorough resource for researchers, students and professors who investigate the use of biomass for fuels, chemicals and products. Advanced analytical chemistry methods and techniques can now provide detailed compositional and chemical measurements of biomass, biomass conversion process streams, intermediates and products. This volume from the Emerging Issues in Analytical Chemistry series brings together the current knowledge on each of these methods, including spectroscopic methods (Fourier Transform Infrared Spectroscopy, Near-infrared Spectroscopy, Solid State Nuclear Magnetic Resonance), pyrolysis (Gas Chromatography/Mass Spectrometry), Liquid Chromatography/High Performance Liquid Chromatography, Liquid Chromatography/Mass Spectrometry, and so on. Authors David C. Dayton and Thomas D. Foust show how these can be used for measuring biomass composition and for determining the composition of intermediates with regard to subsequent processing for biofuels, bio-chemicals and bio-based products. Covers the broad range of techniques and applications that have been developed and perfected in the last decade Highlights specific analyses required for understanding biomass conversion to select intermediates Provides references to seminal books, review articles and technical articles that go into greater depth, serving as a basis for further study

The Oxford Handbook of Archaeological Ceramic Analysis draws together topics

and methodologies essential for the socio-cultural, mineralogical, and geochemical analysis of archaelogical ceramic. Ceramic is one of the most complex and ubiquitous archaeomaterials in the archaeological record: it occurs around the world and through time in almost every culture and context, from building materials and technological installations to utilitarian wares and votive figurines. For more than 100 years, archaeologists have used ceramic analysis to answer complex questions about economy, subsistence, technological innovation, social organization, and dating. The volume is structured around the themes "Research design and data analysis," "Foundational concepts," "Evaluating ceramic provenance," "Investigating ceramic manufacture," "Assessing vessel function," and "Dating ceramic assemblages." It provides a common vocabulary and offers practical tools and guidelines for ceramic analysis using techniques and methodologies ranging from network analysis and typology to rehydroxylation dating and inductively coupled plasma mass spectrometry. Each chapter provides the theoretical background and practical guidelines, such as cost and destructiveness of analysis, for each technique, as well as detailed case studies illustrating the application and interpretation of analytical data for answering anthropological questions.

Nano-scale materials have unique electronic, optical, and chemical properties

which make them attractive for a new generation of devices. Part one of Modeling, Characterization, and Production of Nanomaterials: Electronics, Photonics and Energy Applications covers modeling techniques incorporating quantum mechanical effects to simulate nanomaterials and devices, such as multiscale modeling and density functional theory. Part two describes the characterization of nanomaterials using diffraction techniques and Raman spectroscopy. Part three looks at the structure and properties of nanomaterials, including their optical properties and atomic behaviour. Part four explores nanofabrication and nanodevices, including the growth of graphene, GaN-based nanorod heterostructures and colloidal quantum dots for applications in nanophotonics and metallic nanoparticles for catalysis applications. Comprehensive coverage of the close connection between modeling and experimental methods for studying a wide range of nanomaterials and nanostructures Focus on practical applications and industry needs, supported by a solid outlining of theoretical background Draws on the expertise of leading researchers in the field of nanomaterials from around the world

Summary: The focus of this book is on how the U.S. FDA will approve biosimilar drugs, as learned from recent approvals by the FDA. Understanding the limitations of the statutory limits and non-inferiority testing are presented as tools

to obviate patient trials and minimize testing of immunogenicity. An in-depth scientific, mathematical and statistical view of the tools required to establish biosimilarity of biological drugs of different complexity -- a must for every developer of biosimilars. Features: First comprehensive analysis based on new guidelines and approval packages of several biosimilars Presents the first approach to challenge FDA in reducing or eliminating any testing in patients. Provides a comprehensive understanding of the U.S. statutory requirements vis-a-vis the regulatory guidelines Provides model CQA and Analytical Similarity testing protocols for cytokines and monoclonal antibodies Allow creation of a fast-to-market pathway to develop biosimilars

Parenteral Medications is an authoritative, comprehensive reference work on the formulation and manufacturing of parenteral dosage forms, effectively balancing theoretical considerations with practical aspects of their development. Previously published as a three-volume set, all volumes have been combined into one comprehensive publication that addresses the plethora of changes in the science and considerable advances in the technology associated with these products and routes of administration. Key Features: Provides a comprehensive reference work on the formulation and manufacturing of parenteral dosage forms Addresses changes in the science and advances in the technology associated

with parenteral medications and routes of administration Includes 13 new chapters and updated chapters throughout Contains the contributors of leading researchers in the field of parenteral medications Uses full color detailed illustrations, enhancing the learning process The fourth edition not only reflects enhanced content in all the chapters but also highlights the rapidly advancing formulation, processing, manufacturing parenteral technology including advanced delivery and cell therapies. The book is divided into seven sectionss: Section 1 - Parenteral Drug Administration and Delivery Devices; Section 2 - Formulation Design and Development; Section 3 - Specialized Drug Delivery Systems; Section 4 - Primary Packaging and Container Closure Integrity; Section 5 - Facility Design and Environmental Control; Section 6 - Sterilization and Pharmaceutical Processing; Section 7 - Quality Testing and Regulatory Requirements

The definitive guide to the myriad analytical techniques available to scientists involved in biotherapeutics research Analytical Characterization of Biotherapeutics covers all current and emerging analytical tools and techniques used for the characterization of therapeutic proteins and antigen reagents. From basic recombinant antigen and antibody characterization, to complex analyses for increasingly complex molecular designs, the book explores the history of the

analysis techniques and offers valuable insights into the most important emerging analytical solutions. In addition, it frames critical questions warranting attention in the design and delivery of a therapeutic protein, exposes analytical challenges that may occur when characterizing these molecules, and presents a number of tested solutions. The first single-volume guide of its kind, Analytical Characterization of Biotherapeutics brings together contributions from scientists at the leading edge of biotherapeutics research and manufacturing. Key topics covered in-depth include the structural characterization of recombinant proteins and antibodies, antibody de novo sequencing, characterization of antibody drug conjugates, characterization of bi-specific or other hybrid molecules, characterization of manufacturing host-cell contaminant proteins, analytical tools for biologics molecular assessment, and more. Each chapter is written by a recognized expert or experts in their field who discuss current and cutting edge approaches to fully characterizing biotherapeutic proteins and antigen reagents Covers the full range of characterization strategies for large molecule based therapeutics Provides an up-to-date account of the latest approaches used for large molecule characterization Chapters cover the background needed to understand the challenges at hand, solutions to characterize these large molecules, and a summary of emerging options for analytical characterization

Analytical Characterization of Biotherapeutics is an up-to-date resource for analytical scientists, biologists, and mass spectrometrists involved in the analysis of biomolecules, as well as scientists employed in the pharmaceuticals and biotechnology industries. Graduate students in biology and analytical science, and their instructors will find it to be fascinating and instructive supplementary reading.

This one-of-a-kind reference examines conventional and advanced methodologies for the quantitative evaluation of properties and characterization of microstructures in metals. It presents methods for uncovering valuable information including precipitate mechanisms, kinetics, stability, crystallographic orientation, the effects of thermo-mechanical processing, and residual stress. The editors of Analytical Characterization of Aluminum, Steel, and Superalloys enlist top industry researchers and practitioners from around the world to analyze the methodologies presented in their areas of expertise. Following traditional metallography methods, the book features an atlas of microstructures for aluminum, steel, and superalloys. The text also examines several material characterization methods rarely covered in other references, provides the framework for using advanced laboratory techniques, and discusses component failure identification methods and other measurements that are crucial to

components manufacturing. Enabling the evolution of stronger and more function-specific compositions, Analytical Characterization of Aluminum, Steel, and Superalloys offers engineers, researchers, and materials scientists an invaluable reference of many advanced laboratory techniques in the context of characterization and property evaluation methodologies for metals and alloys. Several books on the market cover combinatorial techniques, but they offer just a limited perspective of the field, focusing on selected aspects without examining all approaches and integrated technologies. Combinatorial Chemistry and Technologies: Methods and Applications answers the demand for a complete overview of the field, covering all of the

Deactivation of the second-stage supported catalyst dominated most of the properties over the course of the run. Consequences of increased catalyst age were increases in aromaticity and phenolic -OH concentration and decreases in hydrogen donor content and paraffinic hydrogen content in most process streams, including product distillates. Donor solvent quality of the whole PFL increased through the early part of the run until Period 8 when it apparently stabilized. The properties of the net product oil and its distillate fractions, as determined by NIPER, show that the coal-derived material has some desirable qualities. The whole crude has a low sulfur content and boils below the maximum

temperature allowed for the production of transportation fuels. The naphtha fraction (IBP-380°F) is highly naphthenic and has a low benzene content. The naphtha fraction appears to be amenable to mild hydrotreating to produce a good gasoline blendstock. The kerosene (380--510°F) fraction is much too cyclic for use as aviation fuel and it is recommended that this fraction be distributed into the two cuts on either end of it (diesel and gasoline feedstocks). The 510--680°F fraction met most specifications as a heating fuel and diesel fuel. It appears that this material, after moderate hydroprocessing, could make a good diesel blendstock. Both the FIMS and CP/MAS 13C-NMR methods, currently being used to analyze the suite of twelve samples from HRI Run CC-15, are expected to provide chemical/molecular information to augment and extend the information provided by the base analyses. Preliminary information is encouraging.

Presents Practical Applications of Mass Spectrometry for Protein Analysis and Covers Their Impact on Accelerating Drug Discovery and Development Covers both qualitative and quantitative aspects of Mass Spectrometry protein analysis in drug discovery Principles, Instrumentation, Technologies topics include MS of peptides, proteins, and ADCs , instrumentation in protein analysis, nanospray technology in MS protein analysis, and automation in MS protein analysis Details emerging areas from drug monitoring to patient care such as Identification and validation of biomarkers for cancer, targeted MS approaches for biomarker validation, biomarker discovery, and regulatory perspectives Brings together the

most current advances in the mass spectrometry technology and related method in protein analysis

Sets forth the state of the science and technology in plasma protein production With contributions from an international team of eighty leading experts and pioneers in the field, Production of Plasma Proteins for Therapeutic Use presents a comprehensive overview of the current state of knowledge about the function, use, and production of blood plasma proteins. In addition to details of the operational requirements for the production of plasma derivatives, the book describes the biology, development, research, manufacture, and clinical indications of essentially all plasma proteins with established clinical use or therapeutic potential. Production of Plasma Proteins for Therapeutic Use covers the key aspects of the plasma fractionation industry in five sections: Section 1: Introduction to Plasma Fractionation initially describes the history of transfusion and then covers the emergence of plasma collection and fractionation from its earliest days to the present time, with the commercial and not-for-profit sectors developing into a multi-billion dollar industry. Section 2: Plasma Proteins for Therapeutic Use contains 24 chapters dedicated to specific plasma proteins, including coagulation factors, albumin, immunoglobulin, and a comprehensive range of other plasma-derived proteins with therapeutic indications. Each chapter discusses the physiology, biochemistry, mechanism of action, and manufacture of each plasma protein including viral safety issues and clinical uses. Section 3: Pathogen Safety of Plasma Products examines issues and procedures for enhancing viral safety and reducing the risk of transmissible spongiform encephalopathy transmission. Section 4: The Pharmaceutical Environment Applied to Plasma Fractionation details the requirements and activities associated with plasma collection, quality assurance,

compliance with regulatory requirements, provision of medical affairs support, and the manufacture of plasma products. Section 5: The Market for Plasma Products and the Economics of Fractionation reviews the commercial environment and economics of the plasma fractionation industry including future trends, highlighting regions such as Asia, which have the potential to exert a major influence on the plasma fractionation industry in the twenty-first century.

This handbook features contributions from a team of expert authors representing the many disciplines within science, engineering, and technology that are involved in pharmaceutical manufacturing. They provide the information and tools you need to design, implement, operate, and troubleshoot a pharmaceutical manufacturing system. The editor, with more than thirty years' experience working with pharmaceutical and biotechnology companies, carefully reviewed all the chapters to ensure that each one is thorough, accurate, and clear.

This book is an indispensable tool for anyone involved in the research, development, or manufacture of new or existing vaccines. It describes a wide array of analytical and quality control technologies for the diverse vaccine modalities. Topics covered include the application of both classical and modern bio-analytical tools; procedures to assure safety and control of cross contamination; consistent biological transition of vaccines from the research laboratory to manufacturing scale; whole infectious attenuated organisms, such as live-attenuated and inactivated whole-cell bacterial vaccines and antiviral vaccines using attenuated or inactivated viruses; principles of viral inactivation and the application of these principles to vaccine development; recombinant DNA approaches to produce modern prophylactic vaccines; bacterial subunit, polysaccharide and glycoconjugate vaccines; combination vaccines that

contain multiple antigens as well as regulatory requirements and the hurdles of licensure.
Medicinal chemistry is both science and art. The science of medicinal chemistry offers mankind one of its best hopes for improving the quality of life. The art of medicinal chemistry continues to challenge its practitioners with the need for both intuition and experience to discover new drugs. Hence sharing the experience of drug research is uniquely beneficial to the field of medicinal chemistry. Drug research requires interdisciplinary team-work at the interface between chemistry, biology and medicine. Therefore, the topic-related series Topics in Medicinal Chemistry covers all relevant aspects of drug research, e.g. pathobiochemistry of diseases, identification and validation of (emerging) drug targets, structural biology, drugability of targets, drug design approaches, chemogenomics, synthetic chemistry including combinatorial methods, bioorganic chemistry, natural compounds, high-throughput screening, pharmacological in vitro and in vivo investigations, drug-receptor interactions on the molecular level, structure-activity relationships, drug absorption, distribution, metabolism, elimination, toxicology and pharmacogenomics. In general, special volumes are edited by well known guest editors

Nanoparticles in Analytical and Medical Devices presents the latest information on the use of nanoparticles for a diverse range of analytical and medical applications. Covers basic principles, proper use of nanoparticles in analytical and medical applications, and recent progress in the field. This comprehensive reference helps readers grasp the full potential of nanoparticles in their analytical research or medical practice. Chapters on cutting-edge topics bring readers up to date on the latest research and usage of nanoparticles, and a chapter on commercially available devices that utilize nanoparticles guides readers in overcoming issues

with marketing biodevices. Synthesizes nanoparticle conjugation and other critical methods Covers nanoparticles in analytical methods and real analytical devices currently used in the medical field Provides useful new information not covered in the current literature in chapters on surface chemical functionalization for bio-immobilization and nanoparticle production from natural sources

Comprehensive Biotechnology, Third Edition unifies, in a single source, a huge amount of information in this growing field. The book covers scientific fundamentals, along with engineering considerations and applications in industry, agriculture, medicine, the environment and socio-economics, including the related government regulatory overviews. This new edition builds on the solid basis provided by previous editions, incorporating all recent advances in the field since the second edition was published in 2011. Offers researchers a one-stop shop for information on the subject of biotechnology Provides in-depth treatment of relevant topics from recognized authorities, including the contributions of a Nobel laureate Presents the perspective of researchers in different fields, such as biochemistry, agriculture, engineering, biomedicine and environmental science

Characterization and Analysis of Microplastics, Volume 75, aims to fulfill the gap on the existence of published analytical methodologies for the identification and quantification of microplastics. This overview includes the following main topics: introduction to the fate and behavior of microplastics in the environment, assessment of sampling techniques and sample handling, morphological, physical, and chemical characterization of microplastics, and the role of laboratory experiments in the validation of field data. The characterization and analysis of microplastics is a hot topic considering the current need for reliable data on concentrations of

microplastics in environmental compartments. This book presents a comprehensive overview of the analytical techniques and future perspectives of analytical methodologies in the field. Concise, comprehensive coverage of analytical techniques and applications Clear diagrams adequately support important topics Includes real examples that illustrate applications of the analytical techniques on the sampling, characterization, and analysis of microplastics

Manufacturing industries are devoted to producing high-quality products in the most economical and timely manner. Quality, economics, and time not only indicate the customer-satisfaction level, but also measure the manufacturing per formance of a company. Today's manufacturing environments are becoming more and more complex, flexible, and information-intensive. Companies invest into the information technologies such as computers, communication networks, sensors, actuators, and other equipment that give them an abundance of information about their materials and resources. In the face of global competition, a manufacturing company's survival is becoming more dependent on how best this influx of in formation is utilized. Consequently, there evolves a great need for sophisticated tools of performance analysis that use this information to help decision makers in choosing the right course of action. These tools will have the capability of data analysis, modeling, computer simulation, and optimization for use in designing products and processes. International competition also has had

its impact on manufacturing education and the government's support of it in the US. We see more courses offered in this area in industrial engineering and manufacturing systems engineering departments, operations research programs, and business schools. In fact, we see an increasing number of manufacturing systems engineering departments and manufacturing research centers in universities not only in the US but also in Europe, Japan, and many developing countries.

Approaches to the Purification, Analysis and Characterization of Antibody-Based Therapeutics provides the interested and informed reader with an overview of current approaches, strategies and considerations relating to the purification, analytics and characterization of therapeutic antibodies and related molecules. While there are obviously other books published in and around this subject area, they seem to be either older (c.a. year 2000 publication date) or are more limited in scope. The book will include an extensive bibliography of the published literature in the respective areas covered. It is not, however, intended to be a how-to methods book. Covers the vital new area of R&D on therapeutic antibodies Written by leading scientists and researchers Up-to-date coverage and includes a detailed bibliography

"Provides comprehensive coverage of the current combinatorial methodologies

and technologies employed for the design, synthesis, and screening of molecular ""libraries."" Features assessments of computer-assisted approaches to guiding library synthesis. Designed to satisfy the demand to create, produce in high yield and purity, and rapidly screen huge numbers of molecules."

Rapid and continued developments in electronics, optics, computing, instrumentation, spectroscopy, and other branches of science and technology resulted in considerable improvements in various methodologies. Due to this revolution in methodology, it is now possible to solve problems which were previously considered difficult to solve. These new methods have led to a better characterization and understanding of foods. The aim of this book is to assemble, for handy reference, various emerging, state-of-the-art methodologies used for characterizing foods. Although the emphasis is on real foods, model food systems are also considered. Methods pertaining to interfaces (food emulsions, foams, and dispersions), fluorescence, ultrasonics, nuclear magnetic resonance, electron spin resonance, Fourier-transform infrared and near infrared spectroscopy, small-angle neutron scattering, dielectrics, microscopy, rheology, sensors, antibodies, flavor and aroma analysis are included. This book is an indispensable reference source for scientists, engineers, and technologists in industries, universities, and government laboratories who are involved in food

research and/or development, and also for faculty, advanced undergraduate, graduate and postgraduate students from Food Science, Food Engineering, and Biochemistry departments. In addition, it will serve as a valuable reference for analytical chemists and surface and colloid scientists.

Approaches to the Purification, Analysis and Characterization of Antibody-Based TherapeuticsElsevier

The third edition of the Encyclopedia of Analytical Science is a definitive collection of articles covering the latest technologies in application areas such as medicine, environmental science, food science and geology. Meticulously organized, clearly written and fully interdisciplinary, the Encyclopedia of Analytical Science provides foundational knowledge across the scope of modern analytical chemistry, linking fundamental topics with the latest methodologies. Articles will cover three broad areas: analytical techniques (e.g., mass spectrometry, liquid chromatography, atomic spectrometry); areas of application (e.g., forensic, environmental and clinical); and analytes (e.g., arsenic, nucleic acids and polycyclic aromatic hydrocarbons), providing a one-stop resource for analytical scientists. Offers readers a one-stop resource with access to information across the entire scope of modern analytical science Presents articles split into three broad areas: analytical techniques, areas of application

and and analytes, creating an ideal resource for students, researchers and professionals Provides concise and accessible information that is ideal for non-specialists and readers from undergraduate levels and higher

Bioethanol is one of the main biofuels currently used as a petroleum-substitute in transport applications. However, conflicts over food supply and land use have made its production and utilisation a controversial topic. Second generation bioalcohol production technology, based on (bio)chemical conversion of non-food lignocellulose, offers potential advantages over existing, energy-intensive bioethanol production processes. Food vs. fuel pressures may be reduced by utilising a wider range of lignocellulosic biomass feedstocks, including energy crops, cellulosic residues, and, particularly, wastes. Bioalcohol production covers the process engineering, technology, modelling and integration of the entire production chain for second generation bioalcohol production from lignocellulosic biomass. Primarily reviewing bioethanol production, the book's coverage extends to the production of longer-chain bioalcohols which will be elemental to the future of the industry. Part one reviews the key features and processes involved in the pretreatment and fractionation of lignocellulosic biomass for bioalcohol production, including hydrothermal and thermochemical pretreatment, and fractionation to separate out valuable process feedstocks. Part two covers

the hydrolysis (saccharification) processes applicable to pretreated feedstocks. This includes both acid and enzymatic approaches and also importantly covers the development of particular enzymes to improve this conversion step. This coverage is extended in Part three, with chapters reviewing integrated hydrolysis and fermentation processes, and fermentation and co-fermentation challenges of lignocellulose-derived sugars, as well as separation and purification processes for bioalcohol extraction. Part four examines the analysis, monitoring and modelling approaches relating to process and quality control in the pretreatment, hydrolysis and fermentation steps of lignocellulose-to-bioalcohol production. Finally, Part five discusses the life-cycle assessment of lignocellulose-to-bioalcohol production, as well as the production of valuable chemicals and longer-chain alcohols from lignocellulosic biomass. With its distinguished international team of contributors, Bioalcohol production is a standard reference for fuel engineers, industrial chemists and biochemists, plant scientists and researchers in this area. Provides an overview of the life-cycle assessment of lignocelluloses-to-bioalcohol production Reviews the key features and processes involved in the pre-treatment and fractionation of lignocellulosic biomass for bioalcohol production Examines the analysis, monitoring and modelling approaches relating to process and quality control in pre-treatment, hydrolysis and fermentation

The second book of the Food Biotechnology series, Functional Foods and Biotechnology: Biotransformation and Analysis of Functional Foods and Ingredients highlights two important and interrelated themes: biotransformation innovations and novel bio-based analytical tools for understanding and advancing functional foods and food ingredients for health-focused food and nutritional security solutions. The first section of this book provides novel examples of innovative biotransformation strategies based on ecological, biochemical, and metabolic rationale to target the improvement of human health relevant benefits of functional foods and food ingredients. The second section of the book focuses on novel host response based analytical tools and screening strategies to investigate and validate the human health and food safety relevant benefits of functional foods and food ingredients. Food biotechnology experts from around the world have contributed to this book to advance knowledge on bio-based innovations to improve wider health-focused applications of functional food and food ingredients, especially targeting non-communicable chronic disease (NCD) and food safety relevant solution strategies. Key Features: Provides system science-based food biotechnology innovations to design and advance functional foods and food ingredients for solutions to emerging global food and nutritional insecurity coupled public health challenges. Discusses biotransformation

innovations to improve human health relevant nutritional qualities of functional foods and food ingredients. Includes novel host response-based food analytical models to optimize and improve wider health-focused application of functional foods and food ingredients. The overarching theme of this second book is to advance the knowledge on metabolically-driven food system innovations that can be targeted to enhance human health and food safety relevant nutritional qualities and antimicrobial properties of functional food and food ingredients. The examples of biotransformation innovations and food analytical models provide critical insights on current advances in food biotechnology to target, design and improve functional food and food ingredients with specific human health benefits. Such improved understanding will help to design more ecologically and metabolically relevant functional food and food ingredients across diverse global communities. The thematic structure of this second book is built from the related initial book, which is also available in the Food Biotechnology Series Functional Foods and Biotechnology: Sources of Functional Food and Ingredients, edited by Kalidas Shetty and Dipayan Sarkar (ISBN: 9780367435226) For a complete list of books in this series, please visit our website at: https://www.crcpress.com/Food-Biotechnology-Series/book-series/CRCFOOBIOTECH

Accurate uranium analysis, and particularly for isotope measurements, is essential in

many fields, including environmental studies, geology, hydrogeology, the nuclear industry, health physics, and homeland security. Nevertheless, only a few scientific books are dedicated to uranium in general and analytical chemistry aspects in particular. Analytical Chemistry of Uranium: Environmental, Forensic, Nuclear, and Toxicological Applications covers the fascinating advances in the field of analytical chemistry of uranium. Exploring a broad range of topics, the book focuses on the analytical aspects of industrial processes that involve uranium, its presence in the environment, health and biological implications of exposure to uranium compounds, and nuclear forensics. Topics include: Examples of procedures used to characterize uranium in environmental samples of soil, sediments, vegetation, water, and air Analytical methods used to examine the rigorous specifications of uranium and its compounds deployed in the nuclear fuel cycle Health aspects of exposure to uranium and the bioassays used for exposure assessment Up-to-date analytical techniques used in nuclear forensics for safeguards in support of non-proliferation, including single particle characterization Each chapter includes an overview of the topic and several examples to demonstrate the analytical procedures. This is followed by sample preparation, separation and purification techniques where necessary. The book supplies readers with a solid understanding of the analytical chemistry approach used today for characterizing the different facets of uranium, providing a good starting point for further investigation into this important element.

This book reflects the latest development in plant cell and tissue culture technology, with special emphasis on its application for food ingredient production. Topics include plant metabolic pathway studies, process development for improving yields, and bioreactor design and operation for large-scale production. Economic considerations and issues related to the commercial development of culture-derived food ingredients, as well as safety assessment schemes and regulatory frameworks set up by regulatory agencies around the world are also included.

TRAC: Trends in Analytical Chemistry, Volume 8 provides information pertinent to the trends in the field of analytical chemistry. This book presents a variety of topics related to analytical chemistry, including protein purification, biotechnology, Raman spectroscopy in pharmaceutical field, electrokinetic chromatography, and flow injection analysis. Organized into 50 chapters, this volume begins with an overview of scientometric investigations that enable the quantitative study of the evolution of its various components and can thereby uncover how information is utilized to diffuse and generate knowledge. This text then discusses the economic significance of sensing and control as being the main factors in determining process economics and in offering products and business opportunities. Other chapters consider the important relationship between Raman spectroscopy and other analytical methods. This book discusses as well the interfaces between a gas chromatograph and a Fourier transform infrared spectrometer. The final chapter deals with chemometrics routines. This book is a

valuable resource for analytical chemists, and biochemists.

This book provides a comprehensive overview of the biosimilar regulatory framework, the development process and clinical aspects for development of biosimilars. The development path of a biosimilar is just as unique as a development path of a new drug, tailored by the mechanism of action, the quality of the molecule, published information on the reference product, the current competitive environment, the target market and regulatory guidance, and most importantly, the emerging totality of evidence for the proposed biosimilar during development. For the ease of readers, the book comprises of six sections as follows: Section I: Business, Health Economics and Intellectual Property Landscape for Biosimilars Section II: Regulatory Aspects of Development and Approval for Biosimilars Section III: Biopharmaceutical Development and Manufacturing of Biosimilars Section IV: Analytical Similarity Considerations for Biosimilars Section V: Clinical aspects of Biosimilar Development Section VI: Biosimilars- Global Development and Clinical Experience Chapters have been written by one or more experts from academia, industry or regulatory agencies who have been involved with one or more aspects of biosimilar product development. The authors and editors have an expertise in commercialization and pricing of biosimilars, intellectual property considerations for biosimilars, chemistry manufacturing controls (CMC) and analytical development for biosimilars, regulatory and clinical aspects of biosimilar development. Besides the industry practitioners, the book includes several contributions

from regulators across the globe.