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## New Trends in Environmental Engineering, Agriculture, Food Production, and Analysis

*MDPI* This Special Issue presents the latest advances in agriculture, aquaculture, food technology and environmental protection and engineering, discussing, among others, the following issues: new technologies in water, stormwater and wastewater treatment; water saving, lake restoration; new sludge and waste management systems; biodiesel production from animal fat waste; the microbiological quality of compound fish feeds for aquaculture; the role of technological processes to improve food quality and safety; new trends in the analysis of food and food components including in vitro, in vivo, and in silico analyses; and functional and structural aspects of bioactivities of food molecules.

# Recommended Methods for the Identification and Analysis of Cannabis and Cannabis Products

## Manual for Use by National Drug Testing Laboratories

*United Nations Publications* Cannabis products are the most widely trafficked drugs worldwide, and it also remains the most widely used drug worldwide. At the same time, production methods have become increasingly sophisticated, resulting in the availability in illicit markets of a wide range of cannabis products. This updated and significantly revised manual has been prepared taking into account both developments in analytical technology and advances in the science of cannabis. It is aimed at the harmonization and establishment of recommended methods of analysis for national drug analysis laboratories. The manual suggests approaches that may assist drug analysts in the selection of methods appropriate to the sample under examination and provide data suitable for the purpose at hand, leaving room also for adaptation to the level of sophistication of different laboratories and the various legal needs.

## Production and Efficiency Analysis with R

*Springer* This textbook introduces essential topics and techniques in production and efficiency analysis and shows how to apply these methods using the statistical software R. Numerous small simulations lead to a deeper understanding of random processes assumed in the models and of the behavior of estimation techniques. Step-by-step programming provides an understanding of advanced approaches such as stochastic frontier analysis and stochastic data envelopment analysis. The text is intended for master students interested in empirical production and efficiency analysis. Readers are assumed to have a general background in production economics and econometrics, typically taught in introductory microeconomics and econometrics courses.

# Production Wine Analysis

*Springer* This text is designed to acquaint the reader with the commonly used procedures of juice and wine analysis as they are generally practiced in the industry, and as they are taught in the Department of Enology at California State University, Fresno. It is assumed that the reader has a basic preparation in the fields of chemistry and microbiology. In developing material for this text, the authors have emphasized analyses as they would be carried out in a production laboratory. Realizing that different laboratories have different analytical capabilities, personnel as well as equipment, we have in many instances provided several different approaches to the same analysis. Throughout this book we have attempted to give special attention to practical considerations and the importance of these analyses in the total spectrum of winery operations. We hope the book's format will satisfy the interests of laboratory personnel as well as winemakers. The process of making wine involves a series of concerns for the winemaker and staff of a winery. The first concerns are viticultural. Upon arrival of the fruit, its quality is assessed, grapes are processed and fermentation is begun. Almost immediately, and in many instances simultaneously, chemical and microbiological stability of the young and/or aging wine become important. Finally, problems do occur on occasion, and a number of what may be considered remedial techniques can be employed to produce an acceptable product.

## Wine Analysis and Production

## Food Analysis Laboratory Manual

*Springer Science & Business Media* This second edition laboratory manual was written to accompany *Food Analysis, Fourth Edition, ISBN 978-1-4419-1477-4*, by the same author. The 21 laboratory exercises in the manual cover 20 of the 32 chapters in the textbook. Many of the laboratory exercises have multiple sections to cover several methods of analysis for a particular food component of characteristic. Most of the laboratory exercises include the following: introduction, reading assignment, objective, principle of method, chemicals, reagents, precautions and waste disposal, supplies, equipment, procedure, data and calculations, questions, and references. This laboratory manual is ideal for the laboratory portion of undergraduate courses in food analysis.

# The Challenge of CMC Regulatory Compliance for Biopharmaceuticals

*Springer Science & Business Media* This book highlights the challenges facing quality assurance/quality control (QA/QC) in today's biopharmaceutical environment and presents the strategic importance and value generated by QA/QC for their involvement in control of manufacturing. It will put into perspective the need for a graded approach to QA/QC from early clinical trials through market approval. Since the first edition published in 2004, there have been more than 50 new regulatory guidances released by the Food and Drug Administration (FDA), European Medicines Agency (EMA) and ICH that affect the CMC regulatory compliance of biopharmaceuticals; also the application of biosimilars has been developed in Europe and is under development in the USA. The revised update will be broadened to include not only biopharmaceuticals (biotech drugs) but also other biologics (vaccines, cell therapy, plasma-derived proteins, etc.)

# Handbook of Operations Analytics Using Data Envelopment Analysis

*Springer* This handbook focuses on Data Envelopment Analysis (DEA) applications in operations analytics which are fundamental tools and techniques for improving operation functions and attaining long-term competitiveness. In fact, the handbook demonstrates that DEA can be viewed as Data Envelopment Analytics. Chapters include a review of cross-efficiency evaluation; a case study on measuring the environmental performance of OECD countries; how to select a set of performance metrics in DEA with an application to American banks; a relational network model to take the operations of individual periods into account in measuring efficiencies; how the efficient frontier methods DEA and stochastic frontier analysis (SFA) can be used synergistically; and how to integrate DEA and multidimensional scaling. In other chapters, authors construct a dynamic three-stage network DEA model; a bootstrapping based methodology to evaluate returns to scale and convexity assumptions in DEA; hybridizing DEA and cooperative games; using DEA to represent the production technology and directional distance functions to measure bank performance; an input-

specific Luenberger energy and environmental productivity indicator; and the issue of reference set by differentiating between the uniquely found reference set and the unary and maximal types of the reference set. Finally, additional chapters evaluate and compare the technological advancement observed in different hybrid electric vehicles (HEV) market segments over the past 15 years; radial measurement of efficiency for the production process possessing multi-components under different production technologies; issues around the use of accounting information in DEA; how to use DEA environmental assessment to establish corporate sustainability; a summary of research efforts on DEA environmental assessment applied to energy in the last 30 years; and an overview of DEA and how it can be utilized alone and with other techniques to investigate corporate environmental sustainability questions.

## Hydrogen Cyanide Production - Cost Analysis - HCN E11A

*Intratec* This report presents a cost analysis of Hydrogen Cyanide production via a direct synthesis method involving the reaction of ammonia, methane (natural gas), and air. The process examined is similar to the Andrussow process. This report was developed based essentially on the following reference(s): (1) "Cyanides," Kirk-Othmer Encyclopedia of Chemical Technology, 5th edition (2) "Hydrogen Cyanide," McKetta, J., Inorganic Chemicals Handbook. Vol. 2. Keywords: Prussic Acid, DuPont, Reactor Waste-Heat Boiler, Air, Methane, Combustion

## Production and Operations Analysis

### Traditional, Latest, and Smart Views

*CRC Press* The aim of this book is to cover various aspects of the Production and Operations Analysis. Apart from the introduction to basic understanding of each topic, the book will also provide insights to various conventional techniques as well as, various other mathematical and nature-based techniques extracted from the existing literature. Concepts like smart factories, intelligent manufacturing, and various techniques of manufacturing will also be included. Various types of numerical examples will also be presented in each chapter and the descriptions will be done in lucid style with figures, point-wise descriptions, tables, pictures to facilitate easy understanding of the subject.

# A First Course in Design and Analysis of Experiments

*W. H. Freeman* Oehlert's text is suitable for either a service course for non-statistics graduate students or for statistics majors. Unlike most texts for the one-term grad/upper level course on experimental design, Oehlert's new book offers a superb balance of both analysis and design, presenting three practical themes to students: • when to use various designs • how to analyze the results • how to recognize various design options Also, unlike other older texts, the book is fully oriented toward the use of statistical software in analyzing experiments.

## Cumene Production Process - Cost Analysis - Cumene E11A

*Intratec* This report presents a cost analysis of Cumene production from benzene and polymer grade (PG) propylene The process examined is a typical alkylation process. This report was developed based essentially on the following reference(s): Keywords: Isopropylbenzene, Phenol, Cumene Hydroperoxide

## Regulatory Affairs in the Pharmaceutical Industry

*Academic Press* **Regulatory Affairs in the Pharmaceutical Industry** is a comprehensive reference that compiles all the information available pertaining to regulatory procedures currently followed by the pharmaceutical industry. Designed to impart advanced knowledge and skills required to learn the various concepts of regulatory affairs, the content covers new drugs, generic drugs and their development, regulatory filings in different countries, different phases of clinical trials, and the submission of regulatory documents like IND (Investigational New Drug), NDA (New Drug Application) and ANDA (Abbreviated New Drug Application). Chapters cover documentation in the pharmaceutical industry, generic drug development, code of Federal Regulation (CFR), the ANDA regulatory approval process, the process and documentation for US registration of foreign drugs, the regulation of combination products and medical devices, the CTD and ECTD formats, and much more. Updated reference on drug approval processes in key global markets Provides comprehensive coverage of concepts and regulatory affairs Presents a concise compilation of the

regulatory requirements of different countries Introduces the fundamentals of manufacturing controls and their regulatory importance

# Advanced Technology for the Conversion of Waste into Fuels and Chemicals

## Volume 1: Biological Processes

*Woodhead Publishing* **Advanced Technology for the Conversion of Waste into Fuels and Chemicals: Volume 1: Biological Processes** presents advanced and combined techniques that can be used to convert waste to energy, including combustion, gasification, pyrolysis, anaerobic digestion and fermentation. The book focuses on solid waste conversion to fuel and energy and presents the latest advances in the design, manufacture, and application of conversion technologies. Contributors from the fields of physics, chemistry, metallurgy, engineering and manufacturing present a truly trans-disciplinary picture of the field. Chapters cover important aspects surrounding the conversion of solid waste into fuel and chemicals, describing how valuable energy can be recouped from various waste materials. As huge volumes of solid waste are produced globally while huge amounts of energy are produced from fossil fuels, the technologies described in this comprehensive book provide the information necessary to pursue clean, sustainable power from waste material. Presents the latest advances in waste to energy techniques for converting solid waste to valuable fuel and energy Brings together contributors from physics, chemistry, metallurgy, engineering and the manufacturing industry Includes advanced techniques such as combustion, gasification, pyrolysis, anaerobic digestion and fermentation Goes far beyond municipal waste, including discussions on recouping valuable energy from a variety of industrial waste materials Describes how waste to energy technologies present an enormous opportunity for clean, sustainable energy

# Land Use Analysis and Planning for Sustainable Food Security

With an Illustration for the State of Haryana, India

*IRRI*

## The Analysis of Tidal Stream Power

*John Wiley & Sons* This text integrates a wide range of research and tidal resource theory and data to present a detailed analysis of the physics and oceanography of tidal stream power devices together with a world wide resource analysis. Clearly structured throughout the book is divided into two distinct parts. Part One provides the theoretical background to the subject and deals with the historical development of the harmonic method for the synthesis of tidal currents; the principles of fluid and tidal flow and the principles of device ducts, turbines and electrical systems. A review and analysis of more than forty tidal stream power proposals is also discussed. Part Two provides a comprehensive overview of current practice. The economic modelling of tidal stream power installations is covered with more than three hundred current meter records from around the world used to analyse the potential and cost of tidal stream power on a global basis. **Hallmark Features:** reviews the tidal resources around the world complete analysis of tidal stream power systems includes historical information on tidal science and biographical information on major figures concentrates on engineering physical geography rather than engineering specifics includes a website with a wide range of computer models, data and simulations

## Handbook of Clean Energy Systems, 6 Volume Set

*John Wiley & Sons* The Handbook of Clean Energy Systems brings together an international team of experts to present a comprehensive overview of the latest research, developments and practical applications throughout all areas of clean

energy systems. Consolidating information which is currently scattered across a wide variety of literature sources, the handbook covers a broad range of topics in this interdisciplinary research field including both fossil and renewable energy systems. The development of intelligent energy systems for efficient energy processes and mitigation technologies for the reduction of environmental pollutants is explored in depth, and environmental, social and economic impacts are also addressed. Topics covered include: Volume 1 - Renewable Energy: Biomass resources and biofuel production; Bioenergy Utilization; Solar Energy; Wind Energy; Geothermal Energy; Tidal Energy. Volume 2 - Clean Energy Conversion Technologies: Steam/Vapor Power Generation; Gas Turbines Power Generation; Reciprocating Engines; Fuel Cells; Cogeneration and Polygeneration. Volume 3 - Mitigation Technologies: Carbon Capture; Negative Emissions System; Carbon Transportation; Carbon Storage; Emission Mitigation Technologies; Efficiency Improvements and Waste Management; Waste to Energy. Volume 4 - Intelligent Energy Systems: Future Electricity Markets; Diagnostic and Control of Energy Systems; New Electric Transmission Systems; Smart Grid and Modern Electrical Systems; Energy Efficiency of Municipal Energy Systems; Energy Efficiency of Industrial Energy Systems; Consumer Behaviors; Load Control and Management; Electric Car and Hybrid Car; Energy Efficiency Improvement. Volume 5 - Energy Storage: Thermal Energy Storage; Chemical Storage; Mechanical Storage; Electrochemical Storage; Integrated Storage Systems. Volume 6 - Sustainability of Energy Systems: Sustainability Indicators, Evaluation Criteria, and Reporting; Regulation and Policy; Finance and Investment; Emission Trading; Modeling and Analysis of Energy Systems; Energy vs. Development; Low Carbon Economy; Energy Efficiencies and Emission Reduction. Key features: Comprising over 3,500 pages in 6 volumes, HCES presents a comprehensive overview of the latest research, developments and practical applications throughout all areas of clean energy systems, consolidating a wealth of information which is currently scattered across a wide variety of literature sources. In addition to renewable energy systems, HCES also covers processes for the efficient and clean conversion of traditional fuels such as coal, oil and gas, energy storage systems, mitigation technologies for the reduction of environmental pollutants, and the development of intelligent energy systems. Environmental, social and economic impacts of energy systems are also addressed in depth. Published in full colour throughout. Fully indexed with cross referencing within and between all six volumes. Edited by leading researchers from academia and industry who are internationally renowned and active in their respective fields. Published in print and online. The online version is a single publication (i.e. no updates), available for one-time purchase or through annual subscription.

# Vaccine Analysis: Strategies, Principles, and Control

*Springer* 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.

## Production and Operations Analysis

### Seventh Edition

*Waveland Press* The Seventh Edition of Production and Operations Analysis builds a solid foundation for beginning students of production and operations management. Continuing a long tradition of excellence, Nahmias and Olsen bring decades of combined experience to craft the most clear and up-to-date resource available. The authors' thorough updates include incorporation of current technology that improves the effectiveness of production processes, additional qualitative sections, and new material on service operations management and servicization. Bolstered by copious examples and problems, each chapter stands alone, allowing instructors to tailor the material to their specific needs. The text is essential reading for learning how to better analyze and improve on all facets of operations.

# Biorefinery of Oil Producing Plants for Value-Added Products

*John Wiley & Sons* **Biorefinery of Oil Producing Plants for Value-Added Products** An instructive and up-to-date pretreatment and industrial applications of oil producing plants **Biorefinery of Oil Producing Plants for Value-Added Products** is a two-volume set that delivers a comprehensive exploration of oil producing plants, from their availability to their pretreatment, bioenergy generation, chemical generation, bioproduct generation, and economic impact. The distinguished team of editors has included a wide variety of highly instructive resources written by leading contributors to the field. This set explores the current and future potential of bioenergy production to address the energy and climate crisis, as well as the technologies used to produce materials like biogas, biodiesel, bioethanol, biobutanol, biochar, fuel pellets, and biohydrogen. It also discusses the production of biobased chemicals, including bio-oil, biosurfactants, cationic surfactants, glycerol, biovanillin, bioplastic, and plant-oil based polyurethanes. Concluding with an insightful analysis of the economic effects of oil producing plants, the set also offers readers: A thorough introduction to the availability of oil producing plants, including palm oil, castor oil, jatropha, nyamplung, and coconut A comprehensive exploration of the pretreatment of oil producing plants, including the physical, chemical and biological pretreatment of lignocellulosic biomass Practical discussion of the generation of bioenergy, including biogas generation in the palm oil mill and biodiesel production techniques using jatropha In-depth examinations of the generation of biobased chemicals, including those produced from the tobacco plant Perfect for researchers and industry practitioners involved with the biorefinery of oil producing plants, **Biorefinery of Oil Producing Plants for Value-Added Products** also belongs in the libraries of undergraduate and graduate students studying agriculture, chemistry, engineering, and microbiology.

## Sustainable Biotechnology- Enzymatic Resources of

# Renewable Energy

*Springer Nature* offers abundant renewable resources that can be used to partially replace fossil fuels and commodity chemicals but issues of cost, technology readiness levels, and compatibility with existing distribution networks remain huge challenges. Cellulosic ethanol and biodiesel are the most immediately obvious target fuels, with hydrogen, methane and butanol as other potentially viable products. This book continues to bridge the technology gap and focus on critical aspects of lignocellulosic biomolecules and the respective mechanisms regulating their bioconversion to liquid fuels into energy and value-added products of industrial significance. This book is a collection of reviews elucidating several broad-ranging areas of progress and challenges in the utilization of sustainable resources of renewable energy, especially in biofuels. This book comes just at a time when government and industries are accelerating their efforts in the exploration of alternative energy resources, with expectations of the establishment of long-term sustainable alternatives to petroleum-based liquid fuels. Apart from liquid fuel this book also emphasizes the use of sustainable resources for value-added products, which may help in revitalizing the biotechnology industry at a broader scale. This book also provides a comprehensive review of basic literature and advance research methodologies to graduate students studying environmental microbiology, chemical engineering, bio-economy and microbial biotechnology.

# Hydrogen Economy

*The Energy and Resources Institute (TERI)* As the dependence on the depleting fossils fuels continues and global warming increases, we need to find an energy system that is renewable and sustainable, efficient and cost-effective, convenient and safe. Hydrogen has been proposed as the perfect fuel to sustain the energy system. The availability of a reliable and cost-effective supply, safe and efficient storage, and convenient end use of hydrogen will be essential for a transition to a hydrogen economy. Research is being conducted throughout the world for the development of safe, cost-effective hydrogen production, storage, and end-use technologies that support and foster this transition. Hydrogen Economy discusses the strategies and roadmaps of introducing hydrogen as the alternate source of fuel for sustainable development. The book examines the link between development and energy, prospects of sustainable development, significance of hydrogen energy economy. It provides an authoritative and up-to-date scientific account

of hydrogen generation, storage, transportation, and safety. Key Features: · Explains the significance of hydrogen economy · Examines the feasibility of transporting, distributing and utilizing hydrogen · Assesses the safety of using hydrogen and potential hazards Contents: Preface 1. Energy and Development · How Energy is Measured? · Fossil Fuels · Contribution of Non-fossil Energy Sources to Global Primary Energy Mix 2. Significance of Hydrogen Economy · Energy Crisis · Environmental Effects of Using Fossil Fuels · Energy and Environment · Sustainable Development · Transition to the Hydrogen Economy 3. Hydrogen Production 4. Hydrogen Storage · Fundamentals of Hydrogen · Hydrogen Embrittlement · Introduction to Packaging and Storage of Hydrogen · Standardization for Hydrogen Gas Cylinders · ASME Code Symbol Stamp · Hydrogen Liquefaction · Liquid Hydrogen Storage · Hydrogen Storage in Metal Hydrides · Developing Hydrogen Storage Media · On-board Hydrogen Storage · Choice of Storage Method 5. Transportation, Distribution, and Utilization of Hydrogen · Transportation of Hydrogen · Compressed Gas Transport · Transfer of Hydrogen Gas 6. Hydrogen Hazards Assessment and Safety · Terms and Definitions · Hazard Analysis · Choosing a Methodology · Hydrogen Hazards · Mandated Requirements · Hydrogen Safety Appendix 1: Liquid Hydrogen Handler's Qualification Training 2: Scaling Laws, Explosions, Blast Effects, and Fragmentation 3: Hydrogen Sensing and Detection 4: Relief Devices Bibliography Index About the Authors

## Bayesian Analysis with R for Drug Development Concepts, Algorithms, and Case Studies

*CRC Press* Drug development is an iterative process. The recent publications of regulatory guidelines further entail a lifecycle approach. Blending data from disparate sources, the Bayesian approach provides a flexible framework for drug development. Despite its advantages, the uptake of Bayesian methodologies is lagging behind in the field of pharmaceutical development. Written specifically for pharmaceutical practitioners, *Bayesian Analysis with R for Drug Development: Concepts, Algorithms, and Case Studies*, describes a wide range of Bayesian applications to problems throughout pre-clinical, clinical, and Chemistry, Manufacturing, and Control (CMC) development. Authored by two seasoned statisticians in the pharmaceutical industry, the book provides detailed Bayesian solutions to a broad array of pharmaceutical problems. Features Provides a single source of information on Bayesian statistics for drug development Covers a wide spectrum of pre-clinical, clinical, and CMC topics Demonstrates proper Bayesian

applications using real-life examples Includes easy-to-follow R code with Bayesian Markov Chain Monte Carlo performed in both JAGS and Stan Bayesian software platforms Offers sufficient background for each problem and detailed description of solutions suitable for practitioners with limited Bayesian knowledge Harry Yang, Ph.D., is Senior Director and Head of Statistical Sciences at AstraZeneca. He has 24 years of experience across all aspects of drug research and development and extensive global regulatory experiences. He has published 6 statistical books, 15 book chapters, and over 90 peer-reviewed papers on diverse scientific and statistical subjects, including 15 joint statistical works with Dr. Novick. He is a frequent invited speaker at national and international conferences. He also developed statistical courses and conducted training at the FDA and USP as well as Peking University. Steven Novick, Ph.D., is Director of Statistical Sciences at AstraZeneca. He has extensively contributed statistical methods to the biopharmaceutical literature. Novick is a skilled Bayesian computer programmer and is frequently invited to speak at conferences, having developed and taught courses in several areas, including drug-combination analysis and Bayesian methods in clinical areas. Novick served on IPAC-RS and has chaired several national statistical conferences.

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

*Elsevier 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

# Modeling, Characterization and Production of Nanomaterials

## Electronics, Photonics and Energy Applications

*Elsevier* 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

## Sensory Analysis for the Development of Meat Products

### Methodological Aspects and Practical Applications

*Woodhead Publishing* **Sensory Analysis for the Development of Meat Products: Methodological Aspects and Practical Applications** highlights the application of sensory analysis in the development of meat products. It presents the background and historical aspects of sensory evaluation on the characterization and development of meat products.

Divided into two sections, the book discusses fundamental concepts, methodological approaches, statistical analysis, innovative methods, and presents case studies using these approaches. Chapter include definitions, applications, literature reviews, recent developments, methods and end of chapter glossaries. Researchers in sensory analysis and meat processing, as well as new product developers, will benefit from this comprehensive resource on the topics discussed. Discusses the use of sensory analysis as a tool for the development of meat products Explores characterization, quality, processing, new ingredients, shelf life, consumer studies, and the health aspects of meat products, with a special focus on sensory attributes Contains case studies that highlight sensory approaches and methods in the context of meat products

## Analytical Techniques and Methods for Biomass

*Springer* This book deals with the application of techniques and methods of chemical analysis for the study of biomass and its conversion processes, aiming to fill the current gap in the book literature on the subject. The use of various techniques and analytical methods is presented and discussed in a straightforward manner, providing the reader with the possibility of choosing the most appropriate methodologies for analysis of the major classes of plant biomass and its products. In the present volume, a select group of international specialists describes different approaches to understand the biomass structure, their physical and chemical properties, the parameters of conversion processes, the products and by-products formation and quantification, quality parameters, etc. Modern chemistry plays a strong economic role in industrial activities based on biomass, with an increasing trend of the importance of its application from the deployment of biorefineries and the principles of green chemistry, which make use of the potential of biomass with decreasing impact negative environmental. In this context, analytical chemistry can contribute significantly to the supply chains of biomass, be it plant or animal origin; however, with the first offering the greatest challenges and the greatest opportunity for technical, scientific and economic progress, given its diversified chemical constitution. Thus, the chemical analysis can be used to examine the composition for characterizing physicochemical properties and to monitor their conversion processes, in order to obtain better products and uses of biomass. The quality of the biomass used determines the product quality. Therefore, reliable information is required about the chemical composition of the biomass to establish the best use (e.g., most suitable conversion process and its conditions), which will influence harvest and preparation steps. Conversion processes should be monitored for their yield, integrity, safety, and environmental impact. Effluent or residues should be monitored and analyzed for environmental control. Co-products

need to be monitored to avoid interference with the product yield and product purity; however, co-products are also a good opportunity to add value to the biomass chain. Finally, products need to be monitored and analyzed to determine their yields and purity and to ensure their quality. In this context, analytical chemistry can contribute significantly to the biomass supply chains, be it of plant or animal origin.

## Sustainable Bioenergy Production - An Integrated Approach

*Springer Science & Business Media* **This book focuses primarily on the advantages and implications of sustainable bioenergy production in terms of ensuring a more sustainable world despite its growing energy demands. It addresses a new concept that focuses on the interactions between different uses of agricultural land (for example, agriculture for food, forage or energy and nature conservation) and their ecological, economic and societal impacts. This research concept provides new insights into the competition for resources and the synergies between different land uses. This book seeks to improve people's understanding of bioenergy's potentials for the future. It will be of interest not only to those involved in sustainable energy, but also to environmental planners, agriculture and soil specialists, and environmental policy-makers.**

## Text analysis and text production

## Strengthening Forensic Science in the United States

## A Path Forward

*National Academies Press* **Scores of talented and dedicated people serve the forensic science community, performing vitally important work. However, they are often constrained by lack of adequate resources, sound policies, and national support. It is clear that change and advancements, both systematic and scientific, are needed in a number of**

forensic science disciplines to ensure the reliability of work, establish enforceable standards, and promote best practices with consistent application. **Strengthening Forensic Science in the United States: A Path Forward** provides a detailed plan for addressing these needs and suggests the creation of a new government entity, the National Institute of Forensic Science, to establish and enforce standards within the forensic science community. The benefits of improving and regulating the forensic science disciplines are clear: assisting law enforcement officials, enhancing homeland security, and reducing the risk of wrongful conviction and exoneration. **Strengthening Forensic Science in the United States** gives a full account of what is needed to advance the forensic science disciplines, including upgrading of systems and organizational structures, better training, widespread adoption of uniform and enforceable best practices, and mandatory certification and accreditation programs. While this book provides an essential call-to-action for congress and policy makers, it also serves as a vital tool for law enforcement agencies, criminal prosecutors and attorneys, and forensic science educators.

## Methods of Soil Analysis, Part 3

### Chemical Methods

*John Wiley & Sons* **A thorough presentation of analytical methods for characterizing soil chemical properties and processes, Methods, Part 3 includes chapters on Fourier transform infrared, Raman, electron spin resonance, x-ray photoelectron, and x-ray absorption fine structure spectroscopies, and more.**

## Computational Intelligent Data Analysis for Sustainable Development

*CRC Press* **Going beyond performing simple analyses, researchers involved in the highly dynamic field of computational intelligent data analysis design algorithms that solve increasingly complex data problems in changing environments, including economic, environmental, and social data. Computational Intelligent Data Analysis for Sustainable Development present**

# Approaches to Class Analysis

*Cambridge University Press* **Few themes have been as central to sociology as 'class' and yet class remains a perpetually contested idea. Sociologists disagree not only on how best to define the concept of class but on its general role in social theory and indeed on its continued relevance to the sociological analysis of contemporary society. Some people believe that classes have largely dissolved in contemporary societies; others believe class remains one of the fundamental forms of social inequality and social power. Some see class as a narrow economic phenomenon whilst others adopt an expansive conception that includes cultural dimensions as well as economic conditions. This 2005 book explores the theoretical foundations of six major perspectives of class with each chapter written by an expert in the field. It concludes with a conceptual map of these alternative approaches by posing the question: 'If class is the answer, what is the question?'**

# Environmental Considerations Associated with Hydraulic Fracturing Operations

# Adjusting to the Shale Revolution in a Green World

*John Wiley & Sons* **A guide to environmental and communication issues related to fracking and the best approach to protect communities Environmental Considerations Associated with Hydraulic Fracturing Operations offers a much-needed resource that explores the complex challenges of fracking by providing an understanding of the environmental and communication issues that are inherent with hydraulic fracturing. The book balances the current scientific knowledge with the uncertainty and risks associated with hydraulic fracturing. In addition, the authors offer targeted approaches for helping to keep communities safe. The authors include an overview of the historical development of hydraulic fracturing and the technology currently employed. The book also explores the risk, prevention, and mitigation factors that are associated with fracturing. The authors also include legal cases, regulatory issues, and data on the cost of recovery. The volume presents audit checklists for gathering critical information and documentation to**

support the reliability of the current environmental conditions related to fracking operations and the impact fracking can have on a community. This vital resource: Contains the technical information and mitigation recommendations for safety and environmental issues related to hydraulic fracturing Offers an historical overview of conventional and unconventional oil and gas drilling Explains the geologic and technical issues associated with fracking of tight sand and shale formulations Presents numerous case studies from the United States EPA and other agencies Discusses issues of co-produced waste water and induced seismicity from the injection of wastewater Written for environmental scientists, geologists, engineers, regulators, city planners, attorneys, foresters, wildlife biologists, and others, Environmental Considerations Associated with Hydraulic Fracturing Operations offers a comprehensive resource to the complex environmental and communication issues related to fracking.

## Biomass Modification, Characterization and Process Monitoring Analytics to Support Biofuel and Biomaterial Production

*Frontiers Media SA* The conversion of lignocellulosic biomass into renewable fuels and other commodities has provided an appealing alternative towards supplanting global dependence on fossil fuels. The suitability of multitudes of plants for deconstruction to useful precursor molecules and products is currently being evaluated. These studies have probed a variety of phenotypic traits, including cellulose, non-cellulosic polysaccharide, lignin, and lignin monomer composition, glucose and xylose production following enzymatic hydrolysis, and an assessment of lignin-carbohydrate and lignin-lignin linkages, to name a few. These quintessential traits can provide an assessment of biomass recalcitrance, enabling researchers to devise appropriate deconstruction strategies. Plants with high polysaccharide and lower lignin contents have been shown to breakdown to monomeric sugars more readily. Not all plants contain ideal proportions of the various cell wall constituents, however. The capabilities of biotechnology can alleviate this conundrum by tailoring the chemical composition of plants to be more favorable for conversion to sugars, fuels, etc. Increases in the total biomass yield, cellulose content, or conversion efficiency through, for example, a reduction in lignin content, are pathways being evaluated to genetically improve plants for use in manufacturing biofuels and bio-based chemicals.

Although plants have been previously domesticated for food and fiber production, the collection of phenotypic traits prerequisite for biofuel production may necessitate new genetic breeding schemes. Given the plethora of potential plants available for exploration, rapid analytical methods are needed to more efficiently screen through the bulk of samples to hone in on which feedstocks contain the desired chemistry for subsequent conversion to valuable, renewable commodities. The standard methods for analyzing biomass and related intermediates and finished products are laborious, potentially toxic, and/or destructive. They may also necessitate a complex data analysis, significantly increasing the experimental time and add unwanted delays in process monitoring, where delays can incur in significant costs. Advances in thermochemical and spectroscopic techniques have enabled the screening of thousands of plants for different phenotypes, such as cell-wall cellulose, non-cellulosic polysaccharide, and lignin composition, lignin monomer composition, or monomeric sugar release. Some instrumental methods have been coupled with multivariate analysis, providing elegant chemometric predictive models enabling the accelerated identification of potential feedstocks. In addition to the use of high-throughput analytical methods for the characterization of feedstocks based on phenotypic metrics, rapid instrumental techniques have been developed for the real-time monitoring of diverse processes, such as the efficacy of a specific pretreatment strategy, or the formation of end products, such as biofuels and biomaterials. Real-time process monitoring techniques are needed for all stages of the feedstocks-to-biofuels conversion process in order to maximize efficiency and lower costs by monitoring and optimizing performance. These approaches allow researchers to adjust experimental conditions during, rather than at the conclusion, of a process, thereby decreasing overhead expenses. This Frontiers Research Topic explores options for the modification of biomass composition and the conversion of these feedstocks into to biofuels or biomaterials and the related innovations in methods for the analysis of the composition of plant biomass, and advances in assessing up- and downstream processes in real-time. Finally, a review of the computational models available for techno-economic modeling and lifecycle analysis will be presented.

## Integrated Environmental Technologies for Wastewater

# Treatment and Sustainable Development

*Elsevier* **Integrated Environmental Technologies for Wastewater Treatment and Sustainable Development** provides comprehensive and advanced information on integrated environmental technologies and their limitations, challenges and potential applications in treatment of environmental pollutants and those that are discharged in wastewater from industrial, domestic and municipal sources. The book covers applied and recently developed integrated technologies to solve five major trends in the field of wastewater treatment, including nutrient removal and resource recovery, recalcitrant organic and inorganic compounds detoxification, energy saving, and biofuel and bioenergy production for environmental sustainability. The book provides future directions to young researchers, scientists and professionals who are working in the field of bioremediation and phytoremediation to remediate wastewater pollutants at laboratory and field scale, for sustainable development. Illustrates the importance of various advanced oxidation processes in effluent treatment plants Describes underlying mechanisms of constructed wetland-microbial fuel cell technologies for the degradation and detoxification of emerging organic and inorganic contaminants discharged in wastewater Highlights the reuse and recycling of wastewater and recovery of value-added resources from wastewater Focuses on recent advances and challenges in integrated environmental technologies, constructed wetland-microbial fuel cell, microbial electrochemical-constructed wetlands, biofilm reactor-constructed wetland, and anammox- microbial fuel cell technology for sustainable development Illustrates the importance of microbes and plants in bio/phytoremediation and wastewater treatment

## Red Meat Science and Production

### Volume 1. The Consumer and Extrinsic Meat Character

*Springer* This book comprehensively describes the biological underpinnings of red meat production, discussing the current state of the science in the context of the provision of red meat products perceived by consumers to offer a quality eating experience. Covering advances in the science of red meat production, it focuses on production system elements that affect product quality. The chapters explore the latest developments in the determination of consumer

preferences, and interpret of these preferences in terms of quality characteristics of red meat, investigating the science-based orchestration of red meat production to achieve product consistency. The book highlights topics such as consumer preferences, the biological and production system elements affecting red meat safety, and the intrinsic (appearance, aroma, and sensory quality) and extrinsic (humane animal and environmentally friendly production) characteristics of red meat. For each characteristic, it discusses the underlying biological and biochemical processes and examines means of altering production systems to impact consumer eating experiences. The book also features a perspective on creating holistic integrated systems for producing red meats to meet consumers' expectations around the globe. Written by leading authorities in the area of global red meat production systems, it is a comprehensive resource for consumer-oriented red meat producers.

## Production and Analysis of GSWP-2 Near-surface Meteorology Data Sets

## Life Cycle Analysis and Assessment in Civil Engineering: Towards an Integrated Vision

## Proceedings of the Sixth International Symposium on Life-Cycle Civil Engineering (IALCCE 2018), 28-31 October 2018, Ghent, Belgium

*CRC Press* This volume contains the papers presented at IALCCE2018, the Sixth International Symposium on Life-Cycle Civil Engineering (IALCCE2018), held in Ghent, Belgium, October 28-31, 2018. It consists of a book of extended

abstracts and a USB device with full papers including the Fazlur R. Khan lecture, 8 keynote lectures, and 390 technical papers from all over the world. Contributions relate to design, inspection, assessment, maintenance or optimization in the framework of life-cycle analysis of civil engineering structures and infrastructure systems. Life-cycle aspects that are developed and discussed range from structural safety and durability to sustainability, serviceability, robustness and resilience. Applications relate to buildings, bridges and viaducts, highways and runways, tunnels and underground structures, off-shore and marine structures, dams and hydraulic structures, prefabricated design, infrastructure systems, etc. During the IALCCE2018 conference a particular focus is put on the cross-fertilization between different sub-areas of expertise and the development of an overall vision for life-cycle analysis in civil engineering. The aim of the editors is to provide a valuable source of cutting edge information for anyone interested in life-cycle analysis and assessment in civil engineering, including researchers, practising engineers, consultants, contractors, decision makers and representatives from local authorities.

## Aniline Production from Nitrobenzene - Cost Analysis - Aniline E11A

*Intratec Solutions* This report presents a cost analysis of Aniline production from nitrobenzene and hydrogen. The process examined is similar to BASF's vapor phase nitrobenzene hydrogenation process. This report was developed based essentially on the following reference(s): Keywords: Bayer, Borsodchem, Sinopec