

5070 S13 Ms 11 Max Papers

In recent years, much attention has been focused on biodegradable polymers from renewable resources. Due to its availability and low cost, starch is a promising candidate among biopolymers for use in biodegradable packaging materials and for other purposes. *Starch-Based Polymeric Materials and Nanocomposites: Chemistry, Processing, and Applications*

The aim of this book is to examine some of the important aspects of recent progress in the use of molecular simulation for investigating fluids. It encompasses both Monte Carlo and molecular dynamic techniques providing details of theory, algorithms and implementation.

This study analyses almost 300 known prehistoric rock art sites dating from c.2500 BC set within their environmental context. Susan Searight discusses the themes and motifs represented, comprising anthropomorphs, human hands and feet, weapons, agricultural tools, chariots and geometric forms, and their distribution. Through a series of case studies, Seabright suggests that the preference for certain motifs in certain areas may reflect their different function, for example, as a means of communication among nomadic pastoralists, as a means of defining territories, denoting ownership, or as commemorative markers. The results of her study of the rock art are put in a Moroccan and North African context.

The Police and Criminal Evidence Act (PACE) and its Codes of Practice are a vital part of the legislative framework that lays out police powers for combating crime. This revised version of PACE Code H sets out the requirements for the detention, treatment and questioning of suspects related to terrorism in police custody by police officers. This Code applies to people in police detention after 00.00 on 27 October 2013, notwithstanding that their period of detention may have commenced before that time

This two-volume set constitutes the refereed proceedings of the Third International Conference on Recent Trends in Image Processing and Pattern Recognition (RTIP2R) 2020, held in Aurangabad, India, in January 2020. The 78 revised full papers presented were carefully reviewed and selected from 329 submissions. The papers are organized in topical sections in the two volumes. Part I: Computer vision and applications; Data science and machine learning; Document understanding and Recognition. Part II: Healthcare informatics and medical imaging; Image analysis and recognition; Signal processing and pattern recognition; Image and signal processing in Agriculture.

Soil diversity (pedodiversity) is part of our natural and cultural heritage. The preservation of the pedosphere is essential for the protection of the biosphere and the Earth's systems, the regulation of climate, and for world food security. In this book, reputed international experts discuss the state of the art of pedodiversity analysis—analyzing the relationships among biodiversity, pedodiversity, landform diversity, lithodiversity, and land use diversity. The first of its kind, the book is intended to be a combined handbook, historical account of pedodiversity research, and essay on its future challenges.

Pulse Dipolar Electron Spin Resonance: Distance Measurements by Peter P. Borbat, Jack H. Freed. *Interpretation of Dipolar EPR Data in Terms of Protein Structure*, by Gunnar Jeschke. *Site-Directed Nitroxide Spin Labeling of Biopolymers*, by Sandip A. Shelke and Snorri Th. Sigurdsson. *Metal-Based Spin Labeling for Distance Determination*, by Daniella Goldfarb. *Structural Information from Spin-Labelled Membrane-Bound Proteins*, by Johann P. Klare, Heinz-Jürgen Steinhoff. *Structural Information from Oligonucleotides*, by Richard Ward and Olav Schiemann. *Orientation selective DEER using rigid spin labels, cofactors, metals, and clusters*, by Claudia E. Tait, Alice M. Bowen, Christiane R. Timmel, Jeffrey Harmer

This edition comprehensively updates the field of fracture mechanics by including details of the latest research programmes. It contains new material on non-metals, design issues and statistical aspects. The application of fracture mechanics to different types of materials is stressed.

From the contents: Robert H Crabtree: Introduction and History. - Montserrat Diéguez, Oscar Pàmies and Carmen Claver: Iridium-catalysed hydrogenation using phosphorous ligands. - David H. Woodmansee and Andreas Pfaltz: Iridium Catalyzed Asymmetric Hydrogenation of Olefins with Chiral N,P and C,N Ligands. - Ourida Saidi and Jonathan M J Williams: Iridium-catalyzed Hydrogen Transfer Reactions. - John F. Bower and Michael J. Krische: Formation of C-C Bonds via Iridium Catalyzed Hydrogenation and Transfer Hydrogenation. - Jongwook Choi, Alan S. Goldman: Ir-Catalyzed Functionalization of C?H Bonds. - Mark P. Pouy and John F. Hartwig: Iridium-Catalyzed Allylic Substitution. - Daniel Carmona and Luis A. Oro: Iridium-catalyzed 1.3-dipolar cycloadditions.

Clinical microbiologists are engaged in the field of diagnostic microbiology to determine whether pathogenic microorganisms are present in clinical specimens collected from patients with suspected infections. If microorganisms are found, these are identified and susceptibility profiles, when indicated, are determined. During the past two decades, technical advances in the field of diagnostic microbiology have made constant and enormous progress in various areas, including bacteriology, mycology, mycobacteriology, parasitology, and virology. The diagnostic capabilities of modern clinical microbiology laboratories have improved rapidly and have expanded greatly due to a technological revolution in molecular aspects of microbiology and immunology. In particular, rapid techniques for nucleic acid amplification and characterization combined with automation and user-friendly software have significantly broadened the diagnostic arsenal for the clinical microbiologist. The conventional diagnostic model for clinical microbiology has been labor-intensive and frequently required days to weeks before test results were available. Moreover, due to the complexity and length of such testing, this service was usually directed at the hospitalized patient population. The physical structure of laboratories, staffing patterns, workflow, and turnaround time all have been influenced profoundly by these technical advances. Such changes will undoubtedly continue and lead the field of diagnostic microbiology inevitably to a truly modern discipline. *Advanced Techniques in Diagnostic Microbiology* provides a comprehensive and up-to-date description of advanced methods that have evolved for the diagnosis of infectious diseases in the routine clinical microbiology laboratory. The book is divided into two sections. The first techniques section covers the principles and characteristics of techniques ranging from rapid antigen testing, to advanced antibody detection, to in vitro nucleic acid amplification techniques, and to nucleic acid microarray and mass spectrometry. Sufficient space is assigned to cover different nucleic acid amplification formats that are currently being used widely in the diagnostic microbiology field. Within each technique, examples are given regarding its application in the diagnostic field. Commercial product information, if available, is introduced with commentary in each chapter. If several test formats are available for a technique, objective comparisons are given to illustrate the contrasts of their advantages and disadvantages. The second applications section provides practical

examples of application of these advanced techniques in several "hot" spots in the diagnostic field. A diverse team of authors presents authoritative and comprehensive information on sequence-based bacterial identification, blood and blood product screening, molecular diagnosis of sexually transmitted diseases, advances in mycobacterial diagnosis, novel and rapid emerging microorganism detection and genotyping, and future directions in the diagnostic microbiology field. We hope our readers like this technique-based approach and your feedback is highly appreciated. We want to thank the authors who devoted their time and efforts to produce their chapters. We also thank the staff at Springer Press, especially Melissa Ramondetta, who initiated the whole project. Finally, we greatly appreciate the constant encouragement of our family members through this long effort. Without their unwavering faith and full support, we would never have had the courage to commence this project.

For more than five decades, Sears and Zemansky's College Physics has provided the most reliable foundation of physics education for students around the world. The Ninth Edition continues that tradition with new features that directly address the demands on today's student and today's classroom. A broad and thorough introduction to physics, this new edition maintains its highly respected, traditional approach while implementing some new solutions to student difficulties. Many ideas stemming from educational research help students develop greater confidence in solving problems, deepen conceptual understanding, and strengthen quantitative-reasoning skills, while helping them connect what they learn with their other courses and the changing world around them. Math review has been expanded to encompass a full chapter, complete with end-of-chapter questions, and in each chapter biomedical applications and problems have been added along with a set of MCAT-style passage problems. Media resources have been strengthened and linked to the Pearson eText, MasteringPhysics®, and much more. This package contains: College Physics, Ninth Edition

In the last few decades, near-infrared (NIR) spectroscopy has distinguished itself as one of the most rapidly advancing spectroscopic techniques. Mainly known as an analytical tool useful for sample characterization and content quantification, NIR spectroscopy is essential in various other fields, e.g. NIR imaging techniques in biophotonics, medical applications or used for characterization of food products. Its contribution in basic science and physical chemistry should be noted as well, e.g. in exploration of the nature of molecular vibrations or intermolecular interactions. One of the current development trends involves the miniaturization and simplification of instrumentation, creating prospects for the spread of NIR spectrometers at a consumer level in the form of smartphone attachments—a breakthrough not yet accomplished by any other analytical technique. A growing diversity in the related methods and applications has led to a dispersion of these contributions among disparate scientific communities. The aim of this Special Issue was to bring together the communities that may perceive NIR spectroscopy from different perspectives. It resulted in 30 contributions presenting the latest advances in the methodologies essential in near-infrared spectroscopy in a variety of applications.

How the amino acid sequence of a protein determines its three-dimensional structure is a major problem in biology and chemistry. Leading experts in the fields of NMR spectroscopy, X-ray crystallography, protein engineering and molecular modeling offer provocative insights into current views on the protein folding problem and various aspects for future progress.

This edited volume is based on the best papers accepted for presentation during the 1st Springer Conference of the Arabian Journal of Geosciences (CAJG-1), Tunisia 2018. The book is of interest to all researchers in the fields of Mineralogy, Geochemistry, Petrology and Volcanology. The Earth's interior is a source of heat, which makes our planet unique. This source regulates the formation and evolution of rocks at larger scales, and of minerals and sediments toward smaller scales. In such context, the exploration of georesources (products) has to be related to petrogenesis (processes). This volume offers an overview of the state-of-the-art petrogenesis and exploration in, but not limited to, the Middle East and Mediterranean regions. It gives new insights into processes and products related to the Earth's interior, and associated georesources by international researchers. Main topics include: 1. Petrogenetic processes: geochemistry, geochronology and geophysical approaches 2. Surficial processes: sedimentation and facies analysis 3. Applied mineralogy and tectonics 4. Geological research applied to mineral deposits

This Code of Practice is a reference tool for those dealing with, and caring for people admitted to hospital and care homes with mental health problems. Authored by the Department of Health and produced following wide consultation with those who provide and receive services under the Mental Health Act, this publication will come into force on 3 November 2008. Through the Mental Health Act 2007, the Government has updated the 1983 Act to ensure it keeps pace with the changes in the way that mental health services are - and need to be - delivered. This publication provides guidance and advice to registered medical practitioners, approved clinicians, managers and staff of hospitals, and approved mental health professionals on how they should proceed when undertaking duties under the Act. It also gives guidance to doctors and other professionals about certain aspects of medical treatment for mental disorder more generally. The Mental Health Act Code of Practice is also aimed at all of those working in primary care, Mental Health Trusts, NHS Foundation Trusts as well as solicitors and attorneys who advise on mental health law. The Code should also be beneficial to the police and ambulance services and others in health and social services (including the independent and voluntary sectors) involved in providing services to people who are, or may become, subject to compulsory measures under the Act. It will also be a guide for those working with people with specific mental health needs such as those in nursing and care homes, and those in prison.

This Special Issue is one of the first for the new MDPI flagship journal Chemistry (ISSN 2624-8549) which has a broad remit for publishing original research in all areas of chemistry. The theme of this issue is Supramolecular Chemistry in the 3rd Millennium and I am sure that this topic will attract many exciting contributions. We chose this topic because it encompasses the unity of contemporary pluridisciplinary science, in which organic, inorganic, physical and theoretical chemists work together with molecular biologists and physicists to develop a systems-level understanding of molecular interactions. The description of supramolecular chemistry as 'chemistry beyond the molecule' (Jean-Marie Lehn, Nobel Lecture and Gautam R. Desiraju, Nature, 2001, 412, 397) addresses the wide variety of weak, non-covalent interactions that are the basis for the assembly of supramolecular architectures, molecular receptors and molecular recognition, programmed molecular systems, dynamic combinatorial libraries, coordination networks and functional supramolecular materials. We welcome submissions from all disciplines involved in this exciting and evolving area of science.

This book comprises selected proceedings of the International Conference on Engineering Materials, Metallurgy and Manufacturing (ICEMMM 2018). It discusses innovative manufacturing processes, such as rapid prototyping, nontraditional machining, advanced computer numerical control (CNC) machining, and advanced metal forming. The book particularly focuses on finite element simulation and optimization, which aid in reducing experimental costs and time. This book is a valuable resource for students, researchers, and professionals alike.

The challenges faced by the atmospheric research community today are vast, complex, and multi-faceted. The book Urban Atmospheric Aerosols: Sources, Analysis, and Effects highlights important aspects concerning the chemical and optical properties, size distribution, sources, and potential health effects of fine urban air particles (PM_{2.5}). The physical and chemical characterization of PM_{2.5}, its source assignment, and the assessment of the magnitude and distribution of its emissions are crucial for establishing effective fine air particle regulations and assessing the associated risks to human health. This book brings together eight papers covering the main topics of the field and will be of interest to researchers who are interested in air quality in outdoor and indoor environments, air particle toxicity, and atmospheric chemistry, as well as global climate modelers.

The book has evolved from the author's continuing teaching of the subject and from two editions of a text of the same title. The first edition was published in 1978 by the School of Surveying, University of New South Wales, Sydney, Australia. Like its predecessors, this totally revised third edition is designed to make the subject matter more readily available to students proceeding to degrees in Surveying and related fields. At the same time, it is a comprehensive reference book for all surveyors as well as for other professionals and scientists who use electronic distance measurement as a measuring tool. Great emphasis is placed on the understanding of measurement principles and on proper reduction and calibration procedures. It comprises an extensive collection of essential formulae, useful tables and numerous literature references. After a review of the history of EDM instruments in Chapter 1, some fundamental laws of physics and units relevant to EDM are revised in Chapter 2. Chapter 3 discusses the principles and applications of the pulse method, the phase difference method, the Doppler technique and includes an expanded section on interferometers. The basic working principles of electro-optical and microwave distance meters are presented in Chapter 4, with special emphasis on modulation/demodulation techniques and phase measurement systems. Important properties of infrared emitting and lasing diodes are discussed.

Atomically precise metal nanocluster research has emerged as a new frontier. This book serves as an introduction to metal nanoclusters protected by ligands. The authors have summarized the synthesis principles and methods, the characterization methods and new physicochemical properties, and some potential applications. By pursuing atomic precision, such nanocluster materials provide unprecedented opportunities for establishing precise relationships between the atomic-level structures and the properties. The book should be accessible to senior undergraduate and graduate students, researchers in various fields (e.g., chemistry, physics, materials, biomedicine, and engineering), R&D scientists, and science policy makers.

Our understanding of the quantitative aspects of free radical chemistry and the involvement of radicals in such areas as biology, medicine, the environment, etc., has developed spectacularly over recent years, yet the various topics are commonly discussed separately, in specific meetings and specialised publications. *Free Radicals in Biology and Environment* draws together two important areas of free radical chemistry, using as a bridge the fundamental physical chemistry of free radicals (spectroscopic detection of free radicals, evaluation of absolute rate constants, elucidation of mechanisms of free radical reactions and catalysis, photochemical and radiation processes, etc.). The most relevant topics covered are the EPR detection of radicals in biochemical systems and in pollutant formation and degradation, oxidation processes in biology and in the troposphere, radiation and induced damage, and atmospheric pollutants arising from incomplete combustion. Also covered are the chemistry and biochemistry of nitric oxide and peroxy nitrite, the chemistry and biochemistry of DNA radicals, the role of radicals in myeloperoxidase, lignin peroxidase, radicals and cardiovascular injury, radiation and the fragmentation of cells and tissues.

Meet Little Miss Inventor, an ingenious new Little Miss character full of bright ideas! Little Miss Inventor is constantly inventing new things--her super-speedy reader page turner helps read books faster, and her back-pack-snack-attack fridge was a perfect match for her friend Mr. Greedy. But her greatest challenge yet has her stumped--what on earth could she invent for Mr. Rude?! Children will love learning about the newest Little Miss character and following her exciting adventures in this special, hardcover title.

This comprehensive volume compiles the concepts essential for the understanding of the pharmaceutical science and technology associated with the delivery of subunit vaccines. Twenty-one chapters are divided into four main parts: (1) Background; (2) Delivery Systems for Subunit Vaccines; (3) Delivery Routes, Devices and Dosage Forms; and (4) Pharmaceutical Analysis and Quality Control of Vaccines. Part one provides a basic background with respect to immunology and general vaccine classification. In part two, it presents representative types of vaccine delivery systems individually with focus on the physicochemical properties of the systems and their significance for the immune response they stimulate. These delivery systems include aluminum adjuvants, emulsions, liposomes, bilosomes, cubosomes/hexosomes, ISCOMs, virus-like particles, polymeric nano- and microparticles, gels, implants and cell-based delivery systems. Following these chapters, part three addresses the challenges associated with vaccine delivery via specific routes of administration—in particular subcutaneous, intramuscular, oral, nasal, pulmonary, transdermal and vaginal administration. Furthermore, the specific administration routes are discussed in combination with device technologies relevant for the respective routes as well as dosage forms appropriate for the device technology. Finally, the fourth part concerns pharmaceutical analysis and quality control of subunit vaccines.

Thorough and up-to-date, this book presents recent developments in this exciting research field. To begin with, the text covers the fabrication of chiral nanomaterials via various synthesis methods, including electron beam lithography, ion beam etching, chemical synthesis and biological DNA directed assembly. This is followed by the relevant theory and reaction mechanisms, with a discussion of the characterization of chiral nanomaterials according to the optical properties of metal nanoparticles, semiconductor nanocrystals, and nanoclusters. The whole is rounded off by a summary of applications in the field of catalysis, sensors, and biomedicine. With its comprehensive yet concise coverage of the whole spectrum of research, this is invaluable reading for senior researchers and entrants to the field of nanoscience and materials science.

This book includes both fundamental studies and applications in a multidisciplinary research field involving a high diversity of chiral compounds, including commercial substances with industrial applications, pharmaceuticals, and new chiral compounds with promising biological activities.

Surface acoustic wave (SAW) devices are widely used in mobile communications, a rapidly evolving market. This book gives an overview on the latest SAW technologies with an emphasis on the design and simulation of devices, such as resonator-based devices employing the SH-type leaky SAW.

More than 18 million people in the United States have diabetes mellitus, and about 90% of these have the type 2 form of the disease. This book attempts to dissect the complexity of the molecular mechanisms of insulin action with a special emphasis on those features of the system that are subject to alteration in type 2 diabetes and other insulin resistant states. It explores insulin action at the most basic levels, through complex systems.

One of the most important aspects in research fields where mathematics is "applied" is the construction of a formal model of a real system. As for structural relations, graphs have turned out to provide the most appropriate tool for setting up the mathematical model. This is certainly one of the reasons for the rapid expansion in graph theory during the last decades. Furthermore, in recent years it also became clear that the two disciplines of graph theory and computer science have very much in common, and that each one has been capable of assisting significantly in the development of the other. On

one hand, graph theorists have found that many of their problems can be solved by the use of computing techniques, and on the other hand, computer scientists have realized that many of their concepts, with which they have to deal, may be conveniently expressed in the language of graph theory, and that standard results in graph theory are often very relevant to the solution of problems concerning them. As a consequence, a tremendous number of publications has appeared, dealing with graphtheoretical problems from a computational point of view or treating computational problems using graph theoretical concepts.

Completely revised and updated, taking the scientific rigor to a whole new level, the second edition of the Occupational Ergonomics Handbook is now available in two volumes. This new organization demonstrates the enormous amount of advances that have occurred in the field since the publication of the first edition. The second edition not only provides more information but makes it more accessible. Each volume narrows the focus while broadening the coverage, supplying immediate access to important information. One of the most comprehensive sources for ergonomic knowledge available, written by leading experts, providing both sound theory and practical examples, this book is a valuable resource for anyone in the field. *Fundamental and Assessment Tools for Occupational Ergonomics* merges the frontiers of ergonomics, workplace design, and management issues. The editors have brought together researchers from disciplines such as biomechanics, anthropometry, and cognitive science with pioneering practitioners in industry. They discuss tools of the trade, upper extremity analysis, backs, interventions, management issues, design for ergonomics, principles of product design, band-aid approaches, processing, distribution centers, and service systems. The handbook is a compendium of information authored by top-flight investigators who represent the cutting edge of opinion, research, and interest in the field.

The *Manual of Engineering Drawing* has long been recognised as the student and practising engineer's guide to producing engineering drawings that comply with ISO and British Standards. The information in this book is equally applicable to any CAD application or manual drawing. The second edition is fully in line with the requirements of the new British Standard BS8888: 2002, and will help engineers, lecturers and students with the transition to the new standards. BS8888 is fully based on the relevant ISO standards, so this book is also ideal for an international readership. The comprehensive scope of this book encompasses topics including orthographic, isometric and oblique projections, electric and hydraulic diagrams, welding and adhesive symbols, and guidance on tolerancing. Written by a member of the ISO committee and a former college lecturer, the *Manual of Engineering Drawing* combines up-to-the-minute technical accuracy with clear, readable explanations and numerous diagrams. This approach makes this an ideal student text for vocational courses in engineering drawing and undergraduates studying engineering design / product design. Colin Simmons is a member of the BSI and ISO Draughting Committees and an Engineering Standards Consultant. He was formerly Standards Engineer at Lucas CAV. * Fully in line with the latest ISO Standards * A textbook and reference guide for students and engineers involved in design engineering and product design * Written by a former lecturer and a current member of the relevant standards committees

Argues for an interactionist approach to spatial development that incorporates and integrates essential insights of the Piaget, Nativist, and Vygotskian approaches.

An examination of the cognitive tools that the mind uses to grapple with uncertainty in the real world. How do humans navigate uncertainty, continuously making near-effortless decisions and predictions even under conditions of imperfect knowledge, high complexity, and extreme time pressure? *Taming Uncertainty* argues that the human mind has developed tools to grapple with uncertainty. Unlike much previous scholarship in psychology and economics, this approach is rooted in what is known about what real minds can do. Rather than reducing the human response to uncertainty to an act of juggling probabilities, the authors propose that the human cognitive system has specific tools for dealing with different forms of uncertainty. They identify three types of tools: simple heuristics, tools for information search, and tools for harnessing the wisdom of others. This set of strategies for making predictions, inferences, and decisions constitute the mind's adaptive toolbox. The authors show how these three dimensions of human decision making are integrated and they argue that the toolbox, its cognitive foundation, and the environment are in constant flux and subject to developmental change. They demonstrate that each cognitive tool can be analyzed through the concept of ecological rationality—that is, the fit between specific tools and specific environments. Chapters deal with such specific instances of decision making as food choice architecture, intertemporal choice, financial uncertainty, pedestrian navigation, and adolescent behavior.

Collection of the monthly climatological reports of the United States by state or region, with monthly and annual national summaries.

In recent years, advanced molecular techniques in diagnostic microbiology have been revolutionizing the practice of clinical microbiology in the hospital setting. Molecular diagnostic testing in general and nucleic acid-based amplification methods in particular have been heralded as diagnostic tools for the new millennium. This third edition covers not only the most recent updates and advances, but details newly invented omic techniques, such as next generation sequencing. It is divided into two distinct volumes, with Volume 1 describing the techniques, and Volume 2 addressing their applications in the field. In addition, both volumes focus more so on the clinical relevance of the test results generated by these techniques than previous editions.

A must-have resource that covers everything from out-of-equilibrium chemical systems and materials to dissipative self-assemblies *Out-of-Equilibrium Supramolecular Systems and Materials* presents a comprehensive overview of the synthetic approaches that use supramolecular bonds in various out-of-thermodynamic equilibrium situations. With contributions from noted experts on the topic, the text contains information on the design of dissipative self-assemblies that maintain their structures when fueled by an external source of energy. The contributors also examine molecules and nanoscale objects and materials that can produce mechanical work based on molecular machines. Additionally, the book explores non-equilibrium supramolecular polymers that can be trapped in kinetically stable states, as well as out-of-equilibrium chemical systems and oscillators that are important to understand the emergence of complex behaviors and, in particular, the origin of life. This important book: Offers comprehensive coverage of fields from design of dissipative self-assemblies to non-equilibrium supramolecular polymers Presents information on a highly emerging and interdisciplinary topic Includes contributions from internationally renowned scientists

Written for chemists, physical chemists, biochemists, material scientists, Out-of-Equilibrium Supramolecular Systems and Materials is an indispensable resource written by top scientists in the field.

The Perfect Slime presents the latest state of knowledge and all aspects of the Extracellular Polymeric Substances, (EPS) matrix – from the ecological and health to the antifouling perspectives. The book brings together all the current material in order to expand our understanding of the functions, properties and characteristics of the matrix as well as the possibilities to strengthen or weaken it. The EPS matrix represents the immediate environment in which biofilm organisms live. From their point of view, this matrix has paramount advantages. It allows them to stay together for extended periods and form synergistic microconsortia, it retains extracellular enzymes and turns the matrix into an external digestion system and it is a universal recycling yard, it protects them against desiccation, it allows for intense communication and represents a huge genetic archive. They can remodel their matrix, break free and eventually, they can use it as a nutrient source. The EPS matrix can be considered as one of the emergent properties of biofilms and are a major reason for the success of this form of life. Nevertheless, they have been termed the “black matter of biofilms” for good reasons. First of all: the isolation methods define the results. In most cases, only water soluble EPS components are investigated; insoluble ones such as cellulose or amyloids are much less included. In particular in environmental biofilms with many species, it is difficult to impossible isolate, separate the various EPS molecules they are encased in and to define which species produced which EPS. The regulation and the factors which trigger or inhibit EPS production are still very poorly understood. Furthermore: bacteria are not the only microorganisms to produce EPS. Archaea, Fungi and algae can also form EPS. This book investigates the questions, What is their composition, function, dynamics and regulation? What do they all have in common?

[Copyright: ed170cc96abb054186661eb60c2a540a](https://doi.org/10.1002/9781118666154.ch54)