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Penghasilan kitosan daripada kulit ketam dan tulang sotong serta pencirian membran komposit kitosan dengan selulos asetat Bio Monomers for Green Polymeric Composite Materials Chitosan Based Materials and its Applications Membrane Based Methods for Dye Containing Wastewater Modifikasi alang-Alang Sebagai Filler Adsorben Logam Berat **Chitin, Chitosan, Oligosaccharides and Their Derivatives Polysaccharides Polymers for PEM Fuel Cells** *Chitosan-Based Hydrogels* Sustainable Agriculture Reviews 35 **Cross-linked Chitosan-sago Composite Membrane for Direct Methanol Fuel Cell Application** *Integrated Membrane Systems and Processes Membrane Processes* Chitosan for Biomaterials III *Marine Nutraceuticals Engineering and Innovative Materials VI* **Chitin and Chitosan for Regenerative Medicine Biomedical Engineering Organic-Inorganic Composite Polymer Electrolyte Membranes Chitin and Chitosan** *2D Nanomaterials Applications of Engineering Materials* **Novel Biomaterials for Regenerative Medicine Advances in Water-Electrolyte Imbalance Research and Treatment: 2011 Edition Bio- and Nanosorbents from Natural Resources Chitosan for Biomaterials II Chitin and Chitosan** Recent Advances in Biopolymers **Marine Biomaterials** Advances in Chitin/Chitosan Characterization and Applications *Industrial Applications of Renewable Biomass Products* **Pervaporation of Isopropanol-water Using Chitosan - Nay Zeolite Composite Membrane Handbook of Membrane Separations** *3D Printing for Tissue Engineering and Regenerative Medicine Nanotechnology in Membrane Processes 4th International Conference on Nanotechnologies and Biomedical Engineering* **Chitin and Chitosan Comprehensive Membrane Science and Engineering** *Nanomaterials from Renewable Resources for Emerging Applications* **Membrane Modification**

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This volume deals with chemical modification, structure-property relationship, biological interaction and biomedical applications of chitosan and its chemically modified derivatives. The chapters of this volume provide an overview of the structural comparison of chitosan with other sugar-based biopolymers, a different type of strategy used in chemical modification of chitosan to interact with metal ions and to enhance antimicrobial activity. The chapters further discuss the development of functionalized chitosan hydrogels, films, scaffolds and composites that have the potential to be used in food packaging, enhancing saltiness, biosensors and wound dressing. In addition the fabrication and biological properties of chitosan and its derivatives-based nanofibers are presented. Another important aspect covered in this volume is that of the interaction of chitosan with blood, platelet-rich plasma and stem cells. Finally, this volume presents the current challenges in the development of biomedical products based on chitosan and its derivatives. The volume will be of interest to chemists, material science, biological science and biomaterial scientists can able to understand structure-property relationship, biological interaction and biomedical applications of chitosan and its derivatives. Rapid technological developments in the last century have brought the field of biomedical engineering into a totally new realm. Breakthroughs in materials science, imaging, electronics and, more recently, the information age have improved our understanding of the human body. As a result, the field of biomedical engineering is thriving, with innovations that aim to improve the quality and reduce the cost of medical care. This book is the second in a series of three that will present recent trends in biomedical engineering, with a particular focus on materials science in biomedical engineering, including developments in alloys, nanomaterials and polymer technologies. The Handbook of Membrane Separations: Chemical, Pharmaceutical, and Biotechnological Applications provides detailed information on membrane separation technologies as they have evolved over the past decades. To provide a basic understanding of membrane technology, this book documents the developments dealing with these technologies. It explores chemical, pharmaceutical, food processing and biotechnological applications of membrane processes ranging from selective separation to solvent and material recovery. This text also presents in-depth knowledge of membrane separation mechanisms, transport models, membrane permeability computations, membrane types and modules, as well as membrane reactors. 2D nanomaterials have emerged as promising candidates for use in energy devices owing to their superior electrochemical properties, surface area, nanodevice integration, multifunctionality, printability, and mechanical flexibility. 2D Nanomaterials: Chemistry and Properties covers basic

concepts, chemistries, and properties along with theoretical considerations in designing new 2D nanomaterials, especially for energy applications. This book: Discusses the effect of doping, structural variation, phase, and exfoliation on structural and electrochemical properties of 2D nanomaterials Presents synthesis, characterization, and applications of 2D materials for green energy production and storage Explores new aspects of synthesizing 2D nanomaterials beyond traditionally layered structures Examines challenges in using 2D materials for energy applications This book is aimed at materials scientists, chemists, electrochemists, and engineers working in energy disciplines. This book highlights recent findings of membrane - based dye removal methods along with the application of photocatalytic, nanofiltration and ultrafiltration membrane including membrane based fibers, metal-organic frameworks, polyethersulfone, ceramic, etc. Among water and wastewater pollutants, dyes have been normally observed and detected in various aquatic solutions, including rivers and lakes. Aesthetic pollution, toxicity, persistent, and carcinogenicity are some of the adverse effects of dyes entering the ecosystem. Although dyes have brought a colourful world, their presence in the environment are responsible for adverse effects on the planet. Diverse physical, chemical and biological methods are available to treat dye contaminated water. This book presents membrane separation technology that has been developed in the past decade to treat different wastewaters, and owning to its effective performance, has garnered the attention of academia and industry alike. Due to their unique properties, chitosan-based materials have emerged as useful resources in a variety of medicines, drug controlled-release carriers, tissue engineering scaffolds, and immobilized enzymes. But many of these materials have yet to reach the commercial market. Therefore, more work must be completed to fill the gap between research and production. Exploring the state of the field, Chitosan-Based Hydrogels: Functions and Applications details the latest progress in the research and development of chitosan-based biomaterials. The book introduces the formation and chemical structure of chitosan-based hydrogels. It also discusses the relationship between their structure and functions, which provides a theoretical basis for the design of biomaterials. In addition, many real-world examples illustrate the potential application of chitosan-based hydrogels in various areas, including materials science, biotechnology, pharmaceuticals, regenerative medicine, and cell engineering. By examining the structure and functions of chitosan-based hydrogels in living systems, this book provides the foundation for future research. It encourages readers to contribute to further research and development of these unique biomaterials. Nanotechnology has been established in membrane technology for decades. In this book, comprehensive coverage is given to nanotechnology applications in synthetic membrane processes, which are used in different fields such as water treatment, separation of gases, the food industry, military use, drug delivery, air filtration, and green chemistry. Nanomaterials such as carbon nanotubes, nanoparticles, and dendrimers are contributing to the development of more efficient and cost-effective water filtration processes. Gas separation and carbon capture can be significantly improved in flue gas applications. Nanoporous membrane systems engineered to mimic natural filtration systems are being actively developed for use in smart implantable drug delivery systems, bio artificial organs, and other novel nano-enabled medical devices. The microscopic structure of nanoporous ceramic membranes, mainly focusing on zeolite materials, as well as the energy-saving effect of membrane separation, contribute to various chemical synthesis processes. In the food industry, nanotechnology has the potential to create new tools for pathogen detection and packaging. For each application, nanotechnology is mostly used to make composite membranes, and the book provides a detailed look at the mechanisms by which the composite membrane works in each application area. This book consists of the papers that were introduced at the 6th International Conference on Engineering and Innovative Materials (ICEIM 2017, Tokyo, September 3-5, 2017) and we hope that this collection will be interesting and useful for many specialists from the area of materials science in the various branches of production. This book reviews recent research and applications of chitin and chitosan, as natural alternatives

of fossil fuel products, in green chemistry, energy, biotechnology, bioprinting, medicine, water treatment, agriculture and food science. Chitin and chitosan products are polysaccharides derived from food waste of crustaceans and fungi, and thus are cheap, abundant, sustainable, non-toxic, recyclable and biocompatible. The book examines the possibility of integrating different membrane unit operations (microfiltration, ultrafiltration, nanofiltration, reverse osmosis, electrodialysis and gas separation) in the same industrial cycle or in combination with conventional separation systems. It gives careful analysis of the technical aspects, and the possible fields of industrial development. The book reviews many original solutions in water desalination, agro-food productions and wastewater treatments, highlighting the advantages achievable in terms of product quality, compactness, rationalization and optimization of productive cycles, reduction of environmental impact and energy saving. Also included are examples of membrane reactors and their integration with a fuel cell; polymeric membranes in the integrated gasification combined cycle power plants; integrating a membrane reformer into a solar system; and potential application of membrane integrated systems in the fusion reactor fuel cycle. With detailed analysis and broad coverage, the book is divided into two sections: Bio-applications and Inorganic Applications. This multivolume work covers all aspects of membrane science and technology - from basic phenomena to the most advanced applications and future perspectives. Modern membrane engineering is critical to the development of process-intensification strategies and to the stimulation of industrial growth. The work presents researchers and industrial managers with an indispensable tool toward achieving these aims. Covers membrane science theory and economics, as well as applications ranging from chemical purification and natural gas enrichment to potable water Includes contributions and case studies from internationally recognized experts and from up-and-coming researchers working in this multi-billion dollar field Takes a unique, multidisciplinary approach that stimulates research in hybrid technologies for current (and future) life-saving applications (artificial organs, drug delivery) A reference for engineers, scientists, and academics who want to be abreast of the latest industrial separation/treatment technique, this new volume aims at providing a holistic vision on the potential of advanced membrane processes for solving challenging separation problems in industrial applications. Separation processes are challenging steps in any process industry for isolation of products and recycling of reactants. Membrane technology has shown immense potential in separation of liquid and gaseous mixtures, effluent treatment, drinking water purification and solvent recovery. It has found endless popularity and wide acceptance for its small footprint, higher selectivity, scalability, energy saving capability and inherent ease of integration into other unit operations. There are many situations where the target component cannot be separated by distillation, liquid extraction, and evaporation. The different membrane processes such as pervaporation, vapor permeation and membrane distillation could be used for solving such industrial bottlenecks. This book covers the entire array of fundamental aspects, membrane synthesis and applications in the chemical process industries (CPI). It also includes various applications of pervaporation, vapor permeation and membrane distillation in industrially and socially relevant problems including separation of azeotropic mixtures, close-boiling compounds, organic–organic mixtures, effluent treatment along with brackish and seawater desalination, and many others. These processes can also be applied for extraction of small quantities of value-added compounds such as flavors and fragrances and selective removal of hazardous impurities, viz., volatile organic compounds (VOCs) such as vinyl chloride, benzene, ethyl benzene and toluene from industrial effluents. Including case studies, this is a must-have for any process or chemical engineer working in the industry today. Also valuable as a learning tool, students and professors in chemical engineering, chemistry, and process engineering will benefit greatly from the groundbreaking new processes and technologies described in the volume. Including chemical, synthetic, and cross-disciplinary approaches; this book includes the necessary techniques and technologies to help readers better understand polymers for polymer electrolyte membrane

(PEM) fuel cells. The methods in the book are essential to researchers and scientists in the field and will lead to further development in polymer and fuel cell technologies. • Provides complete, essential, and comprehensive overview of polymer applications for PEM fuel cells • Emphasizes state-of-the-art developments and methods, like PEMs for novel fuel cells and polymers for fuel cell catalysts • Includes detailed chapters on major topics, like PEM for direct liquid fuel cells and fluoropolymers and non-fluorinated polymers for PEM • Has relevance to a range of industries – like polymer engineering, materials, and green technology – involved with fuel cell technologies and R&D This book reviews work that covers everything from basic chemistry to advanced applications. Chitin and chitosan are used in a plethora of applications from wastewater treatment to prosthetics. After introducing the subject of polysaccharides as a whole, the authors turn to the preparation of chitin and chitosan and the characterization of the latter. The book provides information on chitin chemistry, extraction of chitin, chitosan preparation processes, and the applications of their derivatives in various fields. Among the applications that are included in detail are the adsorption of heavy metals for pollution prevention and clean-up, biosensors, cosmetics, various medical applications from anti-tumor activity to bone tissue engineering, agriculture and food production, and proton exchange membranes for fuel cells. Chitin and Chitosan features: • information on molecular structure, synthesis, properties, and latest research related to chitin and chitosan; • coverage of a wide range of topics from the properties of chitosan to its derivatives and applications; • in-depth information on biomedical applications of chitin and chitosan; and • information that can be applied to other biopolymer processing engineering areas. This book will be of interest to practitioners working in a wide variety of industries for which chitin and chitosan are useful materials, researchers in biosensors and heavy-metal adsorption, and to academic researchers investigating the properties, preparation, and uses of these materials. Advances in Water-Electrolyte Imbalance Research and Treatment: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Water-Electrolyte Imbalance. The editors have built Advances in Water-Electrolyte Imbalance Research and Treatment: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Water-Electrolyte Imbalance in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Advances in Water-Electrolyte Imbalance Research and Treatment: 2011 Edition has been produced by the world’s leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/. This book contains 10 Chapters divided into three Sections. Section A covers synthesis of biopolymers. Lignocellulosic feedstock contains cellulose, hemicellulose, and lignin, which are used for synthesis of biopolymers. Polymer-coated noble metal nanoparticles are used in nanobiomedicine and fundamental biomaterials. Section B describes applications of biopolymers in biomedical, antimicrobial, industrial, nanotechnology, laser-based thin films, and regenerative medicines. Section C is dedicated for advancement and engineering in biopolymers for personal protective garments, equipments, membrane separation processes, purifications, and new generation of high-performance biomaterials. A new numerical-cum-graphical method called TI2BioP (Topological Indices to BioPolymers) has been developed to estimate topological indices (TIs) from two-dimensional (2D) graphical approaches for the natural biopolymers DNA, RNA, and proteins. This book gathers the proceedings of the 4th International Conference on Nanotechnologies and Biomedical Engineering, held on September 18-21, 2019, in Chisinau, Republic of Moldova. It continues the tradition of the previous conference proceedings, thus reporting on both fundamental and applied research at the interface between nanotechnologies and biomedical engineering. Topics include: developments in bio-micro/nanotechnologies and devices; biomedical signal processing; biomedical imaging;

biomaterials for biomedical applications; biomimetics; bioinformatics and e-health, and advances in a number of related areas. The book offers a timely snapshot of cutting-edge, multidisciplinary research and developments in the field of biomedical and nano-engineering. Functional advanced biopolymers have received far less attention than renewable biomass (cellulose, rubber, etc.) used for energy production. Among the most advanced biopolymers known is chitosan. The term chitosan refers to a family of polysaccharides obtained by partial de-N-acetylation from chitin, one of the most abundant renewable resources in the biosphere. Chitosan has been firmly established as having unique material properties as well as biological activities. Either in its native form or as a chemical derivative, chitosan is amenable to being processed—typically under mild conditions—into soft materials such as hydrogels, colloidal nanoparticles, or nanofibers. Given its multiple biological properties, including biodegradability, antimicrobial effects, gene transfectability, and metal adsorption—to name but a few—chitosan is regarded as a widely versatile building block in various sectors (e.g., agriculture, food, cosmetics, pharmacy) and for various applications (medical devices, metal adsorption, catalysis, etc.). This Special Issue presents an updated account addressing some of the major applications, including also chemical and enzymatic modifications of oligos and polymers. A better understanding of the properties that underpin the use of chitin and chitosan in different fields is key for boosting their more extensive industrial utilization, as well as to aid regulatory agencies in establishing specifications, guidelines, and standards for the different types of products and applications. This book reviews the work in the field of nanoadsorbents derived from natural polymers, with a special emphasis on materials finding application in water remediation. It includes natural materials both with an organic or an inorganic skeleton, from which the nanomaterials can be made. Those nanomaterials can therefore be used to reinforce other matrices and in their pristine form have an extraordinary adsorption efficiency. Being of natural or biological origin, the materials described in this book distinguish themselves as eco-friendly and non-toxic. The book describes how these benefits of the described materials can be combined and exploited. It will thus appeal to chemists, nanotechnologists, environmental engineers and generally all scientist working in the field of water pollution and remediation as an inspiration for the innovation toward new technologies. Presents new and innovative bio-based monomers to replace traditional petrochemical-based building blocks Featuring contributions from top experts in the field, this book discusses new developments in the area of bio monomers and green polymeric composite materials. It covers bio monomers, green polymeric composites, composites from renewable resources, bio-sourced polymers, green composites, biodegradation, processing methods, green polymeric gels, and green polymeric membranes. Each chapter in Bio Monomers for Green Polymeric Composites Materials presents the most recent research and technological ideas in a comprehensive style. It examines bio monomers for green polymer and the processing methods for the bio nanocomposites. It covers the preparation, characterization, and applications of bio-polymeric materials based blends, as well as the applications of biopolymeric gels in medical biotechnology. The book also explores the properties and applications of gelatins, pectins, and carrageenans gels. Additionally, it offers a plethora of information on green polymeric membranes; the bio-degradation of green polymeric composites materials; applications of green polymeric composites materials; hydrogels used for biomedical applications; and the use of natural aerogels as thermal insulations. Introduces readers to the innovative, new bio-based monomers that are taking the place of traditional petrochemical-based building blocks Covers green polymers, green composites, bio-sourced polymers, bio nanocomposites, biodegradable polymers, green polymer gels, and membranes Features input from leading researchers immersed in the area of study Bio Monomers for Green Polymeric Composites Materials is suitable for academics, researchers, scientists, engineers and advanced students in the field of bio monomers and green polymeric composites materials. Polymeric Bionanocomposites as Promising Materials for Controlled Drug, by M. Prabaharan, R. Jayakumar; Chitosan and Chitosan Derivatives in Drug Delivery and Tissue Engineering, by R.

Riva, H. Ragelle, A. des Rieux, N. Duhem, C. Jérôme, and V. Préat; Chitosan: A Promising Biomaterial for Tissue Engineering Scaffolds, by P. K. Dutta, K. Rinki and J. Dutta; Chitosan-Based Biomaterials for Tissue Repair and Regeneration, by X. Liu, L. Ma, Z. Mao and C. Gao; Use of Chitosan as a Bioactive Implant Coating for Bone-Implant Applications, by M. R. Leedy, H. J. Martin, P. A. Norowski, J. A. Jennings, W. O. Haggard, and J.D. Bumgardner; New Techniques for Optimization of Surface Area and Porosity in Nanochitins and Nanochitosans, by R. A. A. Muzzarelli; Production, Properties and Applications of Fungal Cell Wall Polysaccharides: Chitosan and Glucan, by N. New, T. Furuike, and H. Tamura; Nanomaterials from Renewable Resources for Emerging Applications details developments in nanomaterials produced from renewable materials and their usage in food and packaging, energy conservation, and environmental applications. • Introduces fundamentals of nanomaterials from renewable resources, including processing and characterization. • Covers nanomaterials for applications in food and packaging, including nanocellulose, lignin- and chitosan-based nanomaterials, and nanostarch. • Discusses applications in energy conservation, such as supercapacitors, electrolyte membranes, energy storage devices, and insulation. • Describes environmental uses such as water remediation and purification and oil spill clean-ups. • Highlights advantages and challenges in commercialization of green nanoparticle-based materials. Equally beneficial to researchers and professionals, this book is aimed at readers across materials science and engineering, chemical engineering, chemistry, and related fields interested in sustainable engineering. This book effectively links the latest scientific advances to current technological applications of polymers, mainly focusing on biodegradable polymers obtained from biomass. The individual chapters were written by academic and industry researchers alike, introducing readers to topics that have received little attention in the literature to date. Key topics covered include polymers used in various areas such as food packaging, pharmaceuticals, energy production and the cosmetics industry, as well as the treatment of aqueous effluents. Offers a comprehensive guide to the isolation, properties and applications of chitin and chitosan Chitin and Chitosan: Properties and Applications presents a comprehensive review of the isolation, properties and applications of chitin and chitosan. These promising biomaterials have the potential to be broadly applied and there is a growing market for these biopolymers in areas such as medical and pharmaceutical, packaging, agricultural, textile, cosmetics, nanoparticles and more. The authors – noted experts in the field – explore the isolation, characterization and the physical and chemical properties of chitin and chitosan. They also examine their properties such as hydrogels, immunomodulation and biotechnology, antimicrobial activity and chemical enzymatic modifications. The book offers an analysis of the myriad medical and pharmaceutical applications as well as a review of applications in other areas. In addition, the authors discuss regulations, markets and perspectives for the use of chitin and chitosan. This important book: Offers a thorough review of the isolation, properties and applications of chitin and chitosan. Contains information on the wide-ranging applications and growing market demand for chitin and chitosan Includes a discussion of current regulations and the outlook for the future Written for Researchers in academia and industry who are working in the fields of chitin and chitosan, Chitin and Chitosan: Properties and Applications offers a review of these promising biomaterials that have great potential due to their material properties and biological functionalities. This book covers the subject areas of new functional materials, building materials, new energy materials, environmental catalysis and environment-friendly materials, earthquake-resistant structures, materials and design, biomaterials, chemical materials, thin films, hydrogen and fuel cell science, engineering and technology, textile materials, smart/intelligent materials/intelligent systems and other related topics. An invaluable guide to the topics. Biopolymers found in marine animals and plants offer tremendous, largely untapped pharmaceutical potential. Research shows that these biopolymers can be used to combat various infectious as well as inflammatory, oxidative, and carcinogenic factors. Chitin, Chitosan, Oligosaccharides and Their Derivatives: Biological Activities and

Applications cove This volume explores the latest developments in the area of polymer electrolyte membranes (PEMs) used for high-temperature fuel cells. Featuring contributions from an international array of researchers, it presents a unified viewpoint on the operating principles of fuel cells, various methodologies used for the fabrication of PEMs, and issues related to the chemical and mechanical stabilities of the membranes. Special attention is given to the fabrication of electrospun nanocomposite membranes. The editors have consciously placed an emphasis on developments in the area of fast-growing and promising PEM materials obtained via hygroscopic inorganic fillers, solid proton conductors, heterocyclic solvents, ionic liquids, anhydrous H3PO4 blends, and heteropolyacids. This book is intended for fuel cell researchers and students who are interested in a deeper understanding of the organic–inorganic membranes used in fuel cells, membrane fabrication methodologies, properties and clean energy applications. Oceans are an abundant source of diverse biomaterials with potential for an array of uses. Marine Biomaterials: Characterization, Isolation and Applications brings together the wide range of research in this important area, including the latest developments and applications, from preliminary research to clinical trials. The book is divided into four parts, with chapters written by experts from around the world. Biomaterials described come from a variety of marine sources, such as fish, algae, microorganisms, crustaceans, and mollusks. Part I covers the isolation and characterization of marine biomaterials—bioceramics, biopolymers, fatty acids, toxins and pigments, nanoparticles, and adhesive materials. It also describes problems that may be encountered in the process as well as possible solutions. Part II looks at biological activities of marine biomaterials, including polysaccharides, biotoxins, and peptides. Chapters examine health benefits of the biomaterials, such as antiviral activity, antidiabetic properties, anticoagulant and anti-allergic effects, and more. Part III discusses biomedical applications of marine biomaterials, including nanocomposites, and describes applications of various materials in tissue engineering and drug delivery. Part IV explores commercialization of marine-derived biomaterials—marine polysaccharides and marine enzymes—and examines industry perspectives and applications. This book covers the key aspects of available marine biomaterials for biological and biomedical applications, and presents techniques that can be used for future isolation of novel materials from marine sources. This volume presents 10 reviews contributed by eminent researchers around the world on chitosan based materials. The introductory chapters present information on general characteristics of chitosan and various types of materials which are based on it such as nanofibers, nanoparticles, nanocapsules and other chemically modified chitosans. This is followed by an explanation of chitosan characterization and extraction techniques. Concluding chapters describe the applications of chitosan products in water treatment, drug delivery, edible films and pervaporation membranes. Readers will therefore gain an understanding about chitosan and materials derived from this polymer and their practical applications. The volume serves as a simple reference for chemical engineering students and professionals interested in the basic and applied chemistry of chitosan and chitosan-derived products. Membrane Modification: Technology and Applications is written for engineers, scientists, graduate students, and researchers in the field of membrane science and technology, materials science, applied physics, chemistry, and environmental science. The book presents the complete range of membrane modification techniques used to increase efficiency of membrane processes. The book starts with an examination of the use of membrane modification to optimize the performance of membranes used in industry. It concludes by demonstrating how membrane modification can improve separation processes in industrial sectors that are recognized as global polluters of water sources. Features Illustrates the use of Electrochemical Impedance Spectroscopy (EIS) in the characterization of commercial and novel membranes Overviews various surface modification techniques applied to enhance the bulk and surface properties of nanofiber membranes Covers the factors affecting membrane fouling and the use of nanoparticles in membrane modification processes Explores the use of plasma treatment for the

modification of polymeric membranes Written by professors, engineers, and researchers in the field, the book covers recent advances and comprehensively describes novel and most-used membrane characterization techniques. Modification of different materials and geometrics include flat-sheet, hollow-fiber, and nano-fiber membranes as well as different membrane processes such as reverse osmosis, membrane distillation, gas separation, pervaporation, and membrane fuel cells. Chapters contain tables, figures, photographs, and theoretical equations to aid with reader comprehension. Three-dimensional (3D) printing enables the fabrication of tissue-engineered constructs and devices from a patient's own medical data, leading to the creation of anatomically matched and patient-specific constructs. There is a growing interest in applying 3D printing technologies in the fields of tissue engineering and regenerative medicine. The main printing methods include extrusion-based, vat photopolymerization, droplet-based, and powder-based printing. A variety of materials have been used for printing, from metal alloys and ceramics to polymers and elastomers as well as from hydrogels to extracellular matrix proteins. More recently, bioprinting, a subcategory of 3D printing, has enabled the precise assembly of cell-laden biomaterials (i.e., bioinks) for the construction of complex 3D functional living tissues or artificial organs. In this Special Issue, we aim to capture state-of-the-art research papers and the most current review papers focusing on 3D printing for tissue engineering and regenerative medicine. In particular, we seek novel studies on the development of 3D printing and bioprinting approaches, developing printable materials (inks and bioinks), and utilizing 3D-printed scaffolds for tissue engineering and regenerative medicine applications. These applications are not limited to but include scaffolds for in vivo tissue regeneration and tissue analogues for in vitro disease modeling and/or drug screening. Completely revised and expanded to reflect the latest advancements in the field, Polysaccharides: Structural Diversity and Functional Versatility, Second Edition outlines fundamental concepts in the structure, function, chemistry, and stability of polysaccharides and reveals new analytical techniques and applications currently impacting the cosmetic, medicinal, chemical, and biochemical industries. The authoritative book discusses polysaccharides utilized in medical applications such as polysaccharide-based hydrogels, polysialic acids, proteoglycans, glycolipids, and anticoagulant polysaccharides; renewable resources for the production of various industrial chemicals and engineering plastics polysaccharides; and more. Chitin and Chitosan - Physicochemical Properties and Industrial Applications provides an overview of the extraction, modification, characterization, and application of chitin and chitosan derivatives from crustacean byproducts and their physicochemical properties. It presents and explains important studies and develops new and innovative methods of biological and physicochemical analysis in the fields of organic and mineral environmental pollution, corrosion inhibitors, drug delivery systems, superabsorbent materials, nanotechnology, textiles, biotechnology, and biomedical sciences. This book explores in depth a wide range of new biomaterials that hold great promise for applications in regenerative medicine. The opening two sections are devoted to biomaterials designed to direct stem cell fate and regulate signaling pathways. Diverse novel functional biomaterials, including injectable nanocomposite hydrogels, electrosprayed nanoparticles, and waterborne polyurethane-based materials, are then discussed. The fourth section focuses on inorganic biomaterials, such as nanobioceramics, hydroxyapatite, and titanium dioxide. Finally, up-to-date information is provided on a wide range of smart natural biomaterials, ranging from silk fibroin-based scaffolds and collagen type I to chitosan, mussel-inspired biomaterials, and natural polymeric scaffolds. This is one of two books to be based on contributions from leading experts that were delivered at the 2018 Asia University Symposium on Biomedical Engineering in Seoul, Korea – the companion book examines in depth the latest enabling technologies for regenerative medicine. Mengingat bahaya yang dapat ditimbulkan oleh logam berat, banyak metode -metode baru yang murah, efektif, dan efisien yang dikembangkan untuk menurunkan kadar logam berat dalam air antara lain pengendapan kimia, filtrasi mekanik, penukar ion, elektrodeposisi, oksidasi reduksi, sistem membran, dan adsorpsi fisik (Herwanto dan Eko,

2006). Proses adsorpsi lebih banyak dipakai dalam industri karena lebih ekonomis dan tidak menimbulkan efek samping yang beracun. Adsorpsi adalah proses akumulasi adsorbat pada permukaan adsorben yang disebabkan oleh gaya tarik antar molekul adsorbat dengan permukaan adsorben (Setyaningtyas, 2005 dalam Nurhasni, 2012). There is a great deal of consumer interest in natural bioactive substances due to their health benefits. Offering the potential to provide valuable nutraceuticals and functional food ingredients, marine-derived compounds are an abundant source of nutritionally and pharmacologically active agents, with both chemical diversity and complexity. Functio The book is an excellent reference for scientists, researchers and students working in the field of areas of biopolymeric biomaterials, biomedical engineering, therapeutics, tissue engineering and regenerative medicine. The book is divided into two parts: Part I will focus on the tissue engineering and Part II focuses on therapeutics, functionalization and computer-aided techniques. The book consists of 13 chapters contributed by 20 international contributors who are leading experts in the field of biopolymers and its applications. It will focus on the advancements of chitin and chitosan in regenerative medicine. Regenerative medicine in tissue engineering is the process of replacing or regenerating human cells, tissues, or organs to restore or establish normal function. It is an incredibly progressive field of medicine that may, in the near future, help with the shortage of life-saving organs available through donation for transplantation vis-a-vis regenerative medicine focuses on therapeutics, functionalization and computer-aided techniques. It also covers physical and chemical aspects of chitin and chitosan, structural modifications for biomedical applications, chitosan based scaffolds and biomodelling in tissue engineering, nanomedicines and therapeutic applications. With the broad range of applications, the world is waiting for biopolymers to serve as the basis for regenerative medicine and biomedical applications.