

Charged & Reactive Polymers

Volume 3

Charged Gels and Membranes

Part I

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co-editors **G. Boyd and H. P. Gregor**



Charged Gels And Membranes

E. Séléigny



Charged Gels And Membranes:

Charged Gels and Membranes Eric Sélégny,1976 **Charged Gels and Membranes** E. Sélégny,1976-10-31 The series on Charged and Reactive Polymers was set forth in two volumes concerning the fundamentals and applications of polyelectrolytes A follow up on Charged Gels and Membranes would therefore seem appropriate necessitating however some explanation for non specialists Theories of the most dilute gels originate in that of concentrated polyelectrolytes the methods and problems are similar in structural spectroscopic or thermodynamic properties The borderline can be situated in dialysis conducted with a bag impermeable to polyelectrolytes but not to small ions solutes and water One may recall Donnan's use of such a system to experiment and discover his famous law of unequal distribution of ions of different charge inside and out Remarkably so it is the difference in scale which characterizes the difference between polyelectrolyte solutions and gels and membranes the colloidal solution of macromolecules is heterogeneous only on the microscopic level whereas the gel solution system is a macroscopically heterogeneous one A gel is formed when weak or strong cohesive forces counterbalance the dispersing ones usually by crosslinking without inhibiting the penetration of solvent and of small solutes into the polymeric network The solvophile macromolecules cannot invade the total volume of liquid As a result of phase segregation excess solution and gel coexist and interact The macroscopic swelling depends on gel cross linking as well as on ionic concentration and type and ion selectivities are observed Charged Gels and Membranes E. Sélégny,2012-12-06 The series on Charged and Reactive Polymers was set forth in two volumes concerning the fundamentals and applications of polyelectrolytes A follow up on Charged Gels and Membranes would therefore seem appropriate necessitating however some explanation for non specialists Theories of the most dilute gels originate in that of concentrated polyelectrolytes the methods and problems are similar in structural spectroscopic or thermodynamic properties The borderline can be situated in dialysis conducted with a bag impermeable to polyelectrolytes but not to small ions solutes and water One may recall Donnan's use of such a system to experiment and discover his famous law of unequal distribution of ions of different charge inside and out Remarkably so it is the difference in scale which characterizes the difference between polyelectrolyte solutions and gels and membranes the colloidal solution of macromolecules is heterogeneous only on the microscopic level whereas the gel solution system is a macroscopically heterogeneous one A gel is formed when weak or strong cohesive forces counterbalance the dispersing ones usually by crosslinking without inhibiting the penetration of solvent and of small solutes into the polymeric network The solvophile macromolecules cannot invade the total volume of liquid As a result of phase segregation excess solution and gel coexist and interact The macroscopic swelling depends on gel cross linking as well as on ionic concentration and type and ion selectivities are observed **Charged Gels and Membranes** Eric Selegny,1976 **Membrane Technologies and Applications** Kaustubha Mohanty,Mihir K. Purkait,2011-12-19 Membrane technologies play an increasingly important role in unit operations for resource recovery pollution prevention and energy production as well as environmental monitoring and

quality control They are also key component technologies of fuel cells and bioseparation applications Membrane Technologies and Applications provides essential data and background information on various dimensions of membrane technologies with a major focus on their practical application Membranes of inorganic materials offer cost effective solutions for simple to complex separation problems This book is designed for anyone interested in water and wastewater treatment membrane suppliers as well as students and academics studying the field

Charged and Reactive Polymers, Volume 3: Charged Gels and Membranes E. Sélégny, 1976 Charged Gels and Membranes E. Sélégny, 2014-01-14 The introduction to the first of these two volumes on Charged Gels and Membranes has recalled already that both were issued from the second Advanced Study Institute of Forges les Eaux of which the co directors were Professors G E Boyd and K S Spiegler However it seems necessary to add some further remarks for the eventual readers of this one volume only or for those of all four which now constitute the series One discovers that each volume is precisely linked to the next and the total contains a large number of the very fundamental steps by which macromolecular physical chemistry finds itself simultaneously at the frontiers of application and of biology One often wonders how this is possible Research has been the best means of understanding the microscopic elements of life Biomimetic phenomena or bioanalogue compounds in their turn have led to innumerable practical realisations On one hand the notion of vital force receded and is disappearing due to repetitive total and asymmetric synthesis of always larger and more complex biological molecules On the other hand discoveries of interrelations in physical chemistry disengage the analogies between living and non living systems the interrelations between phenomena between phenomena and structures or the appearance of these structures under the influence of intermolecular forces or of gradients of more statistical forces

Electrically Conductive Membrane Materials and Systems Farah Ahmed, Raed Hashaikeh, Nidal Hilal, 2023-05-04 *Electrically Conductive Membrane Materials and Systems* offers in depth insight into the transformative role of electrically conductive materials in membrane separation processes for desalination and water treatment The book focuses on the intelligent design of conductive membranes and systems fouling and related phenomena fouling control using electrically conductive materials and electrically tunable membrane systems for microfiltration ultrafiltration nanofiltration reverse osmosis and membrane distillation With rising concerns around inaccessibility to freshwater and the ever increasing threats of population growth climate change and urban development the book brings electrically conducting materials to the forefront of membrane separation technology with an emphasis on their role in the mitigation of fouling and related phenomena Electrically conducting materials expand the versatility of membrane technology and ultimately improve access to safe water The book is important reading for scientists engineers entrepreneurs and enthusiasts from the water industry who seek to familiarize themselves with a groundbreaking area of study within modern desalination and water treatment Explores novel membrane materials and systems from preparation methods materials selection and their application in monitoring fouling control and performance enhancement Examines the

mechanism of fouling prevention and cleaning in various electrically conductive materials Evaluates the scalability of antifouling materials and coatings as well as electrically enhanced processes for monitoring and control in membrane separation technology Assesses advantages and limitations of applying electrically conductive membrane systems to fouling control for specific water treatment applications Provides a critical review of scientific literature in the specialized area of electrical conductive materials and systems for membrane technology

Thermal Biophysics of Membranes Thomas Heimburg, 2008-02-08 An overview of recent experimental and theoretical developments in the field of the physics of membranes including new insights from the past decade The author uses classical thermal physics and physical chemistry to explain our current understanding of the membrane He looks at domain and raft formation and discusses it in the context of thermal fluctuations that express themselves in heat capacity and elastic constants Further topics are lipid protein interactions protein binding and the effect of sterols and anesthetics Many seemingly unrelated properties of membranes are shown to be intimately intertwined leading for instance to a coupling between membrane state domain formation and vesicular shape This also applies to non equilibrium phenomena like the propagation of density pulses during nerve activity Also included is a discussion of the application of computer simulations on membranes For both students and researchers of biophysics biochemistry physical chemistry and soft matter physics

Membrane Separation Processes Patrick Meares, 1976

Cleaning and Sanitizing of Spiral-wound Polysulfone Ultrafiltration Membranes Karen Elaine Smith, 1990

Pulsed and Self-Regulated Drug Delivery Joseph Kost, 1990-05-09 This work focuses on several approaches to modulated control release systems including polymers responding to external stimuli pH glucose concentration polymer drug magnetic and ultrasonic systems This book is aimed at the next generation of drug delivery systems pumps that can be activated to provide different rates polymers responding to pH stimuli non erodible polymers containing enzymes that cause the polymer to swell and regulate the rate of delivery in response to external stimuli lectin drug systems that release additional drug due to the affinity of an external molecule for the lectin and release of vesicle entrapped substances in response to changes in environmental conditions This reference shows that drug delivery patterns can be further optimized by pulse or self regulated delivery adjusted to the staging of biological rhythms Written in a systematic format this book is a useful resource for those involved with pharmaceutical sciences biomedical materials research chemistry macromolecules and chemical engineering

Journal of Polymer Science, 1976

Smart Polymers Igor Galaev, Bo Mattiasson, 2007-07-25 The first book to tackle the application of smart polymers in bioseparation and bioprocessing Smart Polymers Applications in Biotechnology and Biomedicine broke new ground in this challenging field Completely revised updated and following in the footsteps of its predecessor the second edition is poised to take its place as a premier reference

Journal of the Royal Society of Arts Royal Society of Arts (Great Britain), 1924

Diagnostic Molecular Biology Chang-Hui Shen, 2023-06-29

Diagnostic Molecular Biology Second Edition describes the fundamentals of molecular biology in a clear concise manner with

each technique explained within its conceptual framework and current applications of clinical laboratory techniques comprehensively covered This targeted approach covers the principles of molecular biology including basic knowledge of nucleic acids proteins and chromosomes the basic techniques and instrumentations commonly used in the field of molecular biology including detailed procedures and explanations and the applications of the principles and techniques currently employed in the clinical laboratory Topics such as whole exome sequencing whole genome sequencing RNA seq and ChIP seq round out the discussion Fully updated this new edition adds recent advances in the detection of respiratory virus infections in humans like influenza RSV hAdV hRV but also corona This book expands the discussion on NGS application and its role in future precision medicine Provides explanations on how techniques are used to diagnosis at the molecular level Explains how to use information technology to communicate and assess results in the lab Enhances our understanding of fundamental molecular biology and places techniques in context Places protocols into context with practical applications Includes extra chapters on respiratory viruses Corona

Polymers: Biomaterials and Medical Applications Jacqueline I. Kroschwitz, 1989-07-25 Comprises all of the original complete articles related to biomedical applications of polymers found in the 19 volume Encyclopedia of Polymer Science and Engineering Articles provide detailed information on properties uses and methods of manufacture of polymers with biomedical applications There are approximately 20 main entries averaging 12 000 words in length prepared by 30 leading authorities from industry academia and research laboratories Coverage includes drug delivery systems prosthetic devices contact lenses medical packaging dental applications skin replacement and more all supported by standards and specifications for materials *Annual Meeting Kōbunshi Gakkai (Japan)*, 1991 **Chemical Abstracts** ,1914 **Bulletin of the Chemical Society of Japan** Nihon Kagakkai, 2000

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