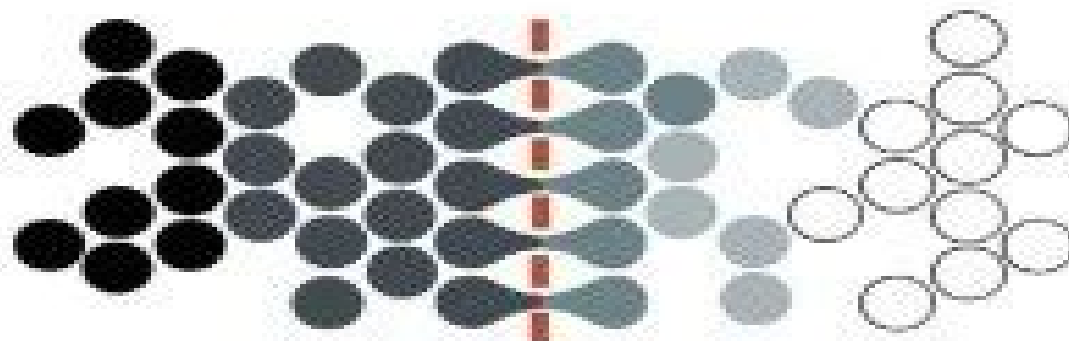




**Membrane Science and
Technology Series, 10**



**NANO AND MICRO ENGINEERED
MEMBRANE TECHNOLOGY**

C.J.M. van Rijn

Nano And Micro Engineered Membrane Technology

CJM van Rijn



Nano And Micro Engineered Membrane Technology:

Nano and Micro Engineered Membrane Technology CJM van Rijn, 2004-02-05 Nano and Micro Engineered Membrane Technology is about Nano and micro engineered membrane technology an emerging new technological area in membrane technology Potential applications cover a broad spectrum of science such as micro and nano filtration gas separation optics and nanophotonics catalysis microbiology controlled drug delivery nanopatterning micro contact printing atomisation cross flow emulsification etc A brief overview of filtration membranes and pore structures is presented in chapter 1 and in the subsequent chapter 2 an overview is presented of conventional micro perforation methods like laser drilling electroforming precision etching etc With micro engineering techniques chapter 3 originating from the semiconductor industry it is relatively easy to downscale and form submicron pores down to 100 nm using photolithographic methods with e g contact masks and wafer steppers In chapter 4 some elementary fluid mechanics related to fluid flow in conduits and single and multiple orifices is presented covering analytical methods as well as computational fluid dynamics Much effort has been put in strength and maximum pressure load analysis chapter 5 of perforated and unperforated membranes New analytical expressions were obtained that were verified by a number of computer simulations and many experiments A separate chapter chapter 6 has been devoted to the pioneering work of manufacturing polymeric perforated membranes because of its potential future economical impact Large scale microfiltration applications on e g skim milk and lager beer are presented in chapter 7 whereas in chapter 8 a micro scale Lab on a Chip microfiltration fractionation demonstrator is discussed Nanotechnology and nano engineered membranes is the fascinating topic of chapter 9 with typical examples as nanopatterning nanophotonics and nanomembrane technology This book closes with novel pioneering applications on atomization chapter 10 for deep pulmonary inhale and cross flow emulsification chapter 11 for the manufacturing of e g functional foods and nano micro emulsions Overview on the implementation of nano and micro engineering techniques in membrane science which is an upcoming new cross road technology Demonstration of feasibility with respect to micro and nano filtration gas separation photonic structures catalysis microbiology controlled drug delivery nanopatterning micro contact printing atomisation and emulsification techniques Informative introductions with rules of thumb for fluid flow in micro channels pressure strength of thin supported perforated and unperforated membranes silicon micro machining techniques membrane filtration technology Rayleigh breakup and cross flow emulsification *Nano and Micro Engineered Membrane Technology* Cornelis Johannes Maria Rijn, 2002 **Handbook of Membrane Separations** Anil Kumar Pabby, Syed S.H. Rizvi, Ana Maria Sastre Requena, 2008-07-07 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 **Modeling Food Processing Operations** Serafim Bakalis, Kai

Knoerzer, Peter J Fryer, 2015-04-28 Computational modeling is an important tool for understanding and improving food processing and manufacturing It is used for many different purposes including process design and process optimization However modeling goes beyond the process and can include applications to understand and optimize food storage and the food supply chain and to perform a life cycle analysis Modeling Food Processing Operations provides a comprehensive overview of the various applications of modeling in conventional food processing The needs of industry current practices and state of the art technologies are examined and case studies are provided Part One provides an introduction to the topic with a particular focus on modeling and simulation strategies in food processing operations Part Two reviews the modeling of various food processes involving heating and cooling These processes include thermal inactivation sterilization and pasteurization drying baking frying and chilled and frozen food processing storage and display Part Three examines the modeling of multiphase unit operations such as membrane separation extrusion processes and food digestion and reviews models used to optimize food distribution Comprehensively reviews the various applications of modeling in conventional food processing Examines the modeling of multiphase unit operations and various food processes involving heating and cooling Analyzes the models used to optimize food distribution *Innovation in agri-food systems* W.M.F. Jongen, M.T.G. Meulenber

berg, 2023-09-04 This is a fully rewritten and extended version of the successful first edition of a textbook which focuses on consumer driven food product innovation using a systems oriented approach It integrates marketing and consumer sciences with technological aspects such as processing logistics and information technology and presents an integrated view of how new food product development is to be situated in a chain oriented approach Attention is also paid to the impact of changes in the environment of the agri food system on food innovation such as the changing consumer the growing concern about food safety and new insights in human nutrition Topics covered include changing markets consumer perception of product quality quality function deployment the use of new and improved technology in food production logistics and information technology the role of regulation and legislation quality management and control systems such as HACCP and TQM The chapters of the first edition have been updated and extended New chapters have been added on consumer behaviour corporate strategy food safety and nutritional aspects of food innovation Researchers and professionals in the food industry as well as students of food science food technology and management will find this publication provides valuable information on the latest developments in the product innovation by agri food systems **Encapsulation and**

Controlled Release Technologies in Food Systems Dr Jamileh M. Lakkis, 2016-02-11 The emergence of the discipline of encapsulation and controlled release has had a great impact on the food and dietary supplements sectors principally around fortifying food systems with nutrients and health promoting ingredients The successful incorporation of these actives in food formulations depends on preserving their stability and bioavailability as well as masking undesirable flavors throughout processing shelf life and consumption This second edition of Encapsulation and Controlled Release Technologies in Food

Systems serves as an improvement and a complement companion to the first. However it differentiates itself in two main aspects. Firstly it introduces the reader to novel encapsulation and controlled release technologies which have not yet been addressed by any existing book on this matter and secondly it offers an in depth discussion on the impact of encapsulation and controlled release technologies on the bioavailability of health ingredients and other actives. In common with the first edition the book includes chapters written by distinguished authors and researchers in their respective areas of specialization. This book is designed as a reference for scientists and formulators in the food, nutraceuticals and consumer products industries who are looking to formulate new or existing products using microencapsulated ingredients. It is also a post graduate text designed to provide students with an introduction to encapsulation and controlled release along with detailed coverage of various encapsulation technologies and their adaptability to specific applications.

Drinking Water Disinfection Techniques Jyoti Kishen Kumar, Aniruddha Bhalchandra Pandit, 2012-12-13 Water is our natural heritage, our miracle of life. However, our increasingly technological society has become indifferent to water. Far from being pure, modern drinking water around the world contains many undesirable chemical and bacterial contaminants. The existing techniques employed for the disinfection of water are either energy intensive or *Extracellular Vesicles in Health and Disease* Paul Harrison, Chris Gardiner, Ian L. Sargent, 2014-05-02 Interest in the role of extracellular vesicles, microvesicles and exosomes is expanding rapidly. It is now apparent that far from being merely cellular debris, these vesicles play a key role in cell to cell communication and signaling. Moreover, they are significantly elevated in a number of diseases. This raises the question of their direct role.

Sustainable Industrial Chemistry Fabrizio Cavani, Gabriele Centi, Siglinda Perathoner, Ferruccio Trifirò, 2009-09-22 In recent years the need for sustainable process design and alternative reaction routes to reduce industry's impact on the environment has gained vital importance. The book begins with a general overview of new trends in designing industrial chemical processes which are environmentally friendly and economically feasible. Specific examples written by experts from industry cover the possibilities of running industrial chemical processes in a sustainable manner and provide an up to date insight into the main concerns, e.g. the use of renewable raw materials, the use of alternative energy sources in chemical processes, the design of intrinsically safe processes, microreactor and integrated reaction separation technologies, process intensification, waste reduction, new catalytic routes and/or solvent and process optimization.

The 15th International Conference on Biomedical Engineering James Goh, 2013-11-18 This volume presents the processing of the 15th ICMBE held from 4th to 7th December 2013, Singapore. Biomedical engineering is applied in most aspects of our healthcare ecosystem. From electronic health records to diagnostic tools to therapeutic, rehabilitative and regenerative treatments, the work of biomedical engineers is evident. Biomedical engineers work at the intersection of engineering, life sciences and healthcare. The engineers would use principles from applied science including mechanical, electrical, chemical and computer engineering together with physical sciences including physics, chemistry and mathematics to apply them to

biology and medicine Applying such concepts to the human body is very much the same concepts that go into building and programming a machine The goal is to better understand replace or fix a target system to ultimately improve the quality of healthcare With this understanding the conference proceedings offer a single platform for individuals and organizations working in the biomedical engineering related field to gather and network with each other in so doing create the catalyst for future development of biomedical engineering in Asia

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