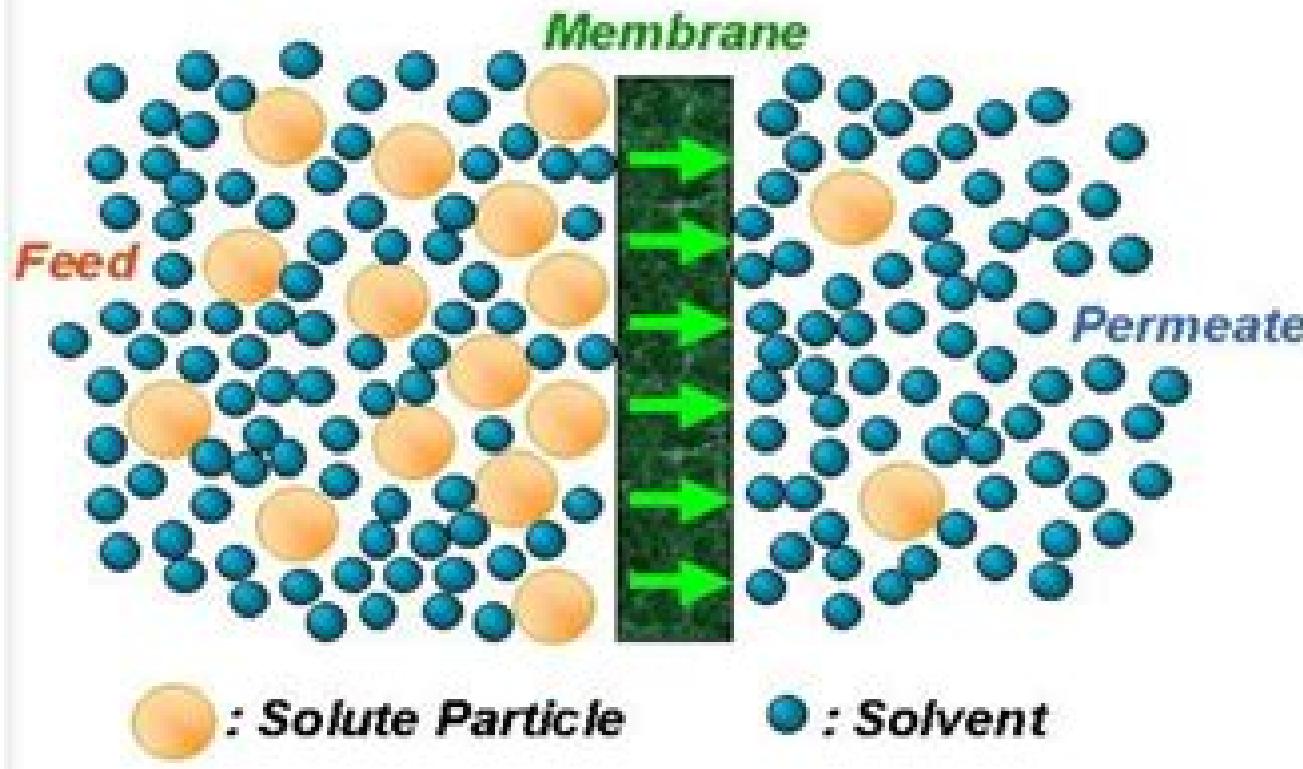


# Membrane Separation Processes



# New Membrane Materials And Processes For Separation

**Yuri Yampolskii, E. Flinkelshtein**

## **New Membrane Materials And Processes For Separation:**

**New Membrane Materials and Processes for Separation** Kamalesh K. Sirkar,Douglas R. Lloyd,1988      New Membrane Materials and Processes for Separation American Institute of Chemical Engineers. Summer National Meeting (1987 : Minneapolis, Minn.),1988      **Membrane Materials for Gas and Separation** Yuri Yampolskii,E.

FIInkelshtein,2017-01-10 Si containing polymers have been instrumental in the development of membrane gas separation practices since the early 1970s Their function is to provide a selective barrier for different molecular species where selection takes place either on the basis of size or on the basis of physical interactions or both Combines membrane science organosilicon chemistry polymer science materials science and physical chemistry Only book to consider polymerization chemistry and synthesis of Si containing polymers both glassy and rubbery and their role as membrane materials Membrane operations present environmental benefits such as reduced waste and recovered recycled valuable raw materials that are currently lost to fuel or to flares

## **Petrochemical Catalyst Materials, Processes, and Emerging Technologies**

Al-Megren, Hamid,Xiao, Tiancun,2016-02-17 Technological advancements are leading the way for innovation within the petrochemical industry New materials discovery and application process modification and automation and market and demand changes are just a few of the many changes occurring as a result of technology innovation and integration Petrochemical Catalyst Materials Processes and Emerging Technologies addresses the latest research on emerging technological applications catalyst materials for fuel upgrading in addition to safety concerns and considerations within the petrochemical industry Emphasizing critical research and emerging developments in the field this publication is an essential resource for engineers researchers and graduate level engineering students in the fields of chemical and petroleum engineering

## **Basic Equations of Mass Transport Through a Membrane Layer** Endre Nagy,2018-11-05

Basic Equations of Mass Transport Through a Membrane Layer Second Edition has been fully updated to deliver the latest research in the field This volume covers the essentials of compound separation product removal concentration and production in the chemical biochemical pharmaceutical and food industries It outlines the various membrane processes and their applications offering a detailed mathematical description of mass transport and defining basic mass transport and concentration distribution expressions Additionally this book discusses the process parameters and application of the expressions developed for a variety of industrial applications Comprehensive explanations of convective diffusive mass transport are provided both with and without polarization layers that help predict and process performance and facilitate improvements to operation conditions and efficiency Basic Equations of Mass Transport Through a Membrane Layer is an ideal resource for engineers and technologists in the chemical biochemical and pharmaceutical industries as well as researchers professors and students in these areas at both an undergraduate and graduate level Cites and analyzes mass transport equations developed for different membrane processes Examines the effect of biochemical chemical reactions in

the presence of convective and diffusive flows in plane and cylindrical spaces Defines the mass transfer rate for first and zero order reactions and analytical approaches are given for other order reactions in closed mathematical forms Analyzes the simultaneous convective and diffusive transports with same or different directions **Membrane Separations Technology** R.D. Noble,S.A. Stern,1995-01-17 The field of membrane separation technology is presently in a state of rapid growth and innovation Many different membrane separation processes have been developed during the past half century and new processes are constantly emerging from academic industrial and governmental laboratories While new membrane separation processes are being conceived with remarkable frequency existing processes are also being constantly improved in order to enhance their economic competitiveness Significant improvements are currently being made in many aspects of membrane separation technology in the development of new membrane materials with higher selectivity and or permeability in the fabrication methods for high flux asymmetric or composite membranes in membrane module construction and in process design Membrane separation technology is presently being used in an impressive variety of applications and has generated businesses totalling over one billion U S dollars annually The main objective of this book is to present the principles and applications of a variety of membrane separation processes from the unique perspectives of investigators who have made important contributions to their fields Another objective is to provide the reader with an authoritative resource on various aspects of this rapidly growing technology The text can be used by someone who wishes to learn about a general area of application as well as by the knowledgeable person seeking more detailed information **Membrane Processes in**

**Separation and Purification** J.G. Crespo,Karl W. Böddeker,2013-11-11 The chapters of this book are based upon lectures presented at the NATO Advanced Study Institute on Membrane Processes in Separation and Purification March 21 April 2 1993 Curia Portugal organized as a successor and update to a similar Institute that took place 10 years ago p M Bungay H K Lonsdale M N de Pinho Eds Synthetic Membranes Science Engineering and Applications NATO ASI Series Reidel Dordrecht 1986 The decade between the two NATO Institutes witnesses the transition from individually researched membrane processes to an applied and established membrane separation technology as is reflected by the contents of the corresponding proceeding volumes By and large the first volume presents itself as a textbook on membrane processes still valid while the present volume focuses on areas of separation need as amenable to membrane processing Biotechnology and Environmental Technology Accordingly the contributions to this volume are grouped into Membranes in Biotechnology 11 papers Membranes in Environmental Technology 6 papers and New Concepts 4 papers This is followed by one contribution each on Energy Requirements and Education i e membrane processes within an academic curriculum The book thus amounts to a state of the art of applied membrane processing and may well augment the more fundamental approach of its predecessor

**Membrane Contactor Technology** Mohammad Younas,Mashallah Rezakazemi,2022-04-18 An eye opening exploration of membrane contactors from a group of industry leaders In Membrane Contactor Technology Water Treatment Food

Processing Gas Separation and Carbon Capture an expert team of researchers delivers an up to date and insightful explanation of membrane contactor technology including transport phenomena design aspects and diverse process applications The book also includes explorations of membrane synthesis process and module design as well as rarely discussed process modeling and simulation techniques The authors discuss the technical and economic aspects of this increasingly important technology and examine the geometry flow energy and mass transport and design aspects of membrane contactor modules They also cover a wide range of application opportunities for this technology from the materials sciences to process engineering Membrane Contactor Technology also includes A thorough introduction to the membrane contactor extraction process including dispersion free membrane extraction processes and supported liquid membrane processes Comprehensive explorations of membrane transport theory including discussions of diffusional mass and heat transfer modeling as well as numerical modeling In depth examinations of module configuration and geometry including design and flow configuration Practical discussions of modes of operation including membrane distillation osmotic evaporation and forward osmosis Perfect for process engineers biotechnologists water chemists and membrane scientists Membrane Contactor Technology also belongs in the libraries of chemical engineers polymer chemists and chemists working in the environmental industry

**Process Sensing and Diagnostics** Jaromír J. Ulbrecht, 1989 Papers from a symposium on title held in Washington DC Nov 1988 Contributions analyzing various aspects of integrating sensors with microprocessors are followed by presentations reporting the exploitation of optical electrical electrochemical and other phenomena to monitor a wide range of p

*Mechanical Materials and Manufacturing Engineering II* Xiong Zhou, Hong Hua Tan, 2012-12-13 Selected peer reviewed papers from the 2012 International Conference on Mechanical Materials and Manufacturing Engineering ICMMME 2012 October 5 6 2012 Dalian China Membrane Engineering for the Treatment of Gases Enrico Drioli, Giuseppe Barbieri, 2011-07-06 Membranes already have important applications in artificial organs the processing of biotechnological products food manufacture waste water treatment and seawater desalination Their uses in gaseous mixture separations are however far from achieving their full potential Separation of air components natural gas dehumidification and sweetening separation and recovery of CO<sub>2</sub> from biogas and H<sub>2</sub> from refinery gases are all examples of current industrial applications The use of membranes for reducing the greenhouse effect and improving energy efficiency has also been suggested New process intensification strategies in the petrochemical industry have opened up another growth area for gas separation membrane systems and membrane reactors This two volume set presents the state of the art in membrane engineering for the separation of gases It addresses future developments in carbon capture and utilization H<sub>2</sub> production and purification and O<sub>2</sub> N<sub>2</sub> separation Topics covered include the applications of membrane gas separation in the petrochemical industry implementation of membrane processes for post combustion capture commercial applications of membranes in gas separations simulation of membrane systems for CO<sub>2</sub> capture design and development of membrane reactors for industrial

applications Pd based membranes in hydrogen production modelling and simulation of membrane reactors for hydrogen production and purification novel hybrid membrane pressure swing adsorption process for gas separation molecular dynamics as a new tool for membrane design and physical aging of membranes for gas separations Volume 1 focuses predominantly on problems relating to membranes *Current Trends and Future Developments on (Bio-) Membranes* Angelo Basile, Evangelos P. Favvas, 2023-11-21 Modern Approaches in Membrane Technology for Gas Separation and Water Treatment presents condensed information on novel and promising membrane materials The book answers some major questions from the membrane community about three promising materials that are to be introduced at industrial scale It introduces recent out of the box ideas concerning the application of new methods capable to enhance the membrane separation efficiency Sections cover potential commercialization important question on three famous membrane materials and new approaches in membrane technology Finally the book describes and discusses three novel ideas about the potential effect of the magnetic field on membrane separation efficiency the use of cryogenic technology on membrane separations and the use of nanobubble technology on water membrane processes Focuses on the necessity for environmental friendly and cost effective purification and separation process Lists all new membrane materials suitable for commercialization Presents new modern approaches and ideas for improving the membrane efficiency *Chemical Engineering Progress*, 1998

Investment Appraisal for Chemical Engineers James B. Weaver, Henry Thorne, 1991 **AIChe Symposium Series** American Institute of Chemical Engineers, 1991 *Tar Sand and Oil Upgrading Technology* Stuart S. Shih, Michael C. Oballa, 1991 Design Institute for Physical Property Data Theodore B. Selover, 1990 Papers presented at the Session 40 symposium of the 1989 AIChe Annual Meeting in San Francisco and the Session 58 symposium of the 1990 Spring National Meeting in Orlando Session 40 includes an historical overview of how DIPPR came to be Session 58 presents a paper on DIPPR data use in reactive ch Results from the Design Institute for Physical Property Data John R. Cunningham, Dennis K. Jones, 1990 In the Phase Equilibrium section the experimental data for 19 binary systems are reported The availability of these data will allow extension and prediction of correlations for predicting such equilibria In the Pure Component Properties section the procedures used for compiling and evaluating pur **Ullmann's Encyclopedia of Industrial Chemistry** Barbara Elvers, Fritz Ullmann, 1990 Supervised by an internationally acclaimed advisory board the articles are written by over 3000 international experts from industry and universities thoroughly edited to uniform style and layout in an in house office All figures are re drawn to give a maximum of clarity and uniformity in style Compared to the prior edition almost 600f the material has either been newly written or thoroughly updated The rest has been checked for validity and newer references have been added throughout Ammonia Plant Safety (and Related Facilities), 1989

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