

Table of Contents

Preface

Chapter 1: Polymeric Membranes

The Effect of Sodium Chloride (NaCl) Coagulant Medium of Polysulfone Ultrafiltration Membrane	
M.F. Shohur, Z. Harun, M.Z. Yunos, S. Hassan and M.R. Jamalludin	3
Effects of Water as Non-Solvent Additive on Performance of Polysulfone Ultrafiltration Membrane	
M.Z. Yunos, Z. Harun, H. Basri and A.F. Ismail	8
Effect of Modified NanoSiO₂ Agents on the Morphologies and Performances of UHMWPE Microporous Membrane via Thermally Induced Phase Separation	
R. Liu, Y. Wang, J. Zhu, Z.M. Hu and J.R. Yu	13
Preparation and Characterization of Poly(Vinylidene Fluoride) Hollow Fiber Membranes via Modified Thermally Induced Phase Separation Process	
A.W. Qin, X. Li, B.M. Ma, C.Y. Liu, X.Z. Zhao and C.J. He	20
Membrane Formation Mechanism for Water-Solvent-PVDF Systems and Membrane Structure for Ultrafiltration Application	
D.Y. Zuo and H.J. Li	24
Study on the Fabrication of Superhydrophobic Microporous Polypropylene Flat Membrane Using <i>In Situ</i> Synthesis of Modified Fluorinated Silica Nano Particles	
S. Raveshian, R. Yegani, B. Pourabbas and A. Tavakkoli	28
Development of Hydrophobic Microporous Isotactic Polypropylene Membrane for Membrane Contactor Application	
W.J. Wan Zulaisa Amira and S.A. Rahman	33
A Novel Method to Fabricate Polymer Porous Membrane by Hot-Pressing Process	
X.Y. Wu, Y.W. Lu, H.Z. Yang and Y.F. Tang	40
Manufacturing Technique and Bacteriostatic Property Evaluation of Polyvinyl Alcohol/Sodium Alginate/Angelicae Dahuricae Radix Fibrous Membrane	
C.W. Lou, M.C. Lin, C.T. Lu, C.H. Huang and J.H. Lin	45
Effect of Bore Liquid Flow Rate on the Structure and Performance of Poly(Vinyl Chloride) Hollow Fiber Membrane	
Y.R. Qiu and H.N. Han	49
Preparation for PTFE Hollow Fiber Membranes Used in Water Treatment and Optimization for its Extrusion Process	
C. Zhuang, Z.Q. Luo and W.Q. Chen	54
Synthesis and Characterization of Cellulose Acetate Blend Ultrafiltration Membranes The Effect of Degrees of Substitution	
L.L. Kong, D.L. Zhang, Z.Q. Shao, B.X. Han and Y.L. Chen	58
Poly(Vinyl Alcohol) Membrane with Surface Immobilized β-Cyclodextrin Synthesis via Glutaraldehyde	
J.M.C. Puguang and H. Kim	63
Preparation and Characterizations of Novel Ultrafiltration Membranes from Sulfonated Poly(Arylene Ether Sulfone)s	
J.J. Zhang, H. Bu, S.W. Chen, H.P. Bi, Z.X. Hu and L.J. Wang	68
Structure and Performance of PP Porous Membrane Prepared with Adipic Acid and NA-40 as Nucleating Agent via TIPS	
H.X. Xuan and C.J. He	73
Preparation, Characterization and Performance Studies of Active PVDF Ultrafiltration-Surfactants Membranes Containing PVP as Additive	
N.I. Md Fadilah and A.R. Hassan	78
Ultra-Thin Electro-Spun PAN Nanofiber Membrane for High-Efficient Inhalable PM_{2.5} Particles Filtration	
S. Su, J.L. Li, L. Zhou, S. Wan, H.C. Bi, Q. Ma and L.T. Sun	84

Surface Morphology Analysis and Mechanical Characterization of Electrospun Nanofibrous Structure	
D. Wong, A. Andriyana, B.C. Ang, Y.R. Chan, J.J.L. Lee, A.M. Afifi and E. Verron	93
Formulation of Nanofiltration Flat Sheet Membrane Using Cellulose from Kenaf Core	
S. Abdullah, N.M. Abdullah and R. Mohd Tajuddin	98
Preparation of Porous Polymer Membrane with Controllable Pore Size via Spray Spinning	
W.T. Sun, S.X. Liu, X.Y. Hu, Q.Y. Jia, Y.Q. Shen and L.L. Liu	104
Fabrication of PAN Hollow Fiber Ultrafiltration Membrane with Salt Porogen	
J.S. Tan, X.M. Liu, B. Yu, H.L. Cong, Z.J. Li, Y.C. Zhao, Y.C. Lian and X.Y. Guo	110
Effects of Organic Solvent Treated on the Performance and Structure of Polysulfone Tubular Ultrafiltration Membrane	
E.H. Liu, H.Y. Xu and X.C. Zhao	114
Ultrafiltration Formulation of Cellulose Acetate / Polysulfone Blended Membrane	
N.M. Abdullah, A.M. Mazira, M.T. Ramlah and A. Sharifah	118
Effect of Ammonia as an Inert Solvent on Structure and Separation Performance for Oil/Water Mixtures of PVDF Porous Membranes	
W.W. Cui, J.Q. Liu, L.Z. Liu, W.H. Xu, Y.Y. Li and Z.Q. Gao	123
Preparation and Performance of Polysulfone Hollow Fiber Ultrafiltration Membranes	
Y. Bai, Z. Liu and D.B. Sun	129
Rheology Assessment of PSf/ NMP Solution and its Influence on Membrane Structure	
P. Anadão, R.R. Montes, H.S. de Santis and H. Wiebeck	133
Structure Morphology of Polyethersulfone Hollow Fiber Membrane via Immersion Precipitation Phase Inversion Process	
P. Lan and W. Wang	139
Preparation and Characterization of Polyacrylonitrile Membranes with High Strength via Thermally Induced Phase Separation Process	
C.Y. Liu and C.J. He	144
The Effects of Evaporation Time on Morphological Structure of Polysulfone/Cellulose Acetate Phthalate/Polyvinylpyrrolidone (PSf/CAP/PVP) Blend Membranes	
A. Ali, R. Mohd Yunus, M. Awang and R. Mat	148

Chapter 2: Inorganic Membranes

Titania Coated Ceramic Membrane from Clay and Muntilan Sand for Wastewater Filter Application	
Masturi, E. Sustini, K. Khairurrijal and A. Mikrajuddin	155
Fabrication and Characterization of Ceramic Membrane by Gel Cast Technique for Water Filtration	
N. Ahmad, N. Binti Mohd Zaidan and M. Mohd Bazin	159
Preparation of Aluminum Composite Ceramic Membrane by Inorganic Precursor Sol-Gel Method	
S.H. Liu, L.L. Guo and Q.P. Wang	164
Ceramic Membrane Made with Inorganic Residue	
H.L. Lira, R.C. de Oliveira Lima, I. Oliveira Guimarães, G. Araújo Neves, R. Nóbrega Tavares, D. Silveira Lira, M.I. Rosas Neto and B.S. Lira	168
Ceramic Membrane Made of Alumina Synthesized by Pechini Method for Application in Microfiltration Processes	
M.C. da Silva, F.N. da Silva, H.d.L. Lira and N.L. de Freitas	194
Preparation and Properties of Asymmetric Porous Aluminium-Oxide Ceramic Hollow Fibre Membranes	
H.B. Mu, G.Z. Hao, X.W. Li and B. Meng	199
Effects of Pore Former on Properties of Alumina Porous Ceramic for Application in Micro-Filtration Membrane Supports	
Q.F. Bao, W.X. Dong, J.E. Zhou, Y.Q. Wang and Y. Liu	204
Application of Ceramic Membrane Technology in Tungsten Fine Particle Concentration Process	
W.F. Huang, X.F. Wang, X.D. Li and S.M. Yan	210

Use of the Processed Waste from Kaolin and Granite Sawing in the Manufacture of Tubular Ceramic Membranes	
A.C. Chaves, G.A. Neves, H.L. Lira, D.N.S. Oliveira and A.M.G.D. Mendonça	219
Permeability of Porous Ceramic Membranes Obtained from Waste of the Coal Extraction Process	
E.S. Gislón, L. Simão, K. Coelho, N.M. Fortes, M.D.d.M. Innocentini and O.R.K. Montedo	225
Towards Fabrication of Low-Cost Carbon/Ceramics Membranes: Substrate Modification	
C. Wang and Y. Huang	230
Preparation SiC Ceramic Composite Filtration Membrane Materials by Dry Pressing and Synchronous Sintering Method	
K.F. Su, L.M. Wang, X.Y. Deng, J.B. Li, C.P. Wang, G.Q. Zhang, Y.N. Jing and C.Y. Bai	235
Preparation of Porous Ceramic Separation Membrane Supports	
J.G. Wang and Y.H. Liu	241
Study on Fabrication of Ceramic Membrane from Shirasu Balloon for Waste Water Filtration	
N. Ahmad, Y. Nakamura, H. Kamibayasi and M. Mohamed Bazin	246
Mixed Conducting Ceramic Capillary Membranes for Catalytic Membrane Reactors: Performance of $\text{Ba}_{0.5}\text{Sr}_{0.5}\text{Co}_{0.8}\text{Fe}_{0.2}\text{O}_{3-\delta}$ Capillaries	
F. Snijkers, C. Buysse, V. Middelkoop, A. Buekenhoudt and A. Kovalevsky	252
Membrane Modification of Ceramic Membrane and its Application in Separation of Waste o/w Emulsion	
J.E. Zhou, Q.B. Chang, Y.Q. Wang, X.Z. Zhang, J. Liang and X. Wang	259
Use of Ceramic Membrane for Indigo Separation in Effluent from Textile Industry	
R.C.O. Lima, H.L. Lira, G.A. Neves, M.C. Silva and K.B. França	264
Application of Inorganic Ceramic Membrane in Wastewater Treatment I: Process Research and Parameter Optimization	
G.Y. Li, X.H. Wang and Y.J. Wei	269
Fabrication of Hydroxyapatite Disc as Filtration Membrane in Waste Water Treatment System	
S.D. Hariyanto, T. Sriani and G.S. Prihandana	274
Preparation of Silicalite-1 Membranes on $\alpha\text{-Al}_2\text{O}_3$ Tubes and its Concentration Performance of Low Ethanol/Water Mixtures	
H.L. Chen, J.S. Yang, Y. Wang, H.Y. Li, X.X. Li and W.S. Yang	280
Effect of Water-to-Cement Ratio on the Property of a Macro-Porous Cementitious Microfiltration Membrane	
Z. Wang, J. Chang, Z.L. Chen and J.M. Shen	285
Synthesis of MCM-22 Zeolite Membrane on a Porous Alumina Support	
A. dos S. Barbosa, A. dos S. Barbosa and M.G.F. Rodrigues	289
MFI Zeolite Membrane from Rice Husk for Biofuels Production	
B. Jufriadi, H. Saputra and A.G.E. Sutjipto	296
Preparation of Membrane Zeolite MCM-22 and Evaluation Process Oil/Water Separation	
A.S. Barbosa, A.S. Barbosa and M.G.F. Rodrigues	301
Synthesis of Zeolite Membranes from Coal Fly Ash	
S. Shirakura, S. Kojima, K. Tanaka and H. Kita	305
Synthesis and Characterization of ZnAPSO-34 Membrane on Porous $\alpha\text{-Al}_2\text{O}_3$ Support	
A. Brahim, A. Lounis, S. Condom and K. Taibi	309
Ti-Al Membranes for Microfiltration	
S. Şuta, G. Thalmaier, N. Sechel, I. Vida-Simiti and V. Petrescu	316
Studies and Researches on the Obtaining of Sintered Gradual Porous Structures by Irregular Nickel Powders Sedimentation	
V. Moldovan, I. Vida-Simiti, N. Jumate, G. Thalmaier, N. Sechel and V. Petrescu	322
Influence of Transmembrane Pressure on Microfiltration of Suspensions	
T. Bakalár, M. Búgel, H. Pavolová and G. Müller	329
Preparation and Utilization of Alumina Oxide Membranes for Sensor Devices	
H. Kynclová, J. Smilek, P. Sedlacek, J. Prášek, M. Klučáková and J. Hubálek	333
Morphological Investigation of Alumina Asymmetric Membrane by Manipulating the Sintering Temperature Profile	
H. Hasbullah, F. Mohamed, R.R. Ali, N. Ibrahim, M.K.A. Hamid, W.N.W. Salleh and N. Yusof	339

Development of Dynamically-Formed Membranes Using Colloidal Silica and Kaolin T.G. Yun, Y.J. Kim, S.H. Lee, J.S. Sohn and J.S. Choi	344
Alumina Membrane Development with Carbon Fiber as Porosity Precursor C.R. Consonni, R.H. Tsunaki and C.A. Fortulan	348
Preparation of Alumina Microfiltration Membrane with Different Titanium Oxide Content R.L. Han, Y. Geng, J.E. Zhou and Y.Q. Wang	354
Study on Film-Forming Technique of Aluminum Composite Membrane Prepared by Inorganic Precursor Sol-Gel Method L.L. Guo, H.M. Wang, W. Liu and M. Xu	358
Effect of Sintering Temperature on Membrane Properties of Sayong Ball Clay N. Ahmad and N.B.M. Zaidan	362
Preparation of Hollow Fiber Membrane Precursor from Glass and PVDF by Non-Solvent Induced Phase Separation J.W. Xu, Y.B. Zhang, Q. Lu, Q.L. Huang and C.F. Xiao	367

Chapter 3: Composite and Hybrid Membranes

Performance and Morphology of PVDF/PEG-POSS Hybrid Membrane F. Hu and J.F. Sun	375
The Adsorption Performance of Hybrid PVDF Membrane by HA Q. Zhao, H. Lu, L. Meng and S.L. Yu	379
Preparation of Ti-Based Hybrid Membranes and its Application for the Removal of Copper(II) Ions from Water J.S. Liu and X.L. Zhou	383
Influence of Additives on Hybrids Membranes Morphology for Water Treatment E.A. dos Santos Filho, A. Florindo Salviano, B.A. Araújo, K.M. de Medeiros, V.d.N. Medeiros, E.M. Araújo and H.L. Lira	387
Influence of the Addition of Inorganic Salt in Obtaining Hybrid Membranes K.M. Medeiros, D.F. Lima, C.A.P. de Lima, E.M. Araújo, H.L. Lira and R.A. da Paz	408
Preparation of Multi-Walled Carbon Nanotubes (MWNTs)/Polymethyl Methacrylate (PMMA) Hybrid Membranes and their Sorption Performance of Benzene/Cyclohexane L.G. Wu, Y.F. Chen, Y. Rong, T. Wang and Y.X. Wang	414
Study on Poly(Ether Imide)/Amino-Modified Silica Hybrid Membranes Y. Chen and J.F. Sun	419
Synthesis of AgCl Nanoparticles in W/O Microemulsion and Study of AgCl/Poly(GMA-co-MMA-co-AMPS) Copolymer Organic-Inorganic Hybrid Membranes T. Wang, L.G. Wu and Z. Jiang	425
Preparation and Characterization of Positively Charged Quaternized Chitosan/PEI Composite Nanofiltration Membranes R.L. Han	430
Rejection of Heavy Metal Ions with Polyelectrolyte Composite Nanofiltration Membrane H.M. Chen, H.X. Guo, Y. Ma, Z.P. Qin and G.L. Xie	434
Surface-Modified Zeolite-Filled Poly(Piperazine-Amide)/Polysulfone Composite Membrane for Potassium Extraction J. Hou, J.S. Yuan and R. Shang	439
Elaboration and Pore Size Control of Macro Porous Carbonized Material by Pyrolysis of Resin/Carbon Composite S. Aroua, A. Lounis and S. Condom	443
Bioenabled Interfacial Polymerized on Nanofibrous Scaffold as Composite Nanofiltration Membrane J. Zhao, L.N. Yu, X. Li, Y. Yang and X.F. Wang	453
Preparation and Characterization of BaTiO₃/ PVDF Inorganic-Organic Composite Ultrafiltration Membranes L.D. Chen, G.X. Jin, X.B. Wu, W.Z. Lang and D.Z. Sun	457
Preparation of Polypropylene and Polysulfone Composite Ultrafiltration Membrane though Physical Coating Method F.F. Shao, Y.F. Zhang and L. Ni	461

Preparation and Characterization of Poly(Vinylidene Fluoride)/Graphene Oxide Composite Nanofiber for MF Application	
W.D. Chen, H.M. Jung, W.G. Jang, B.P. Hong and H.S. Byun	464
Preparation and Properties of Nanocomposite MWCNTs/Polyamide Reverse Osmosis Membrane for Desalination by Interfacial Polymerization	
M. Zhao, H.F. Zhang, H. Huang and Y.S. Zhang	469
Preparation Thin Film Nanocomposite Membrane Incorporating PMMA Modified MWNT for Nanofiltration	
C.C. Yu, H.W. Yu, Y.X. Chu, H.M. Ruan and J.N. Shen	479
Fabrication and Properties of Poly(Ether Imide)/Poly(Vinyl Alcohol) Composite Ultrafiltration Membrane	
W. Chinpa	484
Compatibility of Polyvinylidene Difluoride/Polyurethane and Preparation of Composite Tubular Membrane	
D.Y. Zuo, H.J. Li, C.H. Yi and H.L. Gan	488
Evaluation of the Permeation of O₂, CO₂ and Water Vapor in Membranes of Polyetherimide/Clay Nanocomposites	
V.d.N. Medeiros, A.M.D. Leite, R.A. da Paz, E.M. Araújo and L.A. Pessan	494
Characterization of Polysulfone/TiO₂ Composite Membrane Modified by Plasma	
Z. Chen, C. Yin, S. Wang, K. Ito, Q.M. Fu, Q.R. Deng, Z.D. Lin, P. Fu, Y. Zhang and Z.T. Liu	498
Preparation and Characterization of Al₂O₃/TiO₂/PVDF Polymer Composites Ultrafiltration Membrane	
S. Hong, S. Hua and L. Yan	502
Polyamide66/National Bentonite Clay Nanocomposites Membranes for Water-Oil Separation	
K.M. Medeiros, D.D. Souza, T.R. de Gouveia Silva, E.M. Araújo and H.L. Lira	508
Thin Film Nanofibrous Composite Ultrafiltration Membrane for Oil Removal from Oilfield Wastewater	
X. Li, L.L. Wang, Y. Yang, H. You, W.C. Zhang, X.H. Qin and X.F. Wang	513
Preparation, Structural and Electrochemical Properties of PVC Based Magnesium Molybdate Ion-Exchange Composite Membrane for Desalination of Food Industry Waste Water	
M.M. Ali Khan and M. Naushad	517
Layer Structures of Composite Membranes for Water Filtration Elucidated by Variable-Energy Positron Annihilation	
Z. Chen, K. Ito, H. Yanagishita, N. Oshima, R. Suzuki and Y. Kobayashi	525
Preparation and Characterization of BaBi₂Nb₂O₉/PVDF Inorganic-Organic Composite Ultrafiltration Membranes	
D.H. Zhang, L.J. Pan and D.Z. Sun	529
Membrane Processing of Refined Palm Oil Wastewater Using TiO₂ Entrapped Nanoporous PVDF Membrane	
E. Yuliwati and A.S. Mohruni	534
New Polyester Nanofiltration (NF) Membrane for Humic Acid Removal	
N.A. Jalanni, M.N.A. Seman and C.K.M. Faizal	539
Novel Nanoparticles Incorporated Polyvinylidene Fluoride Ultrafiltration Membrane	
Q.Z. Gao, H.Q. Li and X.R. Zeng	545
Influence of Clay Content in Membrane Morphology of Polymer Polyamide 6.6/Montmorillonite Clay	
L.R. Kojuch, K.M. de Medeiros, E.M. Araújo and H.d.L. Lira	549
Performance Enhancements of Polysulfone Ultrafiltration Membranes through Blending with Functionalized Carbon Nanotubes and Polyaniline Nanofibers	
Y.Z. Liao, X. Wang, Y. Li, W. Qian, X.Y. Li and D.G. Yu	554
Characterization Study of a Highly Specific Affinity Membrane for Trypsin Purification	
S. Hamzah, N. Ali, M. Mohd Ariffin and A.W. Mohammad	560
Influence of Shear Rate on Proteins Separation, Molecular Weight Cut-Off and Average Pore Size of Polysulfone Blend Membranes	
A. Ali, R.M. Yunus, M. Awang and S. Hamzah	564
Investigation on Preparation and Performance of Self-Assembly Nanofiltration Based on the Coordination	
B.W. Su and S.S. Han	569

Advances in Modification of Polymer Membranes with Inorganic Nanoparticles W.F. Huang, J. Liang, X.D. Li and X.F. Wang	574
Morphological Analysis of Membranes of PES/Commercial Clay T.C. de Carvalho, V.d.N. Medeiros, E.M. Araújo and A.M.D. Leite	582
Effect of TiO₂ Concentration on Structure and Performance of Polysulfone Hollow-Fiber Ultrafiltration Membrane Q.Z. Zheng and J.S. Yuan	587
Preparation and Characterization of Poly(Vinylidene) Fluoride Membranes Reinforced by Modified Nano-SiO₂ Particles A.W. Qin, X. Li, B.M. Ma, X.Z. Zhao, C.Y. Liu and C.J. He	592
The Effect of Amorphous Rice Husk Silica to the Polysulfone Membrane Separation Process Z. Harun, M.R. Jamalludin, M.Z. Yunus, M.F. Shohur and A.F. Ismail	596
Selective Transport of Aromatic Molecules across Ultrathin Separation Membranes of p-Sulfonato-Calix[n]Arenas and Cationic Polyelectrolytes A. El-Hashani and B. Tieke	600
Preparation of Polyethersulfone Ultrafiltration Membrane Surface Coated with TiO₂ Nanoparticles and Irradiated under UV Light S.H. Mohamad, M.I. Idris and H.Z. Abdullah	605
Influence of the Polymer Content in the Preparation of Polymeric Membranes K.C. Nóbrega, A.M.D. Leite, E.M. Araújo, H.d.L. Lira and R.A. da Paz	610
Optimization of Chitosan/PVA Concentration in Fabricating Nanofibers Membrane and its Prospect as Air Filtration H. Shalihah, A. Kusumaatmaja, A.D. Nugraheni and K. Triyana	615
Performance of PS/PIMA/PPEES Nanofiltration Membranes before and after Alkali Treatment for Filtration of CaCl₂ and NaCl C. Hegde, A.M. Isloor, B.M. Ganesh, A.F. Ismail, M.S. Abdullah and B.C. Ng	621
High Flux Nanofiltration Membranes Prepared by Dynamic Self-Assembly of PSS-co-MA and PAH for CuCl₂ Removal H.Y. Deng, Q.C. Chen, Z.G. Le, B.K. Zhu and Y.Y. Xu	641
Polysulfone/Polyacrylonitrile Membrane for Oil/Water Separation A. Kusumaatmaja, N. Fauji and K. Triyana	649

Chapter 4: Membrane Technologies for Water and Wastewater Treatment

Evaluation of Organoclay Addition in Surface Modified Sintered UHMWPE Membranes for Oil Separation N.D.S. Gomes, A.L. Pontes, R.C.N. Leite and L.H. Carvalho	657
Study on Combined Process of Adsorption-Membrane Separation for Military Toxicant VX Polluted Municipal Water Treatment X.J. Wang, E.F. Chen and Y.Z. Ji	663
Study on Radioactive Wastewater Treatment by Precipitation and Membrane Separation X. Luo and J. Wang	667
Test Study on Combined Process of Clarification-Adsorption-Membrane Separation for Chemical Agent VX Polluted Surface Water Treatment X.J. Wang, H.W. Zhang, E.F. Chen and Y.Z. Ji	671
Separation of Activated Sludge with Sub-Mili Filtration Y.P. Cui and B.H. Yao	675
Separation of Oil/Water Emulsion from Kitchen Using a Novel Tubular Membrane Z. Xiong, L.M. Li, Z.Y. Liang, L.J. Qi and Y. Liang	679
Influence of Operational Parameters on Oil-Water Separation Efficiency of Titanium Oxide Modified Alpha-Alumina Microfiltration Membrane J.E. Zhou, X.B. Hu, Y.Q. Wang, X.Z. Zhang and J.T. Pan	686
Feasibility Study on Membrane Technology for Ship Oil-Water Separation in China O.C. Cai, J.F. Chen and W. Zhang	690
Predicting Nanofiltration Performance during Treatment of Welding Electrode Manufacturing Wastewater, Using Artificial Neural Networks H.A. Golestani	696

Removing of Nano-Particles from Semiconductor Wastewater Using a Hybrid Treatment System	
B.M. Yang, C.M. Kao, W.P. Sung, C.P. Yang and T.Y. Chen	701
Synthesis of Antibacterial Nanofibrous Membrane Based on Polyacrylonitrile (PAN)/Chitosan by Electrospinning Technique for Water Purification Application	
M. Prama Ekaputra, M.M. Munir, A. Rajak, A. Rahma, A.Y. Nuryantini and Khairurrijal	705
Study on the Treatment of High Salinity Oil Waste Water by Reverse Osmosis Technology	
L. Ji, Y. Liu, Y.F. Zhang and X.D. Liu	709
Nanofiber: Applications and Implementation in Advance Water Treatment Techniques	
M.O. Aijaz, S. Faiz, U.A. Samad, F.S. Al Mubaddel, M. Luqman and O.Y. Alothman	713
PAC Addition on Immersed Ultrafiltration Membrane for the Treatment of Raw Water Containing Taste and Odor Compounds	
S. Liang, X. Li, Y.L. Yang, L. Liu, Y.W. Liu, Z.J. Cheng, B. Li and G.B. Li	717
Recycling of Tannery Deliming-Bating Wastewater by Ultrafiltration Purification with Polyimide Membrane	
H.R. Wang, G. Zhang and Y.J. Li	722
Removal Mechanisms for Pharmaceuticals and Personal Care Products (PPCPs) in Water by NF/RO Membranes	
Z.H. Huang, Z.L. Liu, L.J. Zhu and G.M. Akbar	727
The Role and Prospect of Nanomaterials in Polymeric Membrane for Water and Wastewater Treatment: A State-of-the-Art Overview	
A.F. Ismail and P.S. Goh	731
Preparation and Characterization of PVDF Modified Ultrafiltration Membrane for Purification of Hg in Water	
X.J. Wang, X.J. Lu, W.Y. Xu, J.C. Zhu and L.G. Wang	735
Micro-Flocculation - Film Processing Technology in Dealing with Beer Sterilized Wastewater	
J.X. Fu, H. Liu and R.X. Zhang	740
Advanced Treatment of Electroplating Wastewater by Nanofiltration Membrane Technology	
L. Wang, X.F. Xiong, Z. Fan, G.L. Zhang and Z.Y. Wang	745
Comparison of Pre-Treatment Methods for Nanofiltration (NF) in Drinking Water Treatment Related with Organic Removal and Membrane Fouling Mitigation	
F.Y. Sun, W.Y. Dong and X. Guo	749
Pilot Study on Nanofiltration Seawater Softening for SWRO Desalination	
B.W. Su, Y.H. Wang and X.L. Gao	754
Removal of Chromium from Aqueous Solution by Polymer Enhanced Ultrafiltration Using Copolymer of Maleic Acid and Acrylic Acid	
L.J. Mao, Y.Q. Wang and Y.R. Qiu	758
Immobilization of Peroxidase from Cauliflower Stem on Ultrafiltration Membrane for Phenol Removal	
K. Ratanapongleka and A. Onsarn	763
Pilot-Study of Micro-Polluted Water Treatment by UF Membrane at Different Fluxes	
S. Lu, X. Li and J.Y. Tian	770
Anti-Pollution Behavior Analysis of PVDF UF Membrane Added Different Addition to Filter the Secondary Treated Water of Urban Sewage	
X.R. Meng, L. Zhao, L. Wang and D.X. Huang	775
Study on Production Wastewater in Water Treatment Plants by Submerged Micro-Filtration Membrane	
J.M. Yang, R.B. Jia, Z.J. Wang, X.L. Yang and Z.B. Pan	780
A Coupling Process of Precoating Dynamic Membrane with Photocatalysis for Treatment of Oily Wastewater	
H. Chen, T. Yang, G.C. Li and K.C. Hu	785
Lake Water Treatment Using Polyurethane-Polyvinylidene Fluoride Hollow Fiber Blend Membrane and Polyvinylidene Fluoride Hollow Fiber Membrane in a Coagulation-Microfiltration Process	
L. Wang, B. Zhao, S.L. Ma, H.W. Zhang and Q. Yang	790
Pretreatment Process of Heavy Oil Wastewater from Oil Field Treated by Membrane Technology	
G.F. Sun, J.L. Xu, C.H. Sui and H.Y. Si	795

Advanced Treatment of Drinking Water by Ultrafiltration Membrane Y.X. Yang and J. Chen	799
The Application of Nanofiltration Technology in Recovery of Ionic Liquids from Spinning Wastewater X. Liu and W. Wang	804
Pretreatment Process of Nanofiltration for Silting Density Index Reduction in Drinking Water Treatment System L. Wang, Y.C. Li, H. Zhao, Z.H. Zhang, B. Zhao, H.W. Zhang and L.X. Cui	808
Submerged Ultrafiltration for Minimizing Energy Process of Refinery Wastewater Treatment E. Yuliawati and A.F. Ismail	813
Comparative Study on the Treatment of Biologically Treated Textile Effluent by Nanofiltration and Reverse Osmosis for Water Reuse S.C. Yu, Z.W. Chen, M.H. Liu and J.W. Zhao	820
CFU Combined Process for the Treatment of Oily Car Washing Wastewater J.K. Zhang, Y.B. Yang, H.Y. Wang and Z.B. Dong	825
Factors Influencing the Removal of As(V) from Groundwater by NF/RO W.F. Ma, W.J. Liu, P.Y. Zhang and H. Guo	831
Advanced Treatment of Chemical Wastewater by Using a Combination of Ultrafiltration and Reverse Osmosis System J.D. Zhou, P. Yang, C.J. Yang, B. Lai and Y.H. Zhang	838
Reducing Energy Consumption for Seawater Desalination through the Application of Reflux-Recycle Concepts from Oil Refining K.E. Ting, H.T. Ng and H.C. Li	844
Advanced Treatment of Wastewater from an Ethylene Chemical Enterprise by a Biological Aerated Filter-Ultrafiltration-Reverse Osmosis Process L.H. Li, X.L. Dai and F. Ma	851
Study on the Advanced Treatment and Reuse of Dyeing Wastewater Using Polyamide Nanofiltration Membrane J.Q. Ma, Q. Zhang, Q.L. Lu, X.B. Gan, J.H. Xia and Z.D. Shen	857
Application Research of Microfiltration Membrane Pilot Test in Water Treatment M. Wang, G.Q. Gao and X.L. Wang	861
Analysis of Secondary Pollution in Drinking Water Ultrafiltration System H.Y. Liu and Z.F. Fan	865
Parametric Effects of the Performance of Nanofiltration Membrane A.S. Afolabi, K.O. Sanusi, A.S. Abdulkareem and J.B. Mohamed	869
The Combination Sewage Treatment Process of Nanofiltration and Photocatalytic Oxidation for the Removal of Endocrine Disruptors F.F. Deng, L.M. Yang, Z.D. Deng and G.F. Xu	875
Pilot Study of a Hybrid Process Combining Oxidation- Coagulation- Microfiltration for Drinking Water Production from Surface Water Y.L. Song, B.Z. Dong, N.Y. Gao, Y.F. Yang and C. Chang	880
Hybrid Sorption and Microfiltration Characteristics of Zeolite Š. Sabo, T. Bakalár, M. Búgel and H. Pavolová	887
Processes of Ultra- and Nanofiltration for Cleaning Solutions from Iron Colloid Substances K. Machekhina and L.N. Shiyan	893
The Characteristic Analysis of Interrupted Flow Pulsation on Ultrafiltration System C.W. Huang and H.S. Chen	898
Review of Disposal of Concentrate Streams from Nanofiltration (NF) or Reverse Osmosis (RO) Membrane Process X.Y. Li, L.W. Zhang and C.W. Wang	905
Fabrication of Poly(Acrylonitrile)/PAN Nanofiber Using a Drum Collector Electrospinning System for Water Purification Application M.M. Munir, M. Prama Ekaputra, A. Rajak, A. Rahma, A.Y. Nuryantini and K. Khairurrijal	911
Influence of Inner Configuration of Membrane on Microfiltration of Suspensions T. Bakalár, M. Búgel, H. Pavolová and G. Müller	915
Application of Membrane Science to Remove Endocrine Disrupting Compounds (EDCs) and Pharmaceutically Active Compounds (PhACs): A Review E. Halakoo, J. Adabi, S. Aalinezhad, A. Layeghi Moghaddam and A. Rahimi	921

Deep Treatment of Copper Plant Waste Water Streams with Water Recycling K.L. Timofeev, A.B. Lebed and A.J. Malyutin	925
Review on Methodology for Life Cycle Costing of Membrane System for Wastewater Filtration N.S. Jiran, S. Mahmood, M.Z.M. Saman and M.Y. Noordin	933

Chapter 5: Membrane Bioreactors for Wastewater Treatment

Development of an Integrated Moving Bed Biofilm Reactor-Membrane Bioreactor for Wastewater Treatment L. Duan, Y.H. Song, W. Jiang and S.W. Hermanowicz	943
Study on the Novel Non-Aeration Membrane Bioreactor Z.Q. Wang, B.J. Feng, X.M. Liu and L. Tian	947
Potential of Integrated Membrane Bioreactor in Batik Dye Degradation - A Review N.A. Ramlee, M.N. Muhd Rodhi, A.D. Anak Brandah, A. Anuar, N.H. Alias and T.A. Tengku Mohd	951
Effects of the DO of Nitrification Return Flow on the Nitrogen Removal of A/A-MBR Combined Process X.Y. Zheng, W. Chen, J. Li, Y.J. He, X. Huang and X.N. Wang	956
Biological Nutrient Removal and EPS Performance in Aerobic-MBR and SBR-MBR Systems X.N. Feng, T. Tao, H. Xi, Y.T. Xu, H.F. Wang, Q.Y. Dong, P. Yuan, G.H. Yang and C.S. Li	962
Improvement of Operational Performance of MBR with the Emphasis on Enhanced N and P Removal by Modification in Design K.H. Zhang and B.Z. Wang	969
Pilot Scale Study on Biological Nutrient Removal and Membrane Fouling Alleviation in Combined Membrane Bioreactor for Municipal Wastewater Treatment S. Liu, J.F. Wang, B.Z. Wang, B. Wang and W. Wan	976
The Effect of Temperature on Performance of Powder Activated Carbon-I Membrane Biological Reactor (PAC-IMBR) X.G. Ma, W.J. Ji, J.P. Sun, X.X. Xue, H. Yang and J.X. Fu	983
Effect of Extracellular Polymeric Substances on Operation of Membrane Bioreactor W.Y. Zhang, X.Y. Wang and L.J. Xi	988
Azo Dyes Biodegradation Based on Silicone Membrane-Aerated Bioreactor J. Wang, H. Lu and G.F. Liu	993
Activities of Activated Sludge Affected by Pharmaceutical Wastewater in a Membrane Bioreactor Y.H. Ding, Q. Wang and H.Q. Ren	998
Biological Denitrification of Groundwater by a Composite Membrane Bioreactor G.M. Cao, L.H. Zhang, M. Sheng and Y.D. Liu	1004
Treatment of Coking Wastewater by a Submerged Membrane Bioreactor with Suspended Carriers Q.Y. Gu and M.Y. Li	1011
Industrial Wastewater Reclamation for Sustainable Development – Integration of Membrane Bio-Reactor Process C.H. Ni and J.C.T. Lin	1015
The Evaluation of Photo Catalytic-Membrane Reactor with Nanomaterials for Removing Virus Y.N. Chen, X. Zheng, D. Chen and Y. Yang	1021
Experimental Study on Non-Backwashing Dynamic Membrane Bio-Reactor X.S. Xie and P. Shang	1028
Performance of SIDMBR for Emulsified Oil Wastewater Treatment Z.Y. Han, S. Su, Y. Lu and W.B. Du	1032
Woven Fabric Bioreactor (WFBR) as the Filter Material for Wastewater Treatment Q. Yang, Z.H. Liu and X. Sheng	1036
Analysis of Bacterial Communities in A²O Membrane Bioreactor Treating Oily Wastewater Z.H. Duan, L.M. Pan, H. Wang and N.T. Li	1041

Treatment of Dyes Wastewater with TiO₂ Photocatalytic Membrane Reactors G.Q. Shao	1046
Treatment of Waste Seawater from Shrimp Farm Using a Photocatalytic Membrane Reactor Z.F. Shi, S.M. Zhang and S. Guo	1051
Membrane Separation Coupled with Photocatalysis for Water Supply and Wastewater Treatment Z.Y. Wang, L. Wang, L.F. Yao, M.L. Pei and G.L. Zhang	1056

Chapter 6: Fouling of Membranes, Technologies of Antifouling and Cleaning

Membrane Fouling Mechanism and its Control in the Treatment of Brackish Water with Reverse Osmosis Process J.B. Wang, J.Y. Cheng, T. Shi, Q. Huang and X.W. He	1063
Short Review of Ultrafiltration of Polymer Membrane as a Self-Cleaning and Antifouling in the Wastewater System S.H. Mohamad, M.I. Idris, H.Z. Abdullah and A.F. Ismail	1070
Study on Membrane Fouling Experiment of Stacked AGMD Module in Low Temperature X.H. Yang, R. Tian, S.J. Ma and H.L. Lv	1076
Study on Calcium and Magnesium Fouling of Vacuum Membrane Distillation B.A. Li, X.J. Liu and X.F. Gao	1081
Preparation of Anti-Fouling Poly(Lactic Acid)(PLA) Hollow Fiber Membranes via Non-Solvent Induced Phase Separation P. Shen, K. Tu, C.Y. Yang, J. Li and R.X. Du	1086
Fouling Characterization of Polysulfone-Grafted-Methyl Methacrylate Membrane M.Z. Yunus, Z. Harun, H. Basri, H. Taib and A.F. Ismail	1091
Synthesis of Low Fouling Porous Polymeric Membranes H. Susanto, D.P. Julyanti and A. Roihadin	1096
Improved Antifouling Property of PVDF Membranes with Crosslinked PEG H.X. Xuan and C.J. He	1109
Study on the Membrane Flux of Membrane Reactor and Fouling Control of PVA Membrane Y.Y. Liu and W.L. Zhang	1113
Integration of Different Sintering Temperature of Hydroxyapatite and Polyethersulfone Membrane for Fouling Mitigation S. Hamzah, J. Sukaimi and M.S.M. Ghazali	1118
Study on Fouling of Nanofiltration Membranes when Treating the MBR Effluent X.T. Zhang and K. Sun	1124
UF Membrane Cleaning Fouled by Food Waste Fermentation H. Lin, L.J. Wang, Q.H. Wang, J. Zheng and K. Sonomoto	1129
Investigation of Membrane Fouling along Membrane Surface during Cross-Flow Micro-Filtration of Semiconductor Wastewater J.X. Liu, Z.J. Liu, F.X. Liu, X.F. Xu and Z.Y. Li	1134
Study on the Membrane Fouling of the Process of Using Two Layer Flat-Sheet Membrane for Sludge Thickening and Water Reuse X.F. Zhu, M.Y. Zhou, Z.W. Wang, W.Y. Yuan and J. Guan	1138
Effects of Sludge Concentration on EPS and Membrane Fouling in Anoxic/Aerobic Membrane Bioreactors Y.Z. Wang, X.Y. Zhu, B.G. Su, Z.Q. Liu and H. Liu	1147
Comparative Assessment of Membrane Fouling Propensity Using Colloidal Silica as Foulant C.H. Koo, A.W. Mohammad, F. Suja' and M.Z. Meor Talib	1152
Effects of Membrane Fouling in A²O-MBR System during Coking Wastewater Treatment S.H. Yan, Q.F. Liu, F.Z. Li, J.J. Zhao and B.L. Yan	1156
Identifying Membrane Foulants in Chemical Cleaning Solutions J.X. Liu, B.Z. Dong, Y.G. Sheng and J.P. Wang	1162
Effect of Aeration Intensity on Membrane Fouling of Non-Woven Fibers - MBR C.H. Zhang, Y.Y. Dong and H.J. Sun	1169

Effect of Aggregated Floc Circulation on Membrane Fouling in Contact Circulated Coagulation-Membrane Filtration Hybrid Process for Treatment of Surface Water X.H. Zhao, H.W. Zhang and J. Wang	1173
The Effect of Different Pretreatment Methods on the Membrane Fouling in the Process of Reverse Osmosis Seawater Desalination J.G. Cheng, J.H. Ma, Z.W. Lin, W.X. Li, Z.S. Ma, Q.T. Ren and Y. Liu	1180
Variation of Membrane Fouling Characteristics at Salinity Wastewater in an Intermittently Aerated Membrane Bioreactor K. Xie, J. Song, S.Q. Xia, L.P. Qiu, J.B. Wang and S.B. Zhang	1188
Study on the Effects of Shear Strength and Aeration Method on Membrane Fouling in Vertical A/O-MBR Process X.B. Chen, Z.Q. Liu, X.H. Liu, G.J. Yu and Z.H. Zhang	1192
Pilot Study on Dosing Suspended Fillers to Alleviate Membrane Fouling G.J. Yu, Z.Q. Liu, Z.H. Zhang, X.B. Chen and X.J. Li	1197
Study on the Influence of Phosphorus Removal Effect and Membrane Fouling by Adding Aluminum Salt to A/O-MBR X.J. Li, Z.Q. Liu, H. He, L. Gao and X. Xu	1202
Research in Surface Modification and Anti-Fouling of Polypropylene Porous Membrane C.L. Miao and H. Wang	1208
The Effect of Media Fill Ratio on Membrane Fouling in Moving Bed Bioreactors-Membrane Bioreactor L. Duan, Y.H. Song, W. Jiang and S.W. Hermanowicz	1212
Effects of Module Configuration on Hollow Fiber Filtration Fouling and Permeability Y.M. Yin, J. Wang, F.W. Yu, H. Jia and N. Luo	1216
The Relationship between Critical Flux and Membrane Fouling W.Y. Li, J.P. Zhang and W.M. Li	1222
Study on Membrane Fouling of a Hydrogen-Based Membrane Biofilm Reactor Treating Nitrate-Contaminated Drinking Water G. Li, J. Yu, Y.H. Zhang, L. Gao and H. Zhang	1226
Metal Ions on the Membrane Bioreactor in the Slow Progress of Membrane Fouling Studies W.Y. Zhang, S.C. Ji, H.F. Zhang and X.X. Zhang	1230
Study and Analysis of the Impacts and Mechanisms of Intermittent Aeration and Movement Degree of Membrane on the Permeate Flux in a Submerged Membrane System X.L. Lei, L. Li, J. Wan and D.K. He	1234
Hydrophilic Modification of PVDF Membrane by Using PHEMA-PDMS-PHEMA Amphiphilic Copolymer as Addictive D. Li and C.J. He	1241
Influence of Hydrophilic Polymer on Pure Water Permeation, Permeability Coefficient, and Porosity of Polysulfone Blend Membranes A. Ali, M. Awang, R. Mat, A. Johari, M.J. Kamaruddin and W.R.W. Sulaiman	1246
Surface Modification of Composite Membranes by Coating PVA/TiO₂ Layer B. Yalcinkaya and J. Chaloupek	1251
Surface Modification of Micro/Nano-Fabricated Filters M. Ebrahimi Warkiani, H.Q. Gong and A. Fane	1256
The Research of Cleaning Method of Membrane Modules in Ultrafiltration Pretreatment System L.Y. Wu, F.Y. Shang, C.J. Gao and Y.D. Hu	1268
The Effects on Phosphorus Removal and Membrane Pollution by Adding PAC and Ca²⁺ into MBR under Different Dosing Methods H.R. Mi, Z.L. Zhang and Z. Chao	1274
Study of Backwashing Process for Ceramic Micro-Filtration Membranes Used in Pretreatment of DMF Wastewater P.W. Xu, W.Q. Huang, Q. Zhang, B.Z. Yang and J. Zhong	1278
Preparation and Properties of Poly(Ether Imide) Ultrafiltration Membrane Modified with Polyether Diamine P. Phomdum and W. Chinpa	1282
The Effects of Nanocrystalline Cellulose on Polysulfone Hollow-Fiber Ultrafiltration Membrane X. Wang, H.L. Bai and L.P. Zhang	1287

Analysis of Axial Local Flux Characteristics in Hollow-Fiber Membrane Z. Cui, J. Wang, H. Jia, X.H. Dai and Y. Zhang	1291
Effect of DS on the Structure and Charged Properties of SPSf/PVDF Blend Membranes via Immersion Precipitation Process C.H. Du, C.J. Wu and L.G. Wu	1296
Effect of Cellulose Acetate Phthalate (CAP) on Characteristics and Morphology of Polysulfone/Cellulose Acetate Phthalate (PSf/CAP) Blend Membranes A. Ali, R.M. Yunus, M. Awang, A. Johari and R. Mat	1301
Performance Studies of Polysulfone-Based Membrane: Effect of Silica Morphology M.R. Jamalludin, Z. Harun, H. Basri, M.Z. Yunus and M.F. Shohur	1306
A Review of Membrane Separation Process Enhanced by Shearing Force P. Wang, Y.H. Han, J.Q. Chen and X.F. Zhang	1311
The Concept of the System for Parameterization of Functionalized Membranes J. Skowroński, M. Bojarska and M. Neska	1315

Chapter 7: Membrane Technologies of Pervaporation and Distillation

Polysulfonamide Thin-Film Composite Membranes Applied to Dehydrate Isopropanol by Pervaporation S.H. Huang, C.H. Wu, K.R. Lee and J.Y. Lai	1325
Novel Hydrophilic Chitosan and Sago Based Membranes for Pervaporation of Organic-Water Mixtures M.G. Mohd Nawawi, Z. Zamrud and A.M. Alamaría	1330
Research on New Pervaporation Membranes and the Effect of Treatment of Wastewater Containing Phenol K. Ma and Y.Y. Fu	1335
Preparation and Pervaporation Properties of Cyclodextrin-Containing PU Membranes H. Ye, J. Wang, X.D. Feng and H.Y. Liang	1339
Novel pH-Sensitive Poly(Vinyl Alcohol) Based Polyampholyte as Pervaporation Membrane P.R. Meng and L.B. Li	1344
Pervaporation Separation of Cyclopentadiene/Methylcyclopentadiene Mixtures from Cracking C5 Fractions Using Polyimide Membranes J.Q. Chen, H.L. Lv, Y.Q. Yao and B. Chen	1349
Effect of Microstructure of Graphene Oxide Fabricated Composite Membranes on Alcohol Dehydration W.S. Hung, K.R. Lee and J.Y. Lai	1354
Preparation and Separation Properties of Oleyl Alcohol-Modified PDMS Membranes Y.P. Liao, H. Ye and Y. Wang	1359
Preparation of Hydrophobic Microporous Polypropylene/Isotactic Polypropylene Blending Membranes via Thermally Induced Phase Separation for Vacuum Membrane Distillation N. Tang, S. Zhang, L. Zhang, P.G. Cheng and J.J. Li	1363
Performance of Surface Modification of Polyvinylidene Fluoride Hollow Fiber Membrane in Membrane Distillation K.C. Chong, S.O. Lai, K.M. Lee, W.J. Lau and B.S. Ooi	1367
Effect of Ethylene Glycol on Polymeric Membrane Fabrication for Membrane Distillation K.C. Chong, C.E. Lim, S.O. Lai and W.J. Lau	1371
Effect of Feed Temperature on the DCMD Performances in Treating Synthetic Textile Wastewater N.M. Mokhtar, W.J. Lau and A.F. Ismail	1376
Taguchi Method in the Evaluation of Vacuum Membrane Distillation in Water Desalination S. Masoudi Soltani and S. Kazemi Yazdi	1382
Purification of D-(-)-Lactic Acid from Fermentation Broth Using Nanofiltration, Esterification, Distillation, and Hydrolysis Technique P. Khunnonkwao, C. Ariyawong, W. Lertsiriyothin and A. Boontawan	1386

Chapter 8: Liquid Membrane Technologies

Extraction of L-Theanine Using Chiral Supported Emulsion Liquid Membrane D.S. Huang, J.G. Yu, W. Liu, Z.L. Huang and N. Wu	1397
Palladium Extraction Using Emulsion Liquid Membrane Process – Stability Study N.F. Mohamed Noah, N. Othman, S.K. Bachok and N.A. Abdullah	1401
Extraction Process of L-Theanine across Aiquat 336-Kerosene Bulk Liquid Membrane D.S. Huang, Z.L. Huang, N. Wu, J. Wang, C. Xu and W. Liu	1407
Study on Transportation of Cu(II) by Dispersion Supported Liquid Membrane System X.N. Wu and B.H. Yao	1411
Simultaneity Extraction of Iron and Nickel from Acidic Leaching Solution of Laterite Ores with Emulsion Liquid Membrane C.Z. Jiang, X.J. Zhai, T.A. Zhang and Y.Q. Tan	1416
Removal of Hexavalent Chromium-Contaminated Wastewater by Micro-Emulsion Liquid Membrane Method C.S. Zhu, L. Qiu, J. Song and Y.L. Yuan	1420
Kinetic Study on the Transport of Chromium(III) by Emulsion Liquid Membrane Y.Z. Xie, D.J. Fei and Y.G. Dang	1425
Electrodeposition of Cobalt and Lead in the Hybrid Liquid Membrane - Electrodialysis-Electrolysis Process T. Sadyrbaeva	1433
Separation Copper Ions from Aqueous Solution by Emulsion Liquid Membrane Using Novel PAMAMG4-1,2-Octenoxid Dendrimer as Carrier C.H. Zhang	1438
The Research of Extracting Hippuric Acid from Breeding Wastewater Q.L. Chen, Y. Guo and N. Guo	1444

Chapter 9: Membranes and Technologies in Gas Separation

Gas Permeation Properties and Characterization of Polymer Based Carbon Membrane N. Sazali, W.N.W. Salleh, Z. Harun and A.F. Ismail	1451
Experimental Study on the Separation of CO₂ from Flue Gas Using Hollow Fiber Membrane Contactors with Mixed Absorbents R. Chen and L.X. Cui	1456
Separation of Methane from Shuttle Tanker Vents Gases by Adsorption on a Polyurethane/Zelite Membrane H. Shehu, E. Okon and E. Gobina	1461
Polyethersulfone/Polyvinyl Acetate Blend Membrane for CO₂/CH₄ Gas Separation S.H.A. Abdul Hadi, H. Mukhtar, H. Abdul Mannan and T. Murugesan	1466
Effects of Oxidation Condition on the Permeation Performances of Phenol-Formaldehyde Based Carbon Membranes for Gas Separation H. Sun, W. Wei, Q. Lin and J.Y. Zhang	1471
Effects of ⁶⁰Co-Irradiation on Gas Permeation Properties of Polyimide Membranes Y.H. Qiao, H.M. Miao, Y.B. Xu, W. Jiang, Y.H. Zheng and L.C. Wang	1476
Membrane Separation of CO₂ from Natural Gas: A State-of-the-Art Review on Material Development A.A. Latif, J.K. Adewole, S.B. Ismail, L.C. Peng and A.S. Sultan	1480
Gas Permeation Study of Carbon Tubular Membrane by Manipulating Carbonization Temperature Profile W.N.W. Salleh, N. Sazali, H. Hasbullah, N. Yusof, J. Jaafar and A.F. Ismail	1493
Carbon Nanotubes Based Mixed Matrix Membrane for Gas Separation S.M. Sanip, A.F. Ismail, P.S. Goh, M.N.A. Norrdin, T. Soga, M. Tanemura and H. Yasuhiko	1497
Preparation and Characterization of Polysulfone Membrane for Gas Separation N. Jusoh, L.K. Keong and A. Mohd Shariff	1503
Research and Development on Membrane Technology in Natural Gas Desulfurization S.L. Wang, J. Wang, E.T. Li and L. Ma	1513
An Electrospun Polyimide Ultrathin Fiber Membrane for Particle Filtration of Hot Gas J.F. Xie	1518
Fabrication and Characterization of Facilitated Transport Membrane for Gas Separation R. Nasir, H. Mukhtar and Z. Man	1522

Gas Permeability Study of Amine-Polymer Blend Membranes to Separate Carbondioxide from Natural Gas	
A. Mushtaq, H. Mukhtar and A.M. Shariff	1526
Interfacial Defects on Mixed Matrix Membranes and Mitigation Techniques for Gas Separation: A Review	
B. Shimekit, A. Mohd Shariff, H. Mukhtar, M.A. Bustam, A.E.I. Elkhalfah, S. Ullah and N. Riaz	1531
Preparation and Characterization of Newly Developed Polysulfone/Polyethersulfone Blend Membrane for CO₂ Separation	
H.A. Mannan, H. Mukhtar and T. Murugesan	1535
Polyethersulfone (PES) Membranes for CO₂/CH₄ Separation: Effect of Polymer Blending	
H.A. Mannan, H. Mukhtar and T. Murugesan	1541
Zeolite Loaded Alginate Membrane for CO₂ and CH₄ Separation	
S.U. Adawiyah, A. Suratman and E.T. Wahyuni	1545
Preparation of PMAM-b-PNVP and its Hydrolysate by RAFT Polymerization: Structure Characterization and its CO₂ Permeation Performance	
J.N. Shen, J. Li, T.T. Jiang and H.M. Ruan	1552
Ba-SAPO-34 Zeolite Membrane for CO₂/N₂ Separation: Process Optimization	
T.L. Chew and A.L. Ahmad	1564
Effect of Solvent Evaporation Time on CO₂/CH₄ Gas Performance for Poly(Lactic) Acid Membranes	
W.N.R. Jami'an, H. Hasbullah, F. Mohamed, A.R.A. Rani, M.F.K. Saman, N. Yusof and N. Ibrahim	1569
Polymer-Nanoclay Mixed Matrix Membranes for CO₂/CH₄ Separation: A Review	
A. Jamil, O.P. Ching and A.M. Shariff	1576
Preparation and Characterization of Matrimid-Based Carbon Membrane Supported on Tube for CO₂ Separation	
W.N.W. Salleh, N.A.I.M. Isa, N. Sazali and A.F. Ismail	1582
Experimental Study on Separation of CO₂ by Using Hollow Fiber Membrane Contactors with Amino Acid Salts Solutions	
W.F. Zhang and Z.H. Lin	1588
A Review on CO₂ Capture Using Membrane Gas Absorption Technology	
Y.X. Lv, C.Q. Xu, G.H. Yan, D.Y. Guo and Q. Xiao	1593
Improvement of CO₂ Separation Performance by Blended Aqueous Solutions of DEA+AMP in Hollow Fiber Membrane Contactor (HFMC)	
Z. Wang, M.X. Fang, S.P. Yan, Y.L. Pang and Z.Y. Luo	1598
The Progress of Polymeric Membrane Separation Technique in O₂/N₂ Separation	
K.C. Chong, S.O. Lai, H.S. Thiam and W.J. Lau	1607
Comparison between Treated and Untreated Zeolite towards the Performance of Polyethersulfone Mixed Matrix Membranes (MMMs) for O₂/N₂ Gas Separation	
N.B. Ridzuan and M.H. Musa	1612
Development of Membrane Reformer System for Hydrogen Production from Natural Gas	
H. Kurokawa, T. Iseki and H. Yakabe	1620
Membranes for Gas Separation Current Development and Challenges	
N. Jusoh, Y.F. Yeong, K.K. Lau and M.S. Azmi	1624
Review on Membrane Technologies for Carbon Dioxide Capture from Power Plant Flue Gas	
Y.X. Lv, G.H. Yan, C.Q. Xu, M. Xu and L. Sun	1630
Gas Separation Properties of Polyimide Membranes Based on 2,2-Bis(3-Amino-4-Hydroxyphenyl)Hexafluoropropane	
Y.H. Zheng, Y. Zhai, J.M. Guo, H.Y. Yu, L.C. Wang and X.M. Zeng	1635
Simulation of Fluidized Bed Oxygen Permeable Membrane Reactors for Hydrogen Production from Natural Gas	
J.W. Ye, D.L. Xie, Z.H. Yang and Z.Y. Cao	1639
Poly(<i>N,N</i>-Dimethylaminoethyl Methacrylate) Gas Separation Membranes	
W.L. Du, T.W. Shen, S.J. Wang, G.G. Ding, Y.Q. Cao, Y.M. Wu and R.H. Du	1644
Nitrogen-Modified Graphdiyne as a Promising Membrane for Helium Separation: First-Principles and Molecular Dynamics Simulations	
J. Xu, J. Li, H.J. Liu and L.M. Zhao	1648

Study of Microstrain and Stress in Non-Planar Palladium Membranes for Hydrogen Separation	
M. Brisotto, M. Gelfi, C. Rinaldi and L.E. Depero	1654
Design and Development of Nb-W-Mo Alloy Membrane for Hydrogen Separation and Purification	
H. Yukawa, T. Nambu and Y. Matsumoto	1660
Hydrogen Separation Using Inorganic Membranes	
M.N. Kajama, N.C. Nwogu and E. Gobina	1671
Preparation and Characterization of Polysulfone Mixed Matrix Membrane Incorporated with Thermodynamically Stable Nano-Palladium for Hydrogen Separation	
H.S. Mohd Suhaimi, L.C. Peng and A.A. Latif	1675
Study on the Influence of Porous Anodic Alumina Membrane on Separation of Hydrogen and Methane	
Q.P. Yang, X.B. Zhao and X.L. Wang	1681
Effects of Working Temperature and Working Pressure on Separation Coefficient and Pressure Drop of Hollow Fiber Membrane Module in an Aircraft Fuel Inerting System	
Y. Cai, G.P. Lin, Y. Zeng, L. Peng and Z.X. Li	1686
Preparation of Pd-Cu-Ce Hydrogen Separation Membrane Alloys	
H. Zhao and J.Q. Liu	1692
Permeation Properties and Stability of Ni-BaCe_{0.4}Zr_{0.4}Nd_{0.2}O_{3-δ} Membrane for Hydrogen Separation	
S.J. Zhan, X.F. Zhu, W.P. Wang, F.S. Huang and W.S. Yang	1696
Investigations of an Ion Transport Membrane Reactor Specially Designed for a Power Cycle	
M. Nemitallah, M.A. Habib and R. Ben-Mansour	1700
The Effects of Solvent on Polysulfone Membrane Structure	
Y.Y. Xue and J.Y. Lian	1707
Synthesis and Characterization of Polysulfone/Montmorillonite (PSF/MMT) Mixed Matrix Membrane for Gas Separation	
P.C. Oh and N.A. Mansur	1711
Synthesis and Characterization of ZIF-8 Mixed Matrix Membranes	
C.C. Lok and Y.F. Yeong	1716
Effects of Montmorillonite (MMT) Inorganic Fillers on Polyvinylidene (PVDF) Mixed Matrix Membrane	
O.P. Ching and M.W. Bak Lung	1720
Validation of a Novel Approach for CO₂/N₂ Gas Separations by Means of a Hybrid Ceramic Membrane	
N.C. Nwogu, M.N. Kajama and E. Gobina	1725
Interfacially Polymerized Composite Hollow Fiber Membrane for CO₂ Separation	
A.A.M. Salih, C.H. Yi, B.L. Yang and P. Chen	1729
Brominated Poly(2,6-Dimethyl-1,4-Phenylene Oxide)/Carbon Materials Nanocomposite Membranes for CO₂/N₂ Separation	
L. Guo, B. Yu, H.L. Cong, X.L. Zhang, Z.J. Li, X.M. Liu, F. Zhai, H. Yuan and T.Z. Hao	1736
Hydrogen Separation Using Silica-Based Composite Membranes	
M.N. Kajama, N.C. Nwogu and E. Gobina	1742
Removal of Amines from Wastewater Using Membrane Separation Processes	
M.U.S. Zainal Abidin, H. Mukhtar and M.S. Shaharun	1747
Electroless Plating of Pd on Macro-Porous Alumina Support for H₂ Purification	
K. Lertwittayanon, O. Truektrong, W. Inthanu and W. Youravong	1752
Ionic Liquid Polymeric Membrane: Synthesis, Characterization & Performance Evaluation	
D.F. Mohshim, H. Mukhtar and Z. Man	1756
A Study on Permeabilities and Selectivities of Small-Molecule Gases for Composite Ionic Liquid and Polymer Membranes	
L.Z. Liang, Q. Gan and P. Nancarrow	1762

Chapter 10: Membrane Technologies in Biomedicine and Bioindustry

Effect of Applied Pressure on the Separation of Succinate and Acetate in Dead-End Nanofiltration K. Sribut and C. Umpuch	1771
Synthesis and Characterization of Modified Polydimethylsiloxane Nanomembrane for Chiral Separation N.D. Masdar, A.H. Mahmud, M.T. Mohd Ali, S.N.A.S. Ismail, R. Tajuddin, N. Saim and A.M. Md Jani	1776
Investigation of Separation of Lactose from Whey Solution by Nanofiltration Process H. Ye, Y.Z. Zhang, H. Li, L.G. Lin, X.L. Ding, L.Z. Zhao and H. Li	1782
Separation of Antihypertensive Peptides Derived from Soybean Protein Isolated with Ultrafiltration Technology S.X. Hu, L.Z. Jiang, Y.Y. Pan, Y. Li and X.N. Sui	1787
Performance of Cellulose Membrane from Bacterial Cellulose in Fermented Coconut Oil Treatment Faridah, Elwina, Helmi, M. Sami and Yudistira	1793
Application of the Enzymolysis and Membrane Technology in Glucan Extraction and Purification from <i>Grifola frondosa</i> C.B. Zhou, Z.P. Xu, W.J. Feng and X.Q. Zhang	1799
Fabrication of Low Cost Anodic Aluminum Oxide (AAO) Tubular Membrane and their Application for Hemodialysis A.K. Kasi, J.K. Kasi, M. Hasan, N. Afzulpurkar, S. Pratontep, S. Porntheeraphat and A. Pankiew	1803
Removal of Lactose from Highly Goat's Milk Concentration through Ultrafiltration Membrane N.S.Z. Abidin, S.A. Hussain and S.M.M. Kamal	1809
The Functionalization of Remaining Solvent in Polymeric Membrane Pores for Biomedical Applications S.I. Voicu, V.I. Antoniac, L. Naftanaila and G. Nechifor	1813
Applications of Ultrafiltration-Nanofiltration Membrane Continuous Combination Technology for Refining of Milk-Derived Oligosaccharides S.M. An, J.H. Wu, L.F. Qian, Y.L. Gao, Y. Wu and G.P. Yu	1817
Purification of Soybean Isoflavones from Soy Sauce Residue by Ultrafiltration B. Li, Z.Q. Wu, L.Y. Dong and L. Li	1823
Chitosan/Cellulose Microfiltration Membranes for Endotoxin Removal N.N. Wang, S.J. Wang, T.W. Shen, Y.Q. Cao, G.G. Ding, Y.M. Wu and R.H. Du	1828
Preliminary Study on the Manufacturing Process of a Membrane Filtration for Protein Concentration from the Recycled Materials T.W. Chung, S.H. Hsu, C.K. Chen, Y.F. Lin and Y.S. Lin	1832
Temperature Coagulant Tub Variation Effect on the Characteristic of Hollow Fiber Dialyser from Cellulose Acetate Composite D-Glucose Monohydrate R.F. Wahyuliswari, Siswanto and P. Widiyanti	1836
Analysis on Mechanical Property for Varied Geometry and Structure Parameters of Silicon Based Filtration Membrane for Artificial Kidney K.A. Mustafa, A.A. Hamzah, Y. Jumril and B.Y. Majlis	1844
Study on Concentrate Tannin from Gallnut Extract by Membrane Integrated Method Q. Ye, L.L. Yan, M.L. Xu, P. Lv, L.F. You and W. Wang	1850
Purification of Ferulic Acid from Wheat by Ultrafiltration Technology S.X. Liu and B. Wang	1854
Soybean Whey Treatment with an Air Sparging Ultrafiltration System S.H. Lv, Z.H. Liang, Y.Y. Zen and H.B. Fan	1858

Chapter 11: Modeling and Calculation of Membrane Technological Systems

Effect of Porous-Jump Model Parameters on Membrane Flux Prediction H.H. Li and Y.Y. Cheng	1867
The Research of Fuzzy Weighted Twin Support Vector Regression in the MBR Simulation Prediction C.J. Ji, C.Q. Li and T. Wang	1871

Maxwell-Stefan Equations Applied to the Modeling of Multi-Component Permeation through a Silicalite-1 Membrane C.H. Xu, Y.C. Chen, A. Peng, N.W. Wang, H. Shang, Y.J. Zhong and W.D. Zhu	1877
Mathematical Modeling of Thickness Dependent Physical Aging in Polymeric Membranes S.S.M. Lock, K.K. Lau, I.S.M. Lock, A.M. Shariff, Y.F. Yeong and B. Abdullah	1883
Charge Characteristics of Nanofiltration Membrane by Streaming Potential Method B.W. Su, X.J. Duan, M.W. Dou, X.L. Gao and C.J. Gao	1889
Mathematical Simulation of Membrane-Absorption for H₂S Capture from Nature Gas L. Ma, S.L. Wang, J. Wang, E.T. Li and X. Cao	1894
Gas Permeation Models in Mixed Matrix Membranes for Gas Separation S. Rafiq, A.S. Maulud, Z. Man and N. Muhammad	1900
Molecular Dynamics Simulation of Gas Transport in Polyisoprene Matrix N. Rakkapao	1908
Mathematical Modeling of the Radial Crossflow Hollow Fiber Membrane Module for Multi-Component Gas Separation S.S.M. Lock, K.K. Lau and M.S. Azmi	1913
Partition-Diffusion Model for Enantioseparation of Phenylalanine Using Hollow Fiber SLM D.S. Huang, Y. Min, L.H. Yao, J. Yang, Y.S. Chen and W. Liu	1917
Mathematical Modeling of Chromium(III) Extraction by Emulsion Liquid Membrane Y.Z. Xie, D.J. Fei, Y.G. Dang and J.X. Wu	1921
Oily Water Treatment Using Ceramic Membrane in Presence of Swirling Flow Induced by a Tangential Inlet via CFD T.V. Mota, H.G. Alves, S.R.F. Neto and A.G.B. de Lima	1926
Analyses on Diffusion Behaviors of Water, Na⁺ and Cl⁻ through the MFI Membranes by Molecular Simulations S.T. Li, Y.D. Hu and D.F. Yang	1933
Modeling of PVA Modified Non-Woven for Submerged Membrane Bioreactor Treating Synthetic Wastewater C.H. Zhang, Y.Y. Dong and F.J. Zhang	1937