

Table of Contents

Preface

Chapter 1: Polymeric Membranes

Fabrication of PSS/PDADMAC Polyelectrolyte Membrane via Layer-by-Layer (LbL) Technique for Forward Osmosis (FO) Application M.T. How and M.N. Abu Seman	3
Preliminary Study of ABS/Chitosan Blend Polymer for DMFC Membranes N. Hidayati, M. Mujiburohman, Hamid, H. Purnama, A. Dwilaksana and F.R. Zubaida	10
Effect of TiO₂ Incorporation on Separation Performance of Pure PES and PES/PVAc Blend Membranes M.A. Abdullah, H. Mukhtar, Y.F. Yeong, M.S. Shaharun and H.A. Mannan	17
Antifouling Property and Morphology of Polyethersulfone Membranes Blended with Bio-Based Amphiphilic Polymer Additives Y. Phuphuak and T. Loythaworn	22
Synthesis and Characterization of Membranes from Cellulose Acetate Derivatives of Corn Husk L. Setyaningsih, H. Priambodo, I. Erfiano, S. Agung and R.K. Utomo	29
Preparation and Characterization of the Hydrophilic Polysulfone Ultrafiltration Membrane X. Wang, Z.P. Zhao and P. Lu	35
A more Sustainable Polyurethane Membrane for Gas Separation at Room Temperature and Low Pressure G.H.G. Santos, M.A. Rodrigues, H.C. Ferraz, L.C. Moura and J.L. de Miranda	40
Nanocellulose as Modifier for Hollow Fiber Ultrafiltration PSF Membranes T.S. Anokhina, S.D. Bazhenov, I.L. Borisov, V.P. Vasilevsky, V.A. Vinokurov and A.V. Volkov	48
Preparation of Polyacrylonitrile Membranes by Vapor Induced Phase Separation A.A. Yushkin, D.S. Bakhtin, M.N. Efimov, G.P. Karpacheva and A.V. Volkov	54
Study of Structure and Optical Density of Track Membranes V.I. Pavlenko, N.I. Cherkashina and V.A. Manaev	60

Chapter 2: Inorganic Membranes

Contaminants Removal in Wastewater Using Membrane Adsorbents Zeolite Y/Alpha-Alumina A.S. Barbosa, A.S. Barbosa and M.G.F. Rodrigues	69
Y-Type Zeolite Membranes: Synthesis by Secondary by Method and Application in Treatment of Oily Effluents A.S. Barbosa, A.S. Barbosa and M.G.F. Rodrigues	73
Silica Modified Membrane for Carbon Dioxide Separation from Natural Gas M.N. Kajama, Y. Yildirim, U.H. Taura, A.S. Grema and S. Abdulrahman	79
Effect of Peptizing Agent Concentration on Morphology of Unsupported Alumina Membrane N. Thongdee, S. Watcharamaisakul and B. Golman	89
Porous Systems Based on Alkali-Activated Fly Ash P. Kejik, V. Bilek Jr., P. Bulejko, J. Hajzler, M. Březina, L. Galvánková and L. Kalina	95
Alumina Membrane Development with Carbon Fiber as Porosity Precursor C.R. Consonni, R.H. Tsunaki and C.A. Fortulan	101
Properties and Filtration Performance of Porous Clay Membrane Produced Using Sawdust as Pore Forming Agent C.Z. Rumaizah, A. Fazureen, R. Mohd Hasmizam, A. Asmadi and M.A.A. Muhamad Nor	107
Development of Asymmetric Ceramic Membranes Coated with Residue of Granite for Use in Wastewater Treatment M.A.R. Bonifácio, H.L. Lira, M. Inocêncio, M.C. da Silva, R.F.V. Farias and K.B. França	113

Chapter 3: Composite and Hybrid Membranes

Preparation and Characterization of Composite Membrane Chitosan-Silica-Polyethylene Glycol	
W. Mahatmanti, N. Nuryono and D. Siswanta	121
Fabrication of Amino-Functionalized CAU-1/Cellulose Acetate Mixed Matrix Membranes for CO₂/N₂ Separation	
Y.F. Yeong and T.S. Khoo	125
Fabrication and Characterization of Electrospun Polysulfone (PSf) / Halloysite (HAL) Nanocomposite Membrane	
R.R. Aquino, M.S. Tolentino, J.C. Millare, C.D. Balboa, C.J.B. Castro and B.A. Basilia	134
Nanostructured Membrane of Sodium Montmorillonite Reinforced Cellulose Acetate for Adsorption of Ca(II) and Mg(II) Ions in Hard Water	
R.R. Aquino, M.S. Tolentino, D.J.C. Ramolete, A.M. Calingasan, M.N. Dela Cruz and B.A. Basilia	140
Effect of Polysulfone/Organomontmorillonite Blends on Nanocomposite Membrane Properties	
R.R. Aquino, M.S. Tolentino, M.L. Esmalde, D.V.B. Condol and B.A. Basilia	146
Characterization of the Properties of Electrospun Blended Hybrid Poly(Vinyl Alcohol) Aloe Vera/Chitosan Nano-Emulsion Nanofibrous Membranes	
H. Sosiati, W. Nur Fatihah, Yusmaniar and M.B. Nur Rahman	152
Development of Lipid/Polymer Membrane by Reduced Graphene Oxide for Sugar Sensor	
K. Pirabul, P. Srinoppakhun, A. Thanapimmetha and M. Saisriyoot	158
Fabrication and Characterization of Electrospun Polysulfone (PSF)/Organo-Montmorillonite (O-MMT) Nanostructured Membranes	
R.R. Aquino, M.S. Tolentino, J.V. Angeles and H. Azelle Millano	163
Toughened Chitosan Composite Nanofiltration Membrane by Introduction of Acrylic Acid	
T. Mu	168
Effect of Casting Solution Composition on Properties of PIM-1/PAN Thin Film Composite Membranes	
M.N. Putintseva, I.L. Borisov, A.A. Yushkin, R. Kirk, P.M. Budd and A.V. Volkov	174
Microporous Aluminum Fumarate (A520) Metal-Organic Framework as Modifier to Free-Standing Mixed Matrix Membrane	
D.P. Bernabe, A.R. Caparanga, C.C. Hu, S.J. You, K.R. Lee and J.Y. Lai	181
Study of Hybrid Membranes Prepared with the Addition of Calcium Chloride	
K.M. Medeiros, D.F. Lima, C.A.P. Lima, E.M. Araújo and H.L. Lira	187
PA6/Sodium Clay Membrane for Application in Petroleum Sector	
M.M.C.C. Mota, E.M. Araújo, L.A.M. Damião, K.M. Medeiros and C.A.P. de Lima	193
Preparation and Characterization of Tubular Composite Membranes and their Application in Water Flow Measurements	
R.S.S. Cunha, J.D. Mota, M.F. Mota, M.G.F. Rodrigues and F. Machado	199

Chapter 4: Membrane Technologies for Water and Wastewater Treatment

Thermo-Fluid Dynamics Analysis of the Oil-Water Separation Using Ceramic Membrane	
H.L. Fernandes Magalhães, G. Moreira, B.R. de Brito Correia, R. Soares Gomez, A.G. Barbosa de Lima and S.R. de Farias Neto	207
Removal of Copper (II) Ion: Effect of Polysulfone Support Thickness	
N.Z.K. Shaari, N.A. Sulaiman and S.N. Hamdan	231
Immobilization of Peroxidase from Cauliflower Stem on Ultrafiltration Membrane for Phenol Removal	
K. Ratanapongleka and A. Onsarn	241
Desalination of Brackish Water/Seawater via Selective Separation	
M.E. Kouli, A. Ferraro, P. Tselou and E. Hristoforou	248
Graphene Utilization for Water Desalination Process	
M. Sabet, H. Soleimani, E. Mohammadian and S. Hosseini	254

Desorption of Mercury Complex from Fe-Modified Montmorillonite Adsorbent Membrane M.J. Lodo and L.J.L. Diaz	260
Sorption and Membrane Technologies for Mine Water Purification K.L. Timofeev, V. Kurdiumov and G. Maltsev	266
Technology of Producing of Sodium Hypochlorite from the Concentrate of Reverse Osmosis Systems L.N. Fesenko, I.V. Pchel'nikov and R.V. Fedotov	273

Chapter 5: Membrane Technologies of Pervaporation and Distillation

Membranes Based on Polyalkylmethysiloxanes for Selective Removal of C5 and C6 Alcohol from Water E.A. Grushevenko, I.A. Podtynnikov, A.A. Knyazeva, O.A. Sharova, T.S. Anokhina and I.L. Borisov	283
Novel Membrane Suitable for Membrane Distillation: Effect of Mixed Nanofillers on the Membrane Performance M.R. El-Marghany, A.H. El-Shazly, M.S.A. Salem, M.N. Sabry and N. Nady	288
Effect of Adding Functionalized Graphene on the Performance of PVDF Membrane in Direct Contact Membrane Distillation M.S.A. Salem, A.H. El-Shazly, M.R. El-Marghany, M.N. Sabry and N. Nady	294

Chapter 6: Liquid Membrane Technologies

Application of Benzoyl-Acetone as a Cation Carrier in Mercury (II) Extraction by Using Liquid Membrane Emulsion Technique B. Hamzah, S. Rahmawati and R. Hardani	303
Membrane Extraction and Electrodeposition of Zinc(II) and Lead(II) during Electrodialysis T. Sadyrbaeva	309

Chapter 7: Membranes and Technologies in Gas Separation

Technical Evaluation of the Applicability of Gas-Liquid Membrane Contactors for CO₂ Removal from CO₂ Rich Natural Gas Streams in Offshore Rigs G.P. da Cunha, J.L. de Medeiros and O.d.Q.F. Araújo	317
Membrane Transport for Gas Separation A. Mondal and C. Bhattacharjee	327
Synthesis and Formation of Gas Separation Membranes Based on Polyalkylenesiloxanes I.L. Borisov, N.V. Ushakov, E.A. Grushevenko, E.S. Finkel'stein and V.V. Volkov	340
MOF-Modified High Permeability Polyimide Membrane for Gas Separation D.P. Bernabe, A.R. Caparanga, C.C. Hu, S.J. You, K.R. Lee and J.Y. Lai	345
P84 Co-Polyimide Based-Tubular Carbon Membrane: Effect of Heating Rates on Helium Separations N. Sazali, W.N.W. Salleh, A.F. Ismail, K. Kadirgama and F.E.C. Othman	351

Chapter 8: Modeling and Calculation of Membrane Technological Systems

Empirical Model of Operating Temperature and Pressure Effect towards Pure and Binary O₂/ N₂ Gas Permeability in Polysulfone Membrane S.S.M. Lock, K.K. Lau, I.S.M. Lock, A.M. Shariff, Y.F. Yeong and F. Ahmad	357
Comparison of Two Elementary Nanomembranes Cells for Gas Mixture Separation Problem E. Tarasov	364
Mass Transport through Composite Asymmetric Membranes A. Mazumder, D. Sen and C. Bhattacharjee	370