

BENNY DEAN FREEMAN

The University of Texas at Austin
McKetta Department of Chemical Engineering
200 E. Dean Keeton St., Stop C0400
Austin, TX 78712-1589
Tel: (512)232-2803
e-mail: freeman@che.utexas.edu

4007 Bannet Lane
Austin, Texas 78746-1914
Tel: (512)626-6612
Texas P.E. Number: 90824

EDUCATION:

- Ph.D. Chemical Engineering - January 1988
University of California, Berkeley
Thesis: "The Effect of Hydrostatic Pressure on Mutual Diffusion Coefficients in Polymer Solutions" Thesis Directors: Morton M. Denn and David S. Soane
- B.S. Chemical Engineering - May 1983 *Summa Cum Laude*
North Carolina State University
Graduate of Engineering Honors Program

PROFESSIONAL EXPERIENCE:

The University of Texas at Austin:

- William J. (Bill) Murray, Jr. Endowed Chair in Engineering, September 2019 – present.
Richard B. Curran Centennial Chair of Engineering, September 2012 – August 2019.
Paul D. and Betty Robertson Meek & American Petrofina Foundation Centennial Professor of Chemical Engineering, September 2007 to September 2012.
Kenneth A. Kobe Professor of Chemical Engineering, September 2005 to September 2012.
Matthew van Winkle Professor of Chemical Engineering, September 2002 to September 2005.
Professor of Chemical Engineering, January 2002 to present.

NC State University:

- Professor of Chemical Engineering, November 1997 to January 2002.
Sabbatical Leave, July 2000 to December 2000. University of California, Berkeley.
Associate Department Head, August 1996 to January 2002.
Associate Professor of Chemical Engineering, August 1994 to November 1997.
Assistant Professor of Chemical Engineering, August 1989 to August 1994.

NATO Postdoctoral Fellow, March 1988 to July 1989, Ecole Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI), Laboratoire Physico-Chimie Structurale et Macromoléculaire, 10 rue Vauquelin, 75231 Paris, France. Research directed by Professor Lucien Monnerie and Professor Liliane Bokobza.

Graduate Student, August 1983 to January 1988, Univ. of California, Berkeley.

Summer Technical Hire, E.I. duPont, Inc. Brevard, NC, Summers of 1981, 1982, and 1983.

HONORS AND AWARDS:

Reilley Lectureship, University of Notre Dame	2020
Membrane Society of Australasia (MSA) Distinguished Scholar Lectureship	2019
American Chemical Society POLY Fellow	2019
American Chemical Society POLY/PMSE Plenary Lecture	2019
Bird, Stewart, and Lightfoot Lecture, University of Wisconsin	2019
North American Membrane Society (NAMS) Fellow	2017
Fulbright Distinguished Chair.....	2016-2017
PMSE Distinguished Service Award (from Polymeric Materials: Science and Engineering Division of ACS)	2015

World Premier International (WPI) Professor of International Institute for Carbon-Neutral Energy Research (I ² CNER) at Kyushu University, Japan	2014-2020
Fellow of the Industrial and Engineering Chemistry Research Division of ACS.....	2014
AIChE Clarence (Larry) G. Gerhold Award.....	2013
Joe J. King Professional Engineering Achievement Award	2013
Society of Plastics Engineers (SPE) International Award	2013
Roy W. Tess Award in Coatings (from PMSE Division of ACS).....	2012
AAAS Fellow.....	2011
ACS Fellow.....	2011
AIChE Fellow	2011
Fellow of the PMSE Division of ACS	2010
ACS Award in Applied Polymer Science	2009
American Institute of Chemical Engineers (AIChE) Institute Award for Excellence in Industrial Gases Technology	2008
IBM Faculty Award	2008, 2012
University CO-OP Research Excellence Award for Best Research Paper in 2006	2007
American Chemical Society (ACS) PMSE Cooperative Research Award.....	2002
National Academy of Engineering Frontiers of Engineering – Japan Symposium	2002
Strategic Environmental Research and Development Program Project of the Year.....	2001
Japan Society for the Promotion of Science Fellowship.....	1997, 2001
Alcoa Foundation Distinguished Engineering Research Award.....	2000
National Technological University Outstanding Teaching Certificate	2000
Academy of Outstanding Teachers	1997
College of Engineering Outstanding Teaching Award	1997
United Technologies Excellence in Teaching Award.....	1997
ALCOA Foundation Research Achievement Award.....	1996
National Academy of Engineering Frontiers of Engineering Symposium	1995
NSF Young Investigator Award	1992-1996
3M Nontenured Faculty Grant Award	1991-1994
NATO Postdoctoral Fellowship	1987
Berkeley Outstanding Graduate Instructor	1986
NSF Graduate Fellowship	1984
Berkeley Fellowship	1983
Phi Kappa Phi Fellowship	1983
P.V. Danckwerts Senior Research Prize in Chemical Engineering	1983
Eastern NC Section AIChE Award	1983
Special Service Award from NC Alpha Chapter of Tau Beta Pi	1983
E.I. duPont Ph.D. Fellowship	1982
Allied Merit Scholarship	1982
SOHIO Merit Scholarship	1981

EXTERNAL PROFESSIONAL ACTIVITIES:

American Chemical Society

Member of Executive Committee, Polymeric Materials: Science and Engineering (PMSE) Division [served as Program Chair, Ford Travel Grant Chair, Member at Large, and Chair of the On-line Preprints Committee]	1994 – present
Vice Chair, PMSE Division	2003 – 2004
Chair, PMSE Division	2005
Past Chair, PMSE Division	2006
Alternate Councilor for PMSE Division	2008 – 2010

Councilor for PMSE Division	2011 – 2021
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American Institute of Chemical Engineers

Vice Chair of Membranes Area of Separations Division	2002 – 2003
Chair of Membranes Area of Separations Division	2003 – 2004
Co-organizer of Topical Conference on Membranes	2003
Director of Separations Division	2003 – 2008
Second Vice Chair of the Separations Division	2009
First Vice Chair of the Separations Division	2010
Chair of the Separations Division	2011
Past-Chair of the Separations Division	2012
Member, Separations Division Nominating Committee	2017
Co-organizer of Topical Conference on Water Technologies for Developed and Developing Countries	2011
Member, AIChE Fellows Admission Committee	2013 – 2018
Second Vice Chair, AIChE Fellows Admission Committee	2015
First Vice Chair, AIChE Fellows Admission Committee	2016
Chair, AIChE Fellows Admission Committee	2017

North American Membrane Society

Vice President	2004 – 2005
President	2005 – 2006
Member, Board of Directors	2001 – 2012
Technical Program Chair of Annual Meeting	2004
Co-Chair of International Congress on Membranes (ICOM)	2008

Other

Vice Chair of the Gordon Research Conference on Membranes: Materials & Processes	2002
Chair of the Gordon Research Conference on Membranes: Materials & Processes	2004

JOURNAL EDITORIAL ACTIVITIES:

Editor-in-Chief, <i>Polymer</i>	2020 – present
Senior Editor, <i>Polymer</i>	2019
Member, Editorial Board, <i>ACS Macro Letters</i>	2020 – present
Member, Editorial Board, <i>ACS Applied Polymer Materials</i>	2020 – present
Member, Editorial Board, <i>Polymer</i>	2011 – 2019
Member, Editorial Board, <i>Desalination</i>	2009 – 2013
Member, Editorial Board, <i>Polymers</i>	2009 – present
Member, International Editorial Advisory Board, <i>Int. Journal of Polymer Science</i>	2008 – present
Associate Editor, <i>Industrial & Engineering Chemistry Research</i>	2007 – 2019
Member, Editorial Board, <i>The Open Macromolecules Journal</i>	2007 – present
Member, Editorial Board, <i>Journal of Membrane Science</i>	2005 – present
Member, Editorial Board, <i>Journal of Applied Membrane Science and Technology</i>	2005 – present
Member, International Editorial Advisory Board, <i>Membrane Journal</i>	2003 – present
Member, International Editorial Advisory Board, <i>Korean Membrane Journal</i>	2003 – present

BOOKS:

1. B.D. Freeman and Y. Yampolskii, Membrane Gas Separation, John Wiley & Sons, Ltd., New York (2010).

2. Y.P. Yampolskii, I. Pinnau, and B.D. Freeman, *Materials Science of Membranes for Gas and Vapor Separation*, John Wiley & Sons, Ltd., New York (2006).
3. I. Pinnau and B.D. Freeman, Editors, *Advanced Materials for Membrane Separations*, ACS Symposium Series Volume 876, American Chemical Society, Washington, DC (2004).
4. I. Pinnau and B.D. Freeman, Editors, *Membrane Formation and Modification*, ACS Symposium Series Volume 744, American Chemical Society, Washington, DC (2000).
5. B.D. Freeman and I. Pinnau, Editors, *Polymeric Membranes for Gas and Vapor Separations: Chemistry and Materials Science*, ACS Symposium Series Volume 733, American Chemical Society, Washington, DC (1999).

PUBLICATIONS: Researcher ID: G-5405-2016 Orcid ID: orcid.org/0000-0003-2779-7788

1. Ricci, E., F.M. Benedetti, M.E. Dose, M.G. De Angelis, B.D. Freeman, and D.R. Paul, "Competitive Sorption in CO₂/CH₄ Separations: the Case of HAB/6FDA Polyimide and its TR derivative and a General Analysis of Its Impact on the Selectivity of Glassy Polymers at Multicomponent Conditions," *Journal of Membrane Science*, 612, 118374 (2020).
2. Galizia, M., D.R. Paul, and B.D. Freeman, "Co-ion Specific Effect on Sodium Halides Sorption and Transport in a Cross-linked Poly(p-styrene sulfonate-co-divinylbenzene) for Membrane Applications," *Journal of Membrane Science*, 612, 118410 (2020).
3. Park, J., K.E. Gaines, L.C. Jheng, S.J. Mecham, J.E. McGrath, H.B. Park, "Characterization and Gas Transport Properties of UV-irradiated Polydimethylsiloxane (PDMS)-containing Polyimide Copolymer Membranes," *Polymer*, 122966 (2020).
4. Moon, J.D., B.D. Freeman, C.J. Hawker, and R.A. Segalman, "Can Self-Assembly Address the Permeability/Selectivity Trade-Offs in Polymer Membranes?," *Macromolecules*, **53**(14), 5649-5654 (2020).
5. Brennecke, J.F. and B.D. Freeman, "Reimagining Petroleum Refining," *Science*, **369**(6501), 254-255 (2020).
6. Roh, J.S., H. Lee, T.H. Lee, H.W. Yoon, T.H. Choi, S.-H. Do, S.Y. Yoo, B. Freeman, T. Song, U. Paik, H.B. Park, "Unprecedentedly Low CO₂ Transport through Vertically Aligned, Conical Silicon Nanotube Membranes," *Nano Letters*, **20**(7), 4754-4760 (2020).
7. Chen, G.Q., K. Wei, A. Hassanvand, B.D. Freeman, and S.E. Kentish, "Single and Binary Ion Sorption Equilibria of Monovalent and Divalent Ions in Commercial Ion Exchange Resins," *Water Research*, **175**, 115681 (2020).
8. Park, J., H.W. Yoon, D.R. Paul, and B.D. Freeman, "Gas Transport Properties of PDMS-coated Reverse Osmosis Membranes," *Journal of Membrane Science*, **604**, 118009 (2020).
9. Rodriguez, C.G., M. Chwatko, J. Park, C.L. Bentley, B.D. Freeman, and N.A. Lynd, "Compositionally Controlled Polyether Membranes via Mono (μ -alkoxo) bis (alkylaluminum)-Initiated Chain-Growth Network Epoxide Polymerization: Synthesis and Transport Properties," *Macromolecules*, **53**(4), 1191-1198 (2020).
10. Freeman, B.D., "Polymer: Looking Forward," *Polymer*, 122312 (2020).

11. Yoon, H.W., T.H. Lee, C.M. Doherty, T.H. Choi, J.S. Roh, H.W. Kim, Y.H. Cho, S.-H. Do, B.D. Freeman, and H.B. Park, "Origin of CO₂-philic sorption by Graphene Oxide Layered Nanosheets and Its Derivatives," *Journal of Chemical Physics Letters*, **11**, 2356-2362 (2020).
12. Jang, E.-S., J. Kamcev, K. Kobayashi, N. Yan, R. Sujanani, T.J. Dilenschneider, H.B. Park, D.R. Paul, and B.D. Freeman, "Influence of Water Content on Alkali Metal Chloride Transport in Cross-Linked Poly(ethylene glycol) Diacrylate. 2. Ion Diffusion," *Polymer*, **192**, 122316 (2020).
13. Lu, J., H. Zheng, J. Hou, X. Li, X. Hu, Y. Hu, C.D. Easton, Q. Li, C. Sun, A.W. Thornton, M.R. Hill, X. Zhang, G. Jiang, J.Z. Liu, A.J. Hill, B.D. Freeman, L. Jiang, and H. Wang, "Ultrafast Metal Ion Sieving in Rectifying and Highly Selective Metal-Organic Framework Based Subnanochannels," *Nature Materials*, <https://doi.org/10.1038/s41563-020-0634-7> (2020).
14. Landsman, M.R., R. Sujanani, S.H. Brodfuehrer, C.M. Cooper, A.G. Darr, R.J. Davis, K. Kim, S. Kum, L.K. Nalle, S.M. Nomaan, C.P. Oden, A. Paspureddi, K.K. Reimund, L.S. Rowles III, S. Yeo, D.F. Lawler, B.D. Freeman, and L.E. Katz, "Water Treatment: Are Membranes the Panacea?," *Annual Review of Chemical and Biomolecular Engineering*, **11:1**, 559-585 (2020).
Erratum – pp. 367-121.
15. Moon, J.D., M. Galizia, H. Borjigin, R. Liu, J.S. Riffle, B.D. Freeman, and D.R. Paul, "Modeling Water Diffusion in Polybenzimidazole Membranes Using Partial Immobilization and Free Volume Theory," *Polymer*, **189**, 122170 (2020).
16. Pérez-Francisco, J.M., J.L. Santiago-García, M.I. Loria-Bastarrachea, D.R. Paul, B.D. Freeman, and M. Aguilar-Vega, "CMS Membranes from PBI/PI Blends: Temperature Effect on Gas Transport and Separation Performance," *Journal of Membrane Science*, **597**, 117703 (2020).
17. Hill, A.J., A.W. Thornton, R.H.J. Hannink, J.D. Moon, and B.D. Freeman, "Role of Free Volume in Molecular Mobility and Performance of Glassy Polymers for Corrosion Protective Coatings," *Corrosion Engineering Science and Technology*, **55(20)**, 145-158 (2020).
18. Galizia, M. and B.D. Freeman, "Don Paul: 60 Years in Research and Education," *Industrial & Engineering Chemistry Research*, **59(12)**, 5203-5204 (2020).
19. Stevens, K.A., J.D. Moon, H. Borjigin, R. Liu, R.M. Joseph, J.S. Riffle, and B.D. Freeman, "Influence of Temperature on Gas Transport Properties of Tetraaminodiphenylsulfone (TADPS) based Polybenzimidazoles," *Journal of Membrane Science*, **593**, 117427 (2020).
20. Miguel Sanchez, C., T. Song, J. Brennecke, and B. Freeman, "Hydrogen Stable Supported Ionic Liquid Membranes with Silver Carriers: Propylene and Propane Permeability and Solubility," *Industrial & Engineering Chemistry Research*, **59(12)**, 5362-5370 (2020).
21. Freeman, B.D., "Reflecting on 12 Years as I&EC Research Associate Editor," *Industrial & Engineering Chemistry Research*, **58**, 21171-21172 (2019).
22. Jang, E.-S., J. Kamcev, K. Kobayashi, N. Yan, R. Sujanani, T.J. Dilenschneider, H.B. Park, D.R. Paul, and B.D. Freeman, "Influence of Water Content on Alkali Metal Chloride Transport in Cross-Linked Poly(ethylene glycol) Diacrylate. I. Ion Sorption," *Polymer*, **178**, 121554 (2019).
23. Li, X., P. Wang, J. Hou, J. Lu, C.D. Easton, X. Zhang, M. Hill, A. Thornton, J.Z. Liu, B. Freeman, A. Hill, L. Jiang, and H. Wang, "Fast and Selective Fluoride Conduction in Sub-1-

- nanometer Metal-Organic Framework Channels,” *Nature Communications*, **10**, Article Number 2490 (2019).
24. Choudhury, S.R., O. Lane, D. Kazerooni, G.S. Narang, E.-S. Jang, B.D. Freeman, J.J. Lesko, and J.S. Riffle, “Synthesis and Characterization of Post-Sulfonated Poly(arylene ether sulfone) Membranes for Potential Applications in Water Desalination,” *Polymer*, **177**, 250-261 (2019).
 25. Moon, J.D., A.T. Bridge, C. D’Ambra, B.D. Freeman, and D.R. Paul, “Gas Separation Properties of Polybenzimidazole/Thermally-Rearranged Polymer Blends,” *Journal of Membrane Science*, **582**, 182-193 (2019).
 26. Jang, E.-S., W. Mickols, R. Sujanani, A. Helenic, T.J. Dilenschneider, J. Kamcev, D.R. Paul, and B.D. Freeman, “Influence of Concentration Polarization and Thermodynamic Non-ideality on Salt Transport in Reverse Osmosis Membranes,” *Journal of Membrane Science*, **572**, 668-675 (2019).
 27. Jang, E.-S., J. Kamcev, K. Kobayashi, N. Yan, R. Sujanani, S. Talley, R. Moore, D. Paul, B. Freeman, “Effect of Water Content on Sodium Chloride Sorption in Cross-Linked Cation Exchange Membranes,” *Macromolecules*, **5265**, 2569-2579 (2019).
 28. Galizia, M., G.S. Manning, D.R. Paul, and B.D. Freeman, “Ion Partitioning Between Brines and Ion Exchange Polymers,” *Polymer*, **165**, 91-100 (2019).
 29. Kirschner, A.Y., Y.-H. Cheng, D.R. Paul, R.W. Field, and B.D. Freeman, “Fouling Mechanisms in Constant Flux Crossflow Ultrafiltration,” *Journal of Membrane Science*, **574**, 65-75 (2019).
 30. Dose, M.E., M. Chwatko, I. Hubacek, N.A. Lynd, D.R. Paul, and B.D. Freeman, “Thermally Cross-linked Diaminophenylindane (DAPI) Containing Polyimides for Membrane Based Gas Separations,” *Polymer*, **161**, 16-26 (2019).
 31. Talebi, S., G.Q. Chen, B. Freeman, F. Suarez, A. Freckleton, K. Bathurst, and S.E. Kentish, “Fouling and *in-situ* Cleaning of Ion-Exchange Membranes During the Electrodialysis of Fresh Acid and Sweet Whey,” *Journal of Food Engineering*, **246**, 192-199 (2019).
 32. Moon, J.D., and B.D. Freeman, “Ordered Polymeric Membranes Using Metals,” *Nature Materials*, **18**, 92-93 (2019).
 33. Moon, J., M. Galizia, H. Borjigin, R. Liu, J. Riffle, B.D. Freeman, and D.R. Paul, “Water Vapor Sorption, Diffusion, and Dilatation in Polybenzimidazoles,” *Macromolecules*, **51(18)**, 7197-7208 (2018).
 34. Kamcev, J., D.R. Paul, and B.D. Freeman, “Equilibrium Ion Partitioning Between Aqueous Salt Solutions and Inhomogeneous Ion Exchange Membranes,” *Desalination*, **446**, 31-41 (2018).
 35. Kamcev, J., C.M. Doherty, K. Lopez, A.J. Hill, D.R. Paul, and B.D. Freeman, “Effect of Fixed Charge Group Concentration on Salt Permeability and Diffusion Coefficients in Ion Exchange Membranes,” *Journal of Membrane Science*, **566**, 307-316 (2018).
 36. Musto, P., P. La Manna, J.D. Moon, M. Galizia, and B.D. Freeman, “Infrared Spectroscopy of Polybenzimidazole in the Dry and Hydrate Forms: A Combined Experimental and Computational Study,” *ACS Omega*, **3**, 11592-11607 (2018).

37. Scholes, C.A., and B.D. Freeman, "Thermal Rearranged Poly(imide-co-ethylene glycol) Membranes for Gas Separation," *Journal of Membrane Science*, **563**, 676-683 (2018).
38. Joseph, R.M., M.M. Merrick, R. Liu, A.C. Fraser, J.D. Moon, S.R. Choudhury, J. Lesko, B.D. Freeman, and J.S. Riffle, "Synthesis and Characterization of Polybenzimidazole Membranes for Gas Separation with Improved Gas Permeability: A Grafting and Blending Approach," *Journal of Membrane Science*, **564**, 587-597 (2018).
39. Yan, N., D.R. Paul, and B.D. Freeman, "Water and Ion Sorption in a Series of Cross-linked AMPS/PEGDA Hydrogel Membranes," *Polymer*, **146**, 196-208 (2018).
40. Kamcev, J., D.R. Paul, G.S. Manning, and B.D. Freeman, "Ion Diffusion Coefficients in Ion Exchange Membranes: Significance of Counterion Condensation," *Macromolecules*, **51(15)**, 5519-5529 (2018).
41. Abdellah, M.H., C.A. Scholes, B.D. Freeman, L. Liu, and S.E. Kentish, "Transport of Terpenes Through Composite PDMS/PAN Solvent Resistant Nanofiltration Membranes," *Separation and Purification Technology*, **207**, 470-476 (2018).
42. Narang, G.S., J.D. Moon, W. Zhang, G.C. Miller, S.R. Choudhury, A. Shaver, B. Vondrasek, J.J. Lesko, J.J. Fallon, M. Bortner, C. D'Ambra, B.D. Freeman, and J.S. Riffle, "Synthesis and Characterization of a Phosphine Oxide Based Poly(arylene ether ketone) and Blends with Poly(2,6-dimethyl-1,4-phenylene oxide) for Gas Separations," *Polymer*, **138**, 156-168 (2018).
43. McGinnis, R.L., K. Reimund, J. Ren, L. Xia, M.R. Chowdhury, X. Sun, M. Abril, J.D. Moon, M.M. Merrick, J. Park, K.A. Stevens, J.R. McCutcheon, and B.D. Freeman, "Large Scale Polymeric Carbon Nanotube Membranes with Sub-1.27 nm Pores," *Science Advances*, **4**, e1700938 (2018).
44. Zhang, H., J. Hou, Y. Hu, P. Wang, R. Ou, L. Jiang, J.Z. Liu, B.D. Freeman, A.J. Hill, H. Wang, "Ultrafast Selective Transport of Alkali Metal Ions in Metal Organic Frameworks with Subnanometer Pores," *Science Advances*, **4(2)**, eaaq0066 (2018).
45. Kamcev, J., R. Sujanani, E.-S. Jang, Ni Yan, N. Moe, D. R. Paul, and B. D. Freeman, "Salt Concentration Dependence of Ionic Conductivity in Ion Exchange Membranes," *Journal of Membrane Science*, **547**, 123-133 (2018).
46. Puertas-Bartolomé, M., M.E. Dose, P. Bosch, B.D. Freeman, J.E. McGrath, J.S. Riffle, A.E. Lozano, J.G. de la Campa, and C. Álvarez, Aromatic Poly(ether ether ketone)s Capable of Crosslinking via UV Irradiation to Improve Gas Separation Performance, *RSC Advances*, **7**, 55371–55381, (2017).
47. Daryaei, A., E.-S. Jang, S.R. Choudhury, D. Kazerooni, J.J. Lesko, B.D. Freeman, J.S. Riffle, and J.E. McGrath, "Structure-Property Relationships of Crosslinked Disulfonated Poly(arylene ether sulfone) Membranes for Desalination of Water", *Polymer*, **132**, 286-293 (2017).
48. Shaver, A., J.D. Moon, D. Savacool, W. Zhang, G. Narang, G. Miller, B. Vondrasek, J.J. Lesko, B. D. Freeman, J.S. Riffle, and J.E. McGrath, "Poly(2,6-dimethyl-1,4-phenylene oxide) Blends with a Poly(arylene ether ketone) for Gas Separation Membranes," *Polymer*, **114**, 135-143 (2017).

49. Galizia, M., W.S. Chi, Z.P. Smith, T.C. Merkel, R.W. Baker, and B.D. Freeman, "Polymers and Mixed Matrix Membranes for Gas and Vapor Separation: A Review and Prospective Opportunities," *Macromolecules*, **50**, 7809-7843 (2017).
50. Kirschner, A.Y., C.-C. Chang, S. Kasemset, T. Emrick, B.D. Freeman, "Fouling-Resistant Ultrafiltration Membranes Prepared via Co-Deposition of Dopamine/Zwitterion Composite Coatings," *Journal of Membrane Science*, **541**, 300-311 (2017).
51. Park, H.B., J. Kamcev, L.M. Robeson, M. Elimelech, and B.D. Freeman, "Maximizing the Right Stuff: The Tradeoff Between Membrane Permeability and Selectivity," *Science*, 356(6343), eaab0530 (2017).
52. Kushwaha, A., M.E. Dose, S. Luo, B.D. Freeman, and R. Guo, "Polybenzoxazole (PBO)-based Gas Separation Membranes Thermally Derived from Blends of *Ortho*-functional Polyimide and Polyamide Precursors," *Separation and Purification Technology*, **184**, 384-293 (2017).
53. Kamcev, J., D.R. Paul, G.S. Manning, and B.D. Freeman, "Accounting for Frame of Reference and Thermodynamic Non-idealities When Calculating Salt Diffusion Coefficients in Ion Exchange Membranes," *Journal of Membrane Science*, **537**, 396-206 (2017).
54. Baek, Y., B.D. Freeman, A.L. Zydney, and J. Yoon, "A Facile Surface Modification for Antifouling Reverse Osmosis Membranes using Polydopamine Under UV Irradiation," *Industrial and Engineering Chemistry Research*, **56**, 5756-5760 (2017).
55. Tiwari, R.R., J. Jin, B.D. Freeman, and D.R. Paul, "Physical Aging, CO₂ Sorption and Plasticization in Thin Films of Polymer with Intrinsic Microporosity (PIM-1)," *Journal of Membrane Science*, **537**, 362-371 (2017).
56. Galizia, M., F.M. Benedetti, D.R. Paul and B.D. Freeman, "Monovalent and Divalent Ion Sorption in a Cation Exchange Membrane Based on Cross-linked Poly(*p*-styrene sulfonate-co-divinylbenzene)," *Journal of Membrane Science*, **535**, 132-142 (2017).
57. Nebipasagil, A., J. Park, O.R. Lane, B.J. Sundell, S.J. Mecham, B.D. Freeman, J.S. Riffle, J.E. McGrath, "Polyurethanes Containing Poly(arylene ether sulfone) and Poly(ethylene oxide) Segments for Gas Separation Membranes," *Polymer*, **118**, 256-267 (2017).
58. He, Z., S. Kasemset, A.Y. Kirschner, Y.-H. Cheng, D.R. Paul, and B.D. Freeman, "The Effects of Salt Concentration and Foulant Surface Charge on Hydrocarbon Fouling of a Poly(vinylidene fluoride) Microfiltration Membrane," *Water Research*, **117**, 230-241 (2017).
59. Stevens, K.A., Z.P. Smith, K.L. Gleason, M. Galizia, D.R. Paul, and B.D. Freeman, "Influence of Temperature on Gas Solubility in Thermally Rearranged (TR) Polymers," *Journal of Membrane Science*, **533**, 75-83 (2017).
60. Kamcev, J., D.R. Paul, and B.D. Freeman, "Effect of Fixed Charge Group Concentration on Equilibrium Ion Sorption in Ion Exchange Membranes," *Journal of Materials Chemistry A*, **5**, 4638-4650 (2017).
61. Kamcev, J., D.R. Paul, G.S. Manning, and B.D. Freeman, "Predicting Salt Permeability Coefficients in Highly Swollen, Highly Charged Ion Exchange Membranes," *ACS Applied Materials & Interfaces*, **9(4)**, 4044-4056 (2017).

62. He, Z., D.J. Miller, S. Kasemset, D.R. Paul, and B.D. Freeman, "The Effect of Permeate Flux on Membrane Fouling During Microfiltration of Oily Water," *Journal of Membrane Science*, **525**, 25-34 (2017).
63. Robeson, L.M., M.E. Dose, B.D. Freeman, and D.R. Paul, "Analysis of the Transport Properties of Thermally Rearranged (TR) Polymers and Polymers of Intrinsic Microporosity (PIM) Relative to Upper Bound Performance," *Journal of Membrane Science*, **525**, 18-24 (2017).
64. Kasemset, S., L. Wang, Z. He, D.J. Miller, A. Kirschner, B.D. Freeman, and M.M. Sharma, "Influence of Polydopamine Deposition Conditions on Hydraulic Permeability, Sieving Coefficients, Pore Size and Pore Size Distribution for a Polysulfone Ultrafiltration Membrane," *Journal of Membrane Science*, **522**, 100-117 (2017).
65. Miller, D.J., D.R. Dreyer, C.W. Bielawski, D.R. Paul, and B.D. Freeman, "Oberflächenmodifizierung von Wasseraufbereitungsmembranen," *Angewandte Chemie*, **129**, 4734-4788 (2017).
66. Miller, D.J., D.R. Dreyer, C.W. Bielawski, D.R. Paul, and B.D. Freeman, "Surface Modification of Water Purification Membranes: A Review," *Angewandte Chemie International Edition*, **56**, 4662-4711 (2017).
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