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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 August 2012.
Kenneth A. Kobe Professor of Chemical Engineering, September 2005 to August 2012.
Matthew van Winkle Professor of Chemical Engineering, September 2002 to August 2005.
Professor of Chemical Engineering, January 2002 to present.

Monash University:

Professorial Fellow, January 2021 – 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:

Billy & Claude R. Hocott Distinguished Centennial Engineering Research Award.....2024
U.S. National Academy of Engineering.....2023
Texas Academy of Medicine, Engineering, Science & Technology (TAMEST).....2023
AIChE Materials Engineering & Sciences Division Braskem Award for Excellence in Materials Science and Engineering.....2023
AIChE Separations Division Founders Award.....2022

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^2CNER) at Kyushu University, Japan 2014-2025
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 – 2022
Associate Member, Committee on Patents and Related Matters	2020 – present

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
Co-Organizer of Annual Meeting	2024

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:

Member, Advisory Board, *Journal of Membrane Science* ..... 2023 – present
Editor-in-Chief, *Polymer* ..... 2020 – present
Senior Editor, *Polymer* 2019
Member, Advisory Board, *Desalination* ..... 2022 – present
Member, Editorial Board, *Industrial & Engineering Chemistry Research* ..... 2020 – present
Member, Editorial Board, *ACS Macro Letters* ..... 2020 – present
Member, Editorial Board, *ACS Applied Polymer Materials* ..... 2020 – present

Member, Editorial Board, *Polymer* ..... 2011 – 2019
Member, Editorial Board, *Desalination* ..... 2009 – 2013
Member, Editorial Board, *Polymers*..... 2009 – present
Member, International Editorial Advisory Board, *Int. Journal of Polymer Science*..... 2008 – present
Associate Editor, *Industrial & Engineering Chemistry Research*..... 2007 – 2019
Member, Editorial Board, *The Open Macromolecules Journal* ..... 2007 – present
Member, Editorial Board, *Journal of Membrane Science*.....2005 – 2023
Member, Editorial Board, *Journal of Applied Membrane Science and Technology*..... 2005 – present
Member, International Editorial Advisory Board, *Membrane Journal*..... 2003 – present
Member, International Editorial Advisory Board, *Korean Membrane Journal*..... 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. Deng, E., K. Chen, A.E. Quigley, M. Yuan, L. Zhu, Z.T. Kralles, B.D. Freeman, NiN.ng Dai, and H Lin. "In Situ Oxidation of Reduced Graphene Oxide Membranes by Peracetic Acid for Dye Desalination, " *Journal of Membrane Science*, 12299 (2024).

2. Irving, P.R., K.K. Reimund, E.S. Zofchak, N. Marioni, B.D. Freeman, and V. Ganesan, "Cellulose Acetate Membranes Exhibit Exceptional Monovalent to Divalent Cation Selectivities, *Journal of Membrane Science*, **706**, 122892 (2024).

3. Cater, H.L., M.J. Allen, M.I. Linnell, A.K. Rylski, Y. Wu, H.-M. Lien, F. Mangolini, B.D. Freeman, and Z.A. Page, "Supersoft Norbornene-Based Thermoplastic Elastomers with High Strength and Upper Service Temperature," *Advanced Materials*, 2402431 (2024).

4. Sujanani, R., K.K. Reimund, K.L. Gleason, and B.D. Freeman, "Hydraulic Permeation-Induced Water Concentration Gradients in Ion Exchange Membranes," *Journal of Membrane Science*, **705**, 122858 (2024).

5. Zhao, C., F. Feng, J. Hou, J. Hu, Y. Su, J. Liu, M. Hill, B. Freeman, H. Wang, and H. Zhang, "Unlocking Direct Lithium Extraction in Harsh Conditions through Thiol-Functionalized Metal-Organic Framework Subnanofluidic Membranes," *Journal of the American Chemical Society*, **146(20)**, 14058-14066 (2024).

6. Chamoun-Farah, A., A.N. Keller, M.Y. Balogun, L.M. Cañada, J.F. Brennecke, and B.D. Freeman, "Amine Functionalized Supported Ionic Liquid Membranes (SILMs) for CO_2/N_2 Separation," *Journal of Membrane Science*, **702**, 122758 (2024).

7. Freeman, B.D., Y. Han, R. Hoogenboom, J.-F. Lutz, and K. Matyjaszewski, "Frontiers in Polymer Science Editorial, *Polymer*, 126930, *in press*.

8. Zofchak, E.S., A.E. Quigley, J.G. Yoh, H.S. Sachar, K.K. Reimund, S.T. Milner, B.D. Freeman, and V. Ganesan, "Molecular and Electrostatic Origins of Mixed Salt Partitioning Phenomena in Uncharged Poly(ethylene oxide)-based Membranes," *Journal of Membrane Science*, **702**, 122800 (2024).

9. Marioni, N., A. Rajesh, Z. Zhang, B.D. Freeman, V. Ganesan, "What is the influence of ion aggregation and counterion condensation on salt transport in ion exchange membranes?," *Journal of Membrane Science*, **701**, 122713 (2024).

10. Oh, H., Y.-M. Tu, L. Samineni, S. DeRespino, M. Rehzad, J. Himanshu, L. Massenburg, H.L. Marques, N. Elessawy, W. Song, H. Behera, R. Dhiman, V.S. Boorla, K. Kher, Y.-C. Lin, C. Maranas, A. Asksimentiev, B. Freeman, and M. Kumar, "Dehydrated Biomimetic Membranes with Skinlike Structure and Function," *ACS Applied Materials & Interfaces*, **16(16)**, 20865-20877 (2024).

11. Marioni, N., O. Nordness, Z. Zhang, R. Sujanani, B. Freeman, R. Segalman, R. Clément, and V. Ganesan, "Ion and Water Dynamics in the Transition from Dry to Wet Conditions in Salt-doped PEG," *ACS Macro Letters*, **13**, 341-347 (2024).

12. A. Khosravanian, M.T. Scalzo, H. Zhang, B.D. Freeman, R.A. Mulvenna, M.R. Hill, and T.F. Scott, "Light-induced additive manufacturing in membrane technology," *Polymer*, **296**, 168233 (2024).

13. Bridge, A.T., N.P. Wamble, M.S. Santoso, J.F. Brennecke, and B.D. Freeman, "Defect-free asymmetric Matrimid® gas separation membranes using dihydrolevoglucosenone (Cyrene™) as a greener polar aprotic solvent than traditional solvents," *Journal of Membrane Science*, **691**, 122221 (2024).

14. Barricella, S., J.M. Fuertes, K.H. Putera, A.E. Quigley, V. Haritos, B.D. Freeman, and G. Garnier, "Spatially Confined Enzymatic Tandem System with GOx and HRP Compartmentalized in Ultrafiltration Membrane," *Journal of Membrane Science*, **690**, 122214 (2024).

15. Lopez-Marques, H., K.L. Gleason, M. Aguilar-Vega, R. Sulub-Sulub, J.E. Eichler, H. Oh, C.B. Mullins, B.D. Freeman, and M. Kumar, "Water vapor sorption and transport in carbon molecular sieve membranes," *Journal of Membrane Science*, 691, 122170 (2024).

16. Zhao, C., J. Hou, M. Hill, B. Freeman, H. Wang, and H. Zhang, "Enhanced Gating Effects in Responsive Sub-nanofluidic Ion Channels", *Accounts of Materials Research*, **4**, 786-797 (2023).

17. Behbahani, H.S., H. Mithaiwala, H.L. Marques, W. Wang, B.D. Freeman, and M.D. Green, "Quaternary Ammonium-Functionalized Poly(Arylene Ether Sulfone) Random Copolymers for Direct Air Capture," *Macromolecules*, **56**, 6470-6481 (2023).

18. Wade, J.L., H.L. Marques, W. Wang, J. Flory, and B. Freeman, "Moisture-Driven CO_2 Pump for Direct Air Capture," *Journal of Membrane Science*, **685**, 121954 (2023).

19. Zofchak, E.S., Z. Zhang, N. Marioni, H.S. Sachar, B.D. Freeman, and V. Ganesan, "Cation-polymer Interactions and Local Heterogeneity Determine the Relative Order of Alkali Cation Diffusion Coefficients in PEGDA Hydrogels," *Journal of Membrane Science*, **685**, 121898 (2023).

20. Banerjee, P., G.R. Burks, S.B. Bialik, M. Nassr. E. Bello, M. Alleyne, B.D. Freeman, J.E. Barrick, C.M. Schroeder, and D.J. Milliron, "Nanostructure-derived Anti-reflectivity in Leafhopper Brochosomes," *Advanced Photonics Research*, **4**, 2200343 (2023).

21. Singh, A., T.G. Mason, Z. Lu, A.J. Hill, S.J. Pas, B.M. Teo, B.D. Freeman, and E.I. Izgorodina, "Structural Elucidation of Polydopamine Facilitated by Ionic Liquid Solvation," *Physical Chemistry Chemical Physics*, **25**, 14700-14710 (2023).

22. Johnston, J., S. Dischinger, M. Nassr, J.Y. Lee, P. Bigdelou, B.D. Freeman, K. Gleason, D. Martinand, D. Miller, S.M. Rafa, N. Spycher, W. Stringfellow, and N. Tilton, "A Reduced-order Model of Concentration Polarization in Reverse Osmosis Systems with Feed Spacers," *Journal of Membrane Science*, **675**, 121508 (2023).

23. Sujanani, R., O. Nordness, A. Miranda, L.E. Katz, J.F. Brennecke, and B.D. Freeman, "Accounting for Ion Pairing Effects on Sulfate Salt Sorption in Cation Exchange Membranes," *Journal of Physical Chemistry, Part B, Section B*, **127**, 1842-1855 (2023).

24. Mason, T.G., B.D. Freeman, and E.I. Izgorodina, "Influencing Molecular Dynamics Simulations of Ion-Exchange Membranes by Considering Comonomer Propagation," *Macromolecules*, **56**, 1263-1277 (2023).

25. Lu, J., G. Jiang, H. Zhang, B. Qian, H. Zhu, Q Gu, Y. Yan, J.Z. Liu, B.D. Freeman, L. Jiang, and H. Wang, "An Artificial Sodium-selective Subnanochannel," *Science Advances*, **9**, eabq1369 (2023).

26. X. Li, G. Jiang, M. Jian, C. Zhao, J. Hou, A. Thornton, X. Zhang, J.Z. Liu, B. Freeman, H. Wang, L. Jiang, and H. Zhang, "Construction of Angstrom-scale Ion Channels with Versatile Pore Configurations and Sizes by Metal-Organic Frameworks," *Nature Communications*, **14**, Article Number 286 (2023).

27. Allen, M.J., H.-M. Lien, N. Prine, C. Burns, A. Rylski, E.V. Anslyn, X. Gu, L. Cox, F. Mangolini, B.D. Freeman, and Z.A. Page, "Multimorphic Materials: Spatially Tailoring Mechanical Properties via Selective Initiation of Interpenetrating Polymer Networks," *Advanced Materials*, 35, 2210208 (2023).

28. Singh, A., T.G. Mason, Z. Lu, B.M. Teo, B.D. Freeman, and E.I. Izgorodina, "Ionic Liquid Facilitated Solvent-Phase Polymerization of Ultrasmooth Coatings of Polycatecholamines," *Macromolecular Chemistry and Physics*, **223**, 2200313 (1 of 8), (2022).

29. Cheng, Y.-H., A. Kirschner, C.-C. Chang, Z. He, M. Nassr, T. Emrick, and B. Freeman, "Surface Modification of Ultrafiltration Membranes with 1, 4-Benzoquinone and Polyetheramines to Improve Fouling Resistance," *ACS Applied Materials & Interfaces*, **14**, 52390-52401 (2022).

30. Marioni, N., Z. Zhang, E. Zofchak, H. Sachar, S. Kadulkar, B. Freeman, and V. Ganesan, "Impact of Ion-Ion Correlated Motion on Salt Transport in Solvated Ion Exchange Membranes," *ACS Macro Letters*, **11**, 1258-1264 (2022).

31. Rylski, A.K., H.L. Cater, K.S. Mason, M.J. Allen, A.J. Arrowood, B.D. Freeman, G.E. Sanoja, and Z.A. Page, "Polymeric Multimaterials by Photochemical Patterning of Crystallinity," *Science*, **378(6616)**, 211-215 (2022).

32. Gokturk, P.A., R. Sujanani, J. Qian, Y. Wang, L. Katz, B.D. Freeman, and E.J. Crumlin, "The Donnan Potential Revealed," *Nature Communications*, **13**, 5880 (2022).

33. Bridge, A.T., M.S. Santoso, J.A. Maisano, A.V. Hillsley, J.F. Brennecke, and B.D. Freeman, "Rapid Macrovoid Characterization in Membranes Prepared via Nonsolvent-induced Phase Separation: A Comparison Between 2D and 3D Techniques," *Journal of Membrane Science,* **661**, 120923 (2022).

34. Hou, R., C. Fong, B.D. Freeman, M.R. Hill, and Z. Xie, "Current Status and Advances in Membrane Technology for Carbon Capture," *Separation and Purification Technology*, **300**, 121863 (2022).

35. Pedretti, B.J., N.J. Czarnecki, C. Zhu, J. Imbrogno, F. Rivers, B.D. Freeman, V. Ganesan, and N.A. Lynd, "Structure−Property Relationships for Polyether-Based Electrolytes in the High-Dielectric-Constant Regime," *Macromolecules*, **55**, 6730-6738 (2022).

36. Soto, C., J. Carmona, B.D. Freeman, L. Palacio, A. González-Ortega, P. Prádanos, Á.E. Lozano, and A. Hernandez, "Free Volume and Permeability of Mixed Matrix Membranes Made from Terbutil-M-terphenyl Polyamide and a Porous Polymer Network," *Polymers*, **14**, 3176 (2022).

37. Cater, H.L., I. Balynska, M.J. Allen, B.D. Freeman, and Z.A. Page, "User Guide to Ring-Opening Metathesis Polymerization of *endo*-Norbornene Monomers with Chelated Initiators," *Macromolecules,* **55**, 6671-6679 (2022).

38. Song, W., J. Park, S. Dasgupta, C. Yao, N. Maroli, H. Behera, X. Yin, D.P. Acharya, X. Zhang, C.M. Doherty, P.K. Maiti, B.D. Freeman, and M. Kumar, "Scalable Pillar[5]arene-Integrated Poly(arylate-amide) Molecular Sieve Membranes to Separate Light Gases," *Chemistry of Materials,* **34**, 6559-6567 (2022).

39. Rodriguez, K.M. W.-N. Wu, T. Alebrahim, Y. Cao, B.D. Freeman, D. Harrigan, M. Jhalaria, A. Kratochvil, S. Kumar, W.H. Lee, Y.M. Lee, H. Lin, J.M. Richardson, Q. Song, B. Sundell, R. Thür, I. Vankelecom, A. Wang, C. Wiscount, J. Xingming, and Z.P. Smith, "Multi-lab Study on the Pure-gas Permeation of Commercial Polysulfone (PSf) Membranes: Measurement Standards and Best Practices," *Journal of Membrane Science*, **659**, 120746 (2022).

40. Sachar, H., E. Zofchak, N. Marioni, Z. Zhang, S. Kadulkar, T. Duncan, B. Freeman, and V. Ganesan, "Impact of Cation-Ligand Interactions on the Permselectivity of Ligand-Functionalized Polymer Membranes in Single and Mixed Salt Systems," *Macromolecules*, **55**, 4821-4831 (2022).

41. Park, S., O. Morales-Collazo, B. Freeman, and J.F. Brennecke, "Ionic Liquid Stabilizes Olefin Facilitated Transport Membranes Against Reduction," *Angewandte Chemie International Edition*, **61(25)**, e202202895 (1 of 8) (2022).

42. Yan, N., R. Sujanani, J. Kamcev, E.-S Jang, K Kobayashi, D.R. Paul, and B.D. Freeman, "Salt and Ion Transport in a Series of Crosslinked AMPS/PEGDA Hydrogel Membranes," *Journal of Membrane Science*, **653**, 120549 (2022).

43. Zofchak, E.S., Z. Zhang, N. Marioni, T. Duncan, H. Sachar, A. Chamseddine, B. Freeman, and V. Ganesan, "Cation-ligand Interactions Dictate Salt Partitioning and Diffusivity in Ligand-functionalized Polymer Membranes," *Macromolecules*, **55**, 2260-2270 (2022).

44. Davenport, M.N., C.L. Bentley, J.F. Brennecke, and B.D. Freeman, "Ethylene and Ethane Transport Properties of Hydrogen-stable Ag^{+}-based Facilitated Transport Membranes," *Journal of Membrane Science*, **647**, 120300 (2022).

45. Yan, N., R. Sujanani, J. Kamcev, M. Galizia, E.-S. Jang, D.R. Paul, and B.D. Freeman, "Influence of Fixed Charge Concentration and Water Uptake on Ion Sorption in AMPS/PEGDA Membranes," *Journal of Membrane Science*, **644**, 120171 (2022).

46. Bridge, A.T., B.J. Pedretti, J.F. Brennecke, and B.D. Freeman, "Preparation of Defect-free Asymmetric Gas Separation Membranes with Dihydrolevoglucosenone (Cyrene^{TM}) as a Greener Polar Aprotic Solvent," *Journal of Membrane Science*, **644**, 120173 (2022).

47. Soto, C., E.S. Torres-Cuevas., L. Palacio, P. Prádanos, B.D. Freeman, A.E. Lozano, A. Hernández, and B. Comesaña-Gándara, "Gas Permeability, Fractional Free Volume and Molecular Kinetic Diameters: The Effect of Thermal Rearrangement on ortho-hydroxy Polyamide Membranes Loaded with a Porous Polymer Network," *Membranes*, **12**, 200 (2022).

48. Hou, R., N.T. Eden, C. Fong, D. Acharya, C.M. Doherty, T. Gengenbach, K. Konstas, Z. Xie, B.D. Freeman, and M.R. Hill, "Enhanced Membrane Performance for Gas Separation by Coupling Effect of the Porous Aromatic Framework (PAF) Incorporation and Photo-Oxidation," *Industrial & Engineering Chemistry Research*, **61**, 6190-6199 (2022).

49. Hou, R., S.J.D. Smith, K. Konstas, C.M. Doherty, C.D. Easton, J. Park, H. Yoon, H. Wang, B.D. Freeman, and Matthew R. Hill, "Synergistically Improved PIM-1 Membrane Gas Separation Performance by PAF-1 Incorporation and UV Irradiation," *Journal of Materials Chemistry*, A, **10**, 10107-10119 (2022).

50. Wang, H., L.O. Jones, I. Hwang, M. Allen, D. Tao, V.M. Lynch, B.D. Freeman, N.M. Khashab, G.C. Schatz, Z.A. Page, and J.L. Sessler, "Selective Separation of Lithium Chloride by Organogels Containing Strapped Calix[4]pyrroles," *Journal of the American Chemical Society*, **143**, 20403-20410 (2021).

51. J. Park, J.W. Yoon, M. Nassr, M.R. Hill, D.R. Paul, and B.D. Freeman, "Pure-and Mixed-gas Transport Properties of a Microporous Tröger's Base Polymer (PIM-EA-TB) Polymer," *Polymer*, 124295 (2021).

52. Zofchak, E.S., Z. Zhang, B. Wheatle, T. Dilenschneider, R. Sujanani, K. Hanson, S. Warnock, S. Zhao, S. Mukherjee, M. Abu-Omar, C. Bates, B. Freeman, and V. Ganesan, "Origins of Lithium/Sodium Reverse Permeability Selectivity in 12-Crown-4-Functionalized Polymer Membranes," *ACS Macro Letters*, **10(9)**, 1167-1173 (2021).

53. Warnock, S.J., R. Sujanani, E.S. Zofchak, S. Zhao, T.J. Dilenschneider, K.G. Hanson, S. Mukherjee, V. Ganesan, B.D. Freeman, M.M. Abu-Omar, and C.M. Bates, "Engineering Li/Na

Selectivity in 12-Crown-4-functionalized Polymer Membranes," *Proceedings of the National Academy of Sciences (PNAS)*, **21(37)**, e2022197118 (2021).

54. Moon, J.D., H. Borjigin, R. Liu, R.M. Joseph, J.S. Riffle, B.D. Freeman, and D.R. Paul, "Impact of Humidity on Gas Transport in Polybenzimidazole Membranes," *Journal of Membrane Science*, **639**, 119758 (2021).

55. Landsman, M.R., F. Rivers, B.J. Pedretti, B.D. Freeman, D.F. Lawler, N.A Lynd, and L.E. Katz, "Boric Acid Removal with Polyol-functionalized Polyether Membranes," *Journal of Membrane Science*, **638**, 119690 (2021).

56. Sujanani, R., L.E. Katz, D.R. Paul, and B.D. Freeman, "Aqueous Ion Partitioning in Nafion: Applicability of Manning's Counter-ion Condensation Theory," *Journal of Membrane Science*, **638**, 119687 (2021).

57. Allen M., R. Sujanani, A. Chemseddine, B. Freeman, and Z. Page, "Mechanically Robust Hydrophobized Double Network Hydrogels and Their Fundamental Salt Transport Properties," *Journal of Polymer Science*, **59**, 2581-2589 (2021).

58. Allen M., R. Sujanani, A. Chemseddine, B. Freeman, and Z. Page, "Mechanically Robust Hydrophobized Double Network Hydrogels for Water Purification, *ChemRxiv*, Posted on 16 April 2021, https://doi.org/10.26434/chemrxiv.14428091.v1.

59. Yu, Y., N. Yan, B.D. Freeman, and C.-C. Chen, "Mobile Ion Partitioning in Ion Exchange Membranes Immersed in Saline Solutions," *Journal of Membrane Science*, **620**, 118760 (2021).

60. Nguyen, A.L.P., T.G. Mason, B.D. Freeman, and E.I. Izgorodina, "Prediction of Lattice Energy of Benzene Crystals: A Robust Theoretical Approach," *Journal of Computational Chemistry*, **42**, 248-260 (2021).

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