# GEOFFREY MATTHEW GEISE

Assistant Professor, Department of Chemical Engineering, University of Virginia
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## EDUCATION:

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|---|---|---|
| Ph.D. | Chemical Engineering, The University of Texas at Austin – Austin, Texas | *August 2012* |
| M.S.E. | Chemical Engineering, The University of Texas at Austin – Austin, Texas | *December 2010* |
| B.S. | Chemical Engineering (with High Distinction)<br>The Pennsylvania State University – University Park, Pennsylvania | *May 2007* |

## APPOINTMENTS:

◆ **The University of Virginia** – Charlottesville, Virginia *August 2014 to Present*
Assistant Professor, Department of Chemical Engineering

◆ **The Pennsylvania State University** – University Park, Pennsylvania *September 2012 to May 2014*
Postdoctoral Scholar, Materials Science and Engineering
Research Advisors: Prof. Michael A. Hickner and Prof. Bruce E. Logan

◆ **The University of Texas at Austin** – Austin, Texas *August 2007 to August 2012*
Graduate Research Assistant, Department of Chemical Engineering
Thesis Advisors: Prof. Donald R. Paul and Prof. Benny D. Freeman

## PUBLICATIONS:

22. L. Ni, J. Meng, G.M. Geise, Y. Zhang, J. Zhou, Water and salt transport properties of zwitterionic polymer films, *Journal of Membrane Science*, 491 (2015) 73-81.
21. M.J. Wallack, G.M. Geise, M.C. Hatzell, M.A. Hickner, B.E. Logan, Reducing nitrogen crossover in microbial reverse-electrodialysis cells by using adjacent anion exchange membranes and anion exchange resin, *Environmental Science: Water Research & Technology*, 1 (2015) 865-873.
20. G.M. Geise, H.J. Cassady, D.R. Paul, B.E. Logan, M.A. Hickner, Specific ion effects on membrane potential and the permselectivity of ion exchange membranes, *Physical Chemistry Chemical Physics*, 16 (2014) 21673-21681.
19. N.M. Vargas-Barbosa, G.M. Geise, M.A. Hickner, T.E. Mallouk, Assessing the utility of bipolar membranes for use in photoelectrochemical water-splitting cells, *ChemSusChem*, 7 (2014) 3017-3020.
18. J. Liu, G.M. Geise, X. Luo, H. Hou, F. Zhang, Y. Feng, M.A. Hickner, B.E. Logan, Patterned ion exchange membranes for improved power production in microbial reverse-electrodialysis cells, *Journal of Power Sources*, 271 (2014) 437-443.
17. G.M. Geise, A.J. Curtis, M.C. Hatzell, M.A. Hickner, B.E. Logan, Effect of salt concentration differences on membrane and reverse electrodialysis stack ionic resistances, *Environmental Science & Technology Letters*, 1 (2014) 36-39.
16. G.M. Geise, C.M. Doherty, A.J. Hill, B.D. Freeman, D.R. Paul, Free volume characterization of sulfonated styrenic pentablock copolymers using positron annihilation lifetime spectroscopy, *Journal of Membrane Science*, 453 (2014) 425-434.
15. G.M. Geise, B.D. Freeman, D.R. Paul, Fundamental water and salt transport properties of polymeric materials, *Progress in Polymer Science*, 39 (2014) 1-42.

14. G.M. Geise, M.A. Hickner, B.E. Logan, Ionic resistance and permselectivity tradeoffs in anion exchange membranes, *ACS Applied Materials & Interfaces*, 5 (2013) 10294-10301.

13. G.M. Geise, M.A. Hickner, B.E. Logan, Ammonium bicarbonate transport in anion exchange membranes for salinity gradient energy, *ACS Macro Letters*, 2 (2013) 814-817.

12. Y.–H. La, J. Diep, R. Al–Rasheed, D. Miller, L. Krupp, G.M. Geise, A. Vora, B. Davis, M. Nassar, B.D. Freeman, M. McNeil, G. Dubois, Enhanced desalination performance of polyamide bi-layer membranes prepared by sequential interfacial polymerization, *Journal of Membrane Science*, 437 (2013) 33-39.

11. G.M. Geise, C.L. Willis, C.M. Doherty, A.J. Hill, T.J. Bastow, J. Ford, K.I. Winey, B.D. Freeman, D.R. Paul, Characterization of aluminum-neutralized sulfonated styrenic pentablock copolymer films, *Industrial & Engineering Chemistry Research*, 52(3) (2013) 1056-1068.

10. G.M. Geise, B.D. Freeman, D.R. Paul, Sodium chloride diffusion in sulfonated polymers for membrane applications, *Journal of Membrane Science*, 427 (2013) 186-196.

9. G.M. Geise, L.P. Falcon, B.D. Freeman, D.R. Paul, Sodium chloride sorption in sulfonated polymers for membrane applications, *Journal of Membrane Science*, 423-424 (2012) 195-208.

8. W. Xie, G.M. Geise, B.D. Freeman, H.-S. Lee, G. Byun, J.E. McGrath, Polyamide interfacial composite membranes prepared from *m*-phenylene diamine, trimesoyl chloride and a new disulfonated diamine, *Journal of Membrane Science*, 403-404 (2012) 152-161.

7. W. Xie, G.M. Geise, B.D. Freeman, C.H. Lee, J.E. McGrath, Influence of processing history on water and salt transport properties of films prepared from disulfonated polysulfone random copolymers, *Polymer*, 53 (2012) 1581-1592.

6. G.M. Geise, B.D. Freeman, D.R. Paul, Comparison of the permeation of $MgCl_2$ vs. NaCl in highly-charged sulfonated polymer membranes, In: Modern Applications in Membrane Science and Technology, I. C. Escobar, B. Van der Bruggen, Eds. American Chemical Society: Washington, D.C., (2011) 239-245.

5. W. Xie, H. Ju, G. Geise, B. Freeman, J. Mardel, A. Hill, J. McGrath, Effect of free volume on water and salt transport properties in directly copolymerized disulfonated poly(arylene ether sulfone) random copolymers, *Macromolecules*, 44 (2011) 4428-4438.

4. G.M. Geise, H.B. Park, A.C. Sagle, B.D. Freeman, J.E. McGrath, Water permeability and water/salt selectivity tradeoff in polymers for desalination, *Journal of Membrane Science*, 369 (2011) 130-138.

3. C.H. Lee, D. Van Houten, O. Lane, J.E. McGrath, J. Hou, L.A. Madsen, J. Spano, S. Wi, J. Cook, W. Xie, H.J. Oh, G.M. Geise, B.D. Freeman, Disulfonated poly(arylene ether sulfone) random copolymer blends tuned for rapid water permeation via cation complexation with poly(ethylene glycol) oligomers, *Chemistry of Materials*, 23 (2011) 1039-1049.

2. G.M. Geise, B.D. Freeman, D.R. Paul, Characterization of a novel sulfonated pentablock copolymer for desalination applications, *Polymer*, 51 (2010) 5815-5822.

1. G.M. Geise, H.–S. Lee, D.J. Miller, B.D. Freeman, J.E. McGrath, D.R. Paul, Water purification by membranes: The role of polymer science, *Journal of Polymer Science Part B: Polymer Physics*, 48 (2010) 1685-1718. **[Selected for the Cover of the Issue]**

**INVITED LECTURES:**

11. G.M. Geise, "Structure/property relationships in polymer membranes for water purification and energy applications" *Center for Nanophase Materials Sciences (CNMS) at Oak Ridge National Laboratory* (Oak Ridge, TN), January 14, 2016.

10. G.M. Geise, "Grand challenges for fresh water availability and emerging polymer membrane technologies for water purification and energy" *National Science Foundation Workshop: FEWS: Food-Energy-Water Systems Challenging Chemists in the 21st Century* (Arlington, VA), October 15, 2015.

9. G.M. Geise, "Structure/property relationships in polymer membranes for water and energy" *Virginia Commonwealth University, Department of Chemical and Life Science Engineering* (Richmond, VA), February 11, 2015.

8. G.M. Geise, B.D. Freeman, D.R. Paul, "Structure/Property relationships in polymer membranes for water purification and power generation" *The Pennsylvania State University, Department of Materials Science & Engineering* (University Park, PA), February 28, 2012.

7. G.M. Geise, J.E. McGrath, B.D. Freeman, D.R. Paul, "Fundamental salt sorption and permeability properties of polymeric membrane materials" *DOW Water & Process Solutions* (Edina, MN), October 18, 2011.

6. G.M. Geise, B.D. Freeman, D.R. Paul, "Water and ion transport through sulfonated styrenic pentablock copolymer membranes for desalination applications" *Université Paul Cézanne* (Aix-en-Provence, France), May 7, 2010.

5. G.M. Geise, B.D. Freeman, D.R. Paul, "Water and ion transport through sulfonated styrenic pentablock copolymer membranes for desalination applications" *Université Paul Sabatier* (Toulouse, France), May 5, 2010.

4. G.M. Geise, B.D. Freeman, D.R. Paul, "Water and ion transport through sulfonated styrenic pentablock copolymer membranes for desalination applications" *The University of Melbourne Department of Chemical Engineering* (Melbourne, VIC Australia), March 11, 2010.

3. G.M. Geise, B.D. Freeman, D.R. Paul, "Water and ion transport through sulfonated styrenic pentablock copolymer membranes for desalination applications" *Victoria University* (Werribee, VIC Australia), March 4, 2010.

2. G.M. Geise, B.D. Freeman, D.R. Paul, "Water and ion transport through sulfonated styrenic pentablock copolymer membranes" *The University of New South Wales* (Sydney, NSW Australia), February 16, 2010.

1. G.M. Geise, B.D. Freeman, D.R. Paul, "Water and ion transport through sulfonated styrenic pentablock copolymer membranes" *Commonwealth Scientific and Industrial Research Organisation – CSIRO* (Clayton, VIC Australia), January 29, 2010.

**PRESENTATIONS:**

42. G.M. Geise (Presenting), "Ion transport structure/property relationships in charged polymer membranes" (Oral Presentation) *Pacifichem 2015* (Honolulu, HI), December 18, 2015. **[Invited Contribution]**

41. T. Xue, G.M. Geise (Presenting), "Water/salt selectivity properties of hydrophilic polymer membranes" (Oral Presentation) *Pacific Polymer Conference 14* (Koloa, HI), December 10, 2015. **[Invited Contribution]**

40. G.M. Geise (Presenting), "Ion transport structure/property relationships in charged polymer membranes" (Oral Presentation) *AIChE Fall National Meeting* (Salt Lake City, UT), November 10, 2015.

39. G.M. Geise (Presenting), "Ion Sorption And Transport in Charged Polymers for Membrane Applications" (Oral Presentation) *North American Membrane Society (NAMS) National Meeting* (Boston, MA), June 3, 2015. **[Invited Contribution]**

38. G.M. Geise (Presenting), "Material Properties of Chlorine Tolerant Sulfonated Polysulfone for Water Purification Applications" (Oral Presentation) *North American Membrane Society (NAMS) National Meeting* (Boston, MA), June 2, 2015. **[Invited Contribution]**

37. G.M. Geise (Presenting), "Ion Sorption And Transport in Charged Polymers for Membrane Applications" (Oral Presentation) *Advances in Materials and Processes for Polymeric Membrane Mediated Water Purification* (Pacific Grove, CA), February 16, 2015. **[Invited Contribution]**

36. G.M. Geise (Presenting), "Structure/property relationships in polymer membranes for water and energy" (Oral Presentation) *Macromex 2014* (Nuevo Vallarta, Mexico), December 6, 2014. **[Invited Contribution]**

35. G.M. Geise (Presenting), "Structure/property relationships in polymer membranes for water purification and energy applications" (Oral Presentation) *AIChE Fall National Meeting* (Atlanta, GA), November 18, 2014.

34. G.M. Geise (Presenting), H.J. Cassady, M.A. Hickner, B.E. Logan, "Ionic resistance and permselectivity of ion exchange membranes" (Poster Presentation) *North American Meeting of the International Society for Microbial Electrochemistry and Technology, NA-ISMET* (University Park, PA), May 14, 2014.

33. G.M. Geise (Presenting), M.A. Hickner, B.E. Logan, "Ion transport in anion exchange membranes for water purification and power generation applications" (Oral Presentation) *AIChE Fall National Meeting* (San Francisco, CA), November 8, 2013.

32. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Salt transport structure/property relationships in polymer membranes for water purification and power generation" (Oral Presentation) *AIChE Fall National Meeting* (San Francisco, CA), November 4, 2013. **[Invited Contribution]**

31. G.M. Geise (Presenting) "Structure/Property relationships in polymer membranes for water purification and energy applications" (Poster Presentation) *AIChE Fall National Meeting* (San Francisco, CA), November 3, 2013.

30. G.M. Geise (Presenting), B.E. Logan, M.A.Hickner, "Ion transport in anion exchange membranes for power generation applications" (Poster Presentation) *Penn State Postdoc Research Exhibition* (University Park, PA), September 13, 2013.

29. G.M. Geise (Presenting), B.E. Logan, M.A.Hickner, "Ion transport in anion exchange membranes for power generation applications" (Poster Presentation) *Gordon Research Conference on Polymers* (South Hadley, MA), June 13, 2013.

28. G.M. Geise (Presenting), C.L. Willis, C.M. Doherty, A.J. Hill, T.J. Bastow, J. Ford, K.I. Winey, B.D. Freeman, D.R. Paul, "Characterization of aluminum-neutralized sulfonated styrenic pentablock copolymer films" (Oral Presentation) *AIChE Fall National Meeting* (Pittsburgh, PA), October 31, 2012.

27. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Diffusive water transport: Relating hydraulic permeability to the apparent water diffusion coefficient in water-swollen polymers" (Oral Presentation) *AIChE Fall National Meeting* (Pittsburgh, PA), October 30, 2012.

26. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Salt transport structure/property relationships and modeling in polymer membranes for water purification and power generation" (Oral Presentation) *AIChE Fall National Meeting* (Pittsburgh, PA), October 30, 2012.

25. G.M. Geise (Presenting) "Structure/property relationships in polymer membranes for water purification and power generation" (Poster Presentation) *AIChE Fall National Meeting* (Pittsburgh, PA), October 28, 2012.

24. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Structure/property relationships in polymer membranes for water purification and power generation" (Oral Presentation) *244th ACS National Meeting* (Philadelphia, PA), August 19, 2012. **[Invited Contribution]**

23. G.M. Geise (Presenting), J.E. McGrath, B.D. Freeman, D.R. Paul, "Fundamental salt sorption and permeability properties of polymeric membrane materials" (Oral Presentation) *AIChE Fall National Meeting* (Minneapolis, MN), October 18, 2011.

22. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Salt transport characteristics of a sulfonated styrenic pentablock copolymer for desalination applications" (Oral Presentation) *The International Congress on Membranes and Membrane Processes - ICOM* (Amsterdam, The Netherlands), July 28, 2011.

21. G.M. Geise (Presenting), H. Ju, W. Xie, A.C. Sagle, C.M. Doherty, J.I. Mardel, A.J. Hill, J.E. McGrath, B.D. Freeman, D.R. Paul, "Positron annihilation lifetime spectroscopy (PALS) characterization of polymeric membrane materials for desalination applications" (Oral Presentation) *The International Congress on Membranes and Membrane Processes - ICOM* (Amsterdam, The Netherlands), July 27, 2011.

20. C.H. Lee, K. Lee, B. Sundell, O. Lane, J. Cook, W. Xie, G. Geise, B.D. Freeman, J.E. McGrath (Presenting), "Crosslinkable chlorine resistant membranes for reverse and forward osmosis (RO,FO)" (Keynote Presentation) *The International Congress on Membranes and Membrane Processes - ICOM* (Amsterdam, The Netherlands), July 25, 2011. **[Invited Contribution]**

19. Y.–H. Na (Presenting), R. Sooriyakumaran, R.D. Allen, G. Geise, B. Freeman, "Enhanced RO performance of polyamide bi-layer membranes prepared by sequential interfacial polymerization" (Oral Presentation) *Advances in Materials and Processes for Polymeric Membrane Mediated Water Purification* (Pacific Grove, CA), March 1, 2011.

18. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Characterization of novel sulfonated styrenic pentablock copolymer materials for desalination applications" (Poster Presentation) *Advances in Materials and Processes for Polymeric Membrane Mediated Water Purification* (Pacific Grove, CA), February 28, 2011.

17. G.M. Geise (Presenting), H. Ju, W. Xie, A.C. Sagle, C.M. Doherty, J.I. Mardel, A.J. Hill, J.E. McGrath, B.D. Freeman, D.R. Paul, "Positron annihilation lifetime spectroscopy characterization of membrane polymers" (Oral Presentation) *The International Congress of Pacific Basin Societies – Pacifichem* (Honolulu, HI), December 18, 2010.

16. G.M. Geise (Presenting), L.K. Passaniti, J.E. McGrath, B.D. Freeman, D.R. Paul, "Understanding the ion sorption and salt transport differences between highly charged and less-highly charged membrane polymers" (Oral Presentation) *The International Congress of Pacific Basin Societies – Pacifichem* (Honolulu, HI), December 16, 2010.

15. G.M. Geise (Presenting), A.J. Hill, B.D. Freeman, D.R. Paul, "Fundamental water transport properties of a sulfonated styrenic pentablock copolymer" (Oral Presentation) *AIChE Fall National Meeting* (Salt Lake City, UT), November 11, 2010.

14. G.M. Geise (Presenting), L.K. Passaniti, J.E. McGrath, B.D. Freeman, D.R. Paul, "Characterization of individual cation and anion sorption related to salt transport in highly charged sulfonated polymers for desalination applications" (Oral Presentation) *AIChE Fall National Meeting* (Salt Lake City, UT), November 11, 2010.

13. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Understanding the effect of ion exchange on water and salt transport properties of a highly-charged sulfonated pentablock copolymer" (Oral Presentation) *240th ACS National Meeting* (Boston, MA), August 24, 2010. **[Invited Contribution]**

12. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Water and salt transport in a sulfonated pentablock copolymer for desalination applications" (Oral Presentation) *North American Membrane Society (NAMS) National Meeting* (Washington, DC), July 21, 2010.

11. G.M. Geise (Presenting), A.J. Hill, B.D. Freeman, D.R. Paul, "Water transport in a novel sulfonated pentablock copolymer analyzed using positron annihilation lifetime spectroscopy (PALS)" (Oral Presentation) *North American Membrane Society (NAMS) National Meeting* (Washington, DC), July 19, 2010.

10. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Characterization of novel sulfonated styrenic pentablock copolymer materials for desalination applications" (Poster Presentation) *North American Membrane Society (NAMS) National Meeting* (Washington, DC), July 19, 2010.

9. G.M. Geise (Presenting), J.E. McGrath, B.D. Freeman, D.R. Paul, "Water and salt transport in novel sulfonated polymer materials for desalination applications" (Oral Presentation) *Advances in Science and Engineering for Brackish Water and Seawater Desalination* (Cetraro, Italy), May 10, 2010. **[Invited Contribution]**

8. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Characterization of novel sulfonated styrenic pentablock copolymer materials for desalination applications" (Poster Presentation) *Advances in Science and Engineering for Brackish Water and Seawater Desalination* (Cetraro, Italy), May 9, 2010.

7. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Water and ion transport properties of Nexar™: A novel sulfonated pentablock copolymer for desalination applications" (Oral Presentation) *239th ACS National Meeting* (San Francisco, CA), March 21, 2010.

6. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Water and ion transport characterization of a novel sulfonated pentablock copolymer for desalination membrane applications" (Oral Presentation) *Membrane Society of Australasia Student Symposium* (Wollongong, Australia), February 19, 2010.

5. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Water and ion transport in a novel sulfonated pentablock copolymer" (Oral Presentation) *34th Annual Condensed Matter and Materials Meeting* (Auckland, New Zealand), February 4, 2010.

4. G.M. Geise (Presenting), L.K. Passaniti, J.E. McGrath, B.D. Freeman, D.R. Paul, "Ion transport through sulfonated polymer membranes for desalination applications" (Oral Presentation) *AIChE Fall National Meeting* (Nashville, TN), November 12, 2009.

3. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Water and ion transport through sulfonated styrenic pentablock copolymer membranes for desalination applications" (Oral Presentation) *238th ACS National Meeting* (Washington, DC), August 17, 2009. **[Invited Contribution]**

2. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Water and ion transport through sulfonated styrenic pentablock copolymer membranes for reverse osmosis applications" (Oral Presentation) *67th Annual Technical Conference – Society of Plastics Engineers* (Chicago, IL), June 22, 2009. **[Peer-Reviewed Conference Paper]**

1. G.M. Geise (Presenting), B.D. Freeman, D.R. Paul, "Water and ion transport through sulfonated styrenic pentablock copolymer membranes for reverse osmosis applications" (Poster Presentation) *Advances in Materials and Processes for Polymeric Membrane Mediated Water Purification* (Pacific Grove, CA), February 23, 2009.

**PROFESSIONAL ACTIVITIES:**

**2015-2016 Ignite Program at the University of Virginia**

**2011 Graduates Linked with Undergraduates in Engineering (GLUE)**
-Part of the Women in Engineering Program (WEP) at the University of Texas at Austin
-Volunteered as a graduate student mentor

**2007-2009 ExploreUT Community Outreach Open House at the University of Texas at Austin**
-Organized and volunteered for the 'Playing with Plastic!' exhibit in 2009
-Volunteered for the 'Playing with Plastic!' exhibit in 2007 and 2008

**Undergraduate/Exchange Student Research Mentor**
-Successfully mentored 12 undergraduate students as they completed individual research projects
-Successfully hosted and mentored 3 visiting French engineering interns

**2008 International Congress on Membranes and Membrane Processes (ICOM)**
Proceedings Committee Chairperson and Administrative Student Staff Member
-Coordinated the compilation, editing, and production of proceedings material
-Responsible for leading the proceedings committee that consisted of 7 graduate students
-Assisted with logistics for running the largest membrane science conference in the world

**North American Membrane Society (NAMS)** – Member
**American Chemical Society (ACS)** – Member
**American Institute of Chemical Engineers (AIChE)** – Member
**American Physical Society (APS)** – Member

**HONORS / AWARDS:**

Engineering Conferences International New Professor Travel Award ..... 2016
North American Membrane Society (NAMS) Young Membrane Scientist Award ..... 2015
Excellence in Diversity Fellowship (University of Virginia) ..... 2014
First Prize Poster Presentation in the Penn State University Postdoc Research Exhibition ..... 2013
The Pennsylvania State University Office of Postdoctoral Affairs Travel Award ..... 2013
University of Texas Office of Graduate Studies Professional Development Award ..... 2011
International Congress on Membranes & Membrane Processes (ICOM)
Outstanding Oral Presentation Award ..... 2011
North American Membrane Society (NAMS) Travel Award ..... 2011
University of Texas Office of Graduate Studies Professional Development Award ..... 2010
University of Texas Graduate Engineering Council Travel Grant ..... 2010
University of Texas Graduate Fellowship in Engineering ..... 2007 – 2011
Selected to represent the Pennsylvania State University Class of 2007
B.S. Chemical Engineers as Student Marshall at Commencement ..... 2007
Merck & Co. Inc. Student Fellowship ..... 2006

**OTHER CERTIFICATIONS:**

U.S. Federal Aviation Administration Private Pilot Certificate (Earned in June 2011)