
Curriculum Vitae

Zachary A. Morseth, Ph.D.

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Address

Education

- The University of North Carolina at Chapel Hill**, Chapel Hill, NC
Doctor of Philosophy in Physical Chemistry 2016
Dissertation: "Elucidating Intramolecular Photoinduced Dynamics in Molecular Assemblies for Solar Energy Conversion"
- Minnesota State University Moorhead**, Moorhead, MN
Summa Cum Laude & Highest Honors
Bachelor of Science in Chemistry (ACS Certified) 2012
Bachelor of Arts in Mathematics 2012
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Professional Experience:

- Scientist** 2016-2017, 2019-present
Alcami Corporation
- Develop, evaluate, qualify, transfer, and validate analytical methods (high-performance liquid chromatography, dissolution, ELISA, cell-based assay, and ultraviolet-visible spectroscopy) in support of pharmaceutical product development and pharmaceutical manufacturing.
 - Performed wet chemistry techniques such as tablet hardness, drug product pH, product appearance, and density measurements
- Assistant Professor of Chemistry** 2017-2019
Minnesota State University Moorhead
- Instructor of environmental chemistry, general chemistry, analytical chemistry, and instrumental analysis.
 - Developed and taught both face-to-face and online sections of chemistry courses.
 - Created learning tutorials for students with topics covering computational chemistry, nonlinear data fitting, and computer programming.
 - Mentored research students to study the electronic structure of light harvesting complexes for solar energy conversion applications.
- Graduate Research Assistant** 2012-2016
The University of North Carolina at Chapel Hill
Advisor: John. M. Papanikolas, Ph.D.
- Employed non-linear spectroscopy, electrochemistry, and computational methods to investigate ultrafast energy and electron transfer dynamics within multichromophoric light-harvesting arrays and chromophore-catalyst assemblies for use in dye-sensitized photoelectrochemical cells (DSPECs).

Honors and Awards

2017	Alcami Excellence Award
2012	Matthew Stuart Morrison Fellowship
2012	Minnesota State University Moorhead Mathematics Senior Award
2011	Minnesota State University Moorhead Mathematics Junior Award
2009	ACS Undergraduate Award in Organic Chemistry
2009	ACS Undergraduate Award in Analytical Chemistry
2007-2012	Minnesota State University Moorhead Academic Dean's List

Professional Service:

Faculty Committee Member, <i>MSUM Strong Foundation</i>	2017-2019
Faculty Judge, <i>MSUM URMS Conference</i>	2017-2019
Editor, U.S. Department of Energy <i>Frontiers in Energy Research</i>	2015-2016
Board Member, <i>MSUM Student Advisory Board</i>	2009-2012

Selected Presentations:

1. **Morseth, Z.A.** "Energy Transfer in Molecular Systems" Minnesota State University Moorhead, Physics Department Seminar. Moorhead, MN. November 3rd, 2017 (presentation)
2. **Morseth, Z.A.** "Ultrafast Energy and Electron Transfer Dynamics in a Light-Harvesting Polymer Assembly: Role of Macromolecular Structure" Minnesota State University Moorhead, Chemistry Department Seminar. Moorhead, MN. September 18th, 2017 (presentation)
3. **Morseth, Z.A.** "Ultrafast Energy and Electron Transfer Dynamics in a Light-Harvesting Polymer Assembly: Role of Macromolecular Structure" University of North Carolina at Chapel Hill, Chemistry Department Seminar. Chapel Hill, NC. March 30th, 2016 (presentation)
4. **Morseth, Z.A.**; Leem, G.; Pho, T.; Sheridan, M.V.; Jiang, J.; Black, H.T.; Meyer, T.J.; Reynolds, J.R.; Schanze, K.S; Papanikolas, J.M.; "Photoinduced dynamics in molecular assemblies for solar energy conversion" Department of Energy Principal Investigator Meeting. Washington, DC. October 26th-27th, 2015 (poster)
5. **Morseth, Z.A.**; Leem, G.; Pho, T.; Sheridan, M.V.; Jiang, J.; Black, H.T.; Meyer, T.J.; Reynolds, J.R.; Schanze, K.S; Papanikolas, J.M.; "Photoinduced dynamics in molecular assemblies for solar energy conversion" Roger E. Miller Physical Chemistry Symposium. Chapel Hill, NC. October 23rd, 2015 (poster)
6. **Morseth, Z.A.**; Leem, G.; Pho, T.; Sheridan, M.V.; Jiang, J.; Black, H.T.; Meyer, T.J.; Reynolds, J.R.; Schanze, K.S; Papanikolas, J.M.; "Photoinduced dynamics in molecular assemblies for solar energy conversion" UNC Solar Energy Research Conference. Chapel Hill, NC. October 16th, 2015 (poster)

7. **Morseth, Z.A.**; Hu, K.; Leem, G.; Pho, T.; Schanze, K.S; Reynolds, J.R.; Meyer, G.J.; Papanikolas, J.M.; "Photoinduced dynamics of molecular assemblies for solar energy conversion" 6th Annual UNC Energy Frontier Research Center Review. Chapel Hill, NC. May 20th, 2015 (presentation)
8. **Morseth, Z.A.**; Wang, L.; Pho, T.; Leem, G.; Puodziukynaite, E.; Gilligan, A.T.; Schanze, K.S; Reynolds, J.R.; Papanikolas, J.M.; "Ultrafast dynamics in multi-functional polymers for solar energy conversion" 6th Annual UNC Energy Frontier Research Center Review. Chapel Hill, NC. May 20th, 2015 (poster)
9. **Morseth, Z.A.**; Wang, L.; Pho, T.; Leem, G.; Puodziukynaite, E.; Gilligan, A.T.; Schanze, K.S; Reynolds, J.R.; Papanikolas, J.M.; "Ultrafast dynamics in multi-functional polymers for solar energy conversion" 24th Winter Inter-American Photochemical Society Conference. Sarasota, FL. January 2nd, 2015 (poster)
10. **Morseth, Z.A.**; Gish, M.K.; Wang, L.; Pho, T.; Leem, G.; Puodziukynaite, E.; Gilligan, A.T.; Schanze, K.S; Reynolds, J.R.; Papanikolas, J.M.; "Ultrafast dynamics in multi-functional polymers for solar energy conversion" Jobin Yvon FluoroFest 2014. Durham, NC. November, 7th, 2014 (poster)
11. **Morseth, Z.A.**; Wang, L.; Pho, T.; Leem, G.; Puodziukynaite, E.; Gilligan, A.T.; Schanze, K.S; Reynolds, J.R.; Papanikolas, J.M.; "Ultrafast dynamics in multi-functional polymers for solar energy conversion" KAUST Applied Functional Materials Chemistry. Thuwal, Kingdom of Saudi Arabia. October 27th, 2014 (poster)
12. **Morseth, Z.A.**; Leem, G.; Puodziukynaite, E.; Jiang, J.; Zhen, F.; Reynolds, J.R.; Papanikolas, J.M.; Schanze, K.S. "Light-harvesting polymers for use in dye-sensitized photoelectrosynthesis cells" 5th Annual UNC Energy Frontier Research Center Review. Chapel Hill, NC. May 21st, 2014 (poster).
13. **Morseth, Z.A.** "2-D Nuclear Magnetic Resonance Spectroscopy: Theory and Applications to Chemistry." Minnesota State University-Moorhead. Moorhead, MN. April 15th, 2011 (presentation)
14. **Morseth, Z.A.**; Berget, E.M.; Kaiser, J.; Marasinghe, P.A.B. "Naturally occurring pigment from *prunus virginiana* for use in dye-sensitized solar cells" 239th ACS National Meeting. San Francisco, CA. March 22nd, 2010 (poster).

Publications:

1. **Morseth, Z.A.**; Pho, T.V.; Schanze, K.S.; Reynolds, J.R.; Papanikolas, J.M. "Electron Transfer Dynamics in an Isoindigo-loaded Light-Harvesting Polymer," **2020** (submitted).
2. **Morseth, Z.A.**; Pho, T.V.; Sheridan, M.V.; Meyer, T.J.; Reynolds, J.R.; Papanikolas, J.M. "Interfacial Dynamics Within an Organic Chromophore-based Water Oxidation Molecular Assembly," *ACS Appl. Mater. Interfaces* **2017**, *9*, 16651-16659.
3. **Morseth, Z.A.**; Pho, T.V.; Gilligan, A.T.; Dillon, R.J.; Schanze, K.S.; Reynolds, J.R.; Papanikolas, J.M. "Role of Macromolecular Structure in the Ultrafast Energy and Electron Transfer Dynamics of a Light-Harvesting Polymer," *J. Phys. Chem. B* **2016**, *120*, 7937-7948.
4. Zigler, D.F.; **Morseth, Z.A.**; White, T. A.; Canterbury, T.R.; Corrales, J.R.; Brennaman, M.K.; Brewer, K.J.; Papanikolas, J.M. "Ultrafast Kinetics of Supramolecules with a Ru(II)- or Os(II)- polypyridyl Light Absorber, cis-Rh(III)Cl₂-polypyridyl Electron Collector, and 2,3-bis(2-pyridyl)pyrazine Bridge," *Inorg. Chim. Acta* **2016**, *454*, 266-274.
5. Leem, G.; Sherman, B.D.; Burnett, A.J.; **Morseth, Z.A.**; Wee, K.R.; Meyer, T.J.; Schanze, K.S. "Light-Driven Water Oxidation using Polyelectrolyte Layer-by-Layer Chromophore-Catalyst Assemblies," *ACS Energ. Lett.* **2016**, *1*, 339-343.
6. Pho, T.V.; Sheridan, M.V.; **Morseth, Z.A.**; Sherman, B.D.; Meyer, T.J.; Papanikolas, J.M.; Schanze, K.S.; Reynolds, J.R. "Efficient Light-Driven Oxidation of Alcohols using an Organic Chromophore-Catalyst Assembly Anchored to TiO₂," *ACS Appl. Mater. Interfaces* **2016**, *8*, 9125-9133.
7. Zigler, D.F.; **Morseth, Z.A.**; Wang, L.; Ashford, D.L.; Brennaman, M.K.; Grumstrup, E.M.; Brigham, E.K.; Gish, M.K.; Dillon, R.J.; Alibabaei, L.; Meyer, G.J.; Meyer, T.J.; Papanikolas, J.M. "Disentangling the Physical Processes Responsible for the Kinetic Complexity in Interfacial Electron Transfer Excited Ru(II) Polypyridyl Dyes on TiO₂," *J. Am. Chem. Soc.* **2016**, *138*, 4426-4438.
8. Leem, G.; **Morseth, Z.A.**; Wee, K.R.; Jiang, J.; Papanikolas, J.M.; Schanze, K.S. "Polymer-based Ruthenium(II) Polypyridyl Chromophores on TiO₂ for Solar Energy Conversion," *Chem. Asian J.* **2016**, *11*, 1257-1267.
9. Leem, G.; Keinan, S.; Jiang, J.; Chen, Z.; Pho, T.; **Morseth, Z.A.**; Hu, Z., Puodziukynaite, E.; Fang, Z.; Reynolds, J.R.; Schanze, K.S. "Ruthenium Derivatized Polystyrenes by Nitroxide-Mediated Living Radical Polymerization: Synthesis, Photophysical Properties, and Molecular Dynamics Studies," *Polym. Chem.*, **2015**, *6*, 8184-8193.
10. **Morseth, Z.A.**; Wang, L.; Puodziukynaite, E.; Leem, G.; Gilligan, A.T.; Reynolds, J.R.; Schanze, K.S.; Papanikolas, J.M. "Ultrafast dynamics of multi-functional Ru(II)-loaded polymers for solar energy conversion," *Acc. Chem. Res.* **2015**, *48*, 818-827.
11. Farnum, B.H.; **Morseth, Z.A.**; Brennaman, M.K.; Papanikolas, J.M.; Meyer, T.J. "Application of degenerately doped metal oxides in the study of photoinduced interfacial electron transfer," *J. Phys. Chem. B.* **2015**, *119*, 7698-7711.

12. Leem, G.; **Morseth, Z.A.**; Puodziukynaite, E.; Jiang, J.; Zhen, F.; Gilligan, A.T.; Reynolds, J.R.; Papanikolas, J.M.; Schanze, K.S. "Light-harvesting and charge separation in a π -conjugated antenna polymer bound to TiO₂," *J. Phys. Chem. C* **2014**, *118*, 28535-28541.
13. Farnum, B.H.; **Morseth, Z.A.**; Brennaman, M.K.; Papanikolas, J.M.; Meyer, T.J. "Driving force dependent, photo-induced electron transfer at degenerately doped, optically transparent semiconductor nanoparticle interfaces" *J. Am. Chem. Soc.* **2014**, *136*, 15869-15872.
14. Farnum, B.H.; **Morseth, Z.A.**; Lapidés A.M.; Rieth, A.J.; Hoertz, P.G.; Brennaman, M.K.; Papanikolas, J.M.; Meyer, T.J. "Photo-induced interfacial electron transfer within a mesoporous transparent conducting oxide film," *J. Am. Chem. Soc.* **2014**, *136*, 2208-2211.
15. Nelson, T.J; Masaki, B.; **Morseth, Z.**; Webster, D.C. "Highly functional bio-based polyols and their use in melamine-formaldehyde coatings," *J. Coat. Tech. Res.* **2013**, *17*, 757-767.