

ZACHERY D. MATESICH

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EDUCATION

University of Illinois at Urbana-Champaign, Urbana, IL **2011 – 2017**
Doctor of Philosophy in Organic Chemistry
Dissertation: *Catalytic Allylation of Aldehydes Mediated via the Water-Gas Shift Reaction*
Advisor: Prof. Scott E. Denmark

The College of Wooster, Wooster, OH **2007 – 2011**
Bachelor of Arts in Chemistry with a Philosophy Minor, summa cum laude, Departmental Honors
Senior Thesis: *Thermodynamic Analysis of the Intramolecular Charge Transfer in Butyl (4-Dimethylamino) Benzoate and Butyl 4-Aminobenzoate.*
Advisor: Prof. Sarah J. Sobeck (Schmidtke)
Completed an American Chemical Society accredited curriculum

PROFESSIONAL EXPERIENCE

Department of Chemistry, The College of Wooster, Wooster, OH **2017 – Present**
Visiting Assistant Professor

Classes taught:

- Senior Independent Study – Mentorship of yearlong self-designed research project for every senior at the College of Wooster. The work culminates in a written thesis that is defended orally to a faculty panel.
- Advanced Organic Chemistry (one-semester course) – Self-designed curriculum that focused on experimental, instrumental, and theoretical methods by which the structure, reactivity, and electronic properties of organic compounds are determined. Included physical organic chemistry, mechanism determination, stereochemistry and advanced spectroscopic methods
- Organic Chemistry I & II (two-semester sequence, with lab) – A collaboratively-taught course with hybrid lecture/problem-solving sessions and use of an online homework. Organic Chemistry I involves early introduction of spectroscopy (IR & NMR). Research-oriented laboratory with long-term individual projects.
- General Chemistry I & II (lecture), General Chemistry II (lab) – A collaboratively-taught course with lectures followed up by problem-solving worksheets and use of an online homework.

TEACHING EXPERIENCE

Department of Chemistry, University of Illinois, Urbana, IL **Spring 2016**
Preparing Future Faculty

- Survey course on breadth of opportunities within the field of academia
- Engaged with several area faculty in learning course design, learning approaches, methods of student assessment, modes of academic service, and directing undergraduate research

Teaching Assistant **Fall 2011 – Spring 2013**

- Supervised undergraduate students in laboratory and planned/presented weekly discussion sessions
- Graded weekly lab reports and pre-laboratory assignments for two sections of students per week
- Led pre-lab lectures involving equipment demonstrations (rotary evaporations, distillations, TLC)
- Designed, proctored, and graded biweekly quizzes
- Aided in creation, proctoring, and grading of course examination

RESEARCH EXPERIENCE

Department of Organic Chemistry, University of Illinois, Urbana, IL **2011 – 2017**
Graduate Research Assistant

- Developed a ruthenium-catalyzed, nucleophilic allylation of aldehydes employing the water-gas shift reaction as the reduction pathway
- Synthesized an enantioselective variant of the aforementioned reaction using pre-formed ruthenium catalysts with chiral, enantioenriched organic molecule backbones
- Collaborated in the design and synthesis of novel chiral, enantioenriched amino alcohols for a library of bisoxazoline ligands
- Explored extensions of the water-gas shift reaction through the implementation of iron or photocatalysis

RESEARCH EXPERIENCE (continued)

Department of Chemistry, The College of Wooster, Wooster, OH

2009 – 2011

Undergraduate Student

- Synthesized analogs of 4-aminobenzoic acid and 4-dimethylaminobenzoic acid and completed spectroscopic studies of the intramolecular charge transfer event
- Collaborated in a spectroscopic study of the salts of 4-aminobenzoic acid and 4-dimethylaminobenzoic acid

Brookhaven National Laboratory, Upton, NY

Summer 2010

ACS Nuclear and Radiochemistry Summer Student

- Performed experiments involving radiometric counting and radiochemical organic synthesis
- Gained familiarity of common radiochemical instrumentation

PUBLICATIONS

- Denmark, S. E.; Matesich, Z. D.; Nguyen, S. T.; Sephton, S. M. Catalytic Nucleophilic Allylation Driven by the Water–Gas Shift Reaction *J. Org. Chem.* **2018**, *83*, 23–48. (chosen as JOC’s 2019 Article of the Year)
- Boroff, J. A.; Matesich, Z. D.; Canache Stuetzer, D.; Schmidtke Sobeck, S. J. Solvent impact on the photophysical properties and excited state behavior of p-aminobenzoic acids. *J. Photochem. Photobio. A: Chem.* **2015**, *305*, 60-66.
- Denmark, S. E.; Matesich, Z. D. Catalytic, Nucleophilic Allylation of Aldehydes with 2-Substituted Allylic Acetates: Carbon–Carbon Bond Formation Driven by the Water–Gas Shift Reaction. *J. Org. Chem.* **2014**, *79*, 5970-5986. (featured article)

PRESENTATIONS

- “Applications of Flow Chemistry in Undergraduate Research.”
 - 257th American Chemical Society National Meeting, Orlando, 2019. (Poster)
- “Catalytic, Nucleophilic Allylation of Aldehydes with 2-Substituted Allylic Acetates.”
 - 27th Annual Beak-Pines Organic Area Allerton Conference, University of Illinois, 2013. (Poster)
- “Thermodynamic Analysis of the Intramolecular Charge Transfer in Butyl (4-Dimethylamino) Benzoate and Butyl 4-Aminobenzoate.”
 - 239th American Chemical Society National Meeting, San Francisco, 2010. (Poster)
 - “Bridging Research Communities,” Carnegie Mellon University, 2010. (Poster)

SENIOR INDEPENDENT STUDY ADVISEES AT THE COLLEGE OF WOOSTER

- Colin Ford **2018 – 2019**
“Adapting the Photocyclization Isomerization of 2-Acetylbenzaldehyde into 3-Methylphthalide to a Continuous Flow System”
- Juliette Shea **2018 – 2019**
“Go with the Flow: The Synthesis of Benzo-15-crown-5: Through the Application of Flow Chemistry”

UNDERGRADUATE RESEARCHERS ADVISED

- Anna Schroeder (The College of Wooster 2021) **Spring 2018 – Spring 2019**
- Anna Hartig (The College of Wooster 2020) **Spring 2018 & 2019**

MENTORING EXPERIENCE

University of Illinois

Snyder Scholar Program

Summer 2015

- Collaboratively mentored visiting undergraduate students in lab techniques and organic synthesis

Bonding With Chemistry

Summers 2012, 2013, & 2014

- Assisted in organization of summer day camp for middle school girls
- Led demonstrations for the opening and closing activities

Encouraging Tomorrow’s Chemists

2011 – 2015

- Participated in outreach to local elementary schools for mini-lessons and demonstrations

The College of Wooster (as an undergraduate student)

Chemistry Tutor

2008 – 2011

- Introductory Chemistry, Organic Chemistry I & II, Chemistry for non-majors

Chemistry Club

2007 – 2011

- Served as Outreach Coordinator and organized trips to local schools to present scientific lessons and demos

HONORS AND AWARDS

University of Illinois

- “List of Teachers Ranked as Excellent by their Students”, 2012, 2013

The College of Wooster

- POLYED Undergraduate Award for Achievement in Organic Chemistry, 2011
- Phi Beta Kappa and Phi Sigma Tau (Philosophy Honor Society) as a Junior, 2010
- Best Poster at “Bridging Research Communities,” Carnegie Mellon University, Pittsburgh, 2010.
- Elias Compton Freshman Prize (among highest ranked First-years), 2008
- Herrick L. Johnson Scholarship in Chemistry (highest ranked incoming chemistry student), 2007

INSTITUTIONAL INVOLVEMENT

The College of Wooster

Educational Technology’s Faculty Fellows Program

Summer 2019 – Present

- With assistance of Educational Technology staff support, implemented curriculum development focusing on virtual reality and gamification in organic chemistry course
- Will make use of Nanome software in conjunction with HTC Vive headsets to introduce stereochemistry concepts

Chair of Department Committee for Undergraduate Professional Development

Spring 2018 – Present

- Formulated plan for professional development seminar
- Invited/hosted speakers from various chemical/medical fields

Student Support and Well-Being Committee

Fall 2018 – Spring 2019

- Working group under the direction of the Strategic Planning and Priorities Advisory Committee
- Worked with director of the student wellness center, dean of students, and other support-based faculty/staff personal to direct the college towards more student-centered care and support

Faculty Advisor for ARCH (Academic Registration and Creative Horizons)

Summers 2018 & 2019

- Participated in summer welcome and orientation program for incoming first-year students
- Advised students in course selection across all academic disciplines
- Contributed to sessions with a focus on international students and integrating them to college in the US

Organic Chemistry Laboratory Training Videos Coordinator

Summer 2018

- Planned, filmed, and edited laboratory safety and equipment guide videos with aid of undergraduate student
- Videos implemented into the organic chemistry laboratory curriculum

STEM Inclusive Workshop

Summers 2017, 2018, & 2019

- Focused on inclusive pedagogy and strategies to encourage engagement from all students
- Worked collaboratively to design new ways to improve approaches to students

University of Illinois

Waste and Safety Liaison

2012 – 2017

- Managed advanced waste submissions for research group
- Collaborated in safety culture development committee
- Led safety training sessions for new group members
- Maintained group documentation for waste and safety
- Assisted in accident management and evaluations

TECHNICAL SKILLS

- Computer software: Origin Pro, Gaussian, StatEase (Design of Experiment program), Mercury, iMovie, Audacity, MestReNova NMR analysis, ChemDraw, Word, Excel, PowerPoint, OneNote, EndNote, Easy Interactive Tools, Nanome, HTC Vive Virtual Reality Hardware

PROFESSIONAL MEMBERSHIPS

- American Chemical Society
- Division of Organic Chemistry