

DANIEL R. ZUIDEMA
Covenant College
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EDUCATION

Ph.D. in Organic Chemistry, Wake Forest University
Winston-Salem, North Carolina, September 2001 - May 2005, GPA 4.000

Bachelor of Science with Honors in Chemistry/Minor in Physics, Calvin College
Grand Rapids, Michigan, September 1995 - May 1999, GPA 3.770

RESEARCH INTERESTS

Photochemistry of α - and γ -pyrones

Total synthesis of natural products

Control of radical telomerization reactions

The chemistry of Raney nickel

Meerwein-Ponndorf-Verley reductions

LABORATORY EXPERIENCE

Visiting Research Faculty, University of Tennessee at Chattanooga
Chattanooga, Tennessee, Summer 2006

Developed a process for a one-pot synthesis of nitriles from aldehydes

Developed new methodology for a modified Meerwein-Ponndorf-Verley reduction

Investigated catalytic reduction using cobalt(II)-porphyrin systems

Research Assistant, Wake Forest University
Winston-Salem, North Carolina, 2001-2005

Employed synthetic organic chemistry techniques and strategies to effect a total synthesis of polypropionate natural products

Investigated the photochemistry of α - and γ -pyrones

Investigated the photochemistry of anthraquinones

Analytical Chemist, Analytical Mass Spec Laboratories
Grand Rapids, Michigan, 1997-2001

Prepared and analyzed samples using the methods of atomic absorption

spectrophotometry, gas chromatography, mass spectrometry, titrimetric analysis, and gravimetric analysis

Research and Development Intern Chemist, Zeeland Chemicals
Zeeland, Michigan, Summer 1999

Researched the synthesis and purification of phenyltrimethylammonium chloride, (-)-mandelic acid, and Succinox^R

Studied the kinetics of high pressure catalytic hydrogenation of 3,5-lutidine as well as how to control the *cis* to *trans* isomer ratio of the product

TEACHING

The role of demonstrations in the teaching of science

INTERESTS

The causes and effects of grade inflation

Dual-enrollment science education programs

The use of probeware in science instruction

**TEACHING
EXPERIENCE**

Professor of Chemistry, Covenant College
Lookout Mountain, Georgia, 2005-present

Teach introductory, general, organic, advanced organic, biochemistry, and physical science courses

Conduct research involving Raney nickel chemistry and modified Meerwein-Ponndorf-Verley reductions

Serve as a consultant for MicroLab, Inc. in designing software and hardware for laboratory equipment to be used in teaching laboratories

Educator, Chattanooga Christian High School (part-time)
Chattanooga, Tennessee, 2007-present

Teach advanced chemistry, physics, physical science, and astronomy classes

Taught remedial chemistry classes from 2007-2009

Teaching Assistant, Wake Forest University
Winston-Salem, North Carolina, 2001-2005

Lectured, supervised, and graded for organic chemistry laboratories

Collaborated with local middle school teachers to promote and develop an NSF funded, inner-city, after-school science club

Undergraduate Research Mentor, Wake Forest University
Winston-Salem, North Carolina, 2003-2004

Directed the research of a senior undergraduate chemistry major

Trained this student in the basic skills necessary for research in a synthetic organic chemistry laboratory

Educator, Forsyth Country Day High School
Lewisville, North Carolina, 2001-2005

Developed curriculum and taught summer physics and chemistry courses

Tutored 12-16 science students weekly

Educator, Grand Rapids Christian High School
Grand Rapids, Michigan, 1999-2001

Taught 11th grade chemistry and 9th grade physical science classes

Head of the Chemistry Department's curriculum development, 2000-2001

INSTRUMENTATION

Nuclear Magnetic Resonance Spectroscopy

EXPERIENCE

Infrared Spectroscopy

Ultraviolet-Visible Spectroscopy

Mass Spectrometry

Atomic Absorption Spectrometry

High Performance Liquid Chromatography

Gas Chromatography

Digital Scanning Calorimetry

PRESENTATIONS "A Quantitative Look at How Two Chemistry Courses' Lab Performance Fared During Masked, Physically-Distanced Instruction." D.R. Zuidema. Southeast Regional Meeting of the American Chemical Society in San Juan, PR. October, 2022.

"Developments in Remote Teaching and Use of Instruments with Zoom's Remote Control Feature." D.R. Zuidema. Southeast Regional Meeting of the American Chemical Society in Birmingham, AL. November, 2021.

"Remote Learning." D.R. Zuidema. National Association of Scientific Materials Managers Conference. (online) July, 2021.

"From Passive Observer to Active Participant: Using Interactive Remote Demonstrations to Increase Student Involvement in Online Chemistry." D.R. Zuidema. Online Learning Consortium Ideate Labs for Online STEM: Innovating STEM Education. (online) August, 2020.

"Remote Interactive Labs using Microlab." D.R. Zuidema. National Association of Scientific Materials Managers Conference. (online) July, 2020.

“Teaching GOB Organic Chemistry as a General Science Core Class for Non-science Majors.” X. Jian, D.R. Zuidema. Southeast Regional Meeting of the American Chemical Society in Savannah, GA. October, 2019.

“Exploration of the Connection Between Studying Chemistry and Studying Language.” D.R. Zuidema. Southeast Regional Meeting of the American Chemical Society in Augusta, GA. November, 2018.

“Teaching an Introductory Organic Chemistry Class for High School Students.” D.R. Zuidema. Southeast Regional Meeting of the American Chemical Society in Charlotte, NC. November, 2017.

“Involving high school students in summer chemistry research.” A.M. Crawford, D.W. Drinnon, L.B. Herndon, H.L. Stimart, D.R. Zuidema. Southeast Regional Meeting of the American Chemical Society in Memphis, TN. November, 2015.

“Using *The Poisoner's Handbook* in conjunction with teaching a first-term general/organic/biochemistry course.” L.B. Herndon, D.R. Zuidema. Southeast Regional Meeting of the American Chemical Society in Nashville, TN. October, 2014.

“Catalytic transfer hydrogenation (CTH) of ketoximes with Raney nickel catalyst and 2-propanol as hydrogen donor.” K. Taylor, R.C. Mebane, C.L. Keller, D.R. Zuidema, W.D. Ricketts, J.W. Groenendyk. Southeast Regional Meeting of the American Chemical Society in Atlanta, GA. November, 2013.

“Faithful Learning in Chemistry.” D.R. Zuidema. Invited chapel talk at Covenant College in Lookout Mountain, GA. March, 2013.

“Comparison of high school dual-enrollment and traditional introductory chemistry class outcomes.” D.R. Zuidema. Southeast Regional Meeting of the American Chemical Society in Raleigh, NC. November, 2012.

“Worshipping God in the Discipline of Chemistry.” D.R. Zuidema. Invited chapel talk at Covenant College in Lookout Mountain, GA. February, 2010.

“A Novel Method of Deoxygenating Aromatic Ketones Using Raney Nickel in 2-Propanol.” D.R. Zuidema, R.C. Mebane, K.J. Wert, S.L. Williams. Southeast Regional Meeting of the American Chemical Society in Nashville, TN. November, 2008.

“Recent Developments in Pyrone Natural Product Photochemistry.” Presented at the Chemistry Departmental Seminar at the University of Tennessee at Chattanooga, Chattanooga, TN. March, 2008.

“A Novel Method of Reducing Ketones Using Sodium Hydroxide in 2-Propanol.” D.R. Zuidema, R.C. Mebane, K.J. Wert, S.L. Williams, S.T. Chill. Southeast Regional Meeting of the American Chemical Society in Greenville, SC. October, 2007.

“A Facile One-Pot Conversion of Aldehydes to Nitriles using Raney Nickel.” D.R. Zuidema, R.C. Mebane, A.L. Dennison. Southeast Regional Meeting of the American Chemical Society in Augusta, GA. November, 2006.

“Photosensitization and Quenching Reactions with Pyrones.” D.R. Zuidema, P. Jones. National Organic Symposium in Salt Lake City, UT. June, 2005.

“Photosensitization Reactions of Pyrone Polypropionates.” Presented at the Chemistry Departmental Seminar at Westminster College, New Wilmington, PA. February, 2005.

“The Photochemistry of Pyrone Natural Products.” D.R. Zuidema. Departmental Seminar at Wake Forest University in Winston-Salem, NC. December, 2004.

“Pyrones as Photosensitizers.” D.R. Zuidema, P. Jones. Southeast Regional Meeting of the American Chemical Society in Durham, NC. November, 2004.

“Middle School Science Clubs: An Effort Devoted to Getting Middle School Students Excited About Science.” D.R. Zuidema, A. King. Biennial Conference for Chemical Education in Ames, IA. July, 2004.

“Solid-Phase Radical Telomerization.” D.R. Zuidema. Proposal Seminar at Wake Forest University in Winston-Salem, NC. June, 2004.

“Towards Total Synthesis of Photodeoxytridachione and Related Polypropionates.” D.R. Zuidema, P. Jones. Proposal Seminar at Wake Forest University in Winston-Salem, NC. August, 2003.

“The Triplet Sensitizing Capability of Pyrones.” D.R. Zuidema, P. Jones. National Organic Symposium in Bloomington, IN. June, 2003.

“Progress Toward the Total Synthesis of Deoxytridachione.” D.R. Zuidema, P. Jones. Southeast Regional Meeting of the American Chemical Society in Charleston, SC. November, 2002.

“An Inside Look at Teaching High School Science: Dazzling Demos and Beyond.” D.R. Zuidema. Calvin College Physics Seminar in Grand Rapids, MI. February, 2001.

PUBLICATIONS

“From Passive Observers to Active Participants: Using Interactive Remote Demonstrations to Increase Student Involvement in Online Chemistry Instruction.” D.R. Zuidema, R.H. Zuidema. *Journal of Chemical Education*, **2021**, 98, 843.

“Teaching an Introductory Organic Chemistry Class for High School Students.” D.R. Zuidema, J.A. Stimart, X. Jian. *Journal of Chemical Education*, **2020**, 97, 4303.

Faithful Learning in Chemistry. D.R. Zuidema, J.D. Green, ed. Presbyterian and Reformed. Phillipsburg, NJ, **2016**.

“Using *The Poisoner’s Handbook* in Conjunction with Teaching a First-term General/Organic/Biochemistry Course.” D.R. Zuidema, L.B. Herndon. *Journal of Chemical Education*, **2016**, 93, 98.

“Comparison of High School Dual-Enrollment and Traditional First-term GOB / Non-

majors' College Chemistry Class Outcomes." D.R. Zuidema, K.J. Eames. *Journal of Chemical Education*, **2014**, *91*, 2058.

"Deoxygenation of Aromatic Ketones Using Transfer Hydrogenolysis with Raney® Nickel in 2-Propanol." D.R. Zuidema, K.J. Wert, S.L. Williams, K.J. Bosma, A.L. Smith, R.C. Mebane. *Synthetic Communications*, **2011**, *41*, 2927.

"A Novel Method of Reducing Ketones Using Sodium Hydroxide in Isopropanol." D.R. Zuidema, K.J. Wert, S.L. Williams, S.T. Chill, K.L. Holte, N.K. Kokes, R.C. Mebane. *Synthetic Communications*, **2010**, *40*, 1187.

"Conversion of Aldoximes into Nitriles with Raney Nickel in Refluxing 2-Propanol." D.R. Zuidema, A.L. Dennison, R.C. Mebane, E.Y. Park. *Synthetic Communications*, **2008**, *38*, 3810.

"Triplet Photosensitization in Cyercene A and Related Pyrones." D.R. Zuidema, P. Jones. *Journal of Photochemistry and Photobiology, B: Biology*, **2006**, *83*, 137.

"Photosensitized Conversion of 9,10-Deoxytridachione to Photodeoxytridachione." D.R. Zuidema, A.K. Miller, D. Trauner, P. Jones. *Organic Letters*, **2005**, *7*, 4959.

"Two New Anthraquinone Photoreactions." R.G. Brinson, S.C. Hubbard, D.R. Zuidema, P. Jones. *Journal of Photochemistry and Photobiology, A: Chemistry*, **2005**, *175*, 118.

"Photochemical Relationships in Sacoglossan Polypropionates." D.R. Zuidema, P. Jones. *Journal of Natural Products*, **2005**, *68*, 481.

AWARDS

Wake Forest University Graduate Tuition
Assistantship, 2001-2005

Distinguished Student Teacher Nominee, 1999

John A. Bolt Scholarship for Excellence in Chemistry, 1999

Academic Achievement Award, 1996-1999

Faculty Honors Scholarship, 1995-1999

ACS Outstanding Chemistry Student of the Year Award, 1995

GRANTS

Hach Grant for High School Chemistry, 2019
American Chemical Society

Hach Grant for High School Chemistry, 2018
American Chemical Society

Pittsburgh Conference Memorial National College Grant, 2015
The Pittsburgh Conference

Hach Grant for High School Chemistry, 2014
American Chemical Society

Hach Grant for High School Chemistry, 2013
American Chemical Society

Kaleo Center Research Grant, 2006-2007
Lilly Foundation

Research Site for Educators in Chemistry Grant, 2006
National Science Foundation