

# Nicholas C. Boyde

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## Education

**Vanderbilt University**, Nashville, TN June 2017  
Ph.D., Inorganic Chemistry  
Dissertation Title: "Synthesis and reactions of sterically encumbered inorganic and organometallic complexes"  
Advisor: Dr. Timothy P. Hanusa

**University of Mount Union**: Alliance, OH May 2012  
Bachelor of Science with Honors: Chemistry  
Honors Thesis: "Synthesis of pyrazolylsilane coordination complexes"

## Research Interests

- Incorporation of technology in and out of the classroom
- Inorganic and organometallic synthesis
- Mechanochemical methods towards solvent reduction and green reactions
- Ligand design and application

## Research Experience

- **Dissertation:** "Synthesis and reactions of sterically encumbered inorganic and organometallic complexes"
  - Synthesis of the novel  $P[N(SiMe_3)_2]_3$ ; completion of the characterization of  $As[N(SiMe_3)_2]_3$  and  $Sb[N(SiMe_3)_2]_3$
  - Preparation of gold, silver, and platinum nanoparticles through the use of  $P[N(SiMe_3)_2]_3$
  - Reaction condition effects on the formation of mixed ligand Group 4  $Cp_xM(Cl,Br)_y(OR)_{(4-x-y)}$  complexes
  - Mechanochemical preparation of  $K[Be(1,3-SiMe_3-C_3H_3)_2]_3$
- **Research Collaboration, Oklahoma State University:** Stillwater OK  
Collaborative researcher: Worked in the lab of Dr. Laleh Tahsini
  - Assisted in procedure optimization
  - Provided technique training and guidance to graduate students
- **University of Mount Union:** Alliance, OH  
*Undergraduate Researcher*  
Honors Thesis: "Synthesis of pyrazolylsilane coordination complexes"
  - A study in the underexplored silicon derivate of pyrazolylborane
  - Complexation of pyrazolylsilane to various metal salts to determine coordination
- **University of Memphis:** Memphis, TN  
*NSF-REU Researcher*
  - Organic chemistry research into biodegradable polymers

## Experience

**Dept of Chemistry University of Science and Arts of Oklahoma** Aug 2018-Current

*Associate Professor of Chemistry*

- General Chemistry I Lecture and Laboratory
- General Chemistry II Lecture and Laboratory
- Inorganic Chemistry Lecture
- Analytical Chemistry Lecture and Laboratory
- Instrumental Analysis Lecture and Laboratory
- General Science Lecture
- Foundations of Physical Science
- Foundations of Science Laboratory
- World Thought and Culture II and III
- Bioinorganic Chemistry
- First Year Seminar

**Dept. of Chemistry Juniata College**

*Assistant Professor of Chemistry*

Aug 2017-Jul 2018

- Instructed two sections of Integrated Chemistry Principles I (general chemistry)
- Instructed two sections of corresponding laboratory section of Integrated Chemistry I
- Scheduled to teach Integrated Chemistry Principles II and Inorganic Chemistry for spring 2018 term

**Dept. of Chemistry Vanderbilt University**

*Teaching Fellow*

Aug 2015 – Mar 2016

- Instructed general chemistry discussion sections

*Teaching Assistant*

Aug 2012 – Dec 2013

- Instructed general chemistry laboratory as an independent course from lecture

*Head Teaching Assistant*

Jan 2014 – May 2015

- Coordinated fellow teaching assistants regarding meetings and accuracy of grade

*PAVE Instructor – Chemistry*

July 2014

July 2015

- Instructed rising high school seniors and incoming college freshman during two-week chemistry lecture and laboratory

## Publications

- N. C. Boyde; G. W. Steelman; T. P. Hanusa. "Multicomponent Mechanochemical Synthesis of Cyclopentadienyl Titanium *tert*-Butoxy Halides,  $Cp_xTiX_y(O^tBu)_{4-(x+y)}$  ( $x, y = 1, 2$ ;  $X = Cl, Br$ )."  
*ACS Omega*. **2018**, 3, 7, 8149. DOI: 10.1021/acsomega.8b00943
- N. C. Boyde; N. R. Rightmire; T. P. Hanusa; W. W. Brennessel. "Symmetric Assembly of a Sterically Encumbered Allyl Complex: Mechanochemical and Solution Synthesis of the Tris(allyl)beryllate,  $K[BeA'_3]$  ( $A' = 1,3-(SiMe_3)_2C_3H_3$ )."  
*Inorganics* **2017**, 5 (2), 36. DOI: 10.3390/inorganics5020036
- N. C. Boyde; N. R. Rightmire; E. J. Bierschenk; G. W. Steelman; T. P. Hanusa; W. W. Brennessel. "Reaction environment and ligand lability in group 4  $Cp_2MXY$  ( $X, Y = Cl, OtBu$ ) complexes"  
*Dalton Transaction*. **2016**, DOI: 10.1039/C6DT03199D

- N. C. Boyde T. P. Hanusa, “Interrelationships Between the Lightest Metals,” in *The Lightest Metals: Science and Technology from Lithium to Calcium*; T. P. Hanusa, Ed.; Wiley: Chichester, **2015**, pp 3-22.
- N. C. Boyde; S. C. Chmely; T. P. Hanusa; A. L. Rheingold; W. W. Brennessel. “Structural Distortions in  $M[E(SiMe_3)_2]_3$  Complexes (M = Group 15, f-Element; E = N, CH): Is Three a Crowd?” *Inorg. Chem.* **2014**, *53*, 9703-9714.

## Honors & Awards

- Warren Fellow, Vanderbilt University 2016
- Honors in the Major – Chemistry 2012
- Senior Service Award, University of Mount Union 2012
- Pappenhagen Chemistry Award, University of Mount Union 2012
- Alumni Chemistry Award, University of Mount Union 2011
- Outstanding Organic Chemistry Award, University of Mount Union 2010
- Outstanding Freshman Chemistry Award, University of Mount Union 2009

## Memberships

- American Chemical Society
- Sigma Xi

## Conference Presentations

**ACS National Spring Meeting**, San Francisco, CA, Mar. 2017

Probing Group 4 mixed ligand (Cp, halide, alkoxide) complexes for multiple bonding character and catalytic activity

**Southeast Regional Meeting of the ACS**, Columbia, SC, Oct. 2016

Oral Presentation: “Mechanochemical and solvent effects on ligand lability in  $Cp_mMX_n(OR)_{4-(m+n)}$  (M = Ti, Zr, Hf)(X = Cl, Br) species”

**Inorganic Gordon Research Conference**, Biddeford, ME. Jun. 2016

Poster Presentation: “Mechanochemical and solvent effects on ligand lability in group 4  $Cp_2MXY$  (X, Y = Cl, OtBu) systems”

**Pacificchem**, Honolulu, HI, Dec. 2015

Poster Presentation: “Mechanochemical synthesis of noble metal nanoparticles aided by  $P[N(SiMe_3)_2]_3$ ”

**ACS National Spring Meeting**, Denver, CO, Mar. 2015

Oral Presentation: “Steric bulk as both inhibitor and promoter of reactivity: the case of group 15  $M[N(SiMe_3)_2]_3$  complexes”

**Southeast Regional Meeting of the ACS**, Nashville, TN, Oct. 2014

Poster Presentation: “Structural distortions in  $M[N(SiMe_3)_2]_3$  complexes (M = Group 15, f-element): have sterics been overlooked?”

**Mid-Eastern Honors Association**, Columbus OH, 2012

Oral Presentation: “Synthesis and characterization of various pyrazolysilane complexes”

**Great Lakes Mid-West Joint Regional Meeting of the ACS**, St. Louis, MO, Oct. 2011  
*Poster Presentation*: “Novel synthesis and characterization of various pyrazolylsilane compounds”

## **Other Experience**

*Resident Assistant University of Mount Union*

**Aug. 2009–May 2011**

- Responsible for the well-being of 20-30 freshmen to juniors during the academic year
- Focus on community development, programming, policy enforcement, conflict resolution, mediation, and emergency response.

## **Skills**

Proficient in air-sensitive chemical handling and synthesis techniques

Conducting mechanochemical reactions with various levels of complexity

Familiar with basic vacuum pump and dry-box repair and troubleshooting

Skilled in handling and disposal of pyrophoric materials