

## John J. Allen

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### Education

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#### Rice University, Houston TX

Ph.D. Chemistry *May 2011*

Thesis Title: "Steric Considerations in Copper(I)-olefin Complexes Incorporating Substituted *Bis*(2-pyridyl)amines"

MA Chemistry *January 2009*

#### Colorado School of Mines, Golden CO\*

BS Chemical Engineering<sup>1</sup> *May 2006*

BS Chemistry<sup>1,2</sup> *May 2006*

\* President's Scholarship (Fall 2002 - Spring 2006)

<sup>1</sup> High scholastic honors

<sup>2</sup> Robert A. Baxter Award for meritorious work in chemistry

### Technical Experience<sup>3</sup>

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#### 2006 - present Graduate Research Assistant, Rice University

Prof. Andrew R. Barron, thesis advisor

- synthesis, handling, and structural/spectroscopic characterization of air-sensitive organometallic complexes
- designed/patented process for stereo-specific olefin separations from isomeric hydrocarbon mixtures using copper(I) complexes. (Industrial sponsored research collaboration)
- palladium catalysis in organic synthesis
- computational modeling
- published articles in peer-reviewed journals
- consulted for editing manuscripts submitted for publication by groups from various other universities
- presented seminar lectures each semester concerning current work

#### 2006 - 2010 Teaching Assistant, Rice University

Dr. Mary E. R. McHale, undergraduate laboratory coordinator

- Laboratory TA, General Chemistry I and II. Delivered pre-laboratory lectures, prepared and graded quiz questions/laboratory assignments, instructed/supervised students during experiments.

Dr. Paul S. Engel, professor of chemistry (instructor for courses listed below)

- Graded exams and homeworks for graduate level classes: CHEM 445 (Physical Organic Chemistry) and CHEM 411 (Spectral Methods in Organic Chemistry)

#### 2004 - 2006 Undergraduate Research Assistant, Colorado School of Mines

Dr. E. D. Sloan, undergraduate advisor (dept. of chemical engineering)

- collaboration with Coors Brewing Co. exploring biochemical liquefaction to yield ethanol from brewer's spent grain.

Dr. C. J. Harlan, undergraduate advisor (dept. of chemistry)

- collaboration with Dentsply Ceramed troubleshooting/optimizing hydroxyapatite production process used in manufacturing facilities

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<sup>3</sup> contact information for work-references available upon request

## Non-technical Experience

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### 2003 - 2006 Building Services and Aquatics Maintenance, City of Golden

Mike Keene, supervisor

1470 10<sup>th</sup> St. Golden, CO 80401

- general facilities and pool maintenance.
- maintenance/repair of various types of chemical and water pumps
- resolution of minor to moderate plumbing issues

### Technical Skill Highlights

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**Laboratory** - Exhaustive experience in preparation, manipulation, and characterization of air/moisture-sensitive organometallic compounds and inorganic materials. Adept with organic synthesis and catalysis. Glass blowing experience (when necessary for custom reaction apparatus)

**Instrumental** (and relevant data collection/processing software):

- X-ray crystallography (Bruker SMART, SAINTplus, & SHELXTL; Mercury, PLATON)
- X-ray powder diffraction (Jade)
- <sup>1</sup>H / <sup>13</sup>C NMR spectroscopy (Bruker Topspin)
- FT-IR spectroscopy: KBr pellet, salt-cell transmission, and ATR methods (OMNIC)
- TG/DTA for thermal analysis (Seiko TGDTA software package)
- UV/VIS (Agilent Technologies ChemStation)
- GC-MS (Agilent Technologies software package)

**Computational** - molecular modeling: Gaussian '03 Package, MOPAC, & Spartan; process design and reaction simulation: Aspen Plus & CHEMKIN.

### Publications, Teaching Modules, & Patents<sup>4</sup>

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1. "Unusual Co-Crystallization of both Monomeric and Dimeric Forms of Cu[PhN(py)(quin)]Cl<sub>2</sub>, J. J. Allen and A. R. Barron, *J. Chem. Cryst.*, 2011, **41**, 654-663..
  2. "Demonstration of Remote Steric Differentiation of *cis/trans* Alkene Coordination in Copper(I) Complexes of Aryl-substituted *Bis*(2-pyridyl)amine. J. J. Allen and A. R. Barron, *Dalton Trans.*, 2011, **40**, 1189 - 1194.
  3. "Synthesis and Characterization of Aryl Substituted *Bis*(2-pyridyl)amines and their Copper Olefin Complexes: Investigation of Remote Steric Control Over Olefin Binding." J. J. Allen, C. E. Hamilton, and A. R. Barron. *Dalton Trans.*, 2010, **39**, 11451-11468..
  4. "Cross coupling of substituted anilines with quinoline: Synthesis and Structural Characterization of HN(py)quin, PhN(py)quin, MesN(py)quin, and [H(PhN(py)quin)]BF<sub>4</sub>" J. J. Allen, C. E. Hamilton, and A. R. Barron, *J. Chem. Cryst.*, 2010, **40**, 137-144.
  5. "Synthesis and Structural Characterization of (2,6-<sup>i</sup>Pr<sub>2</sub>C<sub>6</sub>H<sub>3</sub>)N(quin)<sub>2</sub> and [Cu{(2,6-<sup>i</sup>Pr<sub>2</sub>C<sub>6</sub>H<sub>3</sub>)-N(quin)<sub>2</sub>}<sub>2</sub>]BF<sub>4</sub>" J. J. Allen, C. E. Hamilton, and A. R. Barron, *J. Chem. Cryst.*, 2010, **40**, 130-136.
  6. "Synthesis and Structural Characterization of [Ag(H-dpa)(η<sup>2</sup>-styrene)]BF<sub>4</sub>: Comparing Silver and Copper for Olefin Binding" J. J. Allen and A. R. Barron, *J. Chem. Cryst.*, 2009, **39**, 935-939.
  7. "Molecular Structures of RN(H)Py (R = 2,4,6-Me<sub>3</sub>C<sub>6</sub>H<sub>3</sub>, 2,6-Et<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, Ph<sub>3</sub>C), and the Copper Complex [Cu{(2,4,6-Me<sub>3</sub>C<sub>6</sub>H<sub>3</sub>)N(H)Py}<sub>2</sub>]BF<sub>4</sub>" J. J. Allen, C. E. Hamilton, and A. R. Barron, *J. Chem. Cryst.*, 2009, **39**, 573-580.
  8. "Olefin Coordination in Copper(I) Complexes of *Bis*(2-pyridyl)amine" J. J. Allen and A. R. Barron. *Dalton Trans.*, 2009, 878-890.

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<sup>4</sup> full-text documents available on request for journal articles and teaching module.

9. "Synthesis and Isotopic Labeling of a Naturally-occurring Alkyl-thiadiamondoid by Selective Monomethylation of Meerwein's Ester" V. Russo, J. J. Allen, and Z. T. Ball. *Chem. Commun.*, 2009, 595-596.
10. "Molecular Structure of Quinolin-1-(2-quinolyl)-2-one-mesitylimine: An Unusual Amination Product of 2,4,6-Trimethylaniline and 2-Chloroquinoline." J. J. Allen, C. E. Hamilton, and A. R. Barron, *J. Chem. Cryst.*, 2008, **38**, 873-877.
11. "Molecular Structure of  $[\text{Cu}_2(\text{MeCN})_2(\mu\text{-tpy})_2][\text{BPh}_4]_2$ : A Helical Di-Cuprous Terpyridine Complex." J. J. Allen and A. R. Barron, *J. Chem. Cryst.*, 2008, **38**, 879-882.
12. "Refinement of Crystallographic Disorder in the Tetrafluoroborate Anion" J. J. Allen and A. R. Barron, Connexions module: m36687, 2011; <http://cnx.org/content/m36687/1.1/>.
13. A. R. Barron, J. J. Allen, C. E. Hamilton, R. C. Schucker, and M.. F. Lynch, *Olefin Separation Agents and Methods of Designing, Preparing, and Utilizing Same*, Application for United States Letters Patent.