

**Timothy B. Clark Ph.D.**

**Spring 2008**

Western Washington University  
Department of Chemistry  
516 High Street  
Bellingham, WA 98229

Phone: (360)-650-3167  
Fax: (360)-650-2826  
E-mail: clark@chem.wwu.edu

**Education**

- 2006 Ph.D., Organic Chemistry, *University of California, Irvine*
- 2001 Bachelor of Arts (Cum Laude) in Chemistry (ACS Certified), minor in Religious Studies, *University of San Diego*

**Experience**

- 2007–present **Assistant Professor of Chemistry**  
*Western Washington University, Bellingham, WA*  
Teaching Specialty: organic chemistry/organometallic chemistry  
Research Interests: methodology development/organometallic reactions
- 2006–2007 **NIH Ruth L. Kirschstein Postdoctoral Fellow** with Professor Charles P. Casey  
*University of Wisconsin-Madison*

The synthesis of boron analogues of the Ru(II) Shvo catalyst and studies of their reactivity toward polar unsaturated organic substrates was examined. The activation of boranes and diboron reagents was achieved providing both ruthenium hydrides and ruthenium boryl complexes. These complexes were shown to catalytically hydroborate aldehydes and imines by the addition of boranes. The ruthenium boryl complexes are being examined as an anionic source of boron and for the directed C–H functionalization of organic substrates.

- 2001–2006 **Graduate Research Associate** with Professor Keith A. Woerpel  
*University of California, Irvine*

Di-*tert*-butyl silacyclopropenes and oxasilacyclopentenes were developed as synthetically valuable intermediates in organic synthesis. Mild conditions for silver-catalyzed silylene transfer to alkynes was developed and several unknown classes of silacyclopropenes were synthesized. Copper-catalyzed carbonyl insertion reactions were also achieved providing oxasilacyclopentenes.

The embedded olefin of the oxasilacyclopentene was utilized in hydrogenations, epoxidations, Mukaiyama aldol reactions, and Diels-Alder reactions. These stereoselective transformations demonstrated the synthetic utility of oxasilacyclopentenes by the formation of allylic alcohols, 1,3-diols, 1,2,4-triols, and several other synthetically valuable substrates.

- 2003–2005 **Coordinator of UCI Department of Chemistry Postdoctoral and Graduate Student Colloquium**

- 2000                    **Research Experience for Undergraduates** with Professor Edwin Vedejs, *University of Michigan, Ann Arbor*
- 1999–2001            **Undergraduate Chemistry Tutor**, *University of San Diego*
- 1999                    **Undergraduate Research Internship**, *Aguoron Pharmaceuticals, La Jolla, CA*
- 1998–2001            **Undergraduate Research Assistant** with Tammy J. Dwyer, *University of San Diego*

### Teaching Experience

| <b>Course Number</b> | <b>Title</b>                   | <b>Term Taught</b> |
|----------------------|--------------------------------|--------------------|
| Chem 351             | Organic Chemistry I            | F07                |
| Chem 352             | Organic Chemistry II           | W08                |
| Chem 353             | Organic Chemistry III          | S08                |
| Chem 354             | Organic Chemistry Laboratory I | W08, S08           |

### Honors and Awards

- 2003–current        American Chemical Society Member
- 2001–current        Kappa Gamma Pi Honor Society Member
- 2005                    University of California Regents' Dissertation Fellowship
- 2001                    Outstanding Undergraduate in Chemistry Award, *University of San Diego*
- 1999-2001            University of San Diego Associated Student Undergraduate Research Grant
- 1999-2001            Kiwanis of San Diego Scholarship
- 1998-2001            Bishop Maher Leadership Scholarship
- 1998-2001            Ahmanson Foundation Scholarship
- 1997-2001            University of San Diego Scholarship

### External Research Grants

- 1/2008–12/2009    **Research Corporation Cottrell College Science Award**  
\$44,651  
“Asymmetric Dearomatization Reactions Utilizing eta-2-Rhenium pi-Bases: Use of Benzylic Leaving Groups for Mild Dearomatization”
- 1/2008–8/2010     **American Chemical Society Petroleum Research Fund (Type G)**  
\$50,000  
“Chelation Directed C–H Functionalization Reactions with Ruthenium Boryl Complexes”

## **Publications**

4. Casey, C. P.; Clark, T. B.; Guzei, I. A. "Intramolecular Trapping of an Intermediate in the Reduction of Imines by a Hydroxycyclopentadienyl Ruthenium Hydride: Support for a Concerted Outer Sphere Mechanism" *J. Am. Chem. Soc.* **2007**, *129*, 11821–11827.
3. Clark, T. B.; Woerpel, K. A. "The Formation and Reactivity of Silacyclopropenes Derived from Siloxyalkynes: Stereoselective Formation of 1,2,4-Triols" *Org. Lett.* **2006**, *8*, 4109–4112.
2. Clark, T. B.; Woerpel, K. A. "Silver-Catalyzed Silacyclopropenation of 1-Heteroatom-Substituted Alkynes and Subsequent Rearrangement Reactions" *Organometallics* **2005**, *24*, 6212–6219.
1. Clark, T. B.; Woerpel, K. A. "Formation and Reactivity of Oxasilacyclopentenes Derived from Functionalized Alkynes" *J. Am. Chem. Soc.* **2004**, *126*, 9522-9523.

## **Contributed Presentations**

C. P. Casey,\* T. B. Clark, "Directed C-H functionalization with ruthenium boron analogs of the Shvo hydrogenation catalyst" Presented at the 233<sup>rd</sup> ACS National Meeting, Chicago, IL, March 2007; paper INOR-55.

T. B. Clark, K. A. Woerpel,\* "Formation and Utility of Oxasilacyclopentenes Derived from Functionalized Alkynes" Presented at the 229<sup>th</sup> ACS National Meeting, San Diego, CA, March 2005; paper ORGN-689.

S. A. Calad, J. Cirakovic, T. B. Clark, T. G. Driver, and K. A. Woerpel,\* Metal-Catalyzed Synthesis and Reactions of Silacyclopropanes: New Reactions and Stereoselective Methods for Organic Synthesis, Presented at the James Flack Norris Award Symposium for Professor Robert G. Bergman, 225th National Meeting of the American Chemical Society, New Orleans, LA, March 2003; paper ORGN-1.

T. B. Clark, P. S. Traylor, T. J. Dwyer,\* "Determination of the Mechanism of Quinoxaline Formation" Presented at the 221<sup>st</sup> ACS National Meeting, San Diego, CA, April 2001; poster CHED-198.

T. B. Clark, J. MacKay, E. J. Vedejs,\* "Intramolecular Baylis-Hillman Cyclization: Synthesis and Reaction Methodology" Presented at the 16<sup>th</sup> Biennial Conference on Chemical Education, Ann Arbor, MI, August 2000; poster.

## **Invited Presentations**

"Formation and Synthetic Utility of Silacyclopropenes and Oxasilacyclopentenes," University of San Diego, March 23, 2006, San Diego, CA.