

Paul J. Fischer, Ph.D.

Macalester College, Department of Chemistry
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Curriculum Vitae

April 11, 2008

EDUCATION

Ph.D. in Chemistry

University of Minnesota September 1998
Thesis: Studies on Novel Titanium Carbonyl Compounds
Advisor: Professor John E. Ellis

B.S. in Chemistry, *summa cum laude*

University of Minnesota June 1993

ACADEMIC EMPLOYMENT

Associate Professor of Chemistry

Macalester College, Saint Paul, MN September 2007 to present

Assistant Professor of Chemistry

Macalester College, Saint Paul, MN September 2001 to August 2007

Visiting Assistant Professor of Chemistry

St. Olaf College, Northfield, MN September 1998 to June 2001

General Chemistry Lecturer for Pre-Medical Students

University of Minnesota, College of Liberal Arts February 1997 to February 1999

SCHOLARSHIP AND PROFESSIONAL ACTIVITY

• **PEER-REVIEWED ARTICLES (Undergraduate Co-authors in Boldface)**

- (11) "Bis(2,2-bis(dimethylphosphano)ethane)tricarbonyltitanium(0) and Hexacarbonyl-titanate(II-)." Robert E. Jilek, Paul J. Fischer, and John E. Ellis, *Inorg. Synth*, accepted for publication in Volume 35.
- (10) "Using Graphs of Gibbs Energy vs. Temperature in General Chemistry Discussions of Phase Changes and Colligative Properties." Robert M. Hanson, Patrick Riley, Jeff Schweinefus, and Paul J. Fischer, *J. Chem. Educ.*, in press.
- (9) "[2-(Diphenylphosphino)ethyl)cyclopentadienyl]tricarbonylmetalates: Supporting Ligands for Reactions at Group VI Metal-Copper Bonds." Paul J. Fischer, **Aaron P. Heerboth ('08)**, **Zoey R. Herm ('07)**, Benjamin E. Kucera, *Organometallics* **2007**, 26, 6669.

- (8) “(2-(Trimethylammonium)ethyl)cyclopentadienyltricarboxylmetalates: Group VI Metal Zwitterions.” Paul J. Fischer, **Zoey R. Herm ('07)**, and Benjamin E. Kucera, *Organometallics* **2007**, 26, 4680.
- (7) “(2-(Dimethylammonium)ethyl)cyclopentadienyltricarboxylmetalates: Group VI Metal Zwitterions. Attenuation of the Brønsted Basicity and Nucleophilicity of Formally Anionic Metal Centers.” Paul J. Fischer, **Kristina M. Krohn ('05)**, **Edward T. Mwenda ('05)**, and Victor G. Young, Jr. *Organometallics* **2005**, 24, 5116.
- (6) “(2-(Dimethylamino)ethyl)cyclopentadienyl Group VI Metal Carbonyl Anions and Divalent Tin(IV) Derivatives.” Paul J. Fischer, **Kristina M. Krohn ('05)**, **Edward T. Mwenda ('05)**, and Victor G. Young, Jr. *Organometallics* **2005**, 24, 1776.
- (5) “First Zerovalent Metal Complexes Containing η^3 -Borohydride and Pyrrolyl Ligands: $[\text{Ti}(\text{CO})_4(\eta^3\text{-BH}_4)]^-$ and $[\text{Ti}(\text{CO})_4(\eta^5\text{-C}_4\text{H}_4\text{N})]^-$.” Paul J. Fischer, Victor G. Young, Jr. and John E. Ellis, *Angew. Chem. Int. Ed.* **2000**, 39, 189.
- (4) “Trityltitanium Complexes. X-ray Structural Characterization of $[\text{Ti}(\text{CO})_4\{\eta^5\text{-C}(\text{C}_6\text{H}_4\text{R})_3\}]^-$, R= H, OCH₃.” Paul J. Fischer, **Kateri A. Ahrendt ('97)**, Victor G. Young, Jr. and John E. Ellis, *Organometallics* **1998**, 17, 13.
- (3) “First Isolation and Structural Characterization of Bis(Anthracene)Metal Complexes: $[\text{Ti}(\eta^6\text{-C}_{14}\text{H}_{10})(\eta^4\text{-C}_{14}\text{H}_{10})(\eta^2\text{-dmpe})]$ and $[\text{Ti}(\eta^4\text{-C}_{14}\text{H}_{10})(\eta^2\text{-C}_{14}\text{H}_{10})(\eta^5\text{-C}_5\text{Me}_5)]^-$.” John K. Seaburg, Paul J. Fischer, Victor G. Young, Jr. and John E. Ellis, *Angew. Chem. Int. Ed.* **1998**, 37, 155.
- (2) “Novel Alkoxo- and Aryloxotitanium Carbonyls. Structural Characterization of $[\text{Ti}(\text{CO})_4(\mu\text{-OPh})_2]^{2-}$.” Paul J. Fischer, Pong Yuen, Victor G. Young, Jr. and John E. Ellis, *J. Am. Chem. Soc.* **1997**, 119, 5980.
- (1) “Novel Gold Derivatives of Titanium Carbonyl and Structural Characterization of a Compound Containing an Unsupported Gold-Titanium Bond: $[\text{Ti}(\text{CO})_6(\text{AuPEt}_3)]^-$.” Paul J. Fischer, Victor G. Young, Jr. and John E. Ellis, *Chem. Commun.* **1997**, 1249.

- **INVITED ESSAY**

- (1) “Temporary Teaching Position or Traditional Postdoc: Pros and Cons”, published in And Gladly Teach: A Resource Book for Chemists Considering Academic Careers, American Chemical Society, 1155 Sixteenth Street, NW Washington, DC 20036, **2003**. The second edition was published in **2006**.

- **EXTERNAL FUNDING FOR RESEARCH**

- (4) **American Chemical Society Petroleum Research Fund Type UFS Grant**
“Exploration of $[\text{M}(\text{CO})_2(\eta^5\text{-}\eta^1\text{-C}_5\text{H}_4(\text{CH}_2)_2\text{PR}_2)]^-$ (M = Cr, Mo, W) as Tunable Precursors for Transition Metal Boranes with Unsupported M→B Dative Bonds”, 8/4/08 – 8/7/09, \$50000.
- (3) **American Chemical Society Petroleum Research Fund Type B Grant**
“Studies on Heterobimetallic Complexes Containing Phosphinoethyl-, Aminoethyl-, and Diphenylphosphino-Functionalized Cyclopentadienyl Group VI Metal Carbonyl Fragments”, 8/1/2007 – 8/31/2010, \$55000.
- (2) **Research Corporation Cottrell College Science Award**
“Studies on Intramolecular Amine-Stabilized Transition-Metal Boryl Complexes”, 6/30/03 – 6/30/07, \$50000 (\$35000 and a \$15000 Macalester College match.)

- (1) **American Chemical Society Petroleum Research Fund Type GB Grant**
“Studies on Intramolecular Amine-Stabilized Transition-Metal Boryl Complexes”,
7/1/03 – 8/31/06, \$35000.
- **PENDING PROPOSALS FOR EXTERNAL FUNDING**
 - (1) **National Science Foundation Major Research Instrumentation Program**
“Acquisition of a 400 MHz NMR Spectrometer for Chemical and Chemical Genetics Research”, Proposed Funding Period: 9/1/2008 – 8/31/2009, \$298600. Project Director: Paul J. Fischer, co-PIs: Ronald Brisbois, Rebecca Hoye, Paul Overvoorde, Kathryn Splan. Submitted: 1/24/2008.
 - **PRESENTATIONS OF MACALESTER COLLEGE SCHOLARSHIP AT PROFESSIONAL MEETINGS** (Presenters are underlined and **undergraduate co-authors in boldface**.)
 - (14) “[2-(Diphenylphosphino)ethyl]cyclopentadienyl]tricarbonylmetalates: Supporting Ligands for Reactions at Group VI Metal-Copper Bonds”. Paul J. Fischer, **Aaron P. Heerboth ('08)**, **Zoey R. Herm ('07)**, Benjamin E. Kucera, *Oral Presentation*, 235th American Chemical Society National Meeting, New Orleans, LA, April 6-10, 2008.
 - (13) “(2-(Diphenylphosphino)ethyl)cyclopentadienyl: A Ligand that Permits Nucleophilic Attack at Group VI Metal-Copper Bonds”. **Aaron P. Heerboth ('08)**, Zoey R. Herm ('07), Paul J. Fischer, and Benjamin E. Kucera, *Poster Presentation*, 235th American Chemical Society National Meeting, New Orleans, LA, April 6-10, 2008.
 - (12) “An Ageless Pedagogical Challenge Made Seemingly More Acute: Juggling the “Canon”, Temporal Realities, and the Integration of Modern Research Questions in Advanced Inorganic Chemistry Curricula”. Paul J. Fischer, *Invited Oral Presentation*, 235th American Chemical Society National Meeting, New Orleans, LA, April 6-10, 2008.
 - (11) “Zwitterionic Organometalates: The Impact of Intramolecular Through-Space Electrostatic Interactions on M(CO)₃ Fragment Electronic Environment and Reactivity”. Paul J. Fischer, **Zoey R. Herm ('07)**, **Kristina M. Krohn ('05)**, and **Edward T. Mwenda ('05)**, *Poster Presentation*, Organometallics Gordon Research Conference, Newport, RI, July 8-13, 2007.
 - (10) “(2-(Trimethylammonium)ethyl)cyclopentadienyltricarbonylmetalates: Group VI Metal Zwitterions”. Paul J. Fischer, **Zoey R. Herm ('07)**, and Benjamin E. Kucera, *Oral Presentation*, 233rd American Chemical Society National Meeting, Chicago, IL, March 25-29, 2007.
 - (9) “Methylation of (2-(Dimethylamino)ethyl)cyclopentadienyl Group VI Metal Carbonyl Anions”. **Zoey R. Herm ('07)**, Paul J. Fischer, Benjamin E. Kucera, *Poster Presentation*, 233rd American Chemical Society National Meeting, Chicago, IL, March 25-29, 2007.
 - (8) “¹¹⁹Sn Relayed ¹H-¹⁸³W Correlation Spectroscopy”. T. Andrew Mobley, **Ellie Tennyson ('07)**, **Brian Williams ('07)**, and Paul J. Fischer, *Poster Presentation*, SMASH Nuclear Magnetic Resonance Spectroscopy Conference, Burlington, VT, September 10-13, 2006.
 - (7) “(2-(Dimethylammonium)ethyl)cyclopentadienyltricarbonylmetalates: Group VI Metal Zwitterions”. Paul J. Fischer, **Kristina M. Krohn ('05)**, **Edward T. Mwenda ('05)**

- and Victor G. Young, Jr., *Oral Presentation*, 230th American Chemistry Society National Meeting, Washington, DC, August 28 – September 1, 2005.
- (6) “Synthesis and Characterization of Tin(IV) Derivatives of 2-(Dimethylamino)ethylcyclopentadienyl Group VI Metal Carbonyl Anions”. Paul J. Fischer, **Kristina M. Krohn ('05)**, **Edward T. Mwenda ('05)** and Victor G. Young, Jr., *Oral Presentation*, 229th American Chemistry Society National Meeting, San Diego, CA, March 13-17, 2005.
 - (5) “Dimethylaminoethylcyclopentadienyl Metal Carbonyl Anions of Chromium, Molybdenum and Tungsten”. Paul J. Fischer, **Edward T. Mwenda ('05)**, **Kristina M. Krohn ('05)**, and Victor G. Young, Jr., *Oral Presentation*, 227th American Chemical Society National Meeting, Anaheim, CA, March 30, 2004.
 - (4) “Synthesis and Ligand Isomerization Kinetics of an Allyl-Molybdenum Carbonyl Complex: An Undergraduate Laboratory Project”, Paul J. Fischer, *Oral Presentation*, 227th American Chemical Society National Meeting, Anaheim, CA, March 30, 2004.
 - (3) “Laboratory Experiments that Complement Molecular Thermodynamics General Chemistry Curricula”, Paul J. Fischer and Robert M. Hanson, *Oral Presentation*, 18th Biennial Conference on Chemical Education, Iowa State University, July 18-22, 2004.
 - (2) “Advanced Undergraduate Laboratory Project: Synthesis and Ligand Isomerization Kinetics of an Allyl-Molybdenum Carbonyl Complex”, Paul J. Fischer, *Oral Presentation*, 18th Biennial Conference on Chemical Education, Iowa State University, July 18-22, 2004.
 - (1) “Chemical Demonstrations Explained with Graphs of Free Energy vs. Temperature”, Patrick Riley, Robert M. Hanson and Paul J. Fischer, *Oral Presentation*, 18th Biennial Conference on Chemical Education, Iowa State University, July 18-22, 2004.

• **INVITED PRESENTATIONS**

- (9) “Intramolecular Ion-Pairing and Group VI Metal-Copper Bonds: Novel Chemistry Afforded by Organometallic Anions with Pendant Amines and Phosphines”, Paul J. Fischer, *Oral Presentation*, Chemistry Department Seminar, University of St. Thomas, St. Paul, MN, September 21, 2007.
- (8) “Amine-Functionalized Cyclopentadienyl Group VI Metal Carbonyl Anions: Reactivity Studies of Complexes with Two Nucleophilic Sites”, Paul J. Fischer, *Oral Presentation*, Inorganic Division Chemistry Department Seminar, University of Kansas, Lawrence, KS, May 9, 2006.
- (7) “How a pKa Table Inspired a Research Project: Group VI Metal Zwitterions”, Paul J. Fischer, *Oral Presentation*, Chemistry Department Seminar, Hamline University, St. Paul, MN, February 8, 2006.
- (6) “How a pKa Table Inspired a Research Project: Group VI Metal Zwitterions”, Paul J. Fischer, *Oral Presentation*, Chemistry Department Seminar, St. Olaf College, Northfield, MN, January 13, 2006.
- (5) “An Anionic Metal Center and a Tertiary Amine: What is an Electrophile to do?”. Paul J. Fischer, *Oral Presentation*, Chemistry Department Seminar, Gustavus Adolphus College, St. Peter, MN, November 12, 2004.
- (4) “A Quest to Synthesize Intramolecular Amine-Stabilized Transition-Metal Carbonyl Complexes: The Adventure Begins”, Paul J. Fischer, *Oral Presentation*, Chemistry Department Seminar, Carleton College, Northfield, MN, October 24, 2003.
- (3) “Encouraging Student Reflection on Problem Solving Strategies: ‘Progression Series’ Problem Sets”, Paul J. Fischer, *Poster Presentation*, Developments in

Teaching/Learning Methods in General Chemistry Workshop, Saint Cloud State University, October 25-26, 2002.

- (2) "The Use of Portable Vacuum/Inert Atmosphere Systems in the Undergraduate Chemistry Laboratory Curriculum", Paul J. Fischer, *Oral Presentation*, Midwestern Association of Chemistry Teachers in Liberal Arts Colleges meeting, University of St. Thomas, St. Paul, MN, October 26, 2001.
- (1) "General Chemistry at the University of Minnesota." Paul J. Fischer and Barbara L. Edgar, *Oral Presentation*, Minnesota State College and University Chemistry Workshop, Bloomington, MN, April 26, 1996.

• **PRESENTATIONS BY UNDERGRADUATES (REGIONAL MEETINGS)**

- (7) "(2-(Diphenylphosphino)ethyl)cyclopentadienyl: A Ligand that Permits Nucleophilic Substitution at Group VI Metal-Copper Bonds." Aaron P. Heerboth ('08), Zoey R. Herm ('07), and Paul J. Fischer, *Oral Presentation*, Undergraduate Research Symposium in the Physical Sciences and Mathematics, University of Chicago, Chicago, IL, November 9-11, 2007.
- (6) "Supporting Group VI Metal-Copper Bonds: Synthetically Useful?" Aaron P. Heerboth ('08), Zoey R. Herm ('07), and Paul J. Fischer, *Oral Presentation*, Associated Colleges of the Twin Cities Undergraduate Research Meeting, Macalester College, St. Paul, MN, July 25, 2007.
- (5) "Methylation of (2-(Dimethylamino)ethyl)cyclopentadienyl Group VI Metal Carbonyl Anions." Zoey R. Herm ('07) and Paul J. Fischer, *Oral Presentation*, Undergraduate Research Symposium in the Physical Sciences and Mathematics, Washington University, St. Louis, MO, November 3-5, 2006.
- (4) "Methylation of (2-(Dimethylamino)ethyl)cyclopentadienyl Group VI Metal Carbonyl Anions." Zoey R. Herm ('07) and Paul J. Fischer, *Oral Presentation*, Associated Colleges of the Twin Cities Undergraduate Research Meeting, Macalester College, St. Paul, MN, July 24, 2006.
- (3) "Reactions of 2-(Dimethylamino)ethylcyclopentadienyl Group VI Metal Carbonyl Anions." Kristina M. Krohn ('05), Edward T. Mwenda ('05), and Paul J. Fischer, *Oral Presentation*, Undergraduate Research Symposium in the Physical Sciences and Mathematics, Washington University, St. Louis, MO, November 5-6, 2004.
- (2) "Group VI Metal Carbonyl Compounds with the 2-(Dimethylamino)ethylcyclopentadienide Ligand." Edward T. Mwenda ('05), Kristina M. Krohn ('05) and Paul J. Fischer, *Oral Presentation*, Undergraduate Research Symposium in the Physical Sciences and Mathematics, University of Chicago, Chicago, IL, November 14-16, 2003.
- (1) "Synthetic Explorations of Low Valent Pyrrolylmolybdenum Carbonyl Complexes." Phillip I. Volkers ('02) and Paul J. Fischer, *Poster*, Undergraduate Research Symposium in Mathematics and Physical Sciences, Washington University, St. Louis, MO, November 3-5, 2000.

• **PRESENTATIONS OF DOCTORAL THESIS RESEARCH**

- (8) "Facile Routes to Titanium Carbonyls via $[\text{Ti}(\text{CO})_4(\text{BH}_4)]^-$, an Unusually Labile Borohydride Complex." Jennifer S. Griffiths ('99), John E. Ellis, Paul J. Fischer and Giovanna Tripepi, *Poster*, 217th National Meeting of the American Chemical Society, Anaheim, CA, March 1999.

- (7) “[Ti(CO)₄(η³-BH₄)]-: An Usually Labile Precursor to Zerovalent Carbonyl Complexes.” **Rebecca A. Janes** ('98), Paul J. Fischer, Victor G. Young, Jr., and John E. Ellis, *Poster*, 215th National Meeting of the American Chemical Society, Dallas, TX, March 1998.
- (6) “Studies on Novel Titanium Carbonyl Complexes.” Paul J. Fischer, Victor G. Young, Jr. and John E. Ellis, *Poster*, Department of Chemistry Research Symposium, University of Minnesota, September 24, 1997.
- (5) “Bis(Anthracene)Titanium Complexes.” John K. Seaburg, Paul J. Fischer, Victor G. Young, Jr., and John E. Ellis, *Poster*, 214th National Meeting of the American Chemical Society, Las Vegas, NV, September 1997.
- (4) “Syntheses and Properties of Zerovalent Titanium Carbonyls Containing Alkoxy and Aryloxy Ligands, [Ti(CO)₄(μ-OR)]₂²⁻.” Paul J. Fischer, Pong Yuen, Victor G. Young, Jr., and John E. Ellis, *Oral Presentation*, 213th National Meeting of the American Chemical Society, San Francisco, CA, April 1997.
- (3) “Reactions of Hexacarbonyltitanate(2-), [Ti(CO)₆]²⁻, with Trityl Chloride and Related Organic Electrophiles.” **Kateri A. Ahrendt** ('97), Paul J. Fischer, Victor G. Young, Jr., and John E. Ellis, *Poster*, 213th National Meeting of the American Chemical Society, San Francisco, CA, April 1997.
- (2) “New Leaps in the Investigation of Low Valent Titanium Carbonyl Chemistry.” Paul J. Fischer and John E. Ellis, *Oral Presentation*, Inorganic Chemistry Departmental Seminar, University of Minnesota, February 29, 1996.
- (1) “The Synthesis and Characterization of Bis-Arene Titanium Compounds Using Arene Radical Anions.” Paul J. Fischer, A.J. Kahaian and John E. Ellis, *Poster*, 205th National Meeting of the American Chemical Society, Denver, CO, March 1993.

• **WORKSHOP/SEMINAR PARTICIPATION**

- (6) “Academic Leadership Faculty Seminar”, Macalester College, Center for Scholarship and Teaching, 2007-2008 academic year.
- (5) Multi-Initiative Dissemination Project Workshop (Innovations in Chemical Education), sponsored by the NSF, Macalester College, April 16-17, 2004.
- (4) “Attracting and Retaining Majors in the Sciences” Pew Spring Conference, Chicago, IL, March 7-9, 2003.
- (3) “Developments in Teaching/Learning Methods in General Chemistry” Workshop at Saint Cloud State University on October 25-26, 2002.
- (2) “Molecular Modeling in Undergraduate Chemical Education”, a workshop sponsored by Wavefunction, Inc. on July 22, 2002 at the University of Minnesota.
- (1) “Communicating Chemistry: Reaching Students and the Public-at-Large”, A Chautaugua Short Course provided by Bassam Z. Shkhashiri and Rodney Schreiner at the University of Wisconsin-Madison, June 8-10, 2000.

• **COMPETITIVE, INTRAMURAL FUNDING FOR RESEARCH STIPENDS**

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| (7) | Keck Student-Faculty Collaboration Award (for Aaron Heerboth '08) | 2007 |
| (6) | Keck Student-Faculty Collaboration Award (for Zoey Herm '07) | 2006 |
| (5) | Beltmann Summer Research Fellowship (for Aaron Heerboth '08) | 2006 |
| (4) | Keck Student-Faculty Collaboration Award (for Kristina Krohn '05) | 2004 |
| (3) | Beltmann Summer Research Fellowship (for Kristina Krohn '05) | 2003 |
| (2) | Keck Student-Faculty Collaboration Award (for Edward Mwenda '05) | 2003 |

- (1) Keck Student-Faculty Collaboration Award (for Kristin Sweet '03) 2002

SERVICE

• PROFESSIONAL SOCIETIES

American Chemical Society	1993 to present
Council on Undergraduate Research	2001 to present
Midwestern Association of Chemistry Teachers in Liberal Arts Colleges	2001 to present

• PROFESSIONAL SERVICE

Reviewer/Referee of Manuscripts and Proposals	2003 to present
<i>Journal of Physical Organic Chemistry</i> (1 article), <i>Organometallics</i> (2 articles), <i>European Journal of Inorganic Chemistry</i> (1 article), ACS-PRF (2 proposals)	
“Session Chair” for ACS Inorganic Division at National Meetings	
“Organometallics” oral presentation session (8/31/05)	
“Coordination Chemistry – Synthesis” oral presentation session (4/10/08)	
“Session Chair” at Undergraduate Research Symposia	
University of Chicago	11/12/2001, 11/10/2007
Washington University	11/5/2006

• MACALESTER COLLEGE SERVICE

Representative to the Midstates Consortium for Math and Science	January 2008 - present
Academic Standing Committee	January 2007 - present
Biochemistry Assistant Professor Search Committee	Fall 2004 and 2005
Secretary of the Faculty	Spring 2003, 2003-2004 Academic Year
Chemistry Department Library Representative	Fall 2001 – Fall 2004
Member of the Macalester College Symphonic Band	2001 - 2005

• OTHER SERVICE

Euphonium player in the Cannon Valley Winds	2003 to present
Euphonium player in the Northfield Community Band	2002 to present
Euphonium player in Faribault Bandshell Brass Ensemble	2006 to present
Tenor in “Vesper Singers” at St. John Neumann Catholic Church	2001 to present
Euphonium player in St. John Neumann Catholic Church Brass Ensemble	2002 to present
Exam administrator for the Minnesota Academy of Science Bowl	January 2003