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EDUCATION

Harvard University 1995-2001

Ph.D. in Chemistry, 2001; A.M. in Chemistry, 1998

Thesis: *Chiral Mixed Phosphorus/Sulfur Ligands in Late Transition Metal Catalyzed Reactions: Structure, Reactivity, and Mechanism*

The Pennsylvania State University (University Scholars Program) 1991-1995

B.S. in Chemistry, B.S. in Mathematics, Minor in German, 1995

Graduated with Distinction and with Honors in Chemistry

RESEARCH EXPERIENCE

Associate Professor of Chemistry 2010-present

Assistant Professor of Chemistry 2004-2010

University of Washington, Seattle, WA

Developing new catalytic methods for the construction of molecules with a focus on C-N bond construction. Conducting mechanistic studies of metal-catalyzed and organocatalyzed reactions.

Visiting Scientist 2013-2014

CSIRO, Flexible Electronics Group, Clayton, VIC, Australia

Synthesized conjugated small molecules and evaluated their efficiency in bulk heterojunction solar cells.

Postdoctoral Fellow with Professor Robert G. Bergman 2001-2004

University of California, Berkeley, CA

Reactions and Mechanistic Studies of Azametallacyclobutanes Derived from Imidozirconium Complexes and Allenes

Graduate Fellow with Professor David A. Evans 1995-2001

Harvard University, Cambridge, MA

Mixed Phosphorus/Sulfur Ligands in Enantioselective Transition Metal Catalysis

Research Fellow at Bayer AG Summer 1995

Leverkusen, Germany

Synthesis and testing of ethylene polymerization catalysts

Undergraduate Research Fellow with Professor Roy A. Olofson

1993-1995

The Pennsylvania State University, University Park, PA

Studies of the Ring Opening of Benzocyclobutenoxides

AWARDS

- 2008 National Science Foundation CAREER Award
- 2006 Thieme Journal Award
- 2002-2004 National Institutes of Health Post-Doctoral Fellowship
- 1995-1998 National Science Foundation Graduate Fellowship
- 1991 International Chemistry Olympiad Team Member, Gold Medal, 12th place

PUBLICATIONS (*all published in peer-reviewed journals*)

35. Tabor, J. R.; Obenschain, D. C.; Michael, F. E. "Selenophosphoramidate-Catalyzed Diamination and Oxyamination of Alkenes" *Chem. Sci.* **2020**, *11*, 1677-1682. DOI: 10.1039/C9SC05335B
34. Zheng, T.; Tabor, J. R.; Stein, Z. L.; Michael, F. E. "Regioselective Metal-Free Aza-Heck Reactions of Terminal Alkenes Catalyzed by Phosphine Selenides" *Org. Lett.* **2018**, *20*, 6975-6978. DOI: 10.1021/acs.orglett.8b03159
33. Teh, W. P.; Michael, F. E. "Palladium-Catalyzed Cross-Coupling of N-Sulfonylaziridines and Alkenylboronic Acids: Stereospecific Synthesis of Homoallylic Amines with Di- and Trisubstituted Alkenes" *Org. Lett.* **2017**, *19*, 1738-1740. DOI: 10.1021/acs.orglett.7b00504
32. Ingalls, E. L.; Holtzen, G. A.; Kaminsky, W.; Michael, F. E. "Synthesis and Structural Characterization of Palladium(II) Complexes of Chiral Bidentate N-Heterocyclic Carbene-Quinoline Ligands" *J. Organomet. Chem.* **2017**, *832*, 9-11. DOI: 10.1016/j.jorganchem.2017.01.008
31. Rosewall, C. F.; Ingalls, E. L.; Kaminsky, W.; Michael, F. E. "Chelation-driven Rearrangement of Primary Alkyl Aminopalladation Products to Stable Trisubstituted Alkyl Palladium Complexes" *Angew. Chem. Int. Ed.* **2015**, *54*, 4557-4560. DOI: 10.1002/anie.201412033
30. Duda, M. L.; Michael, F. E. "Palladium-Catalyzed Cross-Coupling of N-Sulfonylaziridines with Boronic Acids" *J. Am. Chem. Soc.* **2013**, *135*, 18347-18349. DOI: 10.1021/ja410686v
29. Pierson, J.; Ingalls, E. L.; Vo, R.; Michael, F. E. "Palladium(II)-Catalyzed Intramolecular Hydroamination of 1,3-Dienes to Give Homoallylic Amines" *Angew. Chem. Int. Ed.* **2013**, *52*, 13311-13313. DOI: 10.1002/anie.201305766
28. McGhee, A.; Cochran, B. M.; Stenmark, T.; Michael, F. E. "Stereoselective synthesis of 2,5-disubstituted morpholines using a palladium-catalyzed hydroamination reaction" *Chem. Comm.* **2013**, *49*, 6800-6802.

27. Ingalls, E. L.; Sibbald, P. A.; Kaminsky, W.; Michael, F. E. "Enantioselective Palladium-Catalyzed Diamination of Alkenes Using *N*-Fluorobenzenesulfonamide" *J. Am. Chem. Soc.* **2013**, *135*, 8854-8856.
26. Okamoto, K.; Housekeeper, J. B.; Michael, F. E.; Luscombe, C. K. "Thiophene based hyperbranched polymers with tunable branching using direct arylation methods" *Polym. Chem.* **2013**, *4*, 3499-3506.
25. Bjelic, S.; Nivon, L. G.; Celebi-Olcum, N.; Kiss, G.; Rosewall, C. F.; Lovick, H. M.; Ingalls, E. L.; Gallaher, J. L.; Seetharaman, J.; Lew, S.; Montelione, G. T.; Hunt, J. F.; Michael, F. E.; Houk, K. N.; Baker, D. "Computational Design of Enone-Binding Proteins with Catalytic Activity for the Morita-Baylis-Hillman Reaction" *ACS Chemical Biology*, **2013**, *8*, 749-757.
24. Liskin, D. V.; Sibbald, P. A.; Rosewall, C. F.; Michael, F. E. "Palladium Catalyzed Alkoxyamination of Alkenes with Use of *N*-Fluorobenzenesulfonimide as Oxidant." *J. Org. Chem.* **2010**, *75*, 6294-6296.
23. Siegel, J. B.; Zanghellini, A.; Lovick, H. M.; Kiss, G.; Lambert, A. R.; St.Clair, J. L.; Gallaher, J. L.; Hilvert, D.; Gelb, M. H.; Stoddard, B.; Houk, K. N.; Michael, F. E.; Baker, D. "Computational design of an enzyme catalyst for a stereoselective bimolecular Diels-Alder reaction." *Science* **2010**, *329*, 309-313.
22. Hoover, J. M.; DiPasquale, A.; Mayer, J. M.; Michael, F. E.; "Platinum Catalyzed Intramolecular Hydrohydrazination: Evidence for Alkene Insertion into a Pt-N Bond." *J. Am. Chem. Soc.* **2010**, *132*, 5043-5053.
21. Lovick, H. M.; Michael, F. E. "Metal-Free Highly Regioselective Aminotrifluoroacetoxylation of Alkenes." *J. Am. Chem. Soc.* **2010**, *132*, 1249-1251.
20. Sibbald, P. A.; Rosewall, C. F.; Swartz, R. D.; Michael, F. E. "Mechanism of *N*-Fluorobenzenesulfonimide Promoted Diamination and Carboamination Reactions: Divergent Reactivity of a Pd(IV) Species." *J. Am. Chem. Soc.* **2009**, *131*, 15945-15951.
19. Rosewall, C. F.; Sibbald, P. A.; Liskin, D. V.; Michael, F. E. "Palladium Catalyzed Carboamination of Alkenes Promoted by *N*-Fluorobenzenesulfonimide via C-H Activation of Arenes." *J. Am. Chem. Soc.* **2009**, *131*, 9488-9489.
18. Sibbald, P. A.; Michael, F. E. "Palladium-Catalyzed Diamination of Unactivated Alkenes Using *N*-fluorobenzenesulfonimide as a Source of Electrophilic Nitrogen." *Org. Lett.* **2009**, *11*, 1147-1149.
17. Lovick, H. M.; Michael, F. E. "Reversal of enantioselectivity using tethered bisguanidine catalysts in the aza-Henry reaction." *Tetrahedron Lett.* **2009**, *50*, 1016-1019.
16. Cochran, B. M.; Michael, F. E. "Metal-free Oxidative Cyclization of Urea-Tethered Alkenes with Hypervalent Iodine." *Org. Lett.* **2008**, *10*, 5039-5042.
15. Hoover, J. M.; Freudenthal, J.; Michael, F. E.; Mayer, J. M. "Reactivity of low-valent Ir, Rh, and Pt complexes with di- and tetrasubstituted hydrazines." *Organometallics* **2008**, *27*, 2238-2245.

14. Sibbald, P. A.; Cochran, B. M.; Michael, F. E. "Palladium-Catalyzed Intramolecular Chloroamination of Alkenes." *Org. Lett.* **2008**, *9*, 793–796.
13. Cochran, B. M.; Michael, F. E. "Synthesis of 2,6-Disubstituted Piperazines by a Diastereoselective Palladium-Catalyzed Hydroamination Reaction." *Org. Lett.* **2008**, *9*, 329–332.
12. Cochran, B. M.; Michael, F. E. "Mechanistic Studies of a Palladium Catalyzed Intramolecular Hydroamination of Unactivated Alkenes: Protonolysis of a Stable Palladium Alkyl Complex is the Turnover-limiting Step." *J. Am. Chem. Soc.* **2008**, *130*, 2786–2792.
11. Chiu, M.; Hoyt, H. M.; Michael, F. E.; Bergman, R. G.; van Halbeek, H. "Synthesis, Structural Characterization, and Quantitative Basicity Studies of Lithium Zirconimide Complexes" *Angew. Chem. Int. Ed. Eng.* **2008**, *47*, 6073–6076.
10. Hoover, J. M.; DiPasquale, A.; Mayer, J. M.; Michael, F. E. "Synthesis and Reactivity of a Ru^{III} bis(anilide) Dimer by Oxidative Addition of an *N,N'*-disubstituted Hydrazine." *Organometallics* **2007**, *26*, 3397–3405.
9. Michael, F. E.; Cochran, B. M. "Room-Temperature Palladium-Catalyzed Intramolecular Hydroamination of Unactivated Alkenes." *J. Am. Chem. Soc.* **2006**, *128*, 4246–4248.
8. Blum, S. A.; Rivera, V. A.; Ruck, R. T.; Michael, F. E.; Bergman, R. G. "Synthetic and Mechanistic Studies of Strained Heterocycle Opening Reactions Mediated by Zirconium(IV) Imido Complexes." *Organometallics* **2005**, *24*, 1647–1659.
7. Michael, F. E.; Duncan, A. P.; Sweeney, Z. K.; Bergman, R. G. "Rearrangements and Stereomutations of Metallacycles Derived from Allenes and Imidozirconium Complexes." *J. Am. Chem. Soc.* **2005**, *127*, 1752–1764.
6. Hoyt, H. M.; Michael, F. E.; Bergman, R. G. "C-H Bond Activation of Hydrocarbons by an Imidozirconocene Complex." *J. Am. Chem. Soc.* **2004**, *126*, 1018–1019.
5. Michael, F. E.; Duncan, A. P.; Sweeney, Z. K.; Bergman, R. G. "Mechanisms of Allene Stereoinversion by Imidozirconium Complexes." *J. Am. Chem. Soc.* **2003**, *125*, 7184–7185.
4. Evans, D. A.; Michael, F. E.; Tedrow, J. S.; Campos, K. R. "Application of Chiral Mixed Phosphorus/Sulfur Ligands to Enantioselective Rhodium-Catalyzed Dehydroamino Acid Hydrogenation and Ketone Hydrosilylation Processes." *J. Am. Chem. Soc.* **2003**, *125*, 3534–3543.
3. Evans, D. A.; Campos, K. R.; Tedrow, J. S.; Michael, F. E.; Gagne, M. R. "Application of Chiral Mixed Phosphorus/Sulfur Ligands to Palladium-Catalyzed Allylic Substitutions." *J. Am. Chem. Soc.* **2000**, *122*, 7905–7920.
2. Evans, D. A.; Campos, K. R.; Tedrow, J. S.; Michael, F. E.; Gagne, M. R. "Chiral Mixed Phosphorus/Sulfur Ligands for Palladium-Catalyzed Allylic Alkylations and Aminations." *J. Org. Chem.* **1999**, *64*, 2994–2995.
1. Fitzgerald, J. J.; Michael, F. E.; Olofson, R. A. "Reaction of Benzocyclobutenoxides with Nitriles: Synthesis of Hypecumine and Other 3-Substituted Isoquinolines." *Tetrahedron Lett.* **1994**, *35*, 9191–9194.