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Aaron K. Vannucci, Ph.D.

EXPERIENCE

Assistant Professor (Aug. 2014 – Present) University of South Carolina

Postdoctoral Research Associate (Sept. 2010 – Aug. 2014) UNC Chapel Hill

Research Assistant/Associate (June 2006 – Sept. 2010) The University of Arizona

Teaching Assistant (Aug. 2004 – May 2006) The University of Arizona

EDUCATION

The University of Arizona Tucson, Arizona
- Ph.D. in chemistry May 2009.
- Advisor: Dennis L. Lichtenberger
- Dissertation Title: Computational, Spectroscopic, and Electrochemical Studies of Molybdoenzyme and Hydrogenase Active Site Inspired Complexes

The College of Wooster Wooster, Ohio
- B.A. in chemistry May 2004
- American Chemical Society certified degree

AWARDS

- Postdoc Research Excellence Award, UNC Chapel Hill (2013)

PROFESSIONAL MEMBERSHIPS

- American Chemical Society (2006 – present)

COMMITTEES

- Heterogeneous High Performance Computing Committee University of South Carolina (2017 – present)
- Curriculum Committee University of South Carolina (2016 – present)
- Bouknight Scholarship Committee University of South Carolina (2014 – present)
- Founding member of GSiC (Graduate Students in Chemistry) a committee to promote community and success for graduate students, The University of Arizona (2008 – 2010)
- Teaching assistants evaluation committee, The University of Arizona (2006 – 2008)

FUNDING

- Development of Electrolysis Processes to Electrochemically Reduce Lignin Samples to Produce a Color Stable Lignin Product – Ingevity Corp. – 1/17 - 6/17 – $10,000
- Catalytic Carbon-Carbon Cross Coupling from a Heterogeneous Catalytic System Based on a Homogeneous Molecular Catalyst. – National Science Foundation Industry/University CRC Grant No. 1464630 – 6/16 - 5/17 – $54,000
- Development of a Photocatalytic System for the Renewable Production of Hydrogen Fuel – University of South Carolina Office of the Vice President of Research – 8/16 – 8/17 - $15,000
- Catalysis for Renewables: Applications, Fundamentals and Technologies (CRAFT) – NSF EPSCoR RII Track-2 Grant No. 1539105 – 8/15 - 8/19 – $4,000,000

PUBLICATIONS

DeLucia, N. A.; Das, N.; Overa, S.; Paul, A.; Vannucci, A. K. "Low Temperature Selective Hydrogeoxygenation of Model Lignin Monomers from a Homogeneous Palladium Catalyst" *Catal. Today* **2017**, *accepted May 2017*.

Paul, A.; Smith, M. D.; Vannucci, A. K. "Photoredox-Assisted Reductive Cross-Coupling: Mechanistic Insight into Catalytic Aryl-Alkyl Cross-Couplings" *J. Org. Chem.* **2017**, *82*, 1996.

Rice, A. M.; Fellows, W. B.; Dolgopolova, E. A.; Greytak, A. B.; Vannucci, A. K.; Smith, M. D.; Karakalos, S. G.; Krause, J. A.; Avdoshenko, S. M.; Popov, A. A.; Shustova, N. B. "Hierarchical Corannulene-Based Materials: Energy Transfer and Solid-State Photophysics" *Angew. Chem. Int. Ed.* **2017**, *56*, 4525.

Salapage, S. R.; Paul, A.; Banerjee, T.; Hanson, K.; Smith, M. D.; Vannucci, A. K.; Shimizu, L. S. "Structure, Electrochemistry and Photophysical Properties of an Exocyclic Di-Ruthenium Complex and its Application as a Photosensitizer" *Dalton Trans.* **2016**, *45*, 9601.

Fellows, W. B.; Rice, A. M.; Williams, D. E.; Dolgopolova, E. A.; Vannucci, A. K.; Pellechia, P. J. Smith, M. D.; Krause, J. A.; Shustova, N. B. "Redox-Active Corannulene Buckybowls in a Crystalline Hybrid Scafdfold" *Angew. Chem. Int. Ed.* **2015**, *55*, 2195.

Hyde, J. T.; Hanson, K.; Vannucci, A. K.; Lapides, A. M.; Alibabaei, L.; Norris, M. R.; Meyer, T. J.; Harrison, D. P. "Electrochemical Instability of Phosphonate-Derivatized RuIII Polypyridyl Complexes on Metal Oxide Surfaces" *ACS Appl. Mater. Interfaces* **2015**, *7*, 9554.

Ashford, D. L.; Gish, M. K.; Vannucci, A. K.; Brennaman, M. K.; Templeton, J. L.; Papanikolas, J. M.; Meyer, T. J. "Molecular Chromophore-Catalyst Assemblies for Solar Fuel Applications" *Chem. Rev.* **2015**, *115*, 9554.

Song, N.; Concepcion, J. J.; Binstead, R. A.; Rudd, J.; Vannucci, A. K.; Dares, C. J.; Coggins, M. K.; Meyer, T. J. "Base-enhanced water oxidation by a carboxylate-bipyridine Ru(II) complex" *Proc. Natl. Acad. Sci.* **2015** *accepted*

Song, W.; Vannucci, A. K.; Farnum, B. H.; Brennaman, M. K.; Lapides, A. M.; Kalanyan, B.; Alibabaei, L.; Concepcion, J. J.; Losego, M. D.; Parsons, G. N.; Meyer, T. J. "Visible Light Driven Benzyl Alcohol Dehydrogenation in a Dye-Sensitized Photoelectrosynthesis Cell" *J. Am. Chem. Soc.* **2014**, *136*, 9773.

Tamaki, Y.; Vannucci, A. K.; Dares, C. J.; Binstead, R. A.; Meyer, T. J. "One-electron Activation of Water Oxidation Catalysis" *J. Am. Chem. Soc.* **2014**, *136*, 6854.

Ashford, D. L.; Lapides, A. M.; Vannucci, A. K.; Hanson, K.; Torelli, D. A.; Harrison, D. P.; Templeton, J. L.; Meyer, T. J. "Water Oxidation by an Electropolymerized Catalyst on Derivatized Mesoporous Metal Oxide Electrodes" *J. Am. Chem. Soc.* **2014**, *136*, 6578.

Coggins, M. K. Zhang, M. T.; Vannucci, A. K.; Dares, C. J.; Meyer, T. J. "Electrocatalyitc Water Oxidation by a Monomeric Amidate-Ligated Fe(III)-Aqua Complex. *J. Am. Chem. Soc.* **2014**, *136*, 5531.

de la Cruz Cruz, J. I.; Juarez-Saavedra, P.; Paz-Michel, B.; Leyva-Ramirez, M. A.; Rajapakshe, A.; Vannucci, A. K.; Lichtenberger, D. L.; Paz-Sandoval, M. A. "Phosphine-substituted η^5-Pentadienyl-Manganese-Carbonyl Complexes: Geometric Structures, Electronic Structures, and Energetic Properties of the Associative Substitution Mechanism, Including Isolation of the Slipped η^3-Pentadienyl Associative Intermediate" *Organometallics* **2014,** *33*, 278

Vannucci, A. K.; Alibabaei, L.; Losego, M. D.; Concepcion, J. J.; Kalanyan, B.; Parsons, G. N.; Meyer, T. J. "Crossing the Divide between Homogeneous and Heterogeneous Catalysis" *Proc. Natl. Acad. Sci.* **2013**, *110*, 20918.

Hanson, K.; Torelli, D. A.; Vannucci, A. K.; Brennaman, M. K.; Luo, H.; Alibabaei, L.; Song, W.; Ashford, D. L.; Norris, M. R.; Glasson, C. R. K.; Concepcion, J. J.; Meyer, T. J. "Self-assembled Bilayer Films of Ru(II) Polypyridyl Complexes by Layer-by-Layer Deposition on High-Surface Area Metal Oxides" *Angew. Chem. Int. Ed.* **2012**, *124*, 12954

Glasson, C. R. K.; Song, W.; Ashford, D. L.; Vannucci, A. K.; Chen, Z.; Concepcion, J. J.; Holland, P. L.; Meyer, T. J. "Self-Assembled Bilayers on ITO (SAB-ITO) Electrodes: A Design for Chromophore-Catalyst Photoanodes" *Inorg. Chem.* **2012,** *51*, 8637

Vannucci, A. K.; Chen, Z.; Concepcion, J. J.; Meyer, T. J. "Nonaqueous Electrocatalytic Oxidation of the Alkylaromatic Ethylebenzene by a Surface Bound $Ru^{V}(O)$ Catalyst" *ACS Catal.* **2012**, *2*, 716.

Gagliardi, C. J.; Vannucci, A. K.; Concepcion, J. J.; Chen, Z.; Meyer, T. J. "The Role of Proton Coupled Electron Transfer in Water Oxidation" *Energy Environ. Sci.* **2012**, *5*, 7704.

Vannucci, A. K.; Hull, J. F.; Chen, Z.; Binstead, R. A.; Concepcion, J. J.; Meyer, T. J. "Water Oxidation Intermediates Applied to Catalysis: Benzyl Alcohol Oxidation" *J. Am. Chem. Soc.* **2012**, *134*, 3972.

Chen, Z.; Vannucci, A. K.; Concepcion, J. J.; Jurss, J. W.; Meyer, T. J. "Proton-coupled Electron Transfer at Modified Electrodes by Multiple Pathways" *Proc. Natl. Acad. Sci. USA* **2011**, *108*, E1461.

Estes, D. P.; Vannucci, A. K.; Hall, A. R.; Lichtenberger, D. L.; Norton, J. R. "Thermodynamics of the Metal-Hydrogen Bonds in $(\eta^5\text{-}C_5H_5)M(CO)_2H$ (M = Re, Ru, Os)" *Organometallics*, **2011**, *30*, 3444.

Chen, J.; Vannucci, A. K.; Mebi, C. A.; Okumura, N.; Borowski, S. C.; Lockett, L. T.; Lichtenberger, D. L.; Evans, D. H.; Glass, R. S. "Synthesis of Diiron Hydrogenase Mimics Bearing Hydroquinone and Related Ligands. Electrochemical and Computational Studies of the Mechanism of Hydrogen Production and the Role of O-H···S Hydrogen Bonding" *Organometallics*, **2010**, *29*, 5330.

Vannucci, A. K.; Wang, S.; Nichol, G. S.; Lichtenberger, D. L.; Evans, D. H.; Glass, R. S. "Electronic and Geometric Effects of Phosphatriazaadamantane Ligands on the Catalytic Activity of an [FeFe] Hydrogenase Inspired Complex" *Dalton Trans*. **2010**, *39*, 2671.

Vannucci, A. K.; Snyder, R. A.; Gruhn, N. E.; Lichtenberger, D. L.; Enemark, J. H. "New Insights into Solvolysis and Reorganizaiton Energy from Gas-Phase, Electrochemical, and Theoretical Studies of Oxo-Tp*Mo(V) Molecules" *Inorg. Chem.* **2009**, *48*, 8856.

Felton, G. A. N.; Mebi, C. A.; Petro, B. J.; Vannucci, A. K.; Evans, D. H.; Glass, R. S.; Lichtenberger, D. L. "Review of Electrochemical Studies of Complexes containing the Fe_2S_2 core characteristic of [FeFe]-Hydrogenases Including Catalysis by these Complexes of the Reduction of Acids to Form Dihydrogen" *J. Organomet. Chem.* **2009**, *694*, 2681 .

Felton, G. A. N.; Vannucci, A. K.; Okumura, N.; Lockett, L. T.; Evans, D. H.; Glass, R. S.; Lichtenberger, D. L. "Hydrogen Generation from Weak Acids: Electrochemical, Computational, and Photoelectron-Spectroscopy Studies in the $[(\eta^5\text{-}C_5H_5)Fe(CO)_2]_2$ System" *Organometallics* **2008**, *27*, 4671.

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