

MATTHEW P. CONLEY, PH. D.

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Education

2008 **University of Chicago**, Ph.D. Chemistry
2004 **University of Illinois at Chicago**, B. S., Chemistry

Professional Experience

2015 – Present **Assistant Professor**
University of California, Riverside
2019 – Present Director, Analytical Chemistry Instrumentation Facility
2011 – 2015 **Postdoctoral Researcher**
Swiss Federal Institute of Technology (ETH) Zürich
Advisor: Dr. Christophe Copéret
2008 – 2011 **Postdoctoral Researcher**
Institut Català d'Investigació Química (ICIQ), Tarragona, Spain
Advisor: Dr. Javier de Mendoza
2004 – 2008 **Graduate Research**
The University of Chicago, Chicago, IL
Advisor: Dr. Richard F. Jordan
2002 – 2004 **Undergraduate Research**
University of Illinois – Chicago, Chicago, IL
Advisor: Dr. Vladimir Gevorgyan

Peer-Reviewed Publications Since Joining UCR

15.) Culver, D. B.; Dorn, R. W.; Venkatesh, A.; Meeprasert, J.; Rossini, A. J.; Pidko, E. A.; Lipton, A. S.; Lief, G. R.; Conley, M. P. Active Sites in A Heterogeneous Organometallic Catalyst for the Polymerization of Ethylene. *Submitted*.

14.) Rodriguez, J.; Conley, M. P. Ethylene Polymerization Activity of (R₃P)Ni(codH)⁺ (cod = 1,5-cyclooctadiene) Sites Supported on Sulfated Zirconium Oxide. *Inorg. Chem.*, **2021**, *In Press*, DOI: 10.1021/acs.inorgchem.1c00454. (*Invited Forum Article for Heterogeneous Interfaces Through the Lens of Inorganic Chemistry*)

13.) Huynh, W.; Conley, M. P. Origin of the ²⁹Si NMR Chemical Shift in R₃Si–X and Relationship to Formation of Silylium (R₃Si⁺) Ions. *Dalton Trans.* **2020**, *49*, 16453-16463. (*Invited Article for New Talent: Americas Issue*)

12.) Witzki, R. J.; Chapvetsky, A.; Conley, M. P.; Kaphan, D. M.; Delferro, M.; Non-Radiational Supports in Surface Organometallic Chemistry. *ACS Catal.* **2020**, *10*, 11822-11840. (*Invited Perspective*)

11.) Culver, D. B.; Huynh, W.; Tafazolian, H.; Conley, M. P.; Solid-State ⁴⁵Sc NMR Studies of Cp*₂Sc–OR (R = CMe₂CF₃, CMe(CF₃)₂, C(CF₃)₃, SiPh₃) and Relationship to the Structure of Cp*₂Sc–sites Supported on Partially Dehydroxylated Silica. *Organometallics*, **2020**, *39*, 1112-1122. (*Invited Article for Organometallic Chemistry at Various Length Scales.*)

- 10.) Culver, D. B.; Venkatesh, A.; Huynh, W.; Rossini, A. J.; Conley, M. P. Al(OR^F)₃ (R^F = C(CF₃)₃) Activated Silica: A Well-Defined Weakly Coordinating Surface Anion. *Chemical Science*, **2020**, *11*, 1510-1517
- 9.) Jones, C.; Asay, M.; Kim, L. J.; Kleinsasser, J.; Saha, A.; Fulton, T.; Berkly, K.; Cascio, D.; Malyutin, A.; Conley, M.; Stoltz, B.; Lavallo, V.; Rodriguez, J.; Nelson, H. Characterization of reactive organometallic species via MicroED. *ACS Cent. Sci* **2019**, *5*, 1507-1513.
- 8.) Rodriguez, J.; Culver, D. B.; Conley, M. P. Generation of Phosphonium Sites on Sulfated Zirconium Oxide: Relationship to Bronsted Acid Strength of Surface –OH Sites. *J. Am. Chem. Soc.* **2019**, *141*, 1484-1488.
- 7.) Jothi, P. R.; Zhang, Y.; Yubuta, K.; Culver, D. B.; Conley, M. P.; Fokwa, B. P. T. Abundant Vanadium Diboride with Graphene-like Boron Layers for Hydrogen Evolution *ACS Appl. Energy Mater.* **2019**, *2*, 176-181.
- 6.) Gordon, C. P.; Culver, D. B.; Conley, M. P.; Eisenstein, O.; Andersen, R. A.; Copéret, C. π -Bond Character in Metal-Alkyl Compounds for C-H Activation: How, When, and Why? *J. Am. Chem. Soc.* **2019**, *141*, 648-656.
- 5.) Culver, D. B.; Conley, M. P. Activation of C–F Bonds by Electrophilic Organosilicon Sites Supported on Sulfated Zirconia. *Angew. Chem. Int. Ed.* **2018**, *130*, 15118-15121.
- 4.) Huynh, W.; Culver, D. B.; Tafazolian, H.; Conley, M. P. Solid-state ⁴⁵Sc NMR of Cp*₂Sc–X and Cp*₂ScX(THF). *Dalton Trans.* 2018, 47, 13063 - 13071. (Invited)
- 3.) Culver, D. B.; Huynh, W.; Tafazolian, H.; Ong, T. C.; Conley, M. P. The β -Agostic Structure in (C₅Me₅)₂ScCH₂CH₃: Solid-State NMR Studies of (C₅Me₅)₂Sc–R (R = Me, Ph, Et). *Angew. Chem. Int. Ed.* **2018**, *57*, 9250-9253.
- 2.) Culver, D. B.; Tafazolian, H.; Conley, M. P. A Bulky Pd(II) α -Diimine Catalyst Supported on Sulfated Zirconia for the Polymerization of Ethylene and Copolymerization of Ethylene and Methyl Acrylate. *Organometallics*, **2018**, *37*, 1001-1006.
- 1.) Tafazolian, H.; Culver, D. B.; Conley, M. P. A Well-Defined Ni(II) α -Diimine Catalyst Supported on Sulfated Zirconia for Polymerization Catalysis. *Organometallics*, **2017**, *36*, 2385 - 2388.

Invited Book Chapters Published Since Joining UCR

Conley, M. P.*, Gao, J.; Huynh, W.; Rodriguez, J.; Samudrala, K. Organometallic Chemistry on Oxide Surfaces. In: *Comprehensive Organometallic Chemistry IV*. Parkin, G. A. Ed; O'Hare, D. Ed; Holland, P. Ed. Elsevier: **2021**.

Peer-Reviewed Publications Prior to Joining UCR

- 33.) Copéret, C.; Allouche, F.; Chang, K.; Conley, M. P.; Delley, M. F.; Fedorov, A.; Moroz, I.; Mougél, V.; Pucino, M.; Searles, K.; Yamamoto, K.; Zhizhko, P. Bridging the Gap Between Industrial and Well-Defined Supported Catalysts. *Angew. Chem. Int. Ed.* **2017**, *57*, 6398-6440.
- 32.) Berruyer, P.; Moreno, L.; Conley, M. P.; Silvero, D. L.; Widdifield, C. M.; Siddiqi, G.; Gajan, D.; Lesage, A.; Copéret, C.; Emsley, L. Three-Dimensional Structure Determination of Surface Sites. *J. Am. Chem. Soc.* **2017**, *139*, 849 – 855.
- 31.) Valla, M.; Wischert, R.; Comas-Vives, A.; Conley, M. P.; Verel, R.; Copéret, C.; Sautet, P. Role of Tri-coordinate Al Sites in CH₃ReO₃ Olefin Metathesis Catalysts. *J. Am. Chem. Soc.* **2016**, *138*, 6774 – 6785.

- 30.) Conley, M. P.; Lapadula, G.; Sanders, K.; Gajan, D.; Lesage, A.; Rosal, I.; Maron, L.; Lukens, W. W.; Copéret, C.; Andersen, R. A. The Nature of Secondary Interactions at Electrophilic Metal Sites of Molecular and Silica-supported Organolutetium Complexes from Solid-State NMR Spectroscopy. *J. Am. Chem. Soc.* **2016**, *138*, 3831 – 3843.
- 29.) Copéret, C.; Comas-Vives, A.; Conley, M. P.; Estes, D.; Nunez-Zarur, F.; Fedorov, A.; Mougél, V.; Nagae, H.; Zhizhko, P.: Surface Organometallic and Coordination Chemistry towards Single-Site Heterogeneous Catalysts: Strategies, Methods, Structures, and Activities. *Chem. Rev.* **2016**, *116*, 323 – 421.
- 28.) Lapadula, G.; Conley, M. P.; Copéret, C.; Andersen, R. A.: Synthesis and Characterization of Rare Earth Siloxide Complexes, $M[\text{OSi}(\text{OtBu})_3]_3(\text{L})_x$ where L is $\text{HOSi}(\text{OtBu})_3$ and $x=0$ or 1. *Organometallics*, **2016**, *34*, 2271 – 2277.
- 27.) Conley, M. P.; Delley, M. F.; Nunez-Zarur, F.; Comas-Vives, A.; Copéret, C.: Heterolytic Activation of C–H Bonds on Cr^{III} –O Surface Sites Is a Key Step in Catalytic Polymerization of Ethylene and Dehydrogenation of Propane. *Inorg. Chem.*, **2015**, *54*, 5065–5078
- 26.) Lapadula, G.; Trummer, D.; Conley, M.P.; Steinmann, M.: Ran, Ying-Fen; Brasselet, S.; Guyot, Y.; Maury, O.; Decurtins, S.; Liu, Shi-Xia; Copéret, C.: One-Photon Near-Infrared Sensitization of Well-Defined Yb(III) Surface Complexes for NIR-to-NIR Single Nanoparticle Imaging. *Chem. Mat.* **2015**, *27*, 2033–2039.
- 25.) Valla, M.; Conley, M. P.; Copéret, C.: $\text{MeReO}_3/\text{Al}_2\text{O}_3$ and Me_4Sn Activated $\text{Re}_2\text{O}_7/\text{Al}_2\text{O}_3$ Alkene Metathesis Catalysts have Similar Active Sites. *Catal. Sci. Tech.*, **2015**, *5*, 1438–1442.
- 24.) Gajan, D.; Bornet, A.; Vuichoudb, B.; Milanib, J.; Melzic, R.; Veyre, L.; Thieuleux, C.; Conley, M. P.; Grüning, W. R.; Schwarzwälder, M.; Lesage, A.; Copéret, C.; Bodenhausen, G.; Emsley, L.; Jannin, S.: Hybrid Polarizing Solids for Pure Hyperpolarized Liquids through Dissolution Dynamic Nuclear Polarization. *Proc. Nat. Acad. Sci. USA*, **2014**, *111*, 14693–14697.
- 23.) Conley, M. P.; Forrest, W. P.; Mougél, V.; Copéret, C.; Schrock, R. R.: A Bulky Aryloxy Ligand Stabilizes a Heterogeneous Metathesis Catalyst. *Angew. Chem. Int. Ed.*, **2014**, *53*, 14221–14224.
- 22.) Feng, G; Conley, M. P.; Jordan, R. F.: Differentiation between Chelate Ring Inversion and Aryl Rotation in a CF_3 -Substituted Phosphine-Sulfonate Palladium Methyl Complex. *Organometallics*, **2014**, *33*, 4486–4496.
- 21.) Filoneko, G. A.; Cosimi, E.; Lefort, L.; Conley, M. P.; Copéret, C.; Lutz, M.; Hensen, E. J. M.; Pidko, E. A.: Lutidine Derived Ru–CNC Hydrogenation Pincer Catalysts with Versatile Coordination Properties. *ACS Catal.* **2014**, *4*, 2667–2671.
- 20.) Delley, M. F.; Núñez-Zarur, F.; Conley, M. P.; Comas-Vives, A.; Siddiqi, G.; Norsic, S.; Monteil, V.; Safonova, O. V.; Copéret, C.: Proton Transfers Are Key Elementary Steps in Ethylene Polymerization on Isolated Chromium(III) Silicates. *Proc. Nat. Acad. Sci. USA*, **2014**, *112*, 11624–11629.
See commentary by K. Theopold, Proc. Nat. Acad. Sci. USA, 2014, 112, 11578-11579.
- 19.) Conley, M. P.; Rossini, A. J.; Comas Vives, A.; Valla, M.; Ouari, O.; Tordo, P.; Lesage, A.; Emsley, L.; Copéret, C.: Evidence for Surface rearrangement involving Q_2 -sites and strained siloxane bridges from ^{119}Sn Surface Enhanced NMR Spectroscopy. *Phys. Chem. Chem. Phys.* **2014**, *16*, 17822–17827.
- 18.) Conley, M. P.; Copéret, C.; Thieuleux, C.: Mesostructured Hybrid Organic Silica Materials: Well-defined and regularly distributed supported Catalysts into the channel pores of a silica matrix. *ACS Catal.* **2014**, *4*, 1458–1469.

- 17.) Delley, M. F.; Conley, M. P.; Copéret, C.: Polymerization on CO-Reduced Phillips Catalyst initiates through the C-H bond activation of ethylene on Cr–O sites. *Catal. Lett.* **2014**, *144*, 805-888.
- 16.) Kermagoret, A.; Kerber, R. N.; Conley, M. P.; Callens, E.; Florian, P.; Massiot, D.; Copéret, C.; Delbecq, F.; Rozanska, X.; Sautet, P.: Chloroalkylaluminum supported on silica: a dinuclear aluminum surface species with bridging μ^2 -Cl–ligand for a highly efficient co-catalyst for the Ni-catalyzed dimerization of ethene. *J. Catal.* **2014**, *313*, 46-54.
- 15.) Conley, M. P.; Copéret, C.: State of the Art and Perspectives in the ‘Molecular Approach’ Towards Well-Defined Heterogeneous Catalysts. *Top. Catal.* **2014**, *57*, 843-851. (*Invited Perspective*)
- 14.) Conley, M. P.; Delley, M. F.; Siddiqui, G.; Lapadula, G.; Norsic, S.; Monteil, V.; Safonova, O. V.; Copéret, C.: Polymerization of Ethylene by Silica-Supported Dinuclear Cr^{III} Sites through an Initiation Step Involving C-H Bond Activation. *Angew. Chem. Int. Ed.* **2014**, *53*, 1872-1876.
- 13.) Lapadula, G.; Bourdolle, A.; Allouche, F.; Conley, M.P.; del Rosal, I.; Maron, L.; Lukens, W. W.; Guyot, Y.; Andraud, C.; Brasselet, S.; Copéret, C.; Maury, O.; Andersen, R. A.: Near-IR Two-photon Microscopy Imaging of Nanoparticles Prepared by Controlled Functionalization of Silica with 4,4’diethylaminostyryl-2,2’bipyridine Yb(III) Surface Sites. *Chem. Mat.* **2014**, *26*, 1062-1073.
- 12.) Conley, M. P.; Mougél, V.; Peryshkov, D. V.; Forrest, W. F.; Gajan, D.; Lesage, A.; Emsley, L.; Copéret, C.; Schrock, R. R.: A well-defined silica-supported tungsten oxo alkylidene as a highly active alkene metathesis catalyst. *J. Am. Chem. Soc.* **2013**, *135*, 19068-19070.
- 11.) Filonenko, G. A.; Conley, M. P.; Copéret, C.; Lutz, M.; Hensen, E. J. M.; Pidko, E. A.: The Impact of Metal-ligand Cooperation in Hydrogenation of Carbon Dioxide Catalyzed by a Ruthenium PNP Pincer. *ACS Catal.* **2013**, *3*, 2522-2526.
- 10.) Gajan, D.; Schwarzwälder, M.; Conley, M. P.; Gruening, W. R.; Rossini, A. J.; Zagdoun, A.; Lelli, M.; Yulikov, M.; Jeschke, G.; Sauvée, C.; Ouari, O.; Tordo, P.; Veyre, L.; Lesage, A.; Thieuleux, C.; Emsley, L.; Copéret, C.: Solid-phase DNP Polarizing Matrices from Homogeneously Distributed Radicals in Mesostructured Hybrid Silica Materials. *J. Am. Chem. Soc.* **2013**, *135*, 15459-15466.
- 9.) Conley, M. P.; Drost, R. M.; Baffert, M.; Gajan, D.; Elsevier, C.; Franks, W. T.; Oschkinat, H.; Veyre, L.; Zagdoun, A.; Rossini, A.; Lelli, M.; Lesage, A.; Casano, G.; Ouari, O.; Tordo, P.; Emsley, L.; Copéret, C.; Thieuleux, C.: A Well-Defined Pd Hybrid Material for the Z-Selective Semi-hydrogenation of Alkynes Characterized at the Molecular Level by DNP SENS. *Chem. Eur. J.* **2013**, *19*, 12234-12238.
- 8.) Kermagoret, A.; Kerber, R. N.; Conley, M. P.; Callens, E.; Florian, P.; Massiot, D.; Copéret, C.; Delbecq, F.; Rozanska, X.; Sautet, P.: Triisobutylaluminum: Bulkier and Yet More Reactive Towards Silica Surfaces than Triethyl or Trimethylaluminum. *Dalton Trans.* **2013**, *42*, 12681-12687.
- 7.) Zagdoun, A.; Rossini, A. J.; Conley, M. P.; Grüning, W. R.; Schwarzwälder, M.; Lelli, M.; Franks, W. T.; Oschkinat, H.; Copéret, C.; Emsley, L.; Lesage, A.: Improved Dynamic Nuclear Polarization Surface-Enhanced NMR Spectroscopy through Controlled Incorporation of Deuterated Functional Groups. *Angew. Chem. Int. Ed.* **2013**, *52*, 1222-1225.
- 6.) Conley, M. P.; Copéret, C.: Solid-state NMR: An EYE Opener in Surface Chemistry. *CHIMIA.* **2012**, *66*, 752-758.
- 5.) Conley, M. P.; Valero, J.; de Mendoza, J. Guanidinium Based Receptors for Oxoanions. In *Supramolecular Chemistry: From Molecules to Nanomaterials*; Gale, P. A. Ed; Wiley-VCH: New York, **2012**.
- 4.) Conley, M. P.; Jordan, R. F.: Cis/trans Isomerization of Phosphinesulfonate Palladium(II) Complexes. *Angew.*

Chem. Int. Ed. **2011**, *50*, 3744-3746.

3.) *Conley, M. P.*; Burns, C. T.; Jordan, R. F.: Mechanism of Ethylene Oligomerization by a Cationic Palladium(II) Alkyl Complex that Contains a (3,5-Me₂-pyrazolyl)₂CHSi(*p*-tolyl)₃ Ligand. *Organometallics* **2007**, *26*, 6750-6759.

2.) Sun, J.; *Conley, M. P.*; Zhang, L.; Kozmin, S. A.: Au- and Pt-Catalyzed Cycloisomerizations of 1,5-Enynes to Cyclohexadienes with a Broad Alkyne Scope. *J. Am. Chem. Soc.* **2006**, *128*, 9705-9710.

1.) Rubina, M.; *Conley, M. P.*; Gevorgyan, V.: Dramatic Acceleration of the Pd-Catalyzed [4+2] Benzannulation Reaction of Enynes and Diynes in the Presence of Lewis Acids and Bases: Expanded Scope and New Mechanistic Insights. *J. Am. Chem. Soc.* **2006**, *128*, 5818-5827.

Teaching Experience

2019–present CHEM 150A: Inorganic Chemistry I
2019–present CHEM 231B: Reactivity and Mechanism in Organometallic Chemistry
2015–2018 CHEM 231A: Structure and Bonding in Inorganic Chemistry (Graduate level)
2015–2018; 2021 CHEM 1B: General Chemistry; second quarter in three quarter sequence

University and Department Service

2019-present Director of the Analytical Chemistry Instrumentation Facility
2016-2019 Graduate Admissions Committee Representative, Inorganic Division

Current Funding

Title: Generation of Single Cation Sites Supported on Oxides (sole PI)

Agency: National Science Foundation (CHE- 2101582)

Amount: \$475,000

Period: 5/2021 – 4/2024

Title: Study on a polymerization catalyst to ascertain how the active catalyst is formed. (sole PI)

Agency: Chevron Phillips LLC

Amount: \$325,000

Period: 8/2017 – 6/2022

Completed Funding

Title: Phosphines Supported on Sulfated Zirconia (sole PI)

Agency: National Science Foundation (CHE-1800561)

Amount: \$426,000

Period: 4/2018 – 4/2021

Invited Seminars

4/2021 Utah State University (virtual seminar)
7/2020 Organometallic Gordon Research Conference*
5/2020 University of Delft*
5/2020 Free University of Berlin*
5/2020 University of Braunschweig*

5/2020 Tübingen University*
5/2020 University of Stuttgart*
5/2020 ETH – Zürich*
5/2020 University of Chicago*
5/2020 Argonne National Lab*
4/2020 University of Florida*
4/2020 Iowa State University*
3/2020 ACS National Meeting, Philadelphia (Inorganic Chemistry Division)*
3/2020 ACS National Meeting, Philadelphia (Catalysis Division)*
12/2019 University of California, Santa Barbara
12/2019 University of California, Los Angeles
11/2019 Michigan State University
11/2019 Texas A&M University
10/2019 University of Southern California
9/2019 University of Illinois at Chicago
3/2018 Baylor University
11/2017 Cal State, San Bernadino
9/2017 East China University of Science and Technology, Shanghai
9/2017 University of Science and Technology of China, Hefei
9/2017 Donghua University, Shanghai
6/2017 Chevron Phillips, LLC. Bartlesville, OK
4/2017 ACS National Meeting, San Francisco
10/2016 University of California, Riverside, MSE
3/2016 ACS National Meeting, San Diego
3/2014 Swiss Federal Institute of Technology, Lausanne (EPFL)
10/2014 Osaka University

* – Postponed due to COVID-19