

Nilay Hazari

Education

2006	Doctor of Philosophy at the University of Oxford (Advisor: <i>Professor Jennifer C. Green</i>)
2003	Masters of Science at the University of Sydney (Advisor: <i>Professor Leslie D. Field</i>)
2002	Bachelor of Science (Advanced) (Hons I and University Medal) at the University of Sydney

Work Experience

2016-current	Professor of Chemistry at Yale University
2013-2016	Associate Professor of Chemistry on Term at Yale University
2009-2013	Assistant Professor of Chemistry at Yale University
2006-2009	Postdoctoral Scholar under the supervision of <i>Professors John E. Bercaw</i> and <i>Jay A. Labinger</i> at the California Institute of Technology

Academic Awards

2020	Elected as Member of the Connecticut Academy of Science and Engineering
2017	American Chemical Society Harry Gray Award for Creative Work in Inorganic Chemistry by a Young Investigator
2015	Arthur Greer Memorial Prize for Outstanding Scholarship by Junior Faculty Members in the Social Sciences and Sciences at Yale University
2014	Selected as a 'Rising Star' by the 41 st International Conference on Coordination Chemistry
2014	Camille and Henry Dreyfus Teacher Scholar Award
2013	Alfred P. Sloan Research Fellow
2012	<i>Organometallics</i> Fellow (from the American Chemical Society Journal <i>Organometallics</i>)
2012	Eli Lilly Young Investigator Lecturer at University of Wisconsin
2012	National Science Foundation Career Award
2012	Thieme Chemistry Journal Award
2003-2006	Rhodes Scholarship for New South Wales to study at the University of Oxford

Publications (H-index = 46, >6,800 total citations)

(Note for publications principally from the Hazari group, the convention for listing author names is to place the first author first and then list other authors alphabetically. When another group is a significant contributor, the Hazari group follows their scheme for listing authors).

132. Yarali, M.; Zhong, Y.; Reed, S.; Wang, J.; Ulman, K. A.; Charboneau, D. J.; Curley, J. B.; Hynek, D.; Pondick, J. V.;

- Yazdani, S.; Hazari, N.; Quek, S. Y.; Wang, H.; Cha, J. J. 'Near-Unity Molecular Doping Efficiency in Monolayer MoS₂.' Submitted.
131. Charboneau, D. J.; Barth, E. L.; Hazari, N.; Uehling, M. R.; Zultanski, S. L. 'A Widely Applicable Dual-Catalytic System for Cross-Electrophile Coupling.' Submitted.
130. Espinosa, M. R.; Doppiu, A.; Hazari, N. 'Differences in the Performance of Allyl Based Palladium Precatalysts for Suzuki-Miyaura Reactions.' *Adv. Synth. Catal.* **2020**, In Press.
129. Brereton, K. R.; Smith, N. E.; Hazari, N.; Miller, A. J. M. 'Thermodynamic and Kinetic Hydricity of Transition Metal Hydrides.' *Chem. Soc. Rev.* **2020**, 49, In Press.
128. Somerville, R. J.; Odena, C.; Obst, M. F.; Hazari, N.; Hopmann, K. H.; Martin, R. 'Ni(I)-Alkyl Complexes Bearing Phenanthroline Ligands: Experimental Evidence for CO₂ Insertion at Ni(I) Centers.' *J. Am. Chem. Soc.* **2020**, 142, 10936-10941.
127. Hazari, N.; Iwasawa, N.; Hopmann, K. H. 'Organometallic Chemistry for Enabling Carbon Dioxide Utilization.' *Organometallics* **2020**, 39, 1457-1460. Guest editorial for special issue on CO₂ utilization in organometallic chemistry.
126. Curley, J. B.; Bernskoetter, W. H.; Hazari, N. 'Additive-Free Formic Acid Dehydrogenation Using a Pincer-Supported Iron Catalyst.' *ChemCatChem*. **2020**, 12, 1934-1938.
125. Artús, L.; Jayarathne, U.; Balcells, D.; Bernskoetter, W. H.; Hazari, N.; Jaraiz, M.; Nova, A. 'Rational Design of Co-Catalysts for the Deaminative Hydrogenation of Amides.' *Chem. Sci.* **2020**, 11, 2225-2230.
124. Townsend, T. M.; Bernskoetter, W. H.; Brudvig, G. W.; Hazari, N.; Lant, H. M. C.; Mercado, B. Q. 'Synthesis of Organometallic Pincer-Supported Cobalt(II) Complexes.' *Polyhedron* **2020**, 177, 114308. Invited contribution to 'John Bercaw' issue.
123. Smith, N. E.; Bernskoetter, W. H.; Hazari, N. 'The Role of Proton Shuttles in the Reversible Activation of Hydrogen via Metal-Ligand Cooperation.' *J. Am. Chem. Soc.* **2019**, 141, 17350-17360.
122. Barth, E. L.; Davis, R. M.; Mohadjer Beromi, M.; Walden, A. G.; Balcells, D.; Brudvig, G. W.; Dardir, A. H.; Hazari, N.; Lant, H. M. C.; Mercado, B. Q.; Peczak, I. L. 'Bis(dialkylphosphino)ferrocene-Ligated Nickel(II) Precatalysts for Suzuki-Miyaura Reactions of Aryl Carbonates.' *Organometallics* **2019**, 38, 3377-3387.
121. Burkart, M. D.; Hazari, N.; Tway, C. L.; Zeitler, E. L. 'Opportunities and Challenges for Catalysis in Carbon Dioxide Utilization.' *ACS Catal.* **2019**, 9, 7937-7956.
120. Lane, E. M.; Zhang, Y.; Hazari, N.; Bernskoetter, W. H. Sequential Hydrogenation of CO₂ to Methanol Using a Pincer Iron Catalyst.' *Organometallics* **2019**, 38, 3084-3091.
119. Dardir, A. H.; Hazari, N.; Miller, S. J.; Shugrue, C. R. 'Palladium-Catalyzed Suzuki-Miyaura Reactions of Aspartic Acid Derived Phenyl Esters.' *Org. Lett.* **2019**, 21, 5762-5766.
118. Heimann, J. E.; Bernskoetter, W. H.; Hazari, N. 'Understanding the Individual and Combined Effects of Solvent and Lewis Acid on CO₂ Insertion into a Metal Hydride.' *J. Am. Chem. Soc.* **2019**, 141, 10520-10529.

117. Mohadjer Beromi, M.; Lant, H. M. C.; Brudvig, G. W.; Hazari, N.; Mercado, B. Q. 'Synthesis and Reactivity of Paramagnetic Ni Polypyridyl Complexes Relevant to Csp^2 - Csp^3 Coupling Reactions.' *Angew. Chem., Int. Ed.* **2019**, 58, 6094-6098. Selected as a very important article by the editors of *Angew. Chem., Int. Ed.*
116. Charboneau, D. J.; Brudvig, G. W.; Hazari, N.; Lant, H. M. C.; Saydjari, A. K. 'Development of an Improved System for the Carboxylation of Aryl Halides through Mechanistic Studies.' *ACS Catal.* **2019**, 9, 3228-3241.
115. Campeau, L.-C.; Hazari, N. 'Cross-Coupling and Related Reactions: Connecting Past Success to the Development of New Reactions for the Future.' *Organometallics* **2019**, 38, 3-35.
114. Espinosa, M. R.; Charboneau, D. J.; Garcia de Oliveira, A.; Hazari, N. 'Controlling Selectivity in the Hydroboration of Carbon Dioxide to the Formic Acid, Formaldehyde, and Methanol Oxidation Levels.' *ACS Catal.* **2019**, 9, 301-314.
113. Heimann, J. E.; Bernskoetter, W. H.; Guthrie, J. A.; Hazari, N.; Mayer, J. M. 'Effect of Nucleophilicity on the Kinetics of CO_2 Insertion into Pincer-Supported Nickel Complexes' *Organometallics* **2018**, 37, 3649-3653.
112. Mohadjer Beromi, M.; Banerjee, G.; Brudvig, G. W.; Charboneau, D. J.; Hazari, N.; Lant, H. M. C.; Mercado, B. Q. 'Modifications to the Aryl Group of dppf-Ligated Ni σ -Aryl Precatalysts: Impact on Speciation and Catalytic Activity in Suzuki-Miyaura Coupling Reactions.' *Organometallics* **2018**, 37, 3943-3955.
111. Curley, J. B.; Smith, N. E.; Bernskoetter, W. H.; Hazari, N.; Mercado, B. Q. 'Catalytic Formic Acid Dehydrogenation and CO_2 Hydrogenation Using Iron $PN^R P$ Pincer Complexes with Isonitrile Ligands.' *Organometallics* **2018**, 37, 3846-3853.
110. Artús, L.; Culakova, Z.; Balcells, D.; Bernskoetter, W. H.; Eisenstein, O.; Goldberg, K. I.; Hazari, N.; Tilset, M.; Nova, A. 'The Key Role of the Hemiaminal Intermediate in the Iron-Catalyzed Deaminative Hydrogenation of Amides.' *ACS Catal.* **2018**, 8, 8751-8762.
109. Heimann, J. E.; Bernskoetter, W. H.; Hazari, N.; Mayer, J. M. 'Acceleration of CO_2 Insertion into Metal Hydrides: Ligand, Lewis Acid, and Solvent Effects on Reaction Kinetics.' *Chem. Sci.* **2018**, 9, 6629-6638.
108. Lane, E. M.; Hazari, N.; Bernskoetter, W. H. 'Iron-Catalyzed Urea Synthesis: Dehydrogenative Coupling of Methanol and Amines.' *Chem. Sci.* **2018**, 9, 4003-4008.
107. Mohadjer Beromi, M.; Banerjee, G.; Brudvig, G. W.; Hazari, N. 'Nickel(I) Aryl Species: Synthesis, Properties, and Catalytic Activity.' *ACS Catal.* **2018**, 8, 2526-2533.
106. Jayarathne, U.; Hazari, N.; Bernskoetter, W. H. 'Selective Iron-Catalyzed N-Formylation of Amines using Dihydrogen and Carbon Dioxide.' *ACS Catal.* **2018**, 8, 1338-1345.
105. Zheng, Y.; Huang, J.; Wang, G.; Kong, J.; Huang, D.; Mohadjer Beromi, M.; Hazari, N.; Taylor, A. D.; Yu, J. 'A Highly Efficient Polymer Non-Fullerene Organic Solar Cell Enhanced by Introducing a Small Molecule as a Crystallizing-Agent.' *Mater. Today* **2018**, 21, 79-87.
104. Dardir, A. H.; Melvin, P. R.; Davis, R. M.; Hazari, N.; Mohadjer Beromi, M. 'A Rapidly Activating Pd-Precatalyst for Suzuki-Miyaura and Buchwald-Hartwig Couplings of Aryl Esters.' *J. Org. Chem.* **2018**, 83, 469-477. Highlighted in *Synfacts*.

103. Hazari, N.; Heimann, J. E. 'Carbon Dioxide Insertion into Group 9 and 10 Metal-Element σ -Bonds.' *Inorg. Chem.* **2017**, *56*, 13655-13678.
102. Smith, N. E.; Bernskoetter, W. H.; Hazari, N.; Mercado, B. Q. 'Synthesis and Catalytic Activity of PNP Supported Iron Complexes with Ancillary Isonitrile Ligands.' *Organometallics* **2017**, *36*, 3995-4004.
101. Melvin, P. R.; Nova, A.; Balcells, D.; Hazari, N.; Tilset, M. 'DFT Investigation of Suzuki-Miyaura Reactions with Aryl Sulfamates Using a Dialkylbiaryl Phosphine-Ligated Palladium Catalyst.' *Organometallics* **2017**, *36*, 3664-3675.
100. Lane, E. M.; Uttley, K. B.; Hazari, N.; Bernskoetter, W. H. 'Iron-Catalyzed Amide Formation from the Dehydrogenative Coupling of Alcohols and Secondary Amines.' *Organometallics* **2017**, *36*, 2020-2025.
99. Kong, J.; Mohadjer Beromi, M.; Mariano Juste, M.; Goh, T.; Antonio, F.; Hazari, N.; Taylor, A. D. 'Colorful Polymer Solar Cells Employing an Energy Transfer Dye Molecule.' *Nano Energy* **2017**, *38*, 36-42. Highlighted in *Chemical & Engineering News*.
98. Bernskoetter, W. H.; Hazari, N. 'Reversible Hydrogenation of Carbon Dioxide to Formic Acid and Methanol: Lewis Acid Enhancement of Base Metal Catalysts.' *Acc. Chem. Res.* **2017**, *50*, 1049-1058.
97. Hazari, N.; Melvin, P. R.; Mohadjer Beromi, M. 'Well-Defined Nickel and Palladium Precatalysts for Cross-Coupling.' *Nat. Rev. Chem.* **2017**, *1*, 0025.
96. Jayarathne, U.; Zhang, Y.; Hazari, N.; Bernskoetter, W. H. 'Selective Iron-Catalyzed Deaminative Hydrogenation of Amides.' *Organometallics* **2017**, *36*, 409-416.
95. Mohadjer Beromi, M.; Nova, A.; Balcells, D.; Brasacchio, A. M.; Brudvig, G. W.; Guard, L. M.; Hazari, N.; Vinyard, D. J. 'Mechanistic Study of an Improved Ni Precatalyst for Suzuki-Miyaura Reactions of Aryl Sulfamates: Understanding the Role of Ni(I) Species.' *J. Am. Chem. Soc.* **2017**, *139*, 922-936.
94. Melvin, P. R.; Hazari, N.; Mohadjer Beromi, M.; Shah, H. P.; Williams, M. 'Pd-Catalyzed Suzuki-Miyaura and Hiyama-Denmark Couplings of Aryl Sulfamates' *Org. Lett.* **2016**, *18*, 5784-5787.
93. Charboneau, D. J.; Balcells, D.; Hazari, N.; Lant, H. M. C.; Mayer, J. M.; Melvin, P. R.; Mercado, B. Q.; Morris, W. D.; Repisky, M.; Suh, H.-W. 'Dinitrogen Facilitated Reversible Formation of a Si-H Bond in a Pincer Supported Ni Complex.' *Organometallics* **2016**, *35*, 3154-3164.
92. Goh, T.; Huang, J.-S.; Yager, K. G.; Sfeir, M. Y.; Nam, C.-Y.; Tong, X.; Guard, L. M.; Melvin, P. R.; Antonio, F.; Bartolome, B. G.; Lee, M. L.; Hazari, N.; Taylor, A. D. 'Quaternary Organic Solar Cells Enhanced by Co-crystalline Squaraines with Power Conversion Efficiencies >10%.' *Adv. Energy Mater.* **2016**, *6*, 1600660. Selected as the back cover article.
91. Hazari, N.; Hruszkewycz, D. P. 'Dinuclear Pd^I Complexes with Bridging Allyl and Related Ligands.' *Chem. Soc. Rev.* **2016**, *45*, 2871-2899.
90. Melvin, P. R.; Hazari, N.; Lant, H. M. C.; Peczak, I. L.; Shah, H. P. 'Comparison of the Catalytic Activity for the Suzuki-Miyaura Reaction of $(\eta^5\text{-Cp})\text{Pd}(\text{IPr})\text{Cl}$ with $(\eta^3\text{-cinnamyl})\text{Pd}(\text{IPr})(\text{Cl})$ and $(\eta^3\text{-1-Bu-indenyl})\text{Pd}(\text{IPr})(\text{Cl})$.'

- Beilstein J. Org. Chem.* **2015**, *11*, 2476-2486. Invited contribution to 'N-Heterocyclic Carbene' issue.
89. Suh, H.-W.; Balcells, D.; Edwards, A. J.; Guard, L. M.; Hazari, N.; Mader, E. A.; Mercado, B. Q.; Repisky, M. 'Understanding the Solution and Solid State Structures of Pd and Pt PSiP Pincer Supported Hydrides.' *Inorg. Chem.* **2015**, *54*, 11411-11422.
88. Sharninghausen, L. S.; Mercado, B. Q.; Crabtree, R. H.; Hazari, N. 'Selective Conversion of Glycerol to Lactic Acid with Iron Pincer Precatalysts.' *Chem. Commun.* **2015**, *51*, 16201-16204.
87. Guard, L. M.; Mohadjer Beromi, M.; Brudvig, G. W.; Hazari, N.; Vinyard, D. J. 'Comparison of dppf-Supported Ni Precatalysts for the Suzuki-Miyaura Reaction: The Observation and Activity of Ni(I).' *Angew. Chem., Int. Ed.* **2015**, *54*, 13352-13356.
86. Melvin, P. R.; Balcells, D.; Hazari, N.; Nova, A. 'Understanding Precatalyst Activation in Cross-Coupling Reactions: Alcohol Facilitated Reduction from Pd(II) to Pd(0) in Precatalysts of the type (η^3 -allyl)Pd(L)(Cl) and (η^3 -indenyl)Pd(L)(Cl).' *ACS Catal.* **2015**, *5*, 5596-5606.
85. Zhang, Y.; MacIntosh, A.; Wong, J. L.; Bielinski, E. A.; Williard, P. G.; Mercado, B. Q.; Hazari, N.; Bernskoetter, W. H. 'Iron Catalyzed CO₂ Hydrogenation to Formate Enhanced by Lewis Acid Co-Catalysts.' *Chem. Sci.* **2015**, *6*, 4291-4299.
84. Melvin, P. R.; Nova, A.; Balcells, D.; Dai, W.; Hazari, N.; Hruszkewycz, D. P.; Shah, H. P.; Tudge, M. T. 'Design of a Versatile and Improved Precatalyst for Palladium Catalyzed Cross-Coupling: (η^3 -1-'Bu-indenyl)₂(μ -Cl)₂Pd₂.' *ACS Catal.* **2015**, *5*, 3680-3688.
83. Field, L. D.; Hazari, N.; Li, H. L. 'Nitrogen Fixation Revisited on Iron(0) Dinitrogen Phosphine Complexes.' *Inorg. Chem.* **2015**, *54*, 4768-4776.
82. Bielinski, E. A.; Förster, M.; Zhang, Y.; Bernskoetter, W. H.; Hazari, N.; Holthausen, M. C. 'Base-Free Methanol Dehydrogenation Using a Pincer-Supported Iron Compound and Lewis Acid Co-Catalyst.' *ACS Catal.* **2015**, *5*, 2404-2415.
81. Ahn, S.; Bielinski, E. A.; Lane, E. M.; Chen, Y.; Bernskoetter, W. H.; Hazari, N.; Palmore, G. T. R. 'Enhanced CO₂ Electroreduction Efficiency Through Secondary Coordination Effects on a Pincer Iridium Catalyst.' *Chem. Commun.* **2015**, *51*, 5947-5950.
80. Hruszkewycz, D. P.; Guard, L. M.; Balcells, D.; Feldman, N.; Hazari, N.; Tilset, M. 'The Effect of 2-Substituents on Allyl-Supported Precatalysts for the Suzuki-Miyaura Reaction: Relating Catalytic Efficiency to the Stability of Pd(I) Bridging Allyl Dimers.' *Organometallics* **2015**, *34*, 381-394.
79. Goh, T.; Huang, J.-S.; Bielinski, E. A.; Thompson, B. A.; Tomasulo, S.; Sfeir, M. Y.; Lee, L. M.; Hazari, N.; Taylor, A. D. 'Co-evaporated Bi-squaraine Inverted Solar Cells: Enhancement Due to Energy Transfer and Open Circuit Voltage Control.' *ACS Photonics* **2015**, *2*, 86-95.
78. Chakraborty, S.; Lagaditis, P. O.; Förster, M.; Bielinski, E. A.; Hazari, N.; Holthausen, M. C.; Jones, W. D.; Schneider, S. 'Well-Defined Iron Catalysts for the Acceptorless Reversible Dehydrogenation-Hydrogenation of Alcohols and

- Ketones.' *ACS Catal.* **2014**, 4, 3994-4003.
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76. Bielinski, E. A.; Lagaditis, P. O.; Zhang, Y.; Mercado, B. Q.; Würtele, C.; Bernskoetter, W. H.; Hazari, N.; Schneider, S. 'Lewis Acid Assisted Formic Acid Dehydrogenation Using a Pincer Supported Iron Catalyst.' *J. Am. Chem. Soc.* **2014**, 136, 10234-10237.
75. Suh, H.-W.; Guard, L. M.; Hazari, N. 'Synthesis and Reactivity of a Masked PSiP Pincer Supported Nickel Hydride.' *Polyhedron* **2014**, 84, 37-43. Invited contribution to 'John Bercaw' issue.
74. Suh, H.-W.; Guard, L. M.; Hazari, N. 'A Mechanistic Study of Allene Carboxylation with CO₂ Resulting in the Development of a Pd(II) Pincer Complex for the Catalytic Hydroboration of CO₂.' *Chem. Sci.* **2014**, 5, 3859-3872.
73. Fillman, K. L.; Bielinski, E. A.; Schmeier, T. J.; Nesvet, J. C.; Woodruff, T. M.; Pan, C. J.; Takase, M. K.; Hazari, N.; Neidig, M. L. 'Flexible Binding of PNP Pincer Ligands to Monomeric Iron Complexes.' *Inorg. Chem.* **2014**, 53, 6066-6072.
72. Li, X.; Guard, L. M.; Jiang, J.; Sakimoto, K.; Huang, J.-S.; Wu, J.; Li, J.; Pokhrel, R.; Brudvig, G. W.; Ismail-Beigi, S.; Hazari, N.; Taylor, A. D. 'Controlled Doping of Carbon Nanotubes with Metallocenes for Application in Hybrid Carbon Nanotube/Si Solar Cells.' *Nano Lett.* **2014**, 14, 3388-3394.
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68. Jin, D.; Williard, P. G.; Hazari, N.; Bernskoetter, W. H. 'An Unstabilized β -Nickelalactone Derived from CO₂-Ethylene Coupling: the Effect of Sodium Cation on Metallocycle Isomerization.' *Chem. Eur. J.* **2014**, 20, 3205-3211.
67. Nova, A.; Suh, H.-W.; Schmeier, T. J.; Guard, L. M.; Eisenstein, O.; Hazari, N.; Maseras, F. 'An Unusual Example of Hypervalent Si: A Five-coordinate Silyl Group Bridging Two Pd or Ni Centers through a Non-symmetrical Four-center Two-electron Bond.' *Angew. Chem., Int. Ed.* **2014**, 53, 1103-1108.
66. Bartholomew, A. K.; Guard, L. M.; Hazari, N.; Luzik Jr, E. D. 'Synthesis of Mg complexes Supported by Tris-(1-pyrazolyl)phosphine.' *Aust. J. Chem.* **2013**, 66, 1455-1458.
65. Dai, W.; Chalkley, M. J.; Brudvig, G. W.; Hazari, N.; Melvin, P. R.; Pokhrel, R.; Takase, M. K. 'Synthesis and Properties of NHC Supported Palladium(I) Dimers with Bridging Allyl, Cyclopentadienyl and Indenyl Ligands.'

Organometallics **2013**, 32, 5114-5127.

64. Manas, M. G.; Graeupner, J.; Allen, L. J.; Dobereiner, G. E.; Rippey, K.; Hazari, N.; Crabtree, R. H. 'Hydrogenation of Quinaldine and Benzylic Aldehydes both Separately and Combined in a Tandem Hydrogenation-Reductive Alkylation of Quinaldine by Aldehydes with Iridium Benzoquinoline Catalysts.' *Organometallics* **2013**, 32, 4501-4506.
63. Chalkley, M. J.; Guard, L. M.; Hazari, N.; Hofmann, P.; Hruszkewycz, D. P.; Schmeier, T. J.; Takase, M. K. 'Synthesis, Electronic Structure and Reactivity of Palladium(I) Dimers with Bridging Allyl, Cyclopentadienyl and Indenyl Ligands.' *Organometallics* **2013**, 32, 4223-4238.
62. Bielinski, E. A.; Dai, W.; Guard, L. M.; Hazari, N.; Takase, M. K. 'Synthesis, Properties and Reactivity Studies of Palladium and Nickel NHC Complexes Supported by Combinations of Allyl, Cyclopentadienyl, and Indenyl Ligands.' *Organometallics* **2013**, 32, 4025-4037. Selected as the cover article.
61. Guard, L. M.; Hazari, N. 'Synthesis and Reactivity of Magnesium Complexes Supported by Tris(2-dimethylaminoethyl)amine (Me₆tren).' *Organometallics* **2013**, 32, 2787-2794.
60. Bernskoetter, W. H.; Hazari, N. 'A Computational Investigation of the Insertion of Carbon Dioxide into Four and Five Coordinate Iridium Hydrides.' *Eur. J. Inorg. Chem.* **2013**, 4032-4041. Invited contribution to 'Small Molecule Activation by Reactive Metal Complexes' issue.
59. Jin, D.; Schmeier, T. J.; Williard, P. G.; Hazari, N.; Bernskoetter, W. H. 'Lewis Acid Induced β -Elimination from a Nickelalactone-Efforts Toward Acrylate Production from CO₂ and Ethylene.' *Organometallics* **2013**, 32, 2152-2159.
58. Huang, J.-S.; Goh, T.; Li, X.; Sfeir, M.; Bielinski, E. A.; Tomasulo, S.; Lee, M. L.; Hazari, N.; Taylor, A. D. 'Polymer Bulk Heterojunction Solar Cells Employing Förster Resonance Energy Transfer.' *Nat. Photonics* **2013**, 7, 479-485. For more information on this work see: Dastoor, P. C. 'Solar Paint: Harvesting Light' *Nat. Photonics* **2013**, 7, 425-426.
57. Wu, J.; Dai, W.; Farnaby, J. H.; Hazari, N.; Le Roy, J. J.; Mereacre, V.; Murugesu, M.; Powell, A. K.; Takase, M. K. 'Synthesis and Catalytic Activity of Iron Complexes with Bidentate NHC Ligands.' *Dalton Trans.* **2013**, 42, 7404-7413. Invited contribution to 'N-Heterocyclic Carbene' issue.
56. Collom, S. L.; Anastas, P. T.; Beach, E. S.; Crabtree, R. H.; Hazari, N.; Sommer, T. 'Differing Selectivities in Mechanochemical versus Conventional Solution Oxidation using Oxone.' *Tetrahedron Lett.* **2013**, 54, 2344-2347.
55. Durrell, A. C.; Jackson, M. N.; Hazari, N.; Gray, H. B. 'Making Carbon-Chlorine Bonds by Dipalladium Electrocatalysis.' *Eur. J. Inorg. Chem.* **2013**, 1134-1137.
54. Dau, P. D.; Hruszkewycz, D. P.; Huang, D.-L.; Chalkley, M. J.; Liu, H.-T.; Green, J. C.; Hazari, N.; Wang, L.-S. 'Photoelectron Spectroscopy of Pd(I) Dimers with Bridging Allyl Ligands.' *Organometallics* **2012**, 31, 8571-8576.
53. Suh, H.-W.; Schmeier, T. J.; Hazari, N.; Kemp, R. A. 'Experimental and Computational Studies of the Reaction of Carbon Dioxide with Pincer Supported Nickel and Palladium Hydrides.' *Organometallics* **2012**, 31, 8225-8236.
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49. Guard, L. M.; Palma, J. L.; Stratton, W. P.; Allen, L. J.; Brudvig, G. W.; Crabtree, R. H.; Batista, V. S.; Hazari, N.; 'Synthesis and Computational Studies of Mg Complexes Supported by 2,2':6,2"-Terpyridine Ligands.' *Dalton Trans.* **2012**, *41*, 8098-8110. Invited contribution to 'New Talent in the America's' issue.
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45. Hruszkewycz, D. P.; Wu, J.; Green, J. C.; Hazari, N.; Schmeier, T. J. 'Mechanistic Studies of the Insertion of CO₂ into Palladium(I) Bridging Allyl Dimers.' *Organometallics* **2012**, *31*, 470-485. For more information on this work see: Paton, R. S.; Brown, J. M. 'Dinuclear Palladium Complexes – Precursors or Catalysts?' *Angew. Chem., Int. Ed.* **2012**, *51*, 10448-10450.
44. Ashley, J. M.; Farnaby, J. H.; Hazari, N.; Kim, K. E.; Luzik Jr, E. D.; Meehan, R. E.; Meyer, E. B.; Schley, N. D.; Schmeier, T. J.; Tailor, A. N. 'Axially Chiral Dimeric Ir and Rh Complexes Bridged by Flexible NHC Ligands.' *Inorg. Chim. Acta* **2012**, *380*, 399-410. Invited contribution to 'Young Investigator Award' issue.
43. Brewster, T. P.; Ding, W.; Schley, N. D.; Hazari, N.; Batista, V. S.; Crabtree, R. H. 'Thiocyanate Linkage Isomerism in a Ruthenium Polypyridyl Complex.' *Inorg. Chem.* **2011**, *50*, 11938-11946.
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41. Schmeier, T. J.; Dobereiner, G. E.; Crabtree, R. H.; Hazari, N. 'Secondary Coordination Sphere Interactions Facilitate the Insertion Step in an Iridium(III) CO₂ Reduction Catalyst.' *J. Am. Chem. Soc.* **2011**, *133*, 9274-9277.
40. Wu, J.; Hazari, N.; Incarvito, C. D. 'Synthesis, Properties and Reactivity with Carbon Dioxide of (allyl)₂Ni(L) Complexes.' *Organometallics* **2011**, *30*, 3142-3150.
39. Hazari, N.; Hruszkewycz, D. P.; Wu, J. 'Pd(I) Bridging Allyl Dimers: A New System for the Catalytic Functionalization of Carbon Dioxide.' *Synlett* **2011**, *13*, 1793-1797. Invited SYNPACT review article.
38. Dobereiner, G. E.; Nova, A.; Schley, N. D.; Hazari, N.; Miller, S. J.; Eisenstein, O.; Crabtree, R. H. 'Iridium-Catalyzed

- Hydrogenation of N-Heterocyclic Compounds under Mild Conditions by an Outer Sphere Pathway.' *J. Am. Chem. Soc.* **2011**, *133*, 7547-7562.
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36. Hruszkewycz, D. P.; Wu, J.; Hazari, N.; Incarvito, C. D. 'Palladium(I) Bridging Allyl Dimers for the Catalytic Functionalization of CO₂.' *J. Am. Chem. Soc.* **2011**, *133*, 3280-3283. Selected as a Science and Technology Concentrate in *Chemical & Engineering News*.
35. Marino, N.; Fazen, C. H.; Blakemore, J. D.; Incarvito, C. D.; Hazari, N.; Doyle, R. P. 'Isostructural Pd^{II} and Pt^{II} Pyrophosphato Complexes: Polymorphism and Unusual Bond Character in d⁸-d⁸ Systems.' *Inorg. Chem.* **2011**, *50*, 2507-2520.
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32. Schmeier, T. J.; Hazari, N.; Incarvito, C. D.; Raskatov, J. R. 'Exploring the Reactions of CO₂ with PCP Supported Nickel Complexes.' *Chem. Commun.* **2011**, *47*, 1824-1826.
31. Wu, J.; Hazari, N. 'Palladium Catalyzed Carboxylation of Allylstannanes and Boranes Using CO₂.' *Chem. Commun.* **2011**, *47*, 1069-1071.
30. Shuman, N. S.; Miller, T. M.; Hazari, N.; Luzik Jr, E. D.; Viggiano, A. A. 'Kinetics Following Addition of Sulfur Fluorides to a Weakly Ionized Plasma from 300 K to 500 K: Rate Constants and Product Determinations for Ion-ion Mutual Neutralization and Thermal Electron Attachment to SF₅, SF₃, and SF₂⁻.' *J. Chem. Phys.* **2010**, *133*, 234304/1-234304/11.
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26. Bercaw, J. E.; Durrell, A. C.; Gray, H. B.; Green, J. C.; Hazari, N.; Labinger, J. A.; Winkler, J. R. 'Electronic Structures of Pd^{II} Dimers.' *Inorg. Chem.* **2010**, *49*, 1801-1810.
25. Oblad, P. F.; Hazari, N.; Labinger, J. A.; Bercaw, J. E. 'Oxidation of Organometallic Platinum and Palladium Complexes Obtained from C-H Activation.' *Organometallics* **2010**, *29*, 789-794.
24. Weinberg, D. R.; Hazari, N.; Labinger, J. A.; Bercaw, J. E. 'Iridium(I) and Iridium(III) Complexes Supported by a

- Diphenolate Imidazolyl-Carbene Ligand.' *Organometallics* **2010**, 29, 89-100.
23. Golisz, S. R.; Hazari, N.; Labinger, J. A.; Bercaw, J. E. 'Activation of the C-N Bond in Nitromethane by Palladium α -Diimine Complexes.' *J. Org. Chem.* **2009**, 74, 8441-8443.
22. Bercaw, J. E.; Hazari, N.; Labinger, J. A. 'Activation of a C-H Bond in Indene by $[(\text{COD})\text{Rh}(\mu_2\text{-OH})]_2$.' *Organometallics* **2009**, 28, 5489-5492.
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19. Esposito, E.; Roberts, D. E.; Cloke, F. G. N.; Caddick, S.; Green, J. C.; Hazari, N.; Hitchcock, P. B. 'Carbon-Silicon Bond Activation by $[\text{Pd}(\text{I}^t\text{Bu})_2]$; the Molecular Structures of $[\text{Pd}(\text{Me}_3\text{Si})(\text{I}^t\text{Bu})(\mu\text{-I})]_2$ and $[\text{Pd}(\text{CH}_2\text{I}^t\text{Bu})\text{I}_2]$.' *Eur. J. Inorg. Chem.* **2009**, 13, 1844-1850. Invited contribution to special issue on 'N-Heterocyclic Carbene Complexes'.
18. Bercaw, J. E.; Hazari, N.; Labinger, J. A.; Oblad, P. F. 'C-H Bond Activation by $[\{(\text{Diimine})\text{Pd}(\mu\text{-OH})\}]_2^{2+}$ Dimers: Mechanism-Guided Catalytic Improvement.' *Angew. Chem., Int. Ed.* **2008**, 47, 9941-9943. Selected as a hot article by the editors of *Angew. Chem., Int. Ed.*
17. Bercaw, J. E.; Hazari, N.; Labinger, J. A. 'Oxidative Aromatization of Olefins with Dioxygen Catalyzed by Palladium Trifluoroacetate.' *J. Org. Chem.* **2008**, 73, 8654-8657.
16. Bercaw, J. E.; Hazari, N.; Labinger, J. A.; Scott, V. J.; Sunley, G. J. 'Selected Methylative Homologation: An Alternate Route to Alkane Upgrading.' *J. Am. Chem. Soc.* **2008**, 130, 11988-11995.
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14. Bercaw, J. E.; Diaconescu, P. L.; Grubbs, R. H.; Hazari, N.; Kay, R. D.; Labinger, J. A.; Mehrkhodavandi, P.; Morris, G. E.; Sunley, G. J.; Vagner, P. 'The Conversion of Methanol to 2,2,3-Trimethylbutane (Triptane) over Indium (III) Iodide.' *Inorg. Chem.* **2007**, 46, 11371-11380.
13. Bercaw, J. E.; Grubbs, R. H.; Hazari, N.; Labinger, J. A.; Li, X. 'Enhanced Selectivity in the Conversion of Methanol to 2,2,3-Trimethylbutane (Triptane) over Zinc Iodide by Added Phosphorous or Hypophosphorous Acid.' *Chem. Commun.* **2007**, 2974-2976.
12. Brayshaw, S. K.; Green, J. C.; Hazari, N.; Weller, A. S. 'A DFT Based Investigation into the Electronic Structure and Properties of Hydride Rich Rhodium Clusters.' *Dalton Trans.* **2007**, 1781-1792. Selected as a hot article by the editors of *Dalton Trans.*
11. Brayshaw, S. K.; Green, J. C.; Hazari, N.; McIndoe, J. S.; Marken, F.; Raithby, P. R.; Weller, A. S. 'Storing and Releasing Hydrogen with a Redox Switch.' *Angew. Chem., Int. Ed.* **2006**, 45, 6005-6008. For more information on this work see: 'Quick Release, Hydrogen Storage.' *Nature*, **2006**, 442, 850 or Takimoto, M.; Hou, Z. 'Hydrogen at the Flick

- of a Switch.' *Nature*, **2006**, *443*, 400-401.
10. Summerscales, O. T.; Cloke, F. G. N.; Hitchcock, P. B.; Green, J. C.; Hazari, N. 'Reductive Cyclotetramerization of CO to Squarate by a U(III) Complex; the X-ray Crystal Structure of $[(U(\eta-C_8H_6\{Si^iPr_3-1,4\}_2)(\eta-C_5Me_4H)]_2(\mu-\eta^2:\eta^2-C_4O_4)$.' *J. Am. Chem. Soc.* **2006**, *128*, 9602-9603.
 9. Cloke, F. G. N.; Green, J. C.; Hazari, N.; Hitchcock, P. B.; Mountford, P.; Nixon, J. F.; Wilson, D. J. 'Reactions of $BuC\equiv P$ with Cyclooctatetraene-Supported Titanium Imido Complexes.' *Organometallics* **2006**, *25*, 3688-3700.
 8. Dunn, S. C.; Hazari, N.; Cowley, A. R.; Green, J. C.; Mountford, P. 'Synthesis and Reactions of Group 4 Imido Complexes Supported by Cyclooctatetraene Ligands.' *Organometallics* **2006**, *25*, 1755-1770.
 7. Summerscales, O. T.; Cloke, F. G. N.; Hitchcock, P. B.; Green, J. C.; Hazari, N. 'Reductive Cyclotrimerization of Carbon Monoxide to the Deltate Dianion by an Organometallic Uranium Complex.' *Science* **2006**, *311*, 829-831. For more information on this work see: Wayland, B.; Fu, X. 'Building Molecules with Carbon Monoxide Reductive Coupling.' *Science* **2006**, *311*, 790-791.
 6. Decleva, P.; Fronzoni, G.; Stener, M.; de Simone, M.; Coreno, M.; Green, J. C.; Hazari, N.; Plekan, O. 'Strong Oscillations in Molecular Valence Photoemission Intensities.' *Phys. Rev. Lett.* **2005**, *95*, 263401/1-263401/4.
 5. Parsons, T. B.; Hazari, N.; Cowley, A. R.; Green, J. C.; Mountford, P. 'Synthesis, Structures, and DFT Bonding Analysis of New Titanium Hydrazido(2-) Complexes.' *Inorg. Chem.* **2005**, *44*, 8442-8458.
 4. Hazari, N.; Mountford, P. 'Reactions and Applications of Titanium Imido Complexes.' *Acc. Chem. Res.* **2005**, *38*, 839-849.
 3. Dunn, S. C.; Hazari, N.; Jones, N. M.; Moody, A. G.; Blake, A. J.; Cowley, A. R.; Green, J. C.; Mountford, P. 'Titanium Imido Complexes of Cyclooctatetraenyl Ligands.' *Chem. Eur. J.* **2005**, *11*, 2111-2124.
 2. Hazari, N.; Cowley, A. R.; Mountford, P. ' μ -dichloro-bis[chloro[N-tertbutylimido]bis(pyridine-N)titanium(IV)].' *Acta Crystallogr.* **2004**, *E60*, m1844-m1846.
 1. Field, L. D.; Hazari, N.; Li, H.; Luck, I. J. 'Dynamic ^{15}N NMR Studies of Iron Phosphine Complexes Containing Coordinated Dinitrogen.' *Magn. Reson. Chem.* **2003**, *41*, 709-713.

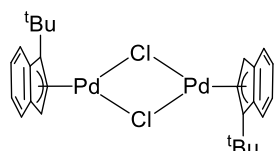
Patents

1. Hazari, N.; Melvin, P. R. 'Cross-Coupling Reaction Catalysts, and Methods of Making and Using Same.' PCT Int. Appl. **2018**, WO 2018183328.
2. Hazari, N.; Hruszkewycz, D. P.; Melvin, P. R. 'Novel Precatalyst Scaffold for Cross-Coupling Reactions, and Methods of Making and Using Same.' PCT Int. Appl. **2016**, WO 2016057600. Also published as CN106795191, IN201717015106, JP2017537879, KR1020170086026, US20170305948, EP3204395. Now approved in Europe (Germany, France, Ireland, Italy, Switzerland, & United Kingdom) and China.
3. Labinger, J. A.; Sunley, G. J.; Hazari, N.; Iglesia, E. I.; Scott, V. J. 'Process for the Production of a Hydrocarbon'. PCT Int. **2009**, WO 2009064622.

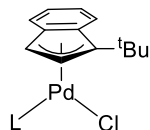
Book Chapters

1. 'Hydrogenation and Dehydrogenation Reactions Catalyzed by Iron Pincer Compounds'. W. H. Bernskoetter and N. Hazari in *Pincer Compounds: Chemistry and Applications*, Ed. David Morales-Morales, Elsevier, New York, 2018, 111-131.
2. 'Titanium Complexes in the Oxidation State +III'. N. Hazari and P. Mountford in *Comprehensive Organometallic Chemistry III*, Eds. R. H. Crabtree and D. M. P. Mingos, Elsevier, New York, 2006, Volume 4, 281-322.

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L = IPr, P^tBu₃, AmPhos & QPhos

Invited Talks and Conference Presentations

Named Lectures

2012: Presented the 2012 Eli Lilly Young Investigator Lecture at the University of Wisconsin Madison.

Seminars

Companies: Bristol Myers Squibb, Exxon-Mobil, Strem Chemicals, Umicore.

Research Universities: Australian National University, Brandeis University, Brock University, Brown University, California Institute of Technology, City College New York, Dartmouth College, George Washington University, Indiana University, Institut Català d'Investigació Química, Lund University, Macquarie University, McMaster University, Michigan State University, Monash University, Princeton University, Temple University, Worcester Polytechnic Institute, Universidad de Alcalá, Universidad de Castilla La Mancha, Universidad de Huelva, Universidad de Jaume I Castellón, Universidad de Sevilla-IIQ, Universidad de Valladolid, Universidad de Zaragoza, University of California Berkeley, University of California Los Angeles, University of California Irvine, University of California Santa Barbara, University of Cincinnati, University of Connecticut, University of Guelph, University of Melbourne, University of Memphis, University of Missouri Columbia, University of New Hampshire, University of New Mexico, University of New South Wales (2), University of North Carolina Chapel Hill, University of Pennsylvania, University of Rochester, University of Southern California, University of Sydney, University of Toronto, University of Washington Seattle, Vanderbilt University, Washington University St Louis.

Undergraduate Institutions: Colby College, Ithaca College, College of William and Mary.

Conference Presentations

33. Hazari, N.; 'The Rational Design of Precatalysts for Cross-Coupling and Related Reactions' presented at the 1st Umicore Catalysis Symposium held on the 25th of October 2019 in Boston, USA.
32. Hazari, N.; 'The Rational Design of Precatalysts for Cross-Coupling and Related Reactions' presented at the 42nd Organic Process Research & Development Conference held from the 23th of September to the 25th of September 2019 in Lisbon, Portugal.
31. Hazari, N.; 'Understanding the Mechanism of Nickel Catalyzed Cross-Coupling and Cross-Electrophile Coupling Reactions' presented at the 258th National Meeting of the American Chemical Society held from the 25th of August to the 29th of August 2019 in San Diego, USA.

30. Hazari, N.; 'Rational Design of Precatalysts for Cross-Coupling and Related Reactions' presented at the Gordon Organic Reactions and Processes Research Conference held from the 21st of July to the 26th of July 2019 in Easton, Massachusetts.
29. Hazari, N.; 'Mechanistic Studies of Nickel Catalyzed Cross-Coupling and Cross-Electrophile Reactions' presented at the 256th National Meeting of the American Chemical Society held from the 19th of August to the 23rd of August 2018 in Boston, USA.
28. Hazari, N.; 'Mechanistic Studies Related to the Conversion of Carbon Dioxide into Value-Added Chemicals' presented at the Gordon Inorganic Chemistry Research Conference held from the 17th of June to the 21st of June 2018 in Biddeford, Maine.
27. Heimann, J. E.; Bernskoetter, W. H.; Hazari, N.; 'Mechanistic Studies of the Insertion of Carbon Dioxide into Late Transition Metal Element Sigma Bonds' presented at the 255th National Meeting of the American Chemical Society held from the 2nd of April to the 6th of April 2018 in New Orleans, USA.
26. Hazari, N.; 'Understanding the Formation of Pd(I) and Ni(I) Complexes in Cross-Coupling Reactions' presented at the 253rd National Meeting of the American Chemical Society held from the 2nd of April to the 6th of April 2017 in San Francisco, USA.
25. Hazari, N.; Bernskoetter, W. H.; 'Rational Development of Pincer Supported Iron Complexes for the Reversible Hydrogenation of CO₂ to Formic Acid and Methanol' presented at the 253rd National Meeting of the American Chemical Society held from the 2nd of April to the 6th of April 2017 in San Francisco, USA.
24. Hazari, N.; 'The Design of Improved Ni and Pd Catalysts for Cross-Coupling' presented at the 252nd National Meeting of the American Chemical Society held from the 21st of August to the 25th of August 2016 in Philadelphia, USA.
23. Hazari, N.; Bernskoetter, W. H.; 'Pincer Supported Iron Complexes for the Reversible Hydrogenation of CO₂ to Formic Acid and Methanol' presented at the 252nd National Meeting of the American Chemical Society held from the 21st of August to the 25th of August 2016 in Philadelphia, USA.
22. Hazari, N.; 'The Design of Improved Ni and Pd Catalysts for Cross-Coupling' presented at the 27th International Conference on Organometallic Chemistry held from the 17th of July to the 22nd of July in Melbourne, Australia.
21. Hazari, N.; Bernskoetter, W. H.; 'Pincer Supported Iron Complexes for the Reversible Hydrogenation of CO₂ to Formic Acid and Methanol' presented at the 2016 Dalton Division Meeting of the Royal Society of Chemistry held from the 29th of March to the 31st of March at the University of Warwick, United Kingdom.
20. Hazari, N.; 'Mechanism Guided Improvement of Ni and Pd Precatalysts for Cross-Coupling' presented on June 13th 2015 as part of the Boston Regional Inorganic Colloquium at the College of Holy Cross.
19. Hazari, N.; 'Mechanism Guided Improvement of Pd(II) Precatalysts for Cross-Coupling' presented at the 2015 Northeast Regional Meeting of the American Chemical Society held from the 10th of June to the 13th of June 2015 in Ithaca, New York.
18. Hazari, N.; Hruszkewycz, D. P.; Melvin, P. R.; 'Mechanism Guided Improvement of Pd(II) Precatalysts for Cross-

- Coupling' presented at the Lower Saxony Catalysis Symposium held from the 16th of August to the 17th of August 2014 at the Georg-August-University Göttingen, Germany.
17. Li, X.; Guard, L. M.; Hazari, N.; Taylor, A. D.; 'Effect of Oxygen and Metallocenes on the Doping of Carbon Nanotubes for Application in Hybrid Carbon Nanotube/Si Solar Cells' presented at the 248th National Meeting of the American Chemical Society held from the 10th of August to the 14th of August 2014 in San Francisco, USA.
 16. Hazari, N.; 'Pincer Supported Iron Complexes for the Hydrogenation of Carbon Dioxide and Dehydrogenation of Formic Acid' presented at the 41st International Coordination Chemistry Conference held from the 21st of July to the 25th of July 2014 in Singapore.
 15. Hazari, N.; 'The Role of Pd(I) Dimers with Bridging Allyl Ligands in Cross-Coupling' presented at the Gordon Organometallics Research Conference held from the 6th of July to the 11th of July 2014 in Newport, Rhode Island.
 14. Bielinski, E. A.; Hazari, N.; Suh, H. W.; Schemeier, T. J.; 'Exploring Carbon Dioxide Insertion into Group 8, 9, and 10 Complexes Supported by Pincer Ligands' presented at the 247th National Meeting of the American Chemical Society held from the 16th of March to the 20th of March 2014 in Dallas, USA.
 13. Hazari, N.; 'Mechanism-Guided Improvement of Palladium Precatalysts for Cross-Coupling' presented at the 25th Organic Reaction Catalysis Society Conference held from the 2nd of March to the 6th of March 2014 in Tucson, Arizona.
 12. Hazari, N.; Schemeier, T. J.; 'Iridium and Iron Catalyzed Conversion of Carbon Dioxide into Formic Acid' presented at the 96th Canadian Chemistry Conference held from the 26th of May to the 30th of May 2013 in Quebec City, Canada.
 11. Hazari, N.; Suh, H. W.; Schemeier, T. J.; Takase, M. K.; 'Exploring Carbon Dioxide Insertion into Group 10 Complexes Supported by Pincer Ligands' presented at the 96th Canadian Chemistry Conference held from the 26th of May to the 30th of May 2013 in Quebec City, Canada.
 10. Schemeier, T. J.; Hazari, N.; 'Iridium and Iron Catalyzed Conversion of Carbon Dioxide into Formic Acid' presented at the 245th National Meeting of the American Chemical Society held from the 7th of April to the 11th of April 2013 in New Orleans, USA.
 9. Chalkley, M. J.; Hazari, N.; Hruszkewycz, D. P.; Wu, J.; 'Synthesis, Electronic Structure, and Reactivity of Nickel(I) and Palladium(I) Dimers with Bridging Allyl, Cyclopentadienyl, and Indenyl Ligands' presented at the 245th National Meeting of the American Chemical Society held from the 7th of April to the 11th of April 2013 in New Orleans, USA.
 8. Hazari, N.; Ashley, J. A.; Farnaby, J. H.; Wu, J.; 'Transition Metal Complexes Supported by Flexible Bidentate NHC Ligands with Amine Based Linkers Ligands' presented at the 244th National Meeting of the American Chemical Society held from the 19th of August to the 23rd of August 2012 in Philadelphia, USA.
 7. Hazari, N.; Chalkley, M. J.; Hruszkewycz, D. P.; Wu, J.; 'Understanding the Chemistry of Palladium(I) Dimers with Bridging Allyl Ligands' presented at the 244th National Meeting of the American Chemical Society held from the 19th of August to the 23rd of August 2012 in Philadelphia, USA.
 6. Hazari, N.; 'The Insertion of Carbon Dioxide into Late Transition Metals' presented at the Mesilla Workshop on 'Ligand-Based Control of Spin and Reactivity in Metal Complexes' from the 11th to the 15th of February 2012 in New Mexico,

USA.

5. Hazari, N.; Wu, J.; Hruszkewycz, D. P.; Schmeier, T. J.; 'Transition Metal Catalyzed Conversion of Carbon Dioxide into Chemical Feedstocks' presented at the 242nd National Meeting of the American Chemical Society held from the 28th of August to the 1st of September 2011 in Denver, USA.
4. Hazari, N.; Wu, J.; Hruszkewycz, D. P.; Schmeier, T. J.; 'Terminal and Bridging Palladium and Nickel Allyls for the Activation of Carbon Dioxide' presented at the 242nd National Meeting of the American Chemical Society held from the 28th of August to the 1st of September 2011 in Denver, USA.
3. Hazari, N.; 'The Insertion of Carbon Dioxide into Late Transition Metal Complexes' presented on June 4th 2011 as part of the Boston Regional Inorganic Colloquium at Massachusetts Institute of Technology.
2. Hazari, N.; 'The Reaction of Carbon Dioxide with Palladium Allyl Bonds' presented at the 2nd Annual Yale Rigaku Seminar on June 18th 2010 at Yale University.
1. Hazari, N.; 'Using Mercury Manometers to Transfer Gases' presented at the Northeast Section Meeting of the American Scientific Glass Blowers Society, on May 1st 2010 at Yale University.

Grants Awarded

Source of Support: Department of Energy (co-PI with 30 others)

Proposal Title: Center for Hybrid Approaches in Solar Energy to Liquid Fuels (CHASE)

Total Award: \$40,000,000

Total Award Period Covered: 15-Sep-20 - 14-Sep-25

Source of Support: Department of Energy (co-PI with Wesley Bernskoetter)

Proposal Title: The Reversible Conversion of CO₂ and H₂ to Formic Acid and Methanol Using Iron Catalysts

Total Award: \$700,000

Total Award Period Covered: 01-Sep-20 - 31-Aug-23

Source of Support: National Science Foundation

Proposal Title: Understanding the Reactions of Carbon Dioxide with Late Transition Metal Complexes

Total Award: \$450,000

Total Award Period Covered: 01-Aug-20 - 31-July-23

Source of Support: Umicore

Proposal Title: Benchmarking of Palladium Precatalysts for Cross-Coupling

Total Award: \$113,172

Total Award Period Covered: 01-Nov-18 - 30-Sep-19

Source of Support: Yale Center for Research on Interface Structures and Phenomena (CRISP) Seed Grant (Lead-PI with five other co-PIs)

Proposal Title: Tuning the Properties of 2D Materials Using Rationally Designed Small Molecules

Total Award: \$80,000

Total Award Period Covered: 01-Jul-18 - 30-Jun-19

Source of Support: National Science Foundation Major Research Instrumentation (co-PI with five others)

Proposal Title: Development of a Hybrid Mass Spectrometry Platform with Mass-Selective Optical Spectroscopy of Cryogenic Ions

Total Award: \$500,000

Total Award Period Covered: 01-Aug-18 - 31-July-21

Source of Support: Department of Energy (co-PI with Wesley Bernskoetter)

Proposal Title: Elucidating the Role of Lewis Acid Co-Catalysts in Transition Metal Promoted Reversible Carbon Dioxide Hydrogenation

Total Award: \$625,000

Total Award Period Covered: 01-Aug-17 - 31-July-20

Source of Support: National Institute of Health

Proposal Title: Mechanistic Studies to Rationally Design Ni and Pd Catalysts for Cross-Coupling

Total Award: \$1,450,000

Total Award Period Covered: 01-Aug-16 - 31-May-21

Source of Support: National Science Foundation Career Award

Proposal Title: Mechanistic Studies of Late Transition Metal Complexes for Catalytic Carbon Dioxide Conversion into Organic Building Blocks

Total Award: \$600,000

Total Award Period Covered: 01-Sep-12 - 31-Aug-17

Source of Support: National Science Foundation (co-PI with André Taylor)

Proposal Title: Using and Understanding Förster Resonance Energy Transfer in Organic Polymer Based Solar Cells

Total Award: \$450,000

Total Award Period Covered: 01-Sep-14 - 31-Aug-16

Source of Support: National Science Foundation Center for Chemical Innovation (co-PI with six others)

Proposal Title: Center for the Capture and Conversion of Carbon Dioxide

Total Award: \$1,750,000

Total Award Period Covered: 01-Sep-12 - 31-Aug-15

Source of Support: Alfred P. Sloan Foundation

Proposal Title: Alfred P. Sloan Foundation 2013 Research Fellowship in Chemistry

Total Award: \$50,000

Total Award Period Covered: 01-Sep-13 - 31-Aug-15

Source of Support: Camille and Henry Dreyfus Foundation

Proposal Title: Mechanistic Studies for the Design of Improved First Row Transition Metal Catalysts for Cross-Coupling

Total Award: \$75,000

Total Award Period Covered: 01-Jun-14 - 31-May-19

Source of Support: American Chemical Society Petroleum Research Fund Doctoral New Investigator (DNI) Research Grant

Proposal Title: Palladium(I) and Nickel(I) Bridging Allyl Dimers for the Catalytic Functionalization of CO₂

Total Award: \$100,000

Total Award Period Covered: 01-Sep-11 - 31-Aug-13

Source of Support: Yale Climate and Energy Institute Seed Grant (co-PI with André Taylor)

Proposal Title: Controlled Growth, Doping, and Modification of Carbon Materials for High Performance Catalysts and Electrodes

Total Award: \$50,000

Total Award Period Covered: 01-Sep-11 - 31-Aug-13

Graduate Students Supervised

Current

Anthony Deziel

Emily Barth

David Charboneau

Julia Curley

Amira Dardir

Matthew Espinosa

Nicholas Smith

Tanya Townsend

Past

Amit Tailor MSc 2010

John Ashley MSc 2013

Timothy Schmeier PhD 2013

Damian Hruszkewycz PhD 2014

Elizabeth Bielinski PhD 2015

Louise Guard PhD 2015
Hee Won Suh PhD 2015
Bennett Thompson MSc 2015
Patrick Melvin PhD 2017
Ryan Davis MSc 2018
Megan Mohadjer Beromi PhD 2019
Jessica Heimann PhD 2019

Postdoctoral Fellows Supervised

Past

Jianguo Wu (2009-2013)
Joy Farnaby (2010-2011)
Wei Dai (2012-2013)
Janice Wong (2014-2015)
Andrew Walden (2017-2018)

Undergraduates Supervised

Yale

Zuzana Culakova (Class of 2011)
Kelly Kim (Class of 2011)
Eric Meyer (Class of 2011)
William Stratton (Class of 2011)
Matthew Ambler (Class of 2013)
Aymarie Bartholomew (Class of 2013)
Matthew Chalkley (Class of 2013)
Yuanchi 'Victor' Zhao (Class of 2013)
Cassie Pan (Class of 2014)
Nicola Feldman (Class of 2015)
Tyler Pearson (Class of 2015)
Hemali Shah (Class of 2016)
Julie Guthrie (Class of 2017)
Ian Peczak (Class of 2018)
Andrew Saydjari (Class of 2018)
Cole Tilden (Class of 2018)
Vivek Suri (Class of 2020)
Orven Mallari (Class of 2021)
André Garcia de Oliveira (Class of 2021)
Miles Waits (Class of 2021)
Jack McArthur (Class of 2022)
Matthew Pecoraro (Class of 2022)

Summer Undergraduate Research Fellows

Nathan Enriquez (Summer 2011, Chaminade University)
Jocelyn Legere (Summer 2014, Bloomsburg University)
Ann Marie Brasacchio (Summer 2015, Wheaton College)

High School Students Supervised

Maria Grishanina (Summer 2013)

Thesis Committees

Past

Graham Dobereiner PhD 2011 (Crabtree & Miller groups)
Alekssei Alferiev MSc 2012 (Crabtree group)
Timothy Brewster PhD 2012 (Crabtree group)
Kurt Luthy MSc 2012 (Crabtree group)
Meng Zhou PhD 2012 (Crabtree group)

Oana Luca PhD 2013 (Crabtree group)
Jonathan Grauepner PhD 2014 (Crabtree group)
Curren Mbofana PhD 2015 (Miller group)
Michael Manas PhD 2015 (Crabtree group)
Sahr Kahn PhD 2015 (Brudvig group)
Jeffrey Chen PhD 2016 (Crabtree group)
Shuming Chen PhD 2016 (Ellman group)
Samuel Collom PhD 2016 (Anastas & Crabtree groups)
Anna Brosnahan MSc 2016 (Holland group)
Megan Reesbeck PhD 2016 (Holland group)
Thoe Michaelos PhD 2017 (Brudvig & Crabtree groups)
Justin Romaine MSc 2017 (Herzon group)
Liam Sharninghausen PhD 2018 (Crabtree group)
Dimitar Shopov PhD 2018 (Brudvig & Crabtree groups)
Shashi Sinha PhD 2018 (Brudvig & Crabtree groups)
Francisco Antonio (Taylor group, Chemical Engineering)
Jacob Black PhD 2019 (Ganim group)
Daniel DeRosha PhD 2019 (Holland group)
Julia Darcy PhD 2019 (Mayer group)
Suzanne Szewczyk PhD 2019 (Newhouse group)
Aneta Turlik PhD 2019 (Newhouse group)
Dongyoung Kim PhD 2020 (Holland group)
Brian Koronkiewicz PhD 2020 (Mayer group)
Hannah Lant (Brudvig & Crabtree groups)
Catherine Wise PhD 2020 (Mayer group)

Current

Samuel Bhutto (Holland group)
Claire Cody (Brudvig & Crabtree groups)
Gannon Connor (Holland & Mayer groups)
Katherine Fisher (Brudvig & Crabtree groups)
Daniel Kim (Holland group)
Fang Lin (Anastas group)
Daniel Martin (Mayer group)
Zixu Tao (Wang group)
Qixuan Yu (Ganim group, Chemical Engineering)

Teaching

Fall 2021: Chemistry 161a General Chemistry (190 undergraduate students)

Spring 2020: Chemistry 252b Introductory Inorganic Chemistry (32 undergraduate students)

Fall 2019: Chemistry 452a/552a Organometallic Chemistry with Professor Robert Crabtree (18 graduate students and 7 undergraduate students)

Fall 2018: Chemistry 457a/557a Modern Coordination Chemistry (7 graduate students and 7 undergraduate students)

Spring 2018: Chemistry 457a/557a Modern Coordination Chemistry (12 graduate students and 6 undergraduate students)

Spring 2017: Chemistry 252b Introductory Inorganic Chemistry (17 undergraduate students)

Fall 2016: Chemistry 452a/552a Organometallic Chemistry (16 graduate students and 10 undergraduate students)

Spring 2016: Chemistry 161b General Chemistry (38 undergraduate students)

Fall 2015: Chemistry 457a/557a Modern Coordination Chemistry (13 graduate students and 5 undergraduate students)

Spring 2015: Chemistry 114b General Chemistry (40 undergraduate students)

Spring 2014: Chemistry 450b/550b Physical Methods in Inorganic Chemistry (7 graduate students and 2 undergraduate students)

Spring 2013: Chemistry 252b Introductory Inorganic Chemistry (28 undergraduate students)

Spring 2012: Chemistry 450b/550b Physical Methods in Inorganic Chemistry (2 graduate students and 7 undergraduate students)

Fall 2011: Chemistry 457a/557a Modern Coordination Chemistry (2 graduate students and 8 undergraduate students)

Spring 2011: Chemistry 450b/550b Physical Methods in Inorganic Chemistry (11 graduate students and 1 undergraduate student)

Fall 2010: Chemistry 452a/552a Organometallic Chemistry (17 graduate students and 4 undergraduate students)

Fall 2009: Chemistry 452a/552a Organometallic Chemistry (12 graduate students and 1 undergraduate student)

Departmental and University Committees Served on at Yale

2020 Poovru Center for Teaching and Learning at Yale Advisory Board

2020 Outside Member Biological Sciences Area Committee and Tenure Appointments Committee

2020 Faculty of Arts and Science Instructional Support Committee for Planning a Response to COVID-19

2019-2020 University Committee on Advising, Placement & Enrollment

2019-2020 Chemistry Department Junior Faculty Mentoring Committee (Dr. Hailiang Wang)

2019-2020 Chemistry Department Administrative Services Committee

2019-2020 Chemistry Department Communications Committee

2019-2020 Chemistry Department Preceptor Search Committee

2019-2020 Graduate Student Awards Committee

2018-2020 Chemistry Department Safety Committee

2017-2018 & 2019-2020 University Undergraduate Admissions Committee

2017-2018 University Cooperative Research Committee

2016, 2018 & 2019 University Churchill Scholarship Selection Committee

2016-2020 Chemistry Department Curriculum Committee

2016-2020 Chemistry Department Advising Committee

2016-2020 Director of Undergraduate Studies Department of Chemistry

2014-2015 University Beckman Scholars Program Selection Committee

2013-2014 & 2015-2020 Yale Sophomore/College Adviser

2012-2016 University Henry Scholarship Selection Committee

2012-2014 West Campus Energy Sciences Institute Junior Faculty Search Committee

2011-2014 Chemistry Department Senior Inorganic Faculty Search Committee

2010-2012 & 2015-2020 University Rhodes, Marshall & Mitchell Scholarship Selection Committee

2010-2011, 2012-2013 & 2014-2018 Davenport College Freshman Adviser

2009-2020 Chemistry Department Inorganic Seminars Coordinator

2009-2017 & 2019-2020 Chemistry Department Graduate Admissions Committee

2009-2014 & 2015-2016 Chemistry Department Junior Faculty Search Committee

2009-2010 & 2015-2016 Chemistry Department Visiting Day Committee

External Committees

2018-2019 National Petroleum Council Carbon Capture, Use, and Storage (CCUS) Study.

2017-2018 National Academies of Sciences Committee for Developing a Research Agenda for Utilization of Gaseous Carbon Waste Streams

Reviewing

Panels

2020: National Science Foundation Chemical Catalysis Virtual Panel

2017: Department of Energy Review of Catalysis Program at Lawrence Berkeley National Laboratory

2016: National Institute of Health General Medical Science Synthetic and Biological Chemistry B Study Section (*ad hoc* member)

2016: National Science Foundation Graduate Research Fellowship Program

2015: National Science Foundation Chemical Catalysis Career Award Virtual Panel

2014: National Science Foundation Division of Materials Research Panel

2013: National Science Foundation Chemistry Catalysis Virtual Panel

2012: Department of Energy Office of Science Graduate Fellowship Program

Ad hoc reviewing

Journals: Accounts of Chemical Research, ACS Applied Energy Materials, ACS Catalysis, ACS Nano, ACS Photonics, Angewandte Chemie International Edition, Carbon, Catalysis Science & Technology, Chemical Communications, Chemical Reviews, Chemical Science, Chemistry: A European Journal, ChemSusChem, Coordination Chemistry Reviews, Crystal Growth & Design, European Journal of Inorganic Chemistry, Industrial & Engineering Chemistry Research, Inorganica Chimica Acta, Inorganic Chemistry, Israel Journal of Chemistry, Journal of Molecular Structure, Journal of Organometallic Chemistry, Journal of Physical Chemistry, Journal of the American Chemical Society, Nature, Nature Catalysis, Nature Reviews Chemistry, New Journal of Chemistry, Organic Chemistry Frontiers, Organic Letters, Organometallics, Science, Synlett, & The Journal of Organic Chemistry.

Funding agencies: ACS Petroleum Research Fund, Army Research Office, Department of Energy, National Institute of Health, Natural Sciences and Engineering Research Council of Canada (NSERC), National Science Foundation, & Swiss National Science Foundation.

Editorial Positions

2020 Guest Editor for Special Issue in *Zeitschrift für anorganische und Allgemeine Chemie* on Pincer Chemistry.

2020 Guest Editor for Special Issue in *Organometallics* entitled 'Organometallic Chemistry for Enabling Carbon Dioxide Utilization'.

2019- Oxford University Press United States Delegate for Chemistry

2019- Editorial Advisory Board for Cell Reports Physical Science

2016-2018 Associate Editor Encyclopedia of Inorganic and Bioinorganic Chemistry

External Examinations

2019: PhD thesis for the University of New South Wales

2018: PhD thesis for the University of New South Wales

2013: Travelled to the University of Lund to be an external examiner for PhD thesis.

2012: Travelled to Brandeis University to be an external examiner for a 2nd year PhD oral examination.

Symposia Organized

2017: Gabor A. Somorjai Award for Creative Research in Catalysis Symposium in Honor of John E. Bercaw at the 253rd National Meeting of the American Chemical Society held from the 2nd of April to the 6th of April 2017 in San Francisco, USA.

2013: Organometallic Chemistry and Catalysis at the 39th Northeast Regional Meeting of the American Chemical Society held from the 23rd of October to the 26th of October 2013 in New Haven, USA.

Outreach

2017-2018: Lecturer in the Yale Young Global Scholars Summer Program (1 lecture per year).

2013: Participant in the New Haven Talented and Gifted Program for 7th Graders. Role was to give five lectures explaining the chemistry behind global warming.

2010-2020: Participant in the Yale University Pathways Program (see <http://onhsa.yale.edu/pathways-science>). Roles were to i) organize an 'Open House' of the Yale Chemistry Department, in which students could tour research laboratories, ii) perform demonstrations at events throughout the year, including in the hour long presentation 'The Wonderful World of Chemistry: A Magic Show', iii) engage with local high school teachers about the chemistry curriculum at New Haven high schools.

2009-2011: Judge at the New Haven Science Fair.