Steven P. Crossley

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1. PERSONAL

Birth Date May 22, 1982. US Citizen. Native American-registered member of Cherokee tribe.

1.1 Education

Oklahoma City University	Chemistry	B.S.: 2004
University of Oklahoma	Chemical Engineering	Ph.D.: 2009

(supervising professor-Daniel Resasco)

1.2 Honors and Awards

2007-Kokes Award recipient at 20th North American Catalysis Society national meeting
2012- NACS Travel grant to attend the 15th International Congress on Catalysis (ICC)
2014- ACS PRF DNI award
2017 NSF CAREER award
2017 Roger and Sherry Teigen President's Associates Presidential Professorship
2017 Sam A. Wilson Professorship in Chemical Engineering

1.2.1 Student Awards

Taiwo Omotoso: First place, hybrid oral/poster competition, Oklahoma EPSCoR Annual State Conference, April 10, 2012, Stillwater, Oklahoma.

- Award includes travel support for the student to attend the upcoming AIChE National Meeting October 28th - November 2nd, 2012 in Pittsburgh.

Nick Briggs:
Hughes Centennial Fellowship
Chevron scholarship 2015
Patrick L. Foster Graduate Fellowship 2016

Abhishek Gumidyala:
"Best presentation in session" for talk at AIChE Fall annual meeting
McNair's Choice for oral presentation during OU Student Research and Creativity Day
2nd place Oral presentation during OU Student Research and Creativity Day

Alejandra Gomez:
Best poster at Spring 2019 annual Great Plains Catalysis Society meeting
ICC travel award 2020

Tram Pham:
Chevron Scholarship – 2019
Marathon Oil Scholarship -2020

Han Chau:
Chevron Scholarship – 2020

Ana Jerdy:
Chevron Scholarship - 2020

1.3 Appointments

July 2017-present	Associate Professor, University of Oklahoma
August 2011-Present	Assistant Professor, University of Oklahoma
January 2010-July 2011	Associate Engineer, ConocoPhillips, Hydroprocessing Research
September 2010-December 2010	Associate Engineer, ConocoPhillips, Integrated Hydrocracking/FCC Research
June 2009-September 2010	Research Engineer, ConocoPhillips, Integrated Hydrocracking/FCC Research,
May 2008-July 2008	Research and Development Intern, ConocoPhillips, Advanced Hydrocarbon Fuels

1.4 Research Interests

Heterogeneous Catalysis:
Conversion of oxygenates over reducible metal oxides.
Biofuels upgrading, reactions at the water/oil interface, selective ring opening, fluid catalytic cracking, hydrocracking, nanostructured zeolite synthesis.

Nanotechnology:
Catalysis and surface science related with the growth and functionalization of carbon nanotubes. Applications include the production of catalyst supports as well as the functionalization of carbon nanotubes for molecular specific sensors and polymer compatibilizers.

1.5 Professional Memberships

American Institute of Chemical Engineers (AIChE); American Chemical Society (ACS); American Indian Science and Engineering Society (AISES); Great Plains Catalysis Society (SWCS); North American Catalysis Society (NACS).

2. RESEARCH ACTIVITIES

2.1 Publications

1. Quantifying the Influence of Water on the Mobility of Aluminum Species and Their Effects on Alkane Cracking in Zeolites. Pham, Tram N., Vy Nguyen, Bin Wang, Jeffery L. White, and Steven Crossley. " *ACS Catalysis* 11: 6982-6994.2021

2. Equilibrium catalyst from a fluidized catalytic cracking unit separated by metal content by using carbon nanotubes and a biphasic system.Briggs, Nicholas M., and Steven P. Crossley. *AIChE Journal* e17260. 2021

3. Interaction of water with zeolites: A review. Resasco, Daniel E., Steven P. Crossley, Bin Wang, and Jeffery L. White. " *Catalysis Reviews*: 1-61.2021

4. Polystyrene and poly (methyl methacrylate) interfaces reinforced with diblock carbon nanotubes. Seyni, Fatoumata Ide, Lawrence Barrett, Steven Crossley, and Brian P. Grady. *Polymer Engineering & Science* 61, no. 4: 1186-1194.2021

5. Methods of treatment and use of spent equilibrium catalyst. Crossley, Steven P., Nicholas M. Briggs, and Daniel E. Resasco. " U.S. Patent 10,946,371, issued March 16, 2021.

6. Selected contributions from symposium of catalytic conversion of biomass-derived oxygenates in 258th ACS National Meeting. Zhu, Xinli, Jimmy A. Faria, and Steven P. Crossley. *Catalysis today* 365: 142. 2021

7. Online Teaching of a Lab Course amid a Pandemic--A Challenge and an Opportunity. Gao, Jie, Steven P. Crossley, Matthias U. Nollert, Lance L. Lobban, and Dimitrios V. Papavassiliou. *Chemical Engineering Education* 55, no. 2: 76-84. 2021

8. Anisotropically Functionalized Nanotube Anchors for Improving the Mechanical Strength of Immiscible Polymer Composites Lawrence Barrett, Fatoumatat Ide Seyni, Mallikharjuna Rao Komarneni, John. A. Zapata-Hincapie, Daniel T. Glatzhofer, Brian P. Grady, and Steven Crossley. *ACS Applied Nano Materials*, 4, 1, 580-589, 2021

9. Structure and Catalytic Characterization of a Second Framework Al (IV) Site in Zeolite Catalysts Revealed by NMR at 35.2 T. Chen, Kuizhi, Sarah Horstmeier, Vy T. Nguyen, Bin Wang, Steven P. Crossley, Tram Pham, Zhehong Gan, Ivan Hung, and Jeffery L. White *Journal of the American Chemical Society* 142(16), 7514-7523, 2020

10. A Perspective on catalysis in solid acids, Ray Gorte and Steven Crossley, *Journal of Catalysis*, *375*, 524-530, 2019

11. Stabilization of furanics to cyclic ketone building blocks in the vapor phase, Taiwo Omotoso, Leidy V. Herrera, Tyler Vann, Nicholas M. Briggs, Laura A. Gomez,

Lawrence Barrett, Donald Jones, Tram Pham, Bin Wang, and Steven P. Crossley. *Applied Catalysis B: Environmental* 254, 491-499, 2019

12. Clarifying the multiple roles of confinement in zeolites: From stabilization of transition states to modification of internal diffusion rates. Steven P. Crossley, Daniel E. Resasco, and Gary L. Haller. *Journal of Catalysis,* 372, 382-387, 2019

13. Brønsted-Brønsted Synergies Between Framework and Non-Crystalline Protons in Zeolite H-ZSM-5, Kuizhi Chen, Maryam Abdolrahmani, Sarah Horstmeier, T. Pham, V. T. Nguyen, Michael Zeets, Bin Wang, Steven P. Crossley, and Jeffery L. White. *ACS Catalysis, 9*(7), 6124-6136 2019.

14. Solvent-Mediated Charge Separation Drives Alternate Hydrogenation Path of Furanics in Liquid Water Zheng Zhao , Mr. Reda Bababrik , Wenhua Xue , Yaping Li, Nicholas Briggs , Dieu-Thy Nguyen, Umi Nguyen, Steven Crossley, Sanwu Wang, Daniel Resasco *Nature Catalysis,* 5, 431 2019

15. Hydrogenation of o-Cresol at the Water/Pt(111) Interface Li, Yaping; Liu, Zhimin; Liu, Yingdi; Crossley, Steven; Jentoft, Friederike; Wang, Sanwu *Journal of Physical Chemistry C, 123(9), 5378-5384*, 2019

16. Identification of active sites on supported metal catalysts with carbon nanotube hydrogen highways Nicholas M Briggs, Lawrence Barrett, Evan C Wegener, Leidy V Herrera, Laura A Gomez, Jeffrey T Miller, Steven P Crossley *Nature Communications*, DOI: 10.1038/s41467-018-06100-9, 2018

17. Effect of hydrogen coverage on hydrogenation of o-cresol on Pt (111) Y Li, Z Liu, SP Crossley, FC Jentoft, S Wang *Applied Surface Science* 443, 575-580, 2018

18. Systems-Level Analysis of Energy and Greenhouse Gas Emissions for Coproducing Biobased Fuels and Chemicals: Implications for Sustainability AW Beck, AJ O'Brien, GG Zaimes, DE Resasco, SP Crossley, V Khanna *ACS Sustainable Chemistry & Engineering* 6 (5), 5826-5834, 2018.

19. Stable Pickering Emulsions using Multi-Walled Carbon Nanotubes of Varying Wettability. Nicholas Briggs, Ashwin Raman, Lawrence Barrett, Chase Brown, Brian Li, Devlin Leavitt, Clint Aichele and Steven Crossley. *Colloids and Surfaces A: Physiochemical and Engineering Aspects* 537, 227-235, 2018

20. A new finding for carbon nanotubes in polymer blends: Reduction of nanotube breakage during melt mixing. Jiaxi Guo, Nicholas Briggs, Steven Crossley, Brian P. Grady, *Journal of Thermoplastic Composite Materials* 0892705716681835, 31(1) 110-118, 2018.

21. Multistage torrefaction and in situ catalytic upgrading to hydrocarbon biofuels: analysis of life cycle energy use and greenhouse gas emissions. Gregory G Zaimes Andrew Beck, Rajiv Janupala, Daniel E. Resasco, Steven P. Crossley, Lance L. Lobban, Vikas Khanna *Energy & Environmental Science.* 10(5):1034-50, 2017

22. Trace water amounts can increase benzene H/D exchange rates in an acidic zeolite. Kuizhi Chen, Abhishek Gumidyala, Maryam Abdolrhamani, Cameron Villines, Steven Crossley and Jeffrey L. White, *Journal of Catalysis*, *351*, pp.130-135, 2017

23. Experimental and First-Principles Evidence for Interfacial Activity of Ru/TiO_2 for the Direct Conversion of m-Cresol to Toluene. Taiwo Omotoso, Byeongjin Baek, Lars C. Grabow, Steven Crossley, *ChemCatChem* 9(14), 2642-2651, **(selected for cover image)** doi:10.1002/cctc.201700157, 2017

24. Enhancing the Acylation Activity of Acetic Acid by Formation of an Intermediate Aromatic Ester. Nhung Dong, Bin Wang, Tawan Sooknoi, Steven Crossley and Daniel E. Resasco *ChemSusChem.* doi:10.1002/cssc.201700394 2017

25. Influence of Tapped Density on the Degradation Profile of Multiwall Carbon Nanotubes. John A. Zapata, Steven Crossley, and Brian P. Grady. *Thermochimica Acta* 654, 140145, 2017

26. Hydrogenation of o-cresol on platinum catalyst: Catalytic experiments and first-principles calculations. Yaping Li, Zhimin Liu, Wenhua Xue, Steven P. Crossley, Friederike C. Jentoft, Sanwu Wang, *Applied Surface Science 393*, 212-220 2017

27. A Systems-Level Roadmap for Biomass Thermal Fractionation and Catalytic Upgrading Strategies. Jeff Herron, Tyler Vann, Nhung Duong, Daniel Resasco, Steven Crossley, Lance Lobban, Christos Maravelias, *Energy Technology*, early view doi:10.1002/ente.201600147 2017

28. Direct carbon-carbon coupling of furanics with acetic acid over Brønsted zeolites. Abhishek Gumidyala, Bin Wang, Steven Crossley, *Science Advances* e1601072, 2016

29. Selective ketonization of acetic acid over HZSM-5: The importance of acyl species and the influence of water. Abhishek Gumidyala, Tawan Sooknoi, and Steven Crossley, *Journal of Catalysis*, 340, 76-84, 2016.

30. C-C Coupling for Biomass-Derived Furanics Upgrading to Chemicals and Fuels. Tuong Bui, Steven Crossley, and Daniel E. Resasco, in *Chemicals and Fuels from Bio-Based Building Blocks*, 431-494, 2016.

31. Zeolite-catalysed C–C bond forming reactions for biomass conversion to fuels and chemicals. Daniel E. Resasco, Bin Wang, and Steven Crossley, *Catalysis Science & Technology*, 6(8), 2543-2559, 2016.

32. Rapid growth of vertically aligned multi-walled carbon nanotubes on a lamellar support. Nicholas Briggs, and Steven Crossley *RSC Advances*, 5(102), 83945-83952, 2015.

33. Decoupling HZSM-5 Catalyst Activity from Deactivation during Upgrading of Pyrolysis Oil Vapors, Shaolong Wan, Christopher Waters, Adam Stevens, Abhishek Gumidyala, Rolf Jentoft, Lance Lobban, Daniel Resasco, Richard Mallinson, and Steven Crossley, *ChemSusChem* 8, no. 3, 552-559, 2015.

34. Epitaxial Growth of ZSM-5@ Silicalite-1: A Core–Shell Zeolite Designed with Passivated Surface Acidity, Arian Ghorbanpour, Abhishek Gumidyala, Lars C. Grabow, Steven P. Crossley, and Jeffrey D. Rimer. *ACS nano* 9, no. 4, 4006-4016, 2015

35. Implementation of concepts derived from model compound studies in the separation and conversion of bio-oil to fuel, Daniel E. Resasco, and Steven P. Crossley. *Catalysis Today* 257, 185-199, 2015.

36. Multiwalled Carbon Nanotubes at the Interface of Pickering Emulsions Nicholas M. Briggs, Javen S. Weston, Brian Li, Deepika Venkataramani, Clint P. Aichele, Jeffrey H. Harwell, and Steven P. Crossley. *Langmuir* 31, no. 48, 13077-13084, 2015

37. Morphology of polystyrene/poly (methyl methacrylate) blends: Effects of carbon nanotubes aspect ratio and surface modification Guo, Jiaxi, Nicholas Briggs, Steven Crossley, and Brian P. Grady. *AIChE Journal* 61, no. 10, 3500-3510, 2015

38. Gluconic Acid from Biomass Fast Pyrolysis Oils: Specialty Chemicals from the Thermochemical Conversion of Biomass. Santhanaraj, Daniel, Marjorie R. Rover, Daniel E. Resasco, Robert C. Brown, and Steven Crossley *ChemSusChem* 7, no. 11 3132-3137, 2014.

39. Generation of synergistic sites by thermal treatment of HY zeolite. Evidence from the reaction of hexane isomers, Anh T. To, Rolf E. Jentoft, Walter E. Alvarez, Steven P. Crossley, Daniel E. Resasco. *Journal of Catalysis*, 317, 11-21, 2014.

40. Understanding the role of TiO_2 crystal structure on the enhanced activity and stability of Ru/TiO_2 catalysts for the conversion of lignin-derived oxygenates Taiwo Omotoso, Sunya Boonyasuwat, Steven Crossley, *Green Chemistry*, 2014,16, 645-652

41. Ketonization of Carboxylic Acids: Mechanisms, Catalysts, and Implications for Biomass Conversion. Tu N. Pham, Tawan Sooknoi, Steven P. Crossley, Daniel E. Resasco, *ACS Catalysis*, 3(11), 2456-2473, 2013.

42. Conversion of Guaiacol over Supported Ru Catalysts, Sunya Boonyasuwat, Taiwo Omotoso, Daniel E. Resasco, Steven P. Crossley, *Catalysis Letters* 143 (8), 783, 2013.

43. Direct Conversion of Triglycerides to Olefins and Paraffins over Noble Metal Supported Catalysts, Martina Chiappero, Phuong Thi Mai Do, Steven Crossley, Lance L. Lobban, Daniel E. Resasco, *Fuel*, 90 (3), 1155-1165, 2011.

44. Catalytic Conversion of Anisole over HY and HZSM-5 Zeolites in the Presence of Different Hydrocarbon Mixtures, Teerawit Prasomsri, Anh T. To, Steven Crossley, Walter E. Alvarez, Daniel E. Resasco, *Applied Catalysis B: Environmental,* 106(1-2), 204-211, 2011.

45. Solid Nanoparticles that Catalyze Biofuel Upgrade Reactions at the Water/Oil Interface, Steven P. Crossley, Jimmy Faria, Min Shen, Daniel E. Resasco, *Science,* 327, 68-72, 2010.

46. Etherification of 2-methylpentanal on Supported Palladium Catalysts, Trung Pham, Steven P. Crossley, Tawan Sooknoi, Lance L. Lobban, Daniel E. Resasco, Richard G. Mallinson, *Applied Catalysis A: General*, 379 (1-2), 135-140, 2010.

47. Challenges and Opportunities for Catalysis Research in Biofuel Refining, Daniel E. Resasco, Steven Crossley, *AIChE CEP*, 105(5), 11, 2009.

48. Molecular Engineering Approach in the Selection of Catalytic Strategies For Upgrading

of Biofuels, Daniel E. Resasco, Steven P. Crossley, *AIChE Journal*, 55(5), 1082-1089, 2009.

49. Activity Inhibition By Nitrogen Compounds in the Simultaneous Hydrogenation of Polyaromatic Compounds over $NiMo/Al_2O_3$ Catalyst in the Presence of Sulfur, Andrea R. Beltramone, Steven Crossley, Daniel E. Resasco, Tushar Choudhary, and Walter E. Alvarez. *Catalysis Letters*, 123, 181-185, 2008.

50. A Novel Micropyrolyis Index (MPI) to Estimate Sooting Tendency of Fuels, Steven P. Crossley, Walter E. Alvarez, Daniel E. Resasco. *Energy and Fuels,* 22(4), 2455-2464, 2008.

51. Catalytic Strategies for Improving Specific Fuel Properties, Phuong Do, Steven Crossley, Malee Santikunaporn, and Daniel E. Resasco, *Catalysis* (Special Periodical Reports) Royal Society of Chemistry, 20, 33-64, 2007.

2.2 Presentations (presenter underlined)

1. Fuels and Chemicals from Renewable and Waste Feedstocks: Identifying Catalyst Active Sites in Complicated Environments Steven Crossley Chemical Engineering Departmental Seminar*,* Washington University of St. Louis February 19, 2021.

2. Catalysis for high value products from renewable and waste feedstocks Steven Crossley, Kenote at Chulalonghorn University organized PPC and PETROMAT VIRTUAL SYMPOSIUM 2021 *,* Bangkok Thailand, July 1, 2021

3. Decoupling the Kinetic Relevance of Surface Intermediates Involved in Selective Friedel Crafts Acylation over Bronsted Zeolites Han Chau, Ismaeel Alaq, Abhishek Gumidyala, Steven Crossley ACS Spring virtual annual meeting, April 5th 2021.

4. Selective conversion of carboxylic acids over promoted MoO_3 catalysts Alejandra Gomez, Reda Bababrick, Malli Komarneni, Steven Crossley ACS Catalysis division Chemists Live virtual event. September 25, 2020.

5. Confinement and diffusion within zeolites, Steven Crossley Great Plains Catalysis Society virtual annual meeting, September 18, 2020

6. Distinguishing the kinetic relevance of sites at a metal-support interface from promoter effects Nicholas Briggs, Lawrence Barrett, Alejandra Gomez, Leidy Herrera, Don Jones, Han Chau, Steven Crossley American Chemical Society Fall Annual Meeting August 25, 2019, San Diego, CA

7. Identification of active sites responsible for selective C-O cleavage on TiO2 supported catalysts, Nicholas Briggs, Lawrence Barrett, Alejandra Gomez, Leidy Herrera, Don Jones, Han Chau, Steven Crossley, North American Catalysis Society 26th North American Meeting, June 25, 2019, Chicago, IL

8. Conversion of renewable oxygenates to high value products over reducible oxides Steven Crossley, Catalysis Club of Philadelphia 2019 Spring Symposium, May 14, 2019, Claymont, DE

9. Selective furfural ring rearrangement reactions over TiO2 supported catalysts in the vapor phase Leidy Herrera, Alejandra Gomez, Tram Pham, Lawrence Barrett, Don Jones, Nicholas Briggs, Bin Wang, and Steven Crossley American Chemical Society Spring Annual Meeting March 31-April 4, 2019, Orlando, FL

10. Use of carbon nanotube hydrogen highways to identify active sites over metals supported on reducible oxides Lawrence Barrett, Nicholas Briggs, Alejandra Gomez, Don Jones, Valeria Herrera, Tram Pham, Han Chau, Steven Crossley American Chemical Society Spring Annual Meeting March 31-April 4, 2019, Orlando, FL

11. Conversion of renewable oxygenates to high value products over zeolites and reducible oxides, Steven Crossley, Winter Catalysis Workshop at the University of Toronto, Canada, December 11, 2018.

12. Unique active sites at the metal/support interface for the production of high value products from furanics, Alejandra Gomez, Leidy Herrera, Lawrence Barrett, Steven Crossley American Chemical Society Fall Annual Meeting August 20, 2018, Boston, MA.

13. Ring rearrangement reactions of furanic species over metals supported on reducible oxides Valeria Herrera, Alejandra Gomez, and Steven Crossley American Chemical Society Spring Annual Meeting March 18-22, 2018, New Orleans, LA

14. Influence of water on hydrocarbon conversion reactions in zeolites American Chemical Society Spring Annual Meeting Abhishek Gumidyala, Kenneth Teel, Jeffery L White, Bin Wang, Steven Crossley March 18-22, 2018, New Orleans, LA

15. Selective catalytic conversion of renewable oxygenates to high value products over zeolites and reducible oxides, Steven Crossley, Departmental Seminar at Iowa State University, Chemical Engineering Department, November 9, 2017. Ames, Iowa.

16. Catalytic conversion of renewable oxygenates to high value products over zeolites and reducible oxides, Steven Crossley, Departmental Seminar at University of Maine, Chemical Engineering Department, October 13, 2017. Orono, Maine.

17. Mechanism and Kinetics of Direct Acylation of Furanic and Phenolic Species with Carboxylic Acids, Abhishek Gumidyala, Bin Wang, and Steven Crossley AIChE Annual Meeting, October 30, 2017, Minneapolis, Minnesota.

18. Reaction Mechanisms Responsible for the Selective Vapor Phase Rearrangement of Furanics, Valeria Herrera, Nicholas M. Briggs, Bin Wang and Steven Crossley AIChE Annual Meeting, October 31, 2017, Minneapolis, Minnesota.

19. Influence of water on furfural ring rearrangement reactions Leidy Herrera, Nicholas Briggs, Bin Wang, Steven Crossley American Chemical Society Fall Annual Meeting, August 20-24, 2017, Washington, DC.

20. Influence of co-adsorbates on metal-reducible oxide interfacial sites for selective C-O cleavage reactions *Leidy Herrera[1], Taiwo Omotoso[1], Nicholas Briggs[1], Lars Grabow[2], Steven Crossley* American Chemical Society Fall Annual Meeting, August 20-24, 2017, Washington, DC

21. Targeted catalytic upgrading of simplified streams produced from staged biomass degradation, Steven Crossley, International Young Scientist Symposium on Catalytic Biomass Conversion (IYCBC), July 16-18, 2017, Dalian, China.

22. Mechanism and kinetics of direct C-C coupling of acetic acid with renewable oxygenates over Brønsted zeolites, Abhishek Gumidyala, Bin Wang, Steven Crossley North American Catalysis Society Meeting, June 4-9, 2017, Denver, CO.

23. A System-Level Analysis on Biomass Thermal Fractionation and Catalytic Upgrading Processes Jeffrey A. Herron, Wangyun Won, Daniel E. Resasco, Steven Crossley and Christos T. Maravelias AIChE Annual Meeting, November 13-18, 2016, San Francisco, CA

24. Multistage Torrefaction of Biomass and in Situ Catalytic Upgrading to Hydrocarbon Biofuels and Specialty Biochemicals George G. Zaimes, Andrew Beck, Daniel E. Resasco, Steven Crossley, Lance Lobban and Vikas Khanna AIChE Annual Meeting, November 13-18, 2016, San Francisco, CA

25. The Influence of Water on Metal/Oxide Perimeter Sites for the Selective Conversion of Phenolic and Furanic Species over Ru/TiO2 Nicholas M. Briggs, Taiwo Omotoso, Tyler Vann, Valeria Herrera and Steven Crossley AIChE Annual Meeting, November 13-18, 2016, San Francisco, CA

26. Kinetics and Mechanism of Ketonization of Acetic Acid on HZSM-5 Catalyst Abhishek Gumidyala, Tawan Sooknoi, Bin Wang and Steven Crossley AIChE Annual Meeting, November 13-18, 2016, San Francisco, CA

27. Direct Carbon-Carbon Coupling of Furanics with Acetic Acid over BrøNsted Zeolites Abhishek Gumidyala, Bin Wang and Steven Crossley AIChE Annual Meeting, November 13-18, 2016, San Francisco, CA

28. Effect of Solid Particles on Interfacial Rheology and Transient Stability of Water-in-Oil Emulsions Ashwin Yegya Raman, Jarred Kelsey, Nicholas Briggs, Jeff White, Steven Crossley and Clint P. Aichele AIChE Annual Meeting, November 13-18, 2016, San Francisco, CA

29. Kinetics of C-C coupling of carboxylic acids via ketonization and acylation over zeolites, Abhishek Gumidyala, Manasa Godavarthy, Bin Wang, and Steven Crossley American Chemical Society Fall Annual Meeting, Philadelphia, PA, August 21-23, 2016

30. Identification of active sites responsible for the conversion of phenolics, Steven Crossley American Chemical Society Fall Annual Meeting, Philadelphia, PA, August 21-23, 2016

31. Influence of Biomass derived do-adsorbates on furfural conversion over Ru/TiO_2. Steven Crossley American Chemical Society Fall Annual Meeting, Philadelphia, PA, August 21-23, 2016

32. Heterogeneous catalysis in biphasic systems, Steven Crossley American Chemical Society Spring Annual Meeting, San Diego, CA ,March 15th, 2016

33. Mechanism and Kinetics of C-C bond forming reactions with carboxylic acids over Bronsted acid sites, Steven Crossley, American Chemical Society Spring Annual Meeting, San Diego, CA ,March 15th, 2016

34. Conversion of carboxylic acids over zeolites, Steven Crossley American Chemical Society Fall Annual Meeting, Boston, MA August 16-20, 2015.

35. Mechanism and kinetics of acetic acid ketonization over zeolites, Abhishek Gumidyala, Manasa Godavarthy and Steven Crossley, American Chemical Society Spring Annual Meeting, Denver, CO March 22-26, 2015.

36. Role of TiO_2 defects and the Ru/TiO_2 interface on the conversion of phenolics, Steven Crossley and Taiwo Omotoso, American Chemical Society Spring Annual Meeting, Denver, CO March 22-26, 2015.

37. Conversion of Furfural to Cyclopentanone over Ru/TiO_2, Tyler Vann, Taiwo Omotoso, Nicholas Briggs and Steven Crossley, AIChE Annual Meeting, November 8-13, 2015, Salt Lake City, UT

38. Controlled Reaction Selectivity Using Functionalized Silica in Biphasic Systems, Nicholas M. Briggs, Javen Weston, Zheng Zhao, Deepika Venkataramani, Clint P. Aichele, Jeffrey Harwell, Daniel E. Resasco and Steven Crossley, AIChE Annual Meeting, November 8-13, 2015, Salt Lake City, UT

39. Kinetics of C-C Coupling Reactions with Carboxylic Acids and Oxygenates over Zeolites, Abhishek Gumidyala, Manasa Godavarthy, Tyler Vann, Bin Wang and Steven Crossley, AIChE Annual Meeting, November 8-13, 2015, Salt Lake City, UT

40. Environmental Life Cycle Evaluation of Multistage Torrefaction and Pyrolysis for Biofuel Production, George G. Zaimes, Nemi Vora, Daniel E. Resasco, Vikas Khanna and Steven Crossley, AIChE Annual Meeting, November 8-13, 2015, Salt Lake City, UT

41. Investigating Emulsion Stability and the Impact of Surfactant Type on Transient Emulsion Behavior Using Diffusion Nuclear Magnetic Resonance Techniques, Deepika Venkataramani, Jarred Kelsey, Ashwin Kumar, Jeff White, Nicholas Briggs, Steven Crossley and Clint P. Aichele, AIChE Annual Meeting, November 8-13, 2015, Salt Lake City, UT

42. Prediction of the Impact of Water Fraction on Emulsion Behavior Using Quantitative Structure-Property Relationship (QSPR) Modeling, Menelik Negash, Deepika Venkataramani, Ashwin Kumar, Clint P. Aichele, Nicholas Briggs, Steven Crossley and B. J. Neely, AIChE Annual Meeting, November 8-13, 2015, Salt Lake City, UT

43. Synthesis of ZSM-5 Nanoparticles Encapsulated within an Ultrathin Silicalite-1 Coating of Tunable Thickness, Arian Ghorbanpour, Abhishek Gumidyala, Lars C. Grabow, Steven Crossley and Jeffrey D. Rimer, AIChE Annual Meeting, November 8-13, 2015, Salt Lake City, UT

44. Conversion of carboxylic acids over zeolites, Abhishek Gumidyala, Manasa Godavarthy Steven Crossley North American Catalysis Society 24th North American Meeting, Pittsburgh, PA June 14-19, 2015.

45. Conversion of phenolics over metals supported on reducible oxides Steven Crossley, Taiwo Omotoso, and Nick Briggs ACS Fall Annual Meeting 2014, San Francisco, CA August 12, 2014.

46. Scalable synthesis and applications of functionalized carbon nanotubes Steven Crossley Seminar to Materials Research AFRL/RX, Wright Patterson Air Force Base, Dayton, Ohio, October 24, 2014

47. Carbon nanotubes as heterogeneous catalyst supports: from biphasic reactions to simplifying complex catalytic systems, Steven Crossley Departmental seminar presented to Kansas State Chemical Engineering Department, November 11, 2014.

48. Effect of Temperature and Role of Water on Acetic Acid Conversion over HZSM5 Abhishek Gumidyala, Tawan Sooknoi, and Steven Crossley, ACS Pentasectional Annual Meeting, Stillwater, Oklahoma April 12, 2014

49. Stabilization of Bio-Oil Fractions for Insertion into Petroleum Refineries Puridej Warakunwit, Nhung Duong, Tu Pham, Shaolong Wan, Daniel Santhanaraj, Ed Sughrue, Steven P. Crossley and Daniel E. Resasco ACS Pentasectional Annual Meeting, Stillwater, Oklahoma April 12, 2014

50. Understanding the Role of Various Active Sites for the Conversion of Catechol on Ru/TiO_2 Taiwo Omotoso and Steven Crossley. ACS Pentasectional Annual Meeting, Stillwater, Oklahoma April 12, 2014

51. Changing Physical Characteristics of Vertical Carbon Nanotubes Grown Between Mica Sheets, Nicholas Briggs and Steven Crossley. ACS Pentasectional Annual Meeting, Stillwater, Oklahoma April 12, 2014

52. Role of acid site proximity on the mechanism of acetic acid conversion over HZSM-5, Abhishek Gumidyala, Tawan Sooknoi, and Steven Crossley, ACS Spring Annual Meeting, March, 2014

53. Conversion of lignin-derived phenolics over Ru/TiO2: Catalyst stability under oxidizing conditions and nature of active sites. Taiwo Omotoso and Steven Crossley, ACS Spring Annual Meeting, March, 2014

54. Kinetics and mechanism for the ketonization of carboxylic acids with different carbon chain lengths on Ru/TiO2 catalysts. D. E. Resasco, T. N. Pham, S. P. Crossley, T. Sooknoi ACS Spring Annual Meeting, March, 2014

55. Deactivation of catalysts during upgrading of pyrolysis vapors. S. Wan, C. Waters, A. Stevens, A. Gumidyala, R. Jentoft, L. Lobban, D. Resasco, S. Crossley, R. Mallinson ACS Spring Annual Meeting, March, 2014

56. Catalytic conversion of biomass to fuels: Active sites required for the conversion of light acids and phenolics, Steven Crossley Invited talk at annual Southwest Catalysis Society meeting in Houston, TX. April 25, 2014

57. A step toward increasing the length of long V-MWNT arrays and increasing production of carbon nanotubes, Nick Briggs and Steven Crossley, Nanotechology for Defense Conference, November 4-7, 2013

58. Understanding the active sites required for the production of renewable fuels and chemicals from biomass, Steven Crossley, Departmental Seminar presented to Chemical Engineering Department at University of Houston, October 04,2013.

59. Understanding the catalytically active sites required for the production of fuels from biomass, Steven Crossley, Departmental Seminar presented to Chemical Engineering Department at Oklahoma State University , October 15,2013.

60. Role of Competitive Adsorption On Conversion of Bio Oil Surrogate Streams Over Ceria Zirconia and Ni/Ceria Zirconia Joseph Hart, Tawan Sooknoi, Daniel E. Resasco, Richard Mallinson and Steven Crossley 2013 AIChE Annual Meeting, November 3-8, 2013.

61. Mechanism of Ketonization of Acetic Acid Over Reducible Oxides and Zeolites Tu N. Pham, Abhishek Gumidyala, Tawan Sooknoi, Daniel E. Resasco and Steven Crossley, 2013 AIChE Annual Meeting, November 3-8, 2013.

62. The Effect of Long Multi-Walled Carbon Nanotubes On Morphology in Solution-Cast Blends Brian P. Grady, Steven Crossley, Nicholas Briggs and Jiaxi Guo 2013 AIChE Annual Meeting, November 3-8, 2013.

63. Effects of Reactor Configurations and Catalyst Properties on HZSM5 Catalyzed Upgrading of Biomass Pyrolysis Vapors, Shaolong Wan, Christopher Waters, Abhishek Gumidyala, Rolf Jentoft, Lance Lobban, Steven Crossley, Daniel Resasco, and Richard Mallinson 2013 AIChE Annual Meeting, November 3-8, 2013.

64. Kinetics and Mechanism of Acetic Acid Ketonization on Ru/TiO_2 Tu N Pham, Dachuan Shi, Tawan Sooknoi, Steven Crossley and Daniel E. Resasco, 23rd North American Catalysis Society Meeting June 2-7, 2013, Louisville, Kentucky

65. Effect of Co-feeding Phenolic Compounds on Catalytic Cracking of Hexane Isomers over USY Zeolite Anh To, Rolf E. Jentoft, Steven Crossley, Walter Alvarez and Daniel E. Resasco 23rd North American Catalysis Society Meeting June 2-7, 2013, Louisville, Kentucky

66. Understanding the Role of Various Active Sites on the Conversion of Lignin-Derived Phenolics on Ru/TiO_2 Taiwo Omotoso and Steven Crossley. 23rd North American Catalysis Society Meeting June 2-7, 2013, Louisville, Kentucky

67. Catalytic Upgrading of Pyrolysis Bio-oils, Steven Crossley, Lance Lobban, , Daniel Resasco, Richard Mallinson, Sub Gollahalli, Kumar Parthasarathy, 2013 DOE BETO Project Peer Review, Alexandria, VA, May 23, 2013.

68. Ru/TiO_2 Based Catalysts as Applied to the Upgrading of Bio-Oils Sunya Boonyasuwat, Taiwo Omotoso, Tu N. Pham, Daniel E. Resasco and Steven Crossley 2012 AICHE Annual Meeting, October 28-November-2.

69. Improved stability of Ru/TiO2 catalysts for the conversion of phenolics from bio-oil S. Boonyasuwat, S. Wan, S.P. Crossley, R.G. Mallinson, D.E. Resasco, 15th International Congress on Catalysis 2012 July 01-06, Munich/Germany.

70. Biofuels Research at the University of Oklahoma, Steven Crossley, Other Institutions of Higher Education (OIHE)- Minority Serving Institutions (MSI) Symposium. McAllen, Texas, February 20, 2012.

71. The Role of Bifunctional Catalysts on the Upgrading of Biomass Pyrolysis Oil Vapors. Steven Crossley, Oklahoma EPSCoR Teleconference. February 15, 2012.

72. The Role of Acidic Support on the Catalytic Upgrading of Bio-Oils. Steven Crossley, Sunya Boonyasuwat, Daniel Resasco, 2011 AIChE Annual Meeting, October 16-21, 2011.

73. OU Research Capabilities in Nanotechnology. Steven Crossley, Presentation to Scott Air Force Base, August 31, 2011.

74. Model compound studies of small aldehyde condensation reactions, Steven Crossley, Quincy Amen, Trung Pham, Lance Lobban, Richard Mallinson, and Daniel E. Resasco. 237th American Chemical Society National Meeting, March 22-26, 2009.

75. Catalytic strategies for upgrading of fuels from conventional and renewable resources, Steven Crossley, Surapas Sithisa, Phuong Do, Trung Pham, and Daniel E. Resasco. 237th American Chemical Society National Meeting, March 22-26, 2009.

76. Impact of Oxygen Incorporation In Molecular Structure on Pyrolytic Soot Formation and Oxidizability, Steven P. Crossley, Maria Pilar Ruiz, Liang Zhang, and Daniel E. Resasco, 2008 AICHE Annual Meeting, November 16-21, 2008.

77. Applications of a Micropyrolysis Index (MPI) towards Molecular Engineering of Fuels, Steven P. Crossley, Maria Pilar Ruiz, Liang Zhang, and Daniel E. Resasco. 2008 AICHE Annual Meeting, November 16-21, 2008.

78. Development of a Coke Index for estimating PM emissions, Steven Crossley and Daniel E. Resasco. North American Catalysis Society - 20th North American Meeting, June 17-22, 2007.

79. Prediction of Hydrogenolysis Product Selectivity of Various Model Hydrocarbons over Ir/Al_2O_3, Steven P. Crossley, Phuong T. Do, Siraprapha Dokjampa, and Daniel E. Resasco, North American Catalysis Society - 20th North American Meeting, June 17-22 2007.

80. Development and Prediction of a New Fuel Property to Measure PM Emissions, Steven Crossley and Daniel E. Resasco. Spring AICHE 2007 Spring National Meeting, April 22-26.

81. Conversion of Biodiesels to Normal Diesels, Steven Crossley, Phuong T. Do, Tanate Danuthai, Somchai Osuwan, and Daniel E. Resasco, AICHE 2007 National Meeting, November 4-9.

2.3 Intellectual Property

Patent Application: Docket No. 5837.150, U.S. Serial No. 15/703,332
METHODS OF TREATING SPENT EQUILIBRIUM CATALYST
Crossley, Briggs, Resasco
Date of Patent Application Filed September 13, 2017, Published March 15, 2018

Provisional Patent: U.S. Serial No. 62/393,931
METHODS OF TREATING SPENT EQUILIBRIUM CATALYST
Crossley, Briggs, Resasco
Date of Provisional Patent Filing: September 13, 2016

Invention Disclosure # 12NOR034
Grady, B., Crossley, S., Guo, J., Briggs, N., *Chemical Functionalized Block Carbon Nanotubes*, Disclosed November 2012.

Invention Disclosure#16NOR011
Crossley, S.and Briggs, N. *Separation of ECAT by metals content,* Disclosed September 2015

2.4 Research Funding
Total research funding awarded (accounting for % of each grant allocated to Crossley) from 2012-2021 (including commitments through 2024) = **$4,080,295.** This amounts to $10,729,856 in cumulative funds going to support research at OU based on grants I have served as PI or co-PI on.

Cumulative research expenditures 2012-2020 ($2,782,196)

Current Projects:

Steven Crossley, PI Polymer Decomposition continuation Funding Agency: Chevron Phillips Chemical Company, Funding Period: 8/2021-8/2023, Funding Amount: $164,000.

Steven Crossley, (PI) *EFRI E3PI: Tuning catalyst design to recycle mixed polymer streams* Funding Agency: NSF, Funding Period 1/2021-12/2024, Funding Amount: $1,999,987

Steven Crossley, (co-PI) *Manufacture of inexpensive carbon nanotubes* Funding Agency: NSF, Funding Period: 8/2020-7/2023, Funding Amount: $498,714

Steven Crossley, (co-PI) *Dehydrocyclization and hydride transfer reactions* Funding Agency: Phillips 66, Funding period: 1/2020-1/2024, Funding Amount: $780,000 (total to OU)

Steven Crossley, (co-PI) *Moisture effects on zeolite-based catalysts* Funding Agency: Phillips 66, Funding period: 1/2020-1/2024, Funding Amount: $160,000 (total to OU)

Steven Crossley, (PI) *Polymer Decomposition* Funding Agency: Chevron Phillips Chemical Company, Funding Period: 8/2019-8/2021, Funding Amount: $130,000.

Steven Crossley, (PI with Resasco) *Evaluating site requirements for direct Friedel-Crafts acylation with carboxylic acids over zeolites* Funding Agency: UOP, Funding Period: 4/19-4/20 Funding Amount: $55,000.

Steven Crossley, (OU PI, with 2 others) Collaborative Research: Understanding an Active and Beneficial Role for Water in Solid-Acid Catalyzed Hydrocarbon Chemistry, NSF, Funding Period: 8/18-8/21 Funding Amount: $598,151-OU portion

Steven Crossley, (PI) *SusChEM:CAREER: Using unique synthesis techniques and reaction kinetics to quantify and manipulate catalytically active sites in metal-reducible oxide systems*, Funding Agency: NSF, Funding Period: 3/17-3/22 Funding Amount: $548,829

Steven Crossley (OU PI) with Bond (Syracuse) - Collaborative Research: SusChEM: Phase-specific catalysis combined with reactive distillation for the selective production of butadiene from y-valerolactone (OU PI, Bond- Syracuse PI) Funding Agency: NSF Funding Period: 8/16/16-8/15/19 Funding Amount: $174,998 -OU part

Steven Crossley (co-PI, Brian Grady, OU, PI.) *Manufacture and Use of Block Nanotubes as polymer blend compatibilizers and emulsion stabilizers* Funding Agency: NSF Funding period: 8/2014-8/2018. Funding Amount: $406,309.

Steven Crossley (PI) *Naphthenic Acid Ketonization Mechanisms over Zeolites* Funding Agency: American Chemical Society (PRF-DNI) Funding Period: 2014-2017 Funding Amount: $100,000

Steven Crossley (co-PI, Daniel Resasco, OU, PI) *Fractionation and Catalytic Upgrading of Bio-Oil* Funding Agency: DOE FOA: Carbon, Hydrogen and Separation Efficiencies in

Bio-Oil Conversion Pathways (CHASE Bio-Oil Pathways) Funding Period: 2013-2017 Funding Amount : $2,393,370.00

Steven Crossley (co-PI, Akwasi Boateng, USDA, PI) (Crossley-OU subcontract PI) *Distributed On-Farm Bioenergy, Biofuels and Biochemicals (FarmBio3) Development and Production via Integrated Catalytic Thermolysis* Funding Agency: USDA Funding Opportunity Number: USDA-NIFA-9008-003828 Funding Period: 2012-2017 Funding Amount: ($299,880-OU portion)-Crossley $100,000/yr for 2 years

Minor Awards:
Steven Crossley (Co-PI) Supplement REU Synthesis of Block Nanotubes Using Scalable Methods and Their Application as Interfacial Modification Moieties Funding Agency: NSF Funding Period: 1/5/15-7/31/17 Funding Amount: $5,000

Steven Crossley (PI) -Broadening Participation Award *Enhanced Stability of Titania Based Catalysts through Oxide and Carbon Nanotube Coatings* Funding Agency: NSF (EPSCoR) Funding Period: 6/11/12-8/11/12 Funding Amount: $4,400

Steven Crossley (PI) –Travel grant to attend the 15th International Congress on Catalysis (ICC) Funding Agency: North American Catalysis Society with funding from a variety of sources (NSF, DOE) and industry (Dow Chemical Co., BASF, BP, SudChemie) Funding Period: 6/30/12-7/6/12 Funding Amount: $2,000

Past Projects:
Steven Crossley (co-PI, Daniel Resasco, OU, PI) *Center for Interfacial Reaction Engineering (CIRE)* + *Proposal for Renewal* Funding Agency: DOE/EPSCoR Funding Amount (sum=$749,074-Crossley portion)

Steven Crossley PI, *Acquisition of a Micro Pyrolysis Unit and GCMS for Biomass Catalytic Conversion* Funding Agency: NSF/EPSCoR Funding Period: 6/1/13-11/30/13 Funding Amount: $110,000

Steven Crossley (co-PI, Robert Brown, ISU, PI) (#12804) *Stabilization of Bio-Oil Fractions for Insertion into Petroleum Refineries* Funding Agency: DOE Funding Period: 3/1/13-2/28/14 Funding Amount: $750,000 (OU portion-$300,000)-Crossley Portion $125,000 +1-month summer support (8.3% time commitment)

Steven Crossley (co-PI, Lance Lobban, OU, PI) *Development of a Process Model for the Conversion of Biomass to Boiler Fuel* Funding Agency:Science Applications International Corporation Funding Period: 1/1/12-12/31/12 Funding Amount: $50,000

2.5 Supervision and Mentoring of Research Students

2.5.1 Doctoral Students

1. Taiwo Omotoso (August 2011-December 2015) *Now at Intel* Ph.D. December 2015→ *Understanding the role of various active sites on the vapor phase conversion of oxygenates over Ru/TiO_2. (now at Intel)*

2. Nicholas Briggs (September 2011-Graduated May 2016) Now at *LyondellBasell*→ *Controlled growth and functionalization of vertically aligned carbon nanotubes for applications in catalysis.*

3. Abhishek Gumidyala (January 2013-Graduated June 2017) (*now at Intel)*→ completed M.S. in 2015, now pursuing Ph.D. *Role of various acid sites in ZSM-5 on the conversion of model oxygenates.*

4. Jie Chen (with Dave Schmidtke) (Graduated Fall 2014)→Ph.D. *Development of Nano-Structured Enzymatic Biofuel Cells. (current Post doctoral associate at University of North Texas at Dallas)*

5. Lawrence Barrett Ph.D. (August 2014-Jan 2019) *Scalable synthesis of block functionalized carbon nanotubes (current Post doctoral associate at OU)*

6. Tram Pham June 2018-present→Ph.D. Role of water on the mechanism of hydrocarbon conversion reactions in zeolites

7. Don Jones August 2018-present→ Ph.D. Synthesis of multifunctional carbon nanotubes as unique catalyst supports

8. Han Chau August 2018-present→ Ph.D. Identifying mechanisms responsible for selective acylation reactions in zeolites

9. Ismaeel Alalq Spring 2019-present→Ph.D. Coupling of carboxylic acids over zeolite catalysts

10. Alejandra Gomez Fall 2019-present→Ph.D. Selective deoxygenation reactions of acids over reducible oxides.

11. Ana Carolina Roncoli Jerdy Fall 2019-present → Ph.D. Identifying role of additives on polymer degradation kinetics

2.5.2 Masters Students

1. Tyler Vann (August 2013-graduated May 2016)→M.S. *Catalytic upgrading of biomass torrefaction vapors. (current at Phillips 66)*

2. Manasa Godavarthy M.S. (January 2014-graduated May 2016) *Understanding the mechanism of ketonization of carboxylic acids over zeolties*

3. Tania Vietery Erazo M.S. (graduated December 2016)

4. Chase Brown M.S. (August 2013-graduated May 2016) *Quantification and characterization of defects resulting from the functionalization of multiwalled carbon nanotubes. Now at University of Oklahoma HSC*

5. Adam Stevens M.S. (August 2013-graduated May 2015), now at Chemical Products Industries*), Zeolite upgrading of biomass pyrolysis vapors.*

6. Valeria Herrera M.S. (August 2015- graduated August 2017) (now at Powercosts incorporated) *Vapor phase furfural ring rearrangement*

7. Mounica Chidurala M.S. (August 2016-May 2018) (Now at Marian University) Selective decarbonylation and dehydration of pentenoic acid to produce specialty chemicals

8. Kenneth Teel M.S. *(June 2017-present*) Kinetic role of water on alkane cracking in zeolites.

9. Ismaeel Alaq *August 2017- Sp 2019→ (switched to Ph.D. in Spring 2019)* Direct acylation with carboxylic acids over zeolites

10. Alejandra Gomez August 2017-Fall 2019→(Switched to Ph.D. Fall 2019) Kinetics of selective deoxygenation of carboxyilic acids to produce olefins

11. Caleb Bavlnka *August 2020-present*. Selective synthesis of multifunctional nanotubes as catalyst supports for polymer decomposition

Post Doctoral researchers

Daniel Santhanaraj→ (Feb 2014-Spring 2015)
oxidation of biomass derived species for the conversion to fuels and chemicals. (Co supervised- Resasco-Crossley) (Now *Assistant Professor at Loyola College)*

Zhimin Liu →(2015) *in-situ analysis of cresol hydrodeoxygenation (now at Charles River Laboratories.)*

Taiwo Omotoso (Spring 16-Summer 16, now at Intel)

Nicholas Briggs (Summer 2016 to May 2017, now at LyondellBasell)

Mohannad Kadhum→ (2015) *with Jeff Harwell and Ben Shiau- partial oxidation at an oil water interface via responsive nanotube carriers.*

Reda Bababrik (January 2020-present) Evaluating role of RE and P cations on hydrocarbon cracking reactions

2.5.2 Undergraduate Students

1. William Campbell-OU Chemical Engineering-(Spring 2012)
2. Issac Schneberger- SWOSU-Chemistry-(Summer 2012)
    a. *Subsequently graduated from OU graduate CBME program with MS*
3. Brandon Bonk-OU Chemical Engineering-(Summer 2012-Summer 2013)
4. Dillon Kang- Summer 2013
5. Bree Cooper-OU Chemical Engineering- (Fall 2013-present)

6.Devlin Leavitt-OU Chemical Engineering-(Spring 2014-Summer 2014)
7.Brian Li-OU Chemical Engineering- (Fall 2012-Spring 2014)
8.Alex Schwans- OU Chemical Engineering- (Spring 2013-Spring 2015)
9.Nick Bray- OU Chemical Engineering- Fall 2014
10. Jared Dopp-OU Chemical Engineering-POE scholar (Spring 2015)
11. Allison Nguyen – OU Chemical Engineering- HERE program (Spring 2015)
12. Paulina Del Rio- OU Chemical Engineering (Spring 2015-present)
13. Kylie Tommaney- OU Chemical Enginerring HERE program (Spring 2015)
14. Trace Youngman- OU Chemical Engineering (Fall 2015)
15. Ean G Beyer (HERE program Spring 2017-2018)
16. Max William Daniels (HERE program Spring 2017-2018)
17. Elizabeth Christine Lankford (HERE program Spring 2017-2018)
18. Anna-Claire Carlton (HERE program Spring 2017-2018)
19. Jacob A Groh (HERE program Spring 2017)
20. Joshua Smelser (Fall 2017-2018)
21. Priyanka Priyadarshini (Fall 2017-2018)
22. Shane Muselmann (Fall 2017-2018)
23. Pheobe Staton (Fall 2017-2018)
24. Cameron Werner (HERE Program Spring 2018)
25. Jordan Sylvester (HERE program Spring 2018)
26. Rose Marinaro (HERE program Spring 2018)
27. Jennifer Alejandra Patricia Gutierrez Alarcon (Fall 2019)
28. Sa'cha Sells (Fall 2019)
29. Gabrielle Nguyen (Spring 2020)
30. Elina Avila (Spring 2020)
31. Gracyn Reynolds (Spring 2020-present)
32. Caleb Bavlnka (Spring 2020-present)
33. Andres Gonzalez (Spring 2021-present)

3. TEACHING

3.1 Courses Taught at OU:

Semester	Course Number	Course Name	Enrollment
Spring 2012	ChE 3432	Unit Operations Lab	20
Fall 2012	ChE 4262	Chemical Engr. Design Lab	16
Fall 2012	ChE 6273	Adv. Kinetics & Reaction Engr.	12
Spring 2013	ChE 3432	Unit Operations Lab	19
Fall 2013	ChE 4262	Chemical Engr. Design Lab	16
Spring 2014	ChE 4273	Advised 2 capstone groups	8
Fall 2014	ChE 6273	Adv. Kinetics & Reaction Engr.	19
Spring 2015	ChE 3432(x2)	Unit Operations Lab (2 sections)	40
Spring 2015	ChE 4273	Advised 3 capstone groups	16
Spring 2016	ChE 3432(x2)	Unit Operations Lab (2 sections)	40
Fall 2016	Che 6273	Adv. Kinetics & Reaction Engr.	11
Spring 2017	ChE 3432(x2)	Unit Operations Lab (2 sections)	40
Spring 2018	ChE 3432(x2)	Unit Operations Lab (2 sections)	40
Fall 2018	ChE 6723	Adv. Kinetics & Reaction Engr.	14
Spring 2019	ChE 5970	Refining Principles	20
Fall 2019	ChE 6723	Adv. Kinetics & Reaction Engr.	13
Spring 2020	ChE 3432	Unit Operations Lab	20
Spring 2021	ChE 5223	Refining Principles	14

Honors Research:	Student name(s)
Fall 2013	Brian Li
Spring 2014	Alex Schwans
Spring 2015	Allison Nguyen
Spring 2015	Kylie Tommaney
Spring 2017	Ean Bayer, Max Daniels, Ellie Lankford, Anna-Claire Carlton, Jacob Groh
Spring 2018	Cameron Werner, Jordan Sylvester, Rose Marinaro
Spring 2020	Gabrielle Nguyen, Elina Avila, Gracyn, Reynolds,Caleb Bavlnka
Spring 2021	Andres Gonzalez

Additionally, twice served as guest lecturer for Catalysis (ChE5163) in Fall 2011-(Enrollment=24) topics covered-temperature programmed techniques and x-ray photoelectron spectroscopy.

4. SERVICE

4.1 Departmental

Served on committee charged with evaluating chemistry laboratory requirements for ChE undergraduate student curriculum (2019-2020)

Served as Advisor for Senior Standard Chemical Enginering Students (Fall 2014–Spring 2015)

Served on faculty search committee (Fall 2014-2016)

Served as Advisor for Junior Standard Chemical Engineering Students (Fall 2013-Fall 2014)

Served as Advisor for Sophomore Standard Chemical Engineering Students (Fall 2012-Spring 2013).

Served as Advisor to Freshman Standard Chemical Engineering Students + all Standard option transfer students. (Fall 2011-Spring 2012)

Assisted during advising sessions for Junior + Senior Chemical Engineering Students (Fall 2011)

Served on voluntary safety committee (Spring 2012-present)

Served as Faculty advisor for Chemical Engineering Graduate Student Society (Summer 2013-Fall 2014)

Served on Safety in undergraduate curriculum committee (Fall 2013-present)

Served as graduate student recruiter (Spring 2014-present)
-tasked with improving graduate student recruiting for Chemical Engineering in collaboration with graduate liaison

Served as committee member for the following graduate students:
(committee chair in italic)

- James Brown- M.S. Chemical Engineering (2011)
- Kyle Elam- M.S. Chemical Engineering (2012)
- Issariya Chirddilok- M.S. Chemical Engineering (2012)
- Paula Zapata- M.S. Chemical Engineering (2012)
- Lei Nei- Ph.D. Chemical Engineering (Spring 2014)

- Mohannad Kadhum- Ph.D Chemical Engineering (Fall 2013)
- Ajay Raj- M.S. Chemical Engineering (Spring 2013)
- Ali Mehdad- Ph. D. Chemical Engineering (Fall 2013)
- *Taiwo Omotoso-Ph.D. Chemical Engineering (2015)*
- *Nick Briggs- Ph.D. Chemical Engineering (in progress)*
- Rich Gude- M.S. Chemical Engineering (Fall 2013)
- Tu Pham-Ph.D. Chemical Engineering (Spring 2014)
- Dachuan Shi- Ph.D. Chemical Engineering (Fall 2013)
- Christoher Waters Ph.D. Chemical Engineering (In progress)
- Joseph Hart-M.S. Chemical Engineering (Fall 2013)
- Miguel Gonzales-Ph.D. Chemical Engineering (2014)
- Alana Denning-M.S. Chemical Engineering (2014)
- *Abhishek Gumidyala- Ph.D. Chemical Engineering (in progress)*
- *Manasa Godavarthy-M.S. Chemical Engineering (in progress)*
- *Tyler Vann-Chemical Engineering (in progress)*
- *Adam Stevens-M.S. Chemical Engineering (2015)*
- *Chase Brown-M.S. Chemical Engineering (in progress)*
- *Jie Chen- Ph.D. Chemical Engineering (Fall 2014)*
- Lauren Gilbert- M.S. Chemical Engineering (2015)
- *Lawrence Barrett- PhD. Chemical Engineering (2019)*
- *Tania Erazo-M.S. Chemical Engineering (in progress)*
- Maria Castillo Sanches- Ph.D. Chemical Engineering (in progress)
- Cristian Jiminez Rojas-M.S. Chemical Engineering (2015)
- Javen Weston-Ph.D. Chemical Engineering (2015)
- *Valeria Herrera –M.S. (2018)*
- Nhung Dong – Ph.D. (2018)
- Duong Ngo – Ph.D. (2019)
- Diken Jain –M.S. Chemical Engineering (2018)
- Felipe Anya Saltarin Ph.D. Chemical Engineering (2019)
- Tuong Bui- Ph.D. Chemical Engineering (2019)
- Zheng Zhao- Ph.D. Chemical Engineering (2019)
- Reda Bababrik- Ph.D. Chemical Engineering (2019)
- *Ismaeel Alalq- Ph.D. Chemical Engineering (in progress)*
- *Han Chao- Ph.D. Chemical Engineering (in progress)*
- *Alejandra Gomez- Ph.D. Chemical Engineering (in progress)*
- *Ana Jerdy- Ph.D. Chemical Engineering (in progress)*
- *Caleb Bavlnka- MS Chemical Engineering (in progress)*

Other programs

- Nicholas Massaro- (Chemistry) Ph.D. (2019)
- Camille Boucher-Jacobs-(Chemistry) Ph.D. (In progress)
- Lukasz Szolc- (Electrical Engineering) Ph.D. (In progress)
- Matthew Houck- (Chemistry) Ph.D. (in progress)
- Nick Godman-(Chemistry) Ph.D. (2015)
- Arun Balakrishnan – PH.D. (Mechanical Engineering,2019)
- Pingmei Wang –Ph.D. (Chemistry, in progress)
- Joe Stevens –Ph.D. (Chemistry, in progress)
- Daniel Bamper –Ph.D. (Chemistry, in progress)

4.2 College

Served as project manager to help carry out college strategic plan-Materials (summer 2014-present)
-tasked with forming and working with a team of faculty to facilitate growth of high impact research and development related to materials.

Served on Search committee for open professor position in Biomedical Engineering Program
(Fall 2015-2016)

Served on COE Faculty Vision Task Force (2018-present)

4.2 University

Served as judge for University of Oklahoma Student Research & Performance Day, March 2nd, 2012.

Summer 2012, 2013, and 2014
Participated BP DEVAS and BP Engineering Academy for the involvement of underrepresented high school students. Involvement in the camp included hands on lab experiments, research lab tours, and a presentation on the topic of biofuels.

Summer 2016, 2017, 2018
Co-led Chem E BP Engineering Days camp, which is a more in-depth all day version of the BP Engineering Academy and Devas camps. The camp focused on chemical engineering and renewable energy, with a combination of interactive presentations and discussions with several hands on activities and contests.

Led two engineering workshops in first Native American STEM day Fall 2014 (involving >70 Native American High School and Jr. High students).

Participate as a faculty advisor for American Indian Science and Engineering Society (AISES)(2014-present)

Served on University Laboratory Safety Committee (Spring 2019-present)

4.3 Professional

Reviewer

- National Science Foundation panelist
- ACS PRF reviewer
- DOE Basic Energy Science reviewer
- Kansas NSF EPSCoR Proposal reviewer
- DOE BETO Strategic planning focus group
- North American Catalysis Society 2015 NAM Abstracts
- Stanford University Global Climate and Energy Project
- Science Advances
- Nature Communications
- Nature Catalysis
- Angewandte Chemie
- Green Chemistry
- ChemSusChem
- ChemCatChem
- Journal of Catalysis
- ACS Catalysis
- Catalysis Science and Technology
- Chemical Engineering Science
- Langmuir
- Macroporous and Mesoporous Materials
- Journal of Analytical and Applied Pyrolysis
- AIChE Journal
- Applied Catalysis A
- Applied Catalysis B
- Energy Technology
- Fuel
- Catalysis Letters
- Industrial and Engineering Chemistry Research
- Catalysis Today
- Inernational Journal of Hydrogen Energy
- Energy and Fuels
- European Journal of Inorganic Chemistry
- Journal of Biomass and Bioenergy

Served on DOE BETO strategic planning focus group (2015)

National Organization Leadership/Meeting Chair/Organizer

- Great Plains Catalysis Society President Elect (2021)
- ACS CATL division Member at Large (2020-present)
- ACS Fall annual meeting Catalysis Division Programming chair Fall 2019 meeting
- Great Plains Catalysis Society Officer,Membership Chair-Fall 2018-2019.
- Great Plains Catalysis Society Secretary (2020-2021)
- AIChE Fall annual meeting 2018; 1 session co-chair, (catalytic processing of biorenewable feedstocks) with Julia Valla (UConn)
- AIChE Fall Annual Meeting 2017: 3 sessions. 1 session (catalytic processing of biorenewable feedstocks) co-chair with Zhenglong Li (Oak Ridge), 2 sessions (catalytic hydrocarbon processing) with Nan Yi (New Hampshire) and Bill Lonergan (Exxon).
- AIChE Fall Annual Meeting 2016: 1 session co-chair with Schwartz (Maine)
- AIChE Fall Annual Meeting 2015: 1 session co-chair with Bond (Syracuse) special session within Catalysis division consisting entirely of invited keyonote tutorials related to the catalytic conversion of biomass to fuels and chemicals.
- ACS Spring Annual Meeting 2014: Chair Catalysis Division Poster session + Chair two sessions on general catalysis papers
- ACS Fall Annual Meeting 2014: Chair/organizer of 4 sessions with topic Catalysis for Biomass Conversion. With co-chairs Roman (MIT) and Bond (Syracuse)
- AIChE Fall Annual Meeting 2014:1 session co-chair with Shabaker (BP).
- AIChE Annual meeting 2013: 2 sessions (Chair- with co-chair Paul Dauenhauer)
- AIChE Annual meeting 2012: co-chair with Fabio Ribero + Daniel Resasco 2 sessions
- Served on Organizing Committee for 2011 ACS Pentasectional meeting

Last Modified: August, 2021.