**Eduardo Santillan-Jimenez, Ph.D.**

*Chemist with Expertise in Heterogeneous Catalysis*

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| **Contact Information**  Address  Phone  E-mail | 2582 Research Park Drive. Lexington, KY 40511  (859) 257 0395  [e.santillan@uky.edu](mailto:e.santillan@uky.edu) |
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| **Education**  Degree  Year  Institution  Degree  Year  Institution | Ph.D. in Chemistry  2008  University of Kentucky  B.S. in Chemistry  2003  University of San Luis Potosi, Mexico |
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| **Experience**  Position  Period  Place of Employment  Duties & Responsibilities  Research projects | Senior Research Scientist | Principal Research Scientist  2011–2014 2014–present  University of Kentucky Center for Applied Energy Research  Writing of research proposals and management of awarded grants  Writing of publications and progress reports for funding agencies  Supervision of students and technical staff  Catalytic deoxygenation of triglycerides and fatty acids to hydrocarbon fuels *via* decarboxylation/decarbonylation  Catalytic upgrading of bio-oils to hydrocarbons *via* hydrotreating |
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| Position  Period  Place of Employment  Research projects | Postdoctoral scholar  2010–2011  University of Kentucky Center for Applied Energy Research  Catalytic upgrading of the products of lignin depolymerization to fuels and chemicals |
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| Position  Period  Place of Employment  Research projects | Postdoctoral fellow  2009–2010  Utrecht University Department of Chemistry  Phase behavior of reactants and products during Fischer-Tropsch synthesis *via in situ* spectroscopy  Operando studies on alkane dehydrogenation catalysts |
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| Position  Period  Place of Employment  Research projects | Visiting Scientist  2008  University of Alicante Department of Inorganic Chemistry  Mechanistic studies on the selective catalytic reduction of nitrogen oxides over carbon nanotube-supported metal catalysts |
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| **Languages**  Language  Proficiency | English | Spanish | French | German  100% 100% 100% 30% |
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| **Service**  Memberships  Refereed journals  Reviewed grant proposals  Lectured courses | American Chemical Society | North American Catalysis Society  Energy & Environmental Science  ACS Catalysis  Green Chemistry  Catalysis Communications  ChemCatChem  Energy Conversion and Management  Bioresource Technology  ACS Sustainable Chemistry & Engineering  Applied Catalysis A  Catalysis Science & Technology  Chemical Engineering Journal  Journal of Colloid and Interface Science  Fuel  Journal of Molecular Catalysis A  Catalysis Today  Energy & Fuels  Fuel Processing Technology  RSC Advances  Catalysts  Nanomaterials  Industrial & Engineering Chemistry Research  Journal of Analytical and Applied Pyrolysis  Journal of Chemical Technology & Biotechnology  International Journal of Chemical Kinetics  Journal of Porous Materials  Kentucky Science and Engineering Foundation – SBIR/STTR program  National Science Foundation – Energy for Sustainability program  Power Generation Technologies  University of Kentucky CME/EGR/CME/ME/EE 599/ EGR 542 |
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| **References**  Name  Affiliation  E-mail  Name  Affiliation  E-mail | Prof. Mark Crocker  University of Kentucky Center for Applied Energy Research  mark.crocker@uky.edu  Prof. dr. ir. Bert Weckhuysen  Utrecht University Department of Chemistry  [b.m.weckhuysen@uu.nl](mailto:b.m.weckhuysen@uu.nl) |
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**Awards**

1. 2017 International Collaborative Research Initiation Award. $5,000 award sponsored by the National Science Foundation given to recognize excellence in the mentoring of students participating in an international Research Experience for Undergraduates.
2. 2007 Dissertation Enhancement Award. $3,000 award sponsored by the University of Kentucky (UK) Graduate School given to doctoral candidates to conduct research at a site away from UK’s campus (in this case the University of Alicante in Spain).

**Awarded Grants**

1. E. Santillan-Jimenez (PI). Probing the economic and industrial viability of converting algae, hemp and waste oils to diesel and jet fuel. University of Kentucky Office of the Vice President for Research – Research Support Grant. $17,378. 07/01/17-06/30/18.
2. M. Crocker (PI), E. Santillan-Jimenez (co-PI). SusChEM: Promotion of Nickel Catalysts for the Conversion of Biomass-derived Oils to Fuel-like Hydrocarbons – REU Supplement. National Science Foundation Catalysis and Biocatalysis program. $10,968. 01/24/17-08/31/17.
3. E. Santillan-Jimenez (PI), Rebekah Radtke (co-PI), Margaret Mohr-Schroeder (co-PI). From SEE(E)D to (S)STEM: Scientists, Engineers, Entrepreneurs, Educators & Designers developing didactic tools to promote Sustainability, Science, Technology, Engineering & Mathematics. University of Kentucky Office of Sustainability – Sustainability Challenge Grant. $25,184. 01/01/16-12/31/16.
4. M. Crocker (PI), E. Santillan-Jimenez (co-PI). MRI: Acquisition of a Gas Chromatograph with Dual Detection Capabilities to be Used in Sustainable Energy Research. National Science Foundation Major Research Instrumentation program. $145,161. 08/01/15-07/30/16.
5. E. Santillan-Jimenez (PI), W. Henderson III (co-PI). Using a research center-based mentoring program to increase the participation of African Americans, Hispanics and Native Americans in engineering, National Science Foundation Broadening Participation in Engineering program. $447,770. 12/01/14-11/30/18.
6. M. Crocker (PI), E. Santillan-Jimenez (co-PI). SusChEM: Promotion of Nickel Catalysts for the Conversion of Biomass-derived Oils to Fuel-like Hydrocarbons. National Science Foundation Catalysis and Biocatalysis program. $371,737. 09/01/14-08/31/17.
7. E. Santillan-Jimenez (PI), M. Crocker (co-PI). Use of carbide catalysts for the upgrading of biomass-derived liquids to renewable fuels. University of Kentucky Office of the Vice President for Research – Research Support Grant. $14,467. 02/01/13-01/31/14.

**Selected Publications**

1. T. Morgan, E. Santillan-Jimenez, K. Huff, K.R. Javed, M. Crocker. *Use of dual detection in the gas chromatographic analysis of oleaginous biomass feeds and biofuel products to enable accurate simulated distillation and lipid profiling.* Energy Fuels 31 (2017) 9498.
2. E. Santillan-Jimenez, R. Loe, M. Garrett, T. Morgan, M. Crocker. *Effect of Cu promotion on cracking and methanation during the Ni-catalyzed deoxygenation of waste lipids and hemp seed oil to fuel-like hydrocarbons.* Catal. Today (IN PRESS: <http://dx.doi.org/10.1016/j.cattod.2017.03.025>).
3. E. Santillan-Jimenez, R. Pace, S. Marques, T. Morgan, C. McKelphin, J. Mobley, M. Crocker. *Extraction, purification, characterization and catalytic upgrading of algae lipids to fuel-like hydrocarbons.* Fuel 180 (2016) 668.
4. R. Loe, E. Santillan-Jimenez, T. Morgan, L. Sewell, Y. Ji, S. Jones, M.A. Isaacs, A.F. Lee, M. Crocker. *Effect of Cu and Sn promotion on the catalytic deoxygenation of model and algal lipids to fuel-like hydrocarbons over supported Ni catalysts*. Appl. Catal. B: Environ. 191 (2016) 147.
5. E. Santillan-Jimenez, M. Perdu, R. Pace, T. Morgan, M. Crocker. *Activated Carbon, Carbon Nanofiber and Carbon Nanotube Supported Molybdenum Carbide Catalysts for the Hydrodeoxygenation of Guaiacol*. Catalysts 5 (2015) 424.
6. J. Choi, V. Schwartz, E. Santillan-Jimenez, M. Crocker, S. Lewis, M. Lance, H. Meyer, K. More. *Structural Evolution of Molybdenum Carbides in Hot Aqueous Environments and Impact on Low-Temperature Hydroprocessing of Acetic Acid*. Catalysts 5 (2015) 406.
7. E. Santillan-Jimenez, T. Morgan, R. Loe, M. Crocker. *Continuous catalytic deoxygenation of model and algal lipids to fuel-like hydrocarbons over Ni-Al layered double hydroxide*. Catal. Today 258 (2015) 284.
8. J.J.H.B. Sattler, J. Ruiz-Martinez, E. Santillan-Jimenez, B. Weckhuysen. *Catalytic Dehydrogenation of Light Alkanes on Metals and Metal Oxides.* Chem. Rev. 114 (2014) 10613.
9. M.H. Wilson, J. Groppo, A. Placido, S. Graham, S.A. Morton, E. Santillan-Jimenez, A. Shea, M. Crocker, C. Crofcheck, R. Andrews. *CO2 recycling using microalgae for the production of fuels.* Appl. Petrochem. Res. 4 (2014) 41.
10. T. Morgan, E. Santillan-Jimenez, M. Crocker. *Simulated distillation approach to the gas chromatographic analysis of feedstock and products in the deoxygenation of lipids to hydrocarbon biofuel*. Energy Fuels 28 (2014) 2654.
11. E. Santillan-Jimenez, T. Morgan, J. Shoup, A.E. Harman-Ware, M. Crocker. *Catalytic deoxygenation of triglycerides and fatty acids to hydrocarbons over Ni-Al layered double hydroxide*. Catal. Today 237 (2014) 136.
12. E. Santillan-Jimenez, T. Morgan, J. Lacny, S. Mohapatra, M. Crocker. *Catalytic deoxygenation of triglycerides and fatty acids to hydrocarbons over carbon-supported nickel*. Fuel 103 (2013) 1010.
13. T. Morgan, E. Santillan-Jimenez, A.E. Harman-Ware, Y. Ji, D. Grubb, M. Crocker. *Catalytic deoxygenation of triglycerides to hydrocarbons over supported nickel catalysts.* Chem. Eng. J. 189-190 (2012) 346.
14. E. Santillan-Jimenez, M. Crocker. *Catalytic deoxygenation of fatty acids and their derivatives to hydrocarbon fuels via decarboxylation/decarbonylation.* J. Chem. Technol. Biotechnol. 87 (2012) 1041.
15. E. Santillan-Jimenez, M. Crocker, A. Bueno-López, C. Salinas-Martínez de Lecea. *Carbon nanotube-supported metal catalysts for NOx reduction using hydrocarbon reductants: gas switching and adsorption studies.* Ind. Eng. Chem. Res. 50 (2011) 7191.
16. E. Santillan-Jimenez, V. Miljković-Kocić, M. Crocker, K. Wilson. *Carbon nanotube-supported catalysts for NOx reduction using hydrocarbon reductants. Part 1: Catalyst preparation, characterization and NOx reduction characteristics.* Appl. Catal. B 102 (2011) 1.
17. T. Morgan, D. Grubb, E. Santillan-Jimenez, M. Crocker. *Conversion of triglycerides to hydrocarbons over supported metal catalysts.* Top. Catal. 53 (2010) 820.
18. J.L. Shumaker, C. Crofcheck, S.A. Tackett, E. Santillan-Jimenez, T. Morgan, Y. Ji, M. Crocker, T.J. Toops. *Biodiesel synthesis using calcined layered double hydroxide catalysts.* Appl. Catal. B 82 (2008) 120.
19. A. Hutchinson, D. Atwood, E. Santillan-Jimenez. *The removal of mercury from water by open chain ligands containing multiple sulfurs.* J. Hazard. Mater. 156 (2008) 458.
20. J.L. Shumaker, C. Crofcheck, S.A. Tackett, E. Santillan-Jimenez, M. Crocker. *Biodiesel production from soybean oil using calcined Li–Al layered double hydroxide catalysts.* Catal. Lett. 115 (2007) 56.

**Selected Presentations**

1. E. Santillan-Jimenez, W. Henderson. *Increasing impact by synergizing research-center based mentoring with LSAMP, EPSCoR, iREUs and other initiatives to broaden participation in STEM*. 2017 NSF Engineering Education and Centers Grantees Conference, Arlington, VA, October 29-31, 2017.
2. E. Santillan-Jimenez, S. Hodges, F. Williams, R. Duran. *Using a research center-based mentoring program to broaden participation in STEM and facilitate access to an international research experience for undergraduates*. 2017 Louis Stokes Midwest Center of Excellence Conference – Take Action: Reaching Deeper into the Nation’s Diverse Pool of STEM Talent, Indianapolis, IN, October 6-8, 2017.
3. R. Loe, E. Santillan-Jimenez, M. Crocker. *Catalytic Deoxygenation of Waste, Hemp and Algal Lipids to Fuel-like Hydrocarbons over Supported Ni Catalysts.* 25th North American Catalysis Society Meeting, Denver, CO, June 4-9, 2017.
4. E. Santillan-Jimenez, T. Morgan, R. Pace, D. Sajkowski, C. Behnke, A. Lappas, M. Crocker. *Co-Processing of Algae-Derived Hydrothermal Liquefaction Bio-Oil and Petroleum Feedstock via Fluid Catalytic Cracking for the Production of Fuel-like Hydrocarbons.*25th North American Catalysis Society Meeting, Denver, CO, June 4-9, 2017.
5. E. Santillan-Jimenez, W. Henderson. *Using a research center-based mentoring program to increase the participation of African Americans, Hispanics and Native Americans in engineering.* 2017 American Society for Engineering Education Annual Conference & Exposition, Columbus, OH, June 25-28, 2017.
6. R. Pace, E. Santillan-Jimenez, M.H. Wilson, J.G. Groppo, S. Kesner, E. Frazar, A. Zeller, M. Crocker. *Processing of algae biomass for the production of fuels and bioplastics.* 7th International Conference on Algal Biomass, Biofuels and Bioproducts, Miami, FL, June 18-21, 2017.
7. C. McKelphin, E. Santillan-Jimenez, M. Crocker. *Kinetic Study of Catalytic Decarboxylation/Decarbonylation of Triglycerides to Fuels*. American Institute of Chemical Engineers National Conference, San Francisco, CA, November 11-14, 2016.
8. E. M. Frazar, R. Pace, R. Loe, E. Santillan-Jimenez, M. Crocker. *Algae-mediated Conversion of CO2 Emissions to Diesel Range Hydrocarbons*. American Institute of Chemical Engineers National Conference, San Francisco, CA, November 11-14, 2016.
9. E. Santillan-Jimenez. *Energy is elementary: Supporting elementary science education by enhancing energy literacy*. Kentucky Science Teachers Association 44th Annual Conference, Lexington, KY, Nov. 10-12, 2016.
10. E. Santillan-Jimenez, W. Henderson. *Using research center-based mentoring to increase minority participation in engineering*. 9th Annual Mentoring Conference, Albuquerque, NM, Oct. 24-27, 2016.
11. R. Loe, E. Santillan-Jimenez, M. Crocker. *Catalytic deoxygenation of model and realistic feeds to fuel-like hydrocarbons over supported nickel-copper catalysts*. 252nd American Chemical Society National Meeting, Philadelphia, PA, August 21-25, 2016.
12. R. Loe, E. Santillan-Jimenez, M. Crocker. *Catalytic Deoxygenation of Model and Realistic Lipid Feeds to Fuel-like Hydrocarbons over Supported Nickel Alloy Catalysts.* 9th International Conference on Environmental Catalysis, Newcastle, Australia, July10-13, 2016.
13. E. Santillan-Jimenez, M. Wilson, M. Crocker. *Algae-mediated conversion of coal-derived flue gas to fuels and bioplastics.* Bioenergy 2016, Washington, D.C., July 12-14, 2016.
14. C. McKelphin, E. Santillan-Jimenez, M. Crocker. *Optimization of Algal Extracts for the Production of Fuels*. 251st American Chemical Society National Meeting, San Diego, CA. March 13-17, 2016.
15. E. Santillan-Jimenez, T. Morgan, R. Loe, R. Pace, S. Marques, M. Crocker.*Extraction, Purification and Catalytic Upgrading of Algae Lipids to Fuel-like Hydrocarbons*. 2015 Algae Biomass Summit, Washington, D.C., September 29-October 2, 2015.
16. E. Santillan-Jimenez, M. Wilson, M. Crocker. *Algae-mediated conversion of flue-gas from a coal-fired power plant to drop-in hydrocarbon fuels*. Bioenergy 2015, Washington, D.C., June 23-24, 2015.
17. E. Santillan-Jimenez, T. Morgan, R. Loe, M. Crocker. *Continuous Deoxygenation of Model and Algal Lipids to Fuel-like Hydrocarbons over Supported Ni Alloy Catalysts*. 24th North American Catalysis Society Meeting, Pittsburgh, PA, June 14-19, 2015.
18. R. Loe, T. Morgan, E. Santillan-Jimenez, M. Crocker. *Catalytic deoxygenation of model and algal lipids to fuel-like hydrocarbons over supported nickel alloy catalysts*. 249th American Chemical Society National Meeting, Denver, CO, March 22-26, 2015.
19. E. Santillan-Jimenez, T. Morgan, R. Loe, M. Crocker. *Continuous deoxygenation of algal lipids to fuel-like hydrocarbons over inexpensive Ni-based catalysts.* 8th International Conference on Environmental Catalysis, Asheville, NC, August 24-27, 2014.
20. R. Loe, E. Santillan-Jimenez, M. Crocker. *Catalytic deoxygenation of tristearin to hydrocarbons over supported nickel alloy catalysts.* 8th International Conference on Environmental Catalysis, Asheville, NC, August 24-27, 2014.
21. R. Loe, T. Morgan, E. Santillan-Jimenez, M. Crocker. Catalytic Deoxygenation of Tristearin to Hydrocarbons over Supported Nickel Alloy Catalysts. Tri-State Catalysis Society Symposium, Louisville, KY, September 15, 2014.
22. J. Choi, V. Schwartz, E. Santillan-Jimenez, M. Crocker, S. Lewis, R. Connatser, H. Meyer, K. More. *Catalytic Performance of Mo2C in Aqueous-Phase Hydroprocessing of Model Bio-oils*. Southeastern Catalysis Society 12th Annual Fall Symposium, Asheville, NC, September 29-30, 2013.
23. M. Crocker, M.H.W. Wilson, J. Groppo, A. Placido, S. Graham, E. Santillan-Jimenez, T. Morgan, J. Shoup, D. Kim, L. Mills, H. Y. Shin, C. Crofcheck. *CO2 recycling using microalgae for the production of liquid fuels*.246th American Chemical Society National Meeting, Indianapolis, IN, September 8-12, 2013.
24. E. Santillan-Jimenez, T. Morgan, M. Crocker. *Conversion of triglycerides and fatty acids to fuel-like hydrocarbons over supported nickel catalysts*. 246th American Chemical Society National Meeting, Indianapolis, IN, September 8-12, 2013.
25. E. Santillan-Jimenez, T. Morgan, J. Shoup, M. Crocker. *Ni-Catalyzed Conversion of Lipids to Fuel-Like Hydrocarbons: From Proof of Concept to Catalyst Recycling Studies*. 23rd North American Catalysis Meeting, Louisville, KY, June 2-7, 2013.
26. J. Choi, V. Schwartz, E. Santillan-Jimenez, M. Crocker, S. Lewis, H. Meyer, K. More. *Catalytic Activity and Stability of Molybdenum Carbides in Aqueous Phase Hydrotreating of Acetic Acid*. 23rd North American Catalysis Meeting, Louisville, KY, June 2-7, 2013.
27. J. Choi, V. Schwartz, E. Santillan-Jimenez, M. Crocker, S. Lewis, H. Meyer, K. More. Catalytic *Performance of Molybdenum Carbides in Aqueous-Phase Hydrotreating of Acetic Acid*. 245th American Chemical Society National Meeting, New Orleans, LA, April 7-11, 2013.
28. J. Shoup, E. Santillan-Jimenez, T. Morgan, M. Crocker. *Conversion of Triglycerides and Fatty Acids to Hydrocarbons Using Supported Nickel Catalysts*. 2012 American Institute of Chemical Engineers Annual Meeting, Pittsburgh, PA, October 28-November 2, 2012.
29. E. Santillan-Jimenez, T. Morgan, M. Crocker. *Conversion of triglycerides and fatty acids to hydrocarbons via decarboxylation/decarbonylation (deCOx) over supported nickel catalysts*. 7th International Conference on Environmental Catalysis, Lyon, France, September 2-6, 2012.
30. S. Mohapatra, T. Morgan, E. Santillan-Jimenez, M. Crocker. *Conversion of triglycerides and fatty acids to hydrocarbons over supported nickel catalysts.* 22nd North American Catalysis Society Meeting, Detroit, MI, June 5-10, 2011.
31. T. Morgan, S.A. Morton, M. Crocker, D. Grubb, E. Santillan-Jimenez. *Application of layered double hydroxides to the production of renewable diesel*. 239th American Chemical Society National Meeting, San Francisco, CA, March 21-25, 2010.
32. T. Morgan, D. Grubb, E. Santillan-Jimenez, S.A. Morton, M. Crocker. *Conversion of vegetable and algae oils to hydrocarbons over supported metal catalysts.* AIChE 2009 Annual Meeting. Nashville, TN, November 8-13, 2009.
33. E. Santillan-Jimenez, C. Salinas-Martinez de Lecea, A. Bueno-López, M.J. Illán-Gómez, M. Crocker. *Carbon nanotube-supported metal catalysts for NOx reduction using hydrocarbon reductants.* Europacat IX, Salamanca, Spain, August 30-September 4, 2009.
34. T. Morgan, D. Grubb, E. Santillan-Jimenez, M. Crocker. *Conversion of triglycerides to hydrocarbons over supported metal catalysts.* Europacat IX, Salamanca, Spain, August 30-September 4, 2009.
35. E. Santillan-Jimenez, M. Crocker, J.E. Parks II, C. Salinas Martínez de Lecea. *Carbon nanotube supported metal catalysts for NOx reduction using hydrocarbon reductants. 5th* International Conference on Environmental Catalysis. Belfast, Northern Ireland, August 31, 2008.
36. J.L. Shumaker, C. Crofcheck, S.A. Tackett, E. Santillan-Jimenez, M. Crocker. *Biodiesel synthesis from soybean oil using calcined Li-Al layered double hydroxide catalysts.* Europacat VIII, Turku, Finland, August 26-31, 2007.
37. J.L. Shumaker, S.A. Tackett, E. Santillan-Jimenez, C. Crofcheck, M. Crocker. *Heterogeneous catalysts for biodiesel production derived from layered double hydroxides.* 19th Annual Michigan Catalysis Society Spring Symposium, Dearborn, MI, May 10, 2007.
38. J.L. Shumaker, S.A. Tackett, E. Santillan-Jimenez, C. Crofcheck, M. Crocker. *Development of heterogeneous catalysts for biodiesel production.* Tri-State Catalysis Society Fall Symposium, Lexington, KY, September 13, 2006.