

Christian Manuel Jimenez

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Summary

Experienced researcher with 4 years of experience in heterogeneous catalysis and material characterization

Education

PhD Chemical Engineering, May 20XX

University of Wisconsin-Madison

- Thesis: "Production of distillate-range fuels from ethanol using mixed metal oxide catalysis"
- GPA: 3.77/4.0

Bachelor of Science Chemical Engineering, December 20XX

Georgia Institute of Technology

- Thesis: "Oxidation of cyclohexane to cyclohexanol and cyclohexanone using Co or Cr-doped SBA-3"
- GPA: 3.59/4.0

Experience

Research Assistant, September 20XX – Present

Connors Research Group – Department of Chemical and Biological Engineering, UW-Madison

Ethanol coupling to higher alcohols for biofuel synthesis

- Discovered a catalytic process (patented) to obtain distillate-range oxygenates (ethers and olefins) from ethanol at >75% selectivity
- Designed and assembled a gas-phase flow reactor to carry out ethanol coupling reaction to higher alcohols
- Integrated and modified metal supported catalysts, layered double-hydroxides acid-base catalysts and noble metal-acid oxide catalysts for use in reactions such as hydrogenation, hydrogenolysis or C-C scission of several biomass-derived compounds

Catalytic production of tetraol for biobased polymers

- Determined the kinetics of levoglucosanol hydrogenolysis into hexan-1,2,5,6-tetraol using bifunctional acid-metal Pt-WO_x/TiO₂ catalysts using batch reactors
- Studied catalyst stability and scaled up hexan-1,2,5,6-tetraol production to industrially relevant concentrations using a liquid-phase flow reactor
- Synthesized and characterized physical properties of polyol-boronate copolymers, including surface area and textural properties, thermal stability, crystallinity, and functional groups
- Supervised three undergraduate research assistants and served as laboratory safety coordinator

Co-op Engineer, June 20XX-December 20XX

Wallington Corp., Seattle, WA

- Investigated main factors of lead dross generation in molten lead extruding machines and implemented measures to reduce produced dross
- Provided support to process engineers and lead-oxide engineering team in data collection, analysis and compilation, and process optimization

Undergraduate Researcher, 20XX – 20XX

Heterogenous Catalysts Research Group at Georgia Tech., Atlanta, GA

- Designed and constructed a reaction system to carry out liquid-phase oxidation of cyclohexane
- Synthesized and characterized Co and Cu-doped SBA-3 catalysts for use in liquid-phase oxidation of cyclohexane

Industry Project Experience

Catalytic Technologies for Production of Distillate Fuels from Biomass

- Determined and studied catalysts and processed conditions for production of higher oxygenates from biomass-sourced ethanol with support from ExxonMobil

Catalyst Design for Mono-Ether and Alcohol Bioblendstocks

- Collaborated with Department of Energy to provide alcohol and oxygenate mixtures for production of C₈+ ethers and oxygenates
- Designed catalyst for application in the Vehicle Technologies Office to reduce the fuel penalty of mixing controlled compression ignition engine aftertreatment

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Skills

Programming: C, C++, Java, MATLAB, OpenMP, Python

Software and Tools: ChemCAD, COMSOL, Git, Inkscape, LaTeX, OpenFOAM

Global Languages: Spanish

Laboratory and Instrumentation: Gas Chromatography (GC), Gas Chromatography-Mass Spectrometry (GC-MS) and High-Performance Liquid Chromatography (HPLC), Nuclear Magnetic Resonance (NMR), X-ray diffraction, Thermogravimetric Analysis and Differential Scanning Calorimetry, Inductively Coupled Plasma Optical Emission Spectroscopy, Fourier-transform Infrared Spectroscopy (FT-IR)

Teaching and Outreach Experience

Teaching Assistant, Department of Chemical and Biological Engineering, UW-Madison

- Taught Intro to Transport Phenomena (graduate level), Chemical Thermodynamics, Chemical Process Analysis, General Physics: Electromagnetism
- Delivered lectures, led discussion sections, held exam review sessions, and developed homework/exam questions

Chemical Engineer, Graduate Student Association, UW-Madison

- President, treasurer, and recruitment chair

Exhibit Organizer, Engineering EXPO, UW-Madison

- Developed and coordinated outreach booths exhibiting fluids research to K-12 students
- Engaged with community members of varied science backgrounds to promote interest in STEM learning and research

Awards and Interests

ACS Chemical Computing Group Excellence Award

UW-Madison Bird Stewart Lightfoot Graduate Fellowship

Wisconsin Science-Student Research Grants Competition-Conference Presentation Award

Kayaking, cross-country skiing, guitar

Publications

Manuel Jimenez, C., Dastitar, L., Wang, S., Du, Y., Lancy, M. P., Wooler, B., Klewer, C. E., Dumesic, J. A., Stuber, G. W., Ethanol to Distillate-Range Molecules using Cu/Mg_xAlO_y catalysts with low Cu loadings (*Submitted*).

Manuel Jimenez, C., Lanci, M. P., Du, Y., Stuber, G. W., Kinetics of ethanol oligomerization to Distillate-range molecules using low loading Cu/Mg_xAlO_y catalysts (*In preparation*).

Restrepo-Florez, J., **Manuel Jimenez, C.**, Canalest, I., Stuber, G. W., Maravelias, A. B., Ethanol upgrading to diesel fuel bioblendstocks: techno-economic and lifecycle analysis (*In preparation*).

Manuel Jimenez, C., Krishna, V., De bruyn, M., Weckhuysen, B. M., Dumesic, L. S., Stuber, G. W., Production of Hexane-1,2,5,6-tetrol from Bio-renewable Levoglucosanol over Pt-WO_x/TiO₂: Kinetics and Catalyst Stability (*Submitted*).

De bruyn, M., **Manuel Jimenez, C.**, Cendejas, M., Bermans, I., He, J., Krishna, V., Lynn, Y., Dumesic, L. S., Stuber, G. W., Weckhuysen, B. M., Hexane-1,2,5,6-Tetrol as a Versatile and Biobased Building Block for the Synthesis of Sustainable (Chiral) Crystalline Mesoporous Polyboronates. *ACS Sustainable Chem. Eng.* **2019**, *7* (15), 13430–13436.

Manuel Jimenez, C., Perrett B., Bolivar D., Rivera-Goyco, C. Design and construction of a reaction system for cyclohexane catalytic aerobic oxidation using cobalt in SBA-3. *Prospect*. Vol 14, 2, 13-21, 2016.

Presentations & Posters

Manuel Jimenez, C., Lanci, M. P., Du, Y., Stuber, G. W., Ethanol oligomerization into alcohols and esters over Mg-Al mixed oxides doped with low-loadings Of Cu. Oral presentation, 2021 AIChE Annual Meeting – Biomass Upgrading I: Oxygenates Conversion, Boston, MA, United States, 2021.

Restrepo-Florez, J., **Manuel Jimenez, C.**, Canales, E., Stuber, G. W., Maravelias, C., Middle Distillates from Ethanol-Technoeconomic and Life CYCLE Assessment, 2021 AIChE Annual Meeting – Sustainable Engineering Forum, Boston, MA, United States, 2021. Contributed to oral presentation.

Christian Jimenez, pg. 3

Manuel Jimenez, C., Krishna, V., De bruyn, T., Dumesic, L. S., Stuber, G. W., Production of Hexane-1,2,5,6-tetrol from Bio-renewable Levoglucosanol over Pt-WOx/TiO2: Kinetics and Catalyst Stability. Poster, Catalysis Club of Chicago Symposium, Chicago, IL, United States, 2021.

Manuel Jimenez, C., Krishna, S. H., De bruyn, T., Weckhuysen, B. M., Dumesic, L. S., Stuber, G. W., Catalytic Production of Hexane-1,2,5,6-tetraol: Kinetics and Stability at Industrially Relevant Feed Concentrations. Poster, Olaf A. Hougen Symposium, Madison, WI, United States, 2019.

De bruyn, M., **Manuel Jimenez, C.**, He, J., Cendejas, T., Ball, A., Krishna, V., Lynn, Y., Hermans, I., Dumesic, J., Huber, G., 23rd Annual Green Chemistry & Engineering Conference, Reston, VA, United States, June 11-13 (2019). Contributed to oral presentation.

Manuel Jimenez, C., Pernet U. X., Materiales Mesoporosos SBA-3 con Co o Cr Incorporados en su Estructura (tl.: SBA-3 Mesoporous materials with Co or Cr incorporated on their structure). Congreso Interamericano y Colombiano de Ingeniería Química, Cartagena de Indias, Colombia, 2014.

Patents

Eagan, J., Lanci, K., Stuber, G., **Manuel Jimenez, C.**, Buchanan T., Processes for producing alcohols from biomass and further products derived therefrom (2020 USPTO provisional application).

Galebach, W., Lanci, K., Stuber, G., Wu, O., Wittrig, C., Eagan, J., **Manuel Jimenez, C.**, Buchanan J., Processes for producing ethers and olefins from primary alcohols (2020 USPTO provisional application).

References

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- If space permits, list references as last résumé section, instead of using an addendum page for references.