

Charles J. Coronella

Associate Professor of Chemical Engineering, University of Nevada, Reno

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Professional Preparation

BS, Chemical Engineering, Lehigh University, June, 1986

BA, Mathematics, Lehigh University, June, 1986

MS, Chemical Engineering, University of Utah, 1989

PhD, Chemical Engineering, University of Utah, 1994

Appointments

1993 – present Assistant Professor, Associate Professor (2000) of Chemical Engineering
University of Nevada, Reno.

January 1, 2007 – December 31, 2007: Chemical Engineer V, GRT, Santa Barbara CA.

Licensed professional chemical engineer, State of Nevada License # 017146, through December 2012

Publications

1. Cody J Wagner, Eugene DeShazo, C. J. Coronella "Oils from digested sludge" *Water Environment Research*, In Review, submitted October 24, 2011.
2. J. G. Lynam, M. T. Reza, V. R. Vasquez, C. J. Coronella, "Effect of Salt Addition on Hydrothermal Carbonization of Lignocellulosic Biomass", *Fuel* 99:271-273 (**2012**) doi:10.1016/j.fuel.2012.04.035.
3. J. G. Lynam, M. T. Reza, V. R. Vasquez, C. J. Coronella "Pretreatment of rice hulls by ionic liquid dissolution", *Bioresource Technology*, 114:629-636 (**2012**) doi:10.1016/j.biortech.2012.03.004
4. W. Yan, S. Islam, C. J. Coronella, and V.R. Vasquez, "Pyrolysis kinetics of Raw/Hydrothermally Carbonized Lignocellulosic biomass", *Environmental Progress & Sustainable Energy* 31(20): 200-204 (**2012**) DOI: 10.1002/ep.11601
5. M. Toufiq Reza, Joan G. Lynam, Victor R. Vasquez and Charles J. Coronella, "Pelletization of Biochar from Hydrothermally Carbonized Wood", *Environmental Progress & Sustainable Energy* 31(2):225-234 (**2012**) DOI: 10.1002/ep.11615
6. J.G. Lynam, C.J. Coronella, W. Yan, M.T. Reza, V.R. Vasquez "Acetic acid and lithium chloride effects on hydrothermal carbonization of lignocellulosic biomass", *Bioresource Technology*, 102, 6192-6199. doi:10.1016/j.biortech.2011.02.035 (**2011**)
7. T.C. Acharjee, C.J. Coronella, V.R. Vasquez, "Effect of thermal pretreatment on equilibrium moisture content of lignocellulosic biomass", *Bioresource Technology*, 102, 4849-4854, April **2011**.
8. Vasquez, V.R., Braganza, A., Coronella, C. J. "Molecular Thermodynamics modeling of equilibrium moisture in foods" *J Food Engr.*, 103(1), 103-114, DOI: 10.1016/j.jfoodeng.2010.10.005, March **2011**
9. Wei Yan, Jason T. Hastings, Tapas C. Acharjee, Charles J. Coronella, and Victor R. Vasquez, "Mass and Energy Balances of Wet Torrefaction of Lignocellulosic Biomass", *Energy Fuels*, 24:4738-4742, **2010** DOI:10.1021/ef901273n.

10. W. Yan, T.C. Acharjee, C.J. Coronella, V.R. Vasquez "Thermal Pretreatment of Lignocellulosic Biomass" *Environmental Progress & Sustainable Energy*, 28(3) 435-440, (2009)
11. S.R. Bellur, C.J. Coronella, V.R. Vasquez "Analysis of Biosolids Equilibrium Moisture and Drying" *Environmental Progress & Sustainable Energy*, 28(2) 291-298 (2009).
12. Vasquez, V.R. and Coronella, C.J. "A Simple Model for Vapor-Moisture Equilibrium in Biomass Substrates" *AIChE J*, 55(6) 1595-1603 (2009).
13. Cooper, S. A. and Coronella, C. J. "CFD Simulations of Particle Mixing in a Fluidized Bed" *Powder Technology* 151 (2005) 27– 36
14. S. Cooper and C. J. Coronella "Fluidized Bed Heat Transfer" in *Handbook of Heat Transfer Calculations* edited by Myer Kutz, McGraw Hill 2005.
15. Coronella., C.J., Deng, J.X. "A novel method for isokinetic measurement of particle flux within the riser of a circulating fluidized bed", *Powder Technol.* 99(3), 211-219, DOI: 10.1016/S0032-5910(98)00110-7, Sept. 1994
16. Coronella, C.J., Lee, S.Y., Seader J.D. "Minimum slugging velocity in fluidized-beds containing vertical rods", *Fuel* 73(9) 1537-1543 (1994) DOI: 10.1016/0016-2361(94)90076-0
17. Lee, SY, Coronella CJ, Bhadkamkar AS., Seader JD, "Modeling and temperature regulation of a thermally coupled reactor system via internal model control strategy" *Ind. Eng. Chem. Res.* 32(12) 3029-3036, DOI: 10.1021/ie00024a011, Dec. (1993).
18. Lee, SY, Coronella CJ, Seader JD, Pitt CH, "Erosion control of 316 stainless steel rods immersed in a bubbling fluidized bed" *Chem. Eng. Sci.* 48(8) 1437-1445, Apr. 1993, DOI: 10.1016/0009-2509(93)80050-Z
19. Coronella CJ, Seader JD "Combustion of Coked Sand in a 2-stage fluidized-bed system", *Fuel* 71(2), 143-150, Feb. 1992

Patent applications:

1. G. Touchton, C. Coronella, Reactor system and method, Filed November 14, 2011
2. Charles Coronella, Wei Yan, Toufiq Reza, and Victor Vasquez, Method for Wet Torrefaction of a Biomass. Filed September 1, 2011. Publication No. US 2012/0110896 A1
3. Charles Coronella and Victor Vasquez, System and Method for Energy Production from Sludge, Filed August 19, 2009. Publication No. US 2010/0043445 A1

Sponsored Projects

1. "Novel flex fuel oxidation for distributed generation" June 1, 2012 – May 31, 2014, ZERE, Inc. (California Energy Commission), CJ Coronella (PI) \$165,728
2. "Hydrothermal conditioning of corn stover" November 30 2011 - September 20, 2012, Idaho National Labs, (US DoE) CJ Coronella (PI), \$50,000
3. "Research and Development to Prepare and Characterize Robust Coal/Biomass Mixtures for Direct Co-Feeding into Gasification Systems", February 1, 2012 - March 31 2013, Gas Technology Institute (US DoE), CJ Coronella (PI), \$65,000
4. "E-Scholars: Engineering careers in energy", July 2010 - July 2014, NSF, J. LaCombe, E. Wang, CJ Coronella (co-PI), \$600,000.
5. "Development of a Model for Determining the Carbon Conversion Efficiency of the Syntrex Alpha Steam Reforming Process", December 15, 2011- February 1, 2012, Synterra Energy, CJ Coronella (PI), \$5000

6. "NV REC: Pretreatment of Biomass", Oct. 2010-December 2011, Nevada Renewable energy Consortium (US DoE), CJ Coronella (PI), VR Vasquez (co-PI), \$100,000
7. "NV REC: Thermal Pretreatment of Biomass", Oct. 2009- December 2010, Nevada Renewable Energy Consortium (US DoE), CJ Coronella (PI), VR Vasquez (co-PI), \$115,000.
8. "Nanotube synthesis", Aug. 2008- May. 2011, NASA, A. Fuchs, CJ Coronella (co-PI), \$12,000.
9. "Fluidized bed production of carbon nanotubes", Aug. 2009- Dec. 2010, NASA, A. Fuchs, CJ Coronella (co-PI), \$30,000.
10. "Sludge2Power Technology Development", Sept. 2008- Sept. 2010, UNR Technology Transfer Office (US- DoE), CJ Coronella (PI) and VR Vasquez \$110,000
11. "Municipal sludge drying and conversion", Oct. 2006 - Nov. 2008, California Energy Commission, CJ Coronella (PI), VR Vasquez, co-PI, \$90,000
12. "Developing thermal conversion options", September 2007 - February 2012, Gas Technology Institute (US DoE), CJ Coronella (PI), VR Vasquez \$494,600
13. "Model Uncertainty and Robustness in Nonlinear Model Predictive Control for Biomedical Applications" , 2003-2004, National Science Foundation, \$75,000, co-PI.

Honors and Awards

AIChE NorCal award for Chemical engineering excellence, 2008-2009
 Senior Scholar Mentor award from UNR college of engineering, 2008
 Gary Leach Award for Service (AIChE), 2007
 Award for distinguished service to ASEE, 2004
 Award for excellence in service, AIChE, 2002

Professional Service:

Reviewer for DOE SBIR grant applications, 2011 – 2012
 Reviewer for DOE SCGF fellowship applications, 2010-2012
 Reviewer for NSF GRFP fellowship applications, 2009-2010
 Manuscript reviewer for multiple journals, including: *Powder Technology, Bioresource Technology, Energy and Fuels, Applied Energy, Biomass Bioenergy, Chemical Engineering Education, Journal of Engineering Education, Chemical Engineering Journal, Fuel, Journal of ASABE, World Renewable Energy Congress, Chemical Engineering Science, Environmental Progress and Renewable Energy, Separation and Purification Technology, etc.*
 American Institute of Chemical Engineers: Director for NorCal local section, 2004-2007
 American Institute of Chemical Engineers: three-year rotation culminating in chair of the student chapters committee (SCC), 2000-2002
 American Institute of Chemical Engineers: Program chair of national student conference, November, 2001, Reno Nevada.
 American Institute of Chemical Engineers: Organized and chaired multiple sessions (more than 20) at the annual meeting, 1995 - 2012
 American Society of Engineering Educators: Workshop leader on "Teaching Teamwork in Engineering Courses" at the Chemical Engineering summer school, July 2012, Orono, Maine
 American Society of Engineering Educators: Program chair for chemical engineering division at the ASEE annual meeting, June 2004, Salt Lake City Utah
 American Society of Engineering Educators: Director of chemical engineering division, 2004 – 2005
 Water Environment Research Foundation, Peer reviewer for projects related to conversion of sewage to energy and fuels, 2010-2012

Conference Presentations:

Presenter is underlined. Students* mentored indicated with asterisk.

1. Coronella, C., Lynam*, J., AIChE annual meeting, Minneapolis, MN, "Cellulose Extraction From Rice Hulls Using Ionic Liquids" (October 2011).
2. Vasquez, V.R., Hanbury, O., Coronella, C. AIChE annual meeting, Minneapolis, MN "Molecular Thermodynamics Modeling of Water Equilibrium and Heat of Sorption In Human Stratum Corneum", October, 2011.
3. Wagner*, C. Coronella, C., Bush, R. AIChE annual meeting, Minneapolis, MN "Synthesis of Green Diesel Fuel From Fatty Acid Feedstocks Via Electrochemical Hofer-Moest Decarboxylation", (October 2011).
4. Coronella, C., Matheus*, M., Vasquez, V.R. AIChE annual meeting, Minneapolis, MN "Technology Development and Demonstration of a Low-Temperature Fluidized-Bed Biomass Dryer", October, 2011.
5. Coronella, C., Reza*, M. Toufiq, Vasquez, V. R. TCBiomass 2011, Chicago, IL, "Hydrothermal Carbonization of Lignocellulosic Biomass: Reaction Kinetics" (September 30, 2011).
6. L. Felix, B. Farthing, J. Irvin, T. Snyder, S. K. Hoekman, C. J. Coronella, TCBiomass 2011, Chicago, IL "Employing Hydrothermal Carbonization for the Production of Energy-dense Fuels from Lignocellulosic Biomass" (September 30, 2011)
7. M. Toufiq Reza*, J. Lynam*, C.J. Coronella, V.R. Vasquez "Pellets from Pretreated Biomass", TCBiomass 2011, Chicago, IL, (September 30, 2011)
8. Coronella, C., Vasquez, V. R., ASEE annual conference, "Cooking a hamburger *in silico* to prevent food poisoning", Vancouver, BC. (June 29, 2011).

Students Mentored

Postdoctoral fellows:

1. Wei Yan, July 1 2008 – June 30, 2010 "Thermal pretreatment of lignocellulosic biomass"

Graduate students:

1. Joan Lynam, "Catalytic and noncatalytic hydrothermal processing lignocellulosic biomass", Ph.D., Chemical Engineering, Expected December 2013.
2. M. Toufiq Reza "Upgrading lignocellulosic biomass by thermal conditioning", Ph.D. Chemical Engineering, Expected August 2013
3. M. Helal Uddin, "CFD Simulations of Chemical Looping Combustion Systems" Ph.D. Chemical Engineering, expected August 2015
4. Kevin Schmidt, "Application of nonequilibrium thermodynamics to drying systems", M.S. Chemical Engineering, Expected December 2012.
5. Cody Wagner, "Production of Renewable Diesel Fuel via Hofer-Moest Electrochemical Decarboxylation of Free Fatty Acids", M.S., Chemical Engineering, May, 2012.
6. Joan Lynam "Pretreatment of Lignocellulosic Biomass with Acetic Acid, Salts, and Ionic Liquids", M.S., Chemical Engineering, May, 2011
7. M. Toufiq Reza "Hydrothermal Carbonization of Lignocellulosic Biomass", M.S., Chemical Engineering, May, 2011
8. Mike Matheus "Low Temperature Drying of Sewage Sludge Using a Fluidized Bed Dryer", M.S., Chemical Engineering, May, 2011
9. Tapas Acharjee "Thermal Pretreatment Options for Lignocellulosic Biomass", M.S., Chemical Engineering, August, 2010
10. Srikanth Bellur "Technoeconomic analysis of biosolids equilibrium moisture and drying for energy utilization", M.S. Chemical Engineering, December, 2008
11. Scott Cooper "CFD simulations of mixing phenomena in a binary fluidized bed", M.S., Chemical Engineering, 2003
12. Jianguo Dai, "Model Uncertainty in Nonlinear Model Predictive Control", M.S., Chemical Engineering, 2002

13. Cui Yi “Application of Genetic Algorithm in Model Predictive Control”, M.S., Chemical Engineering, 2000
14. Raja Chellapa, “Model Predictive Control of a pH process”, M.S., Chemical Engineering, 2001
15. Adam Laputz, “Particle Mixing in conical fluidized beds”, M.S., Chemical Engineering, 2000
16. Juan Varela “Cerium mediated electrochemical oxidation of organic vapors”, M.S., Chemical Engineering, 2000
17. Horatio Chiorean “Retention Time Distribution in a circulating fluidized bed”, M.S., Chemical Engineering, 1998
18. Soumoya Bagchi, “Studies on the application of neural networks to a pH process with variable dead time”, M.S., Metallurgy, 1997
19. Jianxun Deng, “Hydrodynamics of a cold model circulating fluidized bed”, PhD, Metallurgy, 1997

Undergraduate students mentored in research projects:

Alex York, BS, 2012
 Elijah Mlawsky, BS 2012
 David Graves, BS 2011-2012
 Micheil Jones, BS, 2012
 Samantha Kertsen, BS 2010
 Schinthia Islam, BS 2010
 Sean Clark, BS, 2009
 Alex Braganza: BS, 2008
 Kevin Schmidt, BS, 2007
 Jignesh Patel, BS, 2007
 Chris Ard, BS, 2006
 Wyatt Musnicki, BS, 2006
 Rebecca Weber, BS, 2006
 Joshua Bumgardner, BS, 2006

Visiting Scholars hosted:

Zaida Chavez Romero, PhD student from Genoa University (Italy), “Modeling and experimental studies of sludge drying rate” January 1, 2012 – June 30, 2012
 Boyoung Kim, Undergraduate student from Chungbuk National University (South Korea), “Biomass densification”, September 1, 2011 – March 1, 2012