Thermochemical Conversion of Biomass to Renewable Fuels

Paige A. Case

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Doctoral Advisors: William J. DeSisto and M. Clayton Wheeler

I am passionate about research and enjoy working in groups with a diverse set of people. My current research focuses on development of simple, robust processes to deoxygenate and stabilize bio-oils to produce drop-in transportation fuels. I plan to continue research in the field of sustainable fuels and chemicals.

As part of a multidisciplinary, multi-institute research group working on thermochemical conversion strategies for production of fuels and chemicals from woody biomass, I developed methods and techniques that have been adopted by other researchers. Over the course of my research career, I have published four peer-reviewed journal articles and have given several papers and posters at conferences. Each of my poster presentations has been awarded special recognition.

I have extensive experience in non-traditional education and outreach. I assisted with grant writing and was responsible for coordinating UMaine's curriculum for the Renewable Energy minor. I have enjoyed mentoring several undergraduate students, and my work with an REU student last year resulted in a peer-reviewed publication about value-added products from tannins. I have been active in K-12 education outreach as well, and have developed activities for several organizations and represented our department at recruiting events. Perhaps most notably, I have spent three weeks each summer developing design projects and leading teams of high school juniors in laboratory experiments for UMaine's Consider Engineering program.

Publications

"Formate Assisted Pyrolysis of Pine Sawdust for in-situ Oxygen Removal and Stabilization of Bio-oil"
Case, Paige A., Wheeler, M. Clayton, DeSisto, William J. Bioresource Technology. In Press.

"Effect of Residence Time and Hot Gas Filtration on the Physical and Chemical Properties of Pyrolysis Oil"
Case, Paige A., Wheeler, M. Clayton, DeSisto, William J. Energy & Fuels. 28 (6): 3964–3969 (2014)

"Pyrolysis of Pre-treated Tannins Obtained from Radiata Pine Bark"
Case, Paige A., Bizama, Constanza, Segura, Christina, Wheeler, M. Clayton, Berg, Alex, DeSisto, William J. Journal of Analytical and Applied Pyrolysis. 107: 250-255 (2014)

"Liquid hydrocarbon fuels from cellulosic feedstocks via thermal deoxygenation of levulinic acid and formic acid salt mixtures"
Case, Paige A., van Heiningen, Adriaan R.P., Wheeler, M. Clayton. Green Chemistry. 14: 85-89 (2012)

Awards
Third place, TCS2014 Frontier Young Scientist Poster Award
"*Proposed mechanisms for pyrolysis of calcium pretreated pine"*
Poster presentation at TCS2014, Denver, CO (September 2014)

Second place, TCBiomass2013 Student Poster Challenge
"Formate-Assisted Pyrolysis of Biomass"
Poster presentation at TCBiomass2013, Chicago, IL (September 2013)