Bryan W. Weber

Contact Information

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Research Interests

Combustion Engineering: Alternative biofuels including alcohols and biodiesel; design of novel experimental methods for combustion analysis

Education

University of Connecticut, Storrs, CT, USA
Doctor of Philosophy, Mechanical Engineering, 2013 (Planned)
Working Dissertation Title: *High Pressure Ignition Chemistry of Alternative Fuels*

Master of Science, Mechanical Engineering, 2010
Thesis Title: *Autoignition of n-Butanol at Low to Intermediate Temperature and Elevated Pressure*

Advisor: Dr. Chih-Jen (Jackie) Sung

Case Western Reserve University, Cleveland, OH, USA
Bachelor of Science, Aerospace Engineering, 2009
Senior Project Title: *Analysis of Heavy Hydrocarbon Fuels using Gas Chromatography with Mass Spectrometry*
Advisor: Dr. Chih-Jen (Jackie) Sung

Research Experience

Combustion Diagnostics Laboratory — 2007-Present

University of Connecticut, Storrs, CT, USA
Case Western Reserve University, Cleveland, OH, USA

Ongoing Projects:

- Experimentally and computationally studying the ignition properties of the butanol isomers over a wide pressure range
- Designing a species sampling apparatus for time-resolved species measurements in the rapid compression machine

Completed Projects:

- Characterized the components of heavy hydrocarbon fuels, including conventional and synthetic jet fuels, using gas chromatography/mass spectrometry
- Experimentally investigated the autoignition of iso-pentanol, an alternative biofuel, in the rapid compression machine
- Experimentally investigated the autoignition of methylcyclohexane, a surrogate for gasoline, in the rapid compression machine

Teaching Experience

University of Connecticut, Storrs, CT, USA

- ME 3239: Combustion for Energy Conversion — Fall 2012
  Teaching Assistant and substitute lecturer
- ENGR 1166: Introduction to Mechanical Engineering — Spring 2013
  Lecturer

Administrative Experience

Co-chair, Combustion Energy Frontier Research Center Junior Associates Committee 2012-Present

Awards, Fellowships, and Grants

Graduate Assistantship in Areas of National Need **Spring 2010**
Awarded in the area of Sustainable Energy Technologies

Fred H. Vose Prize **Spring 2009**
Awarded to the senior in Mechanical and Aerospace Engineering at Case Western Reserve University showing the most promise for future leadership

Summer Undergraduate Research in Energy Sciences Grant **Summer 2008**
Awarded for research to analyze the composition of traditional petroleum-based hydrocarbon fuels using GC/MS

Journal Publications

B.W. Weber, and C.J. Sung. Comparative Autoignition Trends in Butanol Isomers at Elevated Pressure. Energy and Fuels, Feb. 2013. doi:10.1021/ef302195c

T. Tsujimura, W.J. Pitz, F. Gillespie, H.J. Curran, **B.W. Weber**, Y. Zhang, and C.J. Sung. Development of Isopentanol Reaction Mechanism Reproducing Autoignition Character at High and Low Temperatures. Energy and Fuels, vol. 26, no. 8, pp. 4871-4886, Aug. 2012. doi:10.1021/ef300879k

B.W. Weber, K. Kumar, Y. Zhang, and C.J. Sung. Autoignition of n-butanol at elevated pressure and low-to-intermediate temperature. Combustion and Flame, vol. 158, no. 5, pp. 809-819, Mar. 2011. doi:10.1016/j.combustflame.2011.02.005

Conference Presentations

B.W. Weber and C.J. Sung. Comparative Investigation of the High Pressure Autoignition of the Butanol Isomers. Paper A-01, Fall Technical Meeting of the Eastern States Section of the Combustion Institute, Storrs, CT, October 2011.

M.R. Harper, W.H. Green, K.M. Van Geem, **B.W. Weber**, C.J. Sung, I. Stranic, D.F. Davidson, R.K. Hanson. Combustion of the butanol isomers: Reaction pathways at elevated pressures from low-to-high temperatures. Paper # 84 7^{th} International Conference on Chemical Kinetics, Massachusetts Institute of Technology, Cambridge, MA, July 2011.

B.W. Weber and C.J. Sung. A Rapid Compression Study of the Butanol Isomers at Elevated Pressure. Paper 1B13, 7^{th} US National Technical Meeting of the Combustion Institute, Georgia Institute of Technology, Atlanta, GA, March 2011.

B.W. Weber, K. Kumar, and C.J. Sung. Autoignition of Butanol Isomers at Low to Intermediate Temperature and Elevated Pressure. Paper AIAA-2011-0316, 49^{th} Annual Aerospace Sciences Meeting, Orlando, FL, January 2011.

Poster Presentations

B.W. Weber and C.J. Sung. Validation of Kinetic Models of the Butanol Isomers At High Pressure using a Rapid Compression Machine. Poster T40, 7^{th} International Conference on Chemical Kinetics, Massachusetts Institute of Technology, Cambridge, MA, July 2011.

B.W. Weber. Autoignition of n-Butanol at Elevated Pressure and Low to Intermediate Temperature. 1^{st} Combustion Energy Frontiers Research Center Annual Meeting, Princeton University, Princeton, NJ, September 2010.

B.W. Weber, K. Kumar, and C.J. Sung. An Investigation of Hydrocarbon Flames using Probe Sampling and Gas Chromatography/Mass Spectrometry. Support of Undergraduate Research and Creative Endeavors Symposium and Poster Session, Case Western Reserve University, Cleveland, OH, April 2009.

Other Presentations

B.W. Weber and C.J. Sung. Analysis of Hydrocarbon Fuels using Gas Chromatography/Mass Spectrometry. Summer Undergraduate Research in Energy Sciences, Dominion Energy East Ohio Branch, Cleveland, OH, August 2008.