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, 2014 (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

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
- Experimentally investigating the autoignition of iso-pentanol in the rapid compression machine
- Experimentally investigating the autoignition of methyl-cyclohexane in the rapid compression machine
- Characterized the components of heavy hydrocarbon fuels, including conventional and synthetic jet fuels, using gas chromatography/mass spectrometry

Teaching Experience

University of Connecticut, Storrs, CT, USA

ENGR 1166: Introduction to Mechanical Engineering — **Spring 2013**
Lecturer and Grader

ME 3239: Combustion for Energy Conversion — **Fall 2012**
Teaching Assistant and Substitute Lecturer

Administrative Experience

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

Awards and Fellowships

First Place, Mechanical Engineering Graduate Research Competition **Spring 2013**

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, vol. 27, no. 3, pp. 1688-1698, 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/ Papers

B.W. Weber, W.J. Pitz, C.J. Sung, M. Mehl, E.J. Silke, A.C. Davis. *Experiments and Modeling of the Autoignition of Methyl-Cyclohexane at High Pressure.* Paper 3A02, 8th US National Technical Meeting of the Combustion Institute, Park City, UT, May 2013.

B.W. Weber, S.S. Merchant, C.J. Sung, and W.H. Green. *An Autoignition Study of iso-Butanol: Experiments and Modeling.* Paper 3A01, 8th US National Technical Meeting of the Combustion Institute, Park City, UT, May 2013.

S.M. Sarathy, S. Park, W. Wang, P. Veloo, A.C. Davis, C. Togbé, **B.W. Weber**, C.K. Westbrook, O. Park, G. Dayma, Z. Luo, M.A. Oehlschlaeger, F. Egolfopoulos, T. Lu, W.J. Pitz, C.J. Sung, P. Dagaut. *A Comprehensive Experimental and Modeling Study of iso-Pentanol Combustion.* Paper 2A12, 8th US National Technical Meeting of the Combustion Institute, Park City, UT, May 2013.

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, 7th 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, 7th 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, 49th 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, 7th 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.* 1st Combustion Energy Frontier Research Center Annual Meeting, Princeton University, Princeton, NJ, September 2010.

OTHER PRESENTATIONS

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