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; computational analysis of reaction mechanisms for combustion

Education

University of Connecticut, Storrs, CT, USA
Ph.D., Mechanical Engineering, Planned 2014
Working Dissertation Title: *High Pressure Ignition Chemistry of Alternative Fuels*
Advisor: Chih-Jen (Jackie) Sung

M.S., Mechanical Engineering, August 2010

Case Western Reserve University, Cleveland, OH, USA
B.S.E., Aerospace Engineering, May 2009
cum laude

Journal Publications

2014

B.W. Weber, W.J. Pitz, M. Mehl, A.C. Davis, E.J. Silke, and C.J. Sung. *Experiments and Modeling of the Autoignition of Methylcyclohexane at High Pressure*. Combustion and Flame, Feb. 2014. doi:10.1016/j.combustflame.2014.01.018

2013

S.M. Sarathy, S. Park, **B.W. Weber**, W. Wang, P.S. Veloo, A.C. Davis, C. Togbé, C.K. Westbrook, O. Park, G. Dayma, Z. Luo, M.A. Oehlschlaeger, F.N. Egolfopoulos, T. Lu, W.J. Pitz, C.J. Sung, and P. Dagaut. *A Comprehensive Experimental and Modeling Study of iso-Pentanol Combustion*. Combustion and Flame, vol. 160, no. 12, pp. 2712-2728, Dec. 2013. doi:10.1016/j.combustflame.2013.06.022

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, Mar. 2013. doi:10.1021/ef302195c

2012

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

2011

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 Publications and Presentations

2013

S.S. Merchant (Presenting), W.H. Green, K.M. Van Geem, N. Hansen, **B.W. Weber**, and C.J. Sung. *Combustion of the Butanol Isomers: Reaction Pathways from High to Low Temperature.* 8th International Conference on Chemical Kinetics, University Seville, Seville, Spain, July 2013.

B.W. Weber, W.J. Pitz, C.J. Sung, M. Mehl, E.J. Silke, and 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, and 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.

2011

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 (Presenting), K.M. Van Geem, **B.W. Weber**, C.J. Sung, I. Stranic, D.F. Davidson, and 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.

Conference Posters

2011

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.

2010

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.

2009

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

2008

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.

Research Experience

Combustion Diagnostics Laboratory — 2007-Present

University of Connecticut, Storrs, CT, USA
Case Western Reserve University, Cleveland, OH, USA
http://combdiaglab.engr.uconn.edu

Projects:

- Experimentally and computationally studying the ignition properties of the four butanol isomers, iso-pentanol, methylcyclohexane, and propene over a wide range of pressure, temperature, and fuel-loading conditions
- Designing a species sampling apparatus for time-resolved species measurements in the rapid compression machine
- Characterizing 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

Spring 2013 – Instructor for "Introduction to Mechanical Engineering"
Supervisor: Kevin Murphy
Lecture notes and sample homework problems are available on request

Fall 2012 – Teaching Assistant for "Combustion for Energy Conversion"
Supervisor: Chih-Jen Sung
Sample project assignments are available on request

Professional Service

Combustion Energy Frontier Research Center (CEFRC)
Lead Chair, Junior Associates Committee, 2012–
Coordinate monthly teleconferences for graduate students and post-doctoral researchers in the CEFRC where junior members of the CEFRC present recent research results to the group. Act as the liasion between the Center's principle investigators and the junior members.

U.S. Department of Energy
Member, EFRC Newsletter Editorial Board, 2013–
Contribute articles to the Energy Frontier Research Centers (EFRC) newsletter describing recent scientific advances resulting from EFRC research, including:
"Burning Butanol in a Better Engine"
"The Advantage of Renewable Fuels in High-Efficiency Engines" The audience for the articles is scientifically literate, but not expert in the fields relevant to each article. Edit articles written by other board members for factual and grammatical correctness.

Journal Referee, 2013–
Energy & Fuels
Proceedings of the Combustion Institute

Awards and Fellowships

Doctoral Dissertation Fellowship, University of Connecticut, 2014
Graduate Predoctoral Fellowship, Department of Mechanical Engineering, 2013
Graduate Assistantship in Areas of National Need, University of Connecticut, 2010
Fred H. Vose Prize, Department of Mechanical and Aerospace Engineering, 2009
Summer Undergraduate Research in Energy Sciences Grant, Case Western Reserve University, 2008

Professional Memberships

AIAA - Student Member
ASME - Student Member
The Combustion Institute - Student Member
ACS - Student Member