

Bryan W. Weber

CONTACT INFORMATION

Department of Mechanical Engineering
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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

Ph.D., Mechanical Engineering, Planned 2014

Working Dissertation Title: *High Pressure Ignition Chemistry of Alternative Fuels*

Advisor: Professor Chih-Jen (Jackie) Sung

M.S., Mechanical Engineering, August 2010

Thesis Title: *Autoignition of n-Butanol at Low to Intermediate Temperature and Elevated Pressure*

Advisor: Professor Chih-Jen (Jackie) Sung

Case Western Reserve University, Cleveland, OH, USA

B.S., *Cum Laude* Aerospace Engineering, May 2009

Senior Project Title: *Analysis of Heavy Hydrocarbon Fuels using Gas Chromatography with Mass Spectrometry*

Advisor: Dr. Chih-Jen (Jackie) Sung

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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1016/j.combustflame.2011.02.005)

CONFERENCE PAPERS AND PRESENTATIONS

S.S. Merchant (Presenting), W.H. Green, K.M. Van Geem, N. Hansen, **B.W. Weber**, 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. [Abstract](#)

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.

	<p>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. <i>A Comprehensive Experimental and Modeling Study of iso-Pentanol Combustion</i>. Paper 2A12, 8th US National Technical Meeting of the Combustion Institute, Park City, UT, May 2013.</p> <p>B.W. Weber and C.J. Sung. <i>Comparative Investigation of the High Pressure Autoignition of the Butanol Isomers</i>. Paper A-01, Fall Technical Meeting of the Eastern States Section of the Combustion Institute, Storrs, CT, October 2011.</p> <p>M.R. Harper, W.H. Green (Presenting), K.M. Van Geem, B.W. Weber, C.J. Sung, I. Stranic, D.F. Davidson, R.K. Hanson. <i>Combustion of the butanol isomers: Reaction pathways at elevated pressures from low-to-high temperatures</i>. Paper #84, 7th International Conference on Chemical Kinetics, Massachusetts Institute of Technology, Cambridge, MA, July 2011. Slides</p> <p>B.W. Weber and C.J. Sung. <i>A Rapid Compression Study of the Butanol Isomers at Elevated Pressure</i>. Paper 1B13, 7th US National Technical Meeting of the Combustion Institute, Georgia Institute of Technology, Atlanta, GA, March 2011.</p> <p>B.W. Weber, K. Kumar, and C.J. Sung. <i>Autoignition of Butanol Isomers at Low to Intermediate Temperature and Elevated Pressure</i>. Paper AIAA-2011-0316, 49th Annual Aerospace Sciences Meeting, Orlando, FL, January 2011.</p>	
CONFERENCE POSTERS	<p>B.W. Weber and C.J. Sung. <i>Validation of Kinetic Models of the Butanol Isomers At High Pressure using a Rapid Compression Machine</i>. Poster T40, 7th International Conference on Chemical Kinetics, Massachusetts Institute of Technology, Cambridge, MA, July 2011. Poster</p> <p>B.W. Weber. <i>Autoignition of n-Butanol at Elevated Pressure and Low to Intermediate Temperature</i>. 1st Combustion Energy Frontier Research Center Annual Meeting, Princeton University, Princeton, NJ, September 2010.</p> <p>B.W. Weber, K. Kumar, and C.J. Sung. <i>An Investigation of Hydrocarbon Flames using Probe Sampling and Gas Chromatography/Mass Spectrometry</i>. Support of Undergraduate Research and Creative Endeavors Symposium and Poster Session, Case Western Reserve University, Cleveland, OH, April 2009.</p>	
OTHER PRESENTATIONS	<p>B.W. Weber and C.J. Sung. <i>Analysis of Hydrocarbon Fuels using Gas Chromatography/Mass Spectrometry</i>. Summer Undergraduate Research in Energy Sciences Program, Dominion Energy East Ohio Branch, Cleveland, OH, August 2008.</p>	
TEACHING EXPERIENCE	<p>University of Connecticut, Storrs, CT, USA</p> <p>Fall 2012 - Spring 2013</p> <p>Instructor for ENGR 1166: Introduction to Mechanical Engineering</p> <ul style="list-style-type: none"> • Spring 2013 • Prepared and delivered lectures covering the fundamental topics in Mechanical Engineering, including Vector Math and Calculus, Statics, Dynamics, Solid Mechanics, Thermodynamics, Fluid Mechanics and Heat Transfer • Prepared and graded weekly homework assignments for 60 2nd semester engineering students • Held weekly office hour sessions for up to 10 students <p>Lecture notes and sample homework problems are available on request</p>	

Substitute Instructor and Grader for ME 3239: Combustion for Energy Conversion

- Fall 2012
 - Assisted in the preparation of lectures
 - Developed intensive student projects using the CHEMKIN-Pro software
 - Graded 20 8th semester students' projects
- Sample project assignments are available on request

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

PROFESSIONAL
EXPERIENCE

Combustion Energy Frontier Research Center

2012-Present

- Co-chair, Junior Associates Committee
- Duties include planning monthly teleconferences for junior members of the CEFRC, attending PI teleconferences on behalf of the junior members, etc.

AWARDS AND
FELLOWSHIPS

University of Connecticut

- **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

Case Western Reserve University

- **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

PROFESSIONAL
MEMBERSHIPS

AIAA - Student Member

ASME - Student Member

The Combustion Institute - Student Member

SKILLS

Programming/Scripting Languages:

- Python, MATLAB, FORTRAN 77, UNIX shell scripting (bash)

Software Packages:

- CHEMKIN-II and associated programs (SENKIN, etc.)
- CHEMKIN-Pro
- T_EX (L^AT_EX, B_IB_TE_X),
- Microsoft Office, Google Docs
- Solidworks 3D Modeling

Operating Systems:

- Microsoft Windows (XP, Vista, 7, 8), Linux (Ubuntu)