

Bryan W. Weber

CONTACT INFORMATION

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RESEARCH INTERESTS

My research interests generally lie in developing tools to apply fundamental combustion insights to solve engineering problems. My recent work involves developing experimental methods to analyze intermediate species at practical combustion conditions. I am also interested in developing methods to analyze computational models, particularly kinetic models of combustion.

EDUCATION

Ph.D., Mechanical Engineering, University of Connecticut, 2014
M.S., Mechanical Engineering, University of Connecticut, 2010
B.S.E., Aerospace Engineering, Case Western Reserve University, 2009

PROFESSIONAL EXPERIENCE

Visiting Assistant Professor, University of Connecticut 2014–Present
Conducting research on the combustion kinetics of alternative and traditional fuels. Teaching undergraduate courses in thermal-fluids engineering.

Graduate Research Assistant, University of Connecticut 2009–2014
Undergraduate Research Assistant, Case Western Reserve University 2007–2009
[Combustion Diagnostics Laboratory](#) — Director: C.-J. Sung
Conducted experimental and computational studies of the ignition properties of several alternative fuels and foundational fuels, with focus on engine-relevant conditions. Designed a species sampling apparatus for time-resolved species measurements in the rapid compression machine, using gas chromatography/mass spectrometry to identify and quantify combustion intermediates. Analyzed kinetic models for combustion to determine the parameters controlling prediction of ignition delay and improve the ability of the models to predict combustion events.

JOURNAL PUBLICATIONS

B.W. Weber, M.W. Renfro, and C.J. Sung. *On the Uncertainty of Temperature Estimation in a Rapid Compression Machine*. Submitted to Combustion and Flame, Sep. 2014.

S.M. Burke, U. Burke, R. Mc Donagh, O. Mathieu, I. Osorio, C. Keese, A. Morones, E.L. Petersen, W. Wang, T.A. DeVerter, M.A. Oehlschlaeger, B. Rhodes, R.K. Hanson, D.F. Davidson, **B.W. Weber**, C.J. Sung, J. Santner, Y. Ju, F.M. Haas, F.L. Dryer, E.N. Volkov, E.J. Nilsson, A.A. Konnov, M. Alrefae, F. Khaled, A. Farooq, P. Dirrenberger, P.A. Glaude, F. Battin-Leclerc, and H.J. Curran. *An Experimental and Modeling Study of Propene Oxidation. Part 2: Ignition Delay Time and Flame*

Speed Measurements. Combustion and Flame, Sep. 2014.
doi:10.1016/j.combustflame.2014.07.032

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, vol. 161, no. 8, pp. 1972–1983, Aug. 2014.
doi:10.1016/j.combustflame.2014.01.018

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

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
PUBLICATIONS
AND
PRESENTATIONS

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.

	<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, and 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.</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.</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 2014 — Fundamentals of Engineering Thermodynamics Spring 2013 — Introduction to Mechanical Engineering (Instructor of Record)</p>	
PROFESSIONAL SERVICE	<p>Combustion Energy Frontier Research Center (CEFRC)</p> <p>Lead Chair, Junior Associates Committee</p> <p>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 liaison between the Center's principle investigators and the junior members.</p>	2012–2014

U.S. Department of Energy

2013–2014

Member, EFRC Newsletter Editorial Board

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”

“Confined Catalysts Last Longer”

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

Energy & Fuels

Proceedings of the Combustion Institute

Combustion Science & Technology

SAE World Congress

AWARDS AND FELLOWSHIPS

Doctoral Dissertation Fellowship, University of Connecticut, 2014

Graduate Predoctoral Fellowship, Department of Mechanical Engineering, 2013

Graduate Teaching 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 - Member

ASME - Member

The Combustion Institute - Member

ACS - Member