

# Stanford

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## David Davidson

Sr Research Engineer, Mechanical Engineering

### Bio

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#### BIO

##### Education

University of Toronto Physics B.S (1978)

University of Toronto Aerospace Sciences M.Sc. (1980)

York University Physics Ph.D. (1986)

##### Appointment:

1986-present Senior Research Engineer, Mechanical Engineering Department

##### Research Activities:

Dr. Davidson's research interests span the fields of gas dynamics and combustion kinetics. During his tenure at Stanford University he investigated the chemical kinetics of combustion using a wide array of optical and laser-based diagnostic methods and advanced the use of these diagnostics in shock tubes. He co-authored over 350 research publications with his students and Professor Ronald Hanson. He continues to advise and mentor the graduate students who use shock tubes in the High Temperature Gasdynamics Laboratories. An overview of the shock tube studies performed at Stanford under Prof. Hanson's and Dr. Davidson's supervision can be found in the report entitled "Fundamental Kinetics Database Utilizing Shock Tube Measurements" available at <http://purl.stanford.edu/kb621cw6967>.

He claims he is now retired, but apparently, he is still working.

#### ACADEMIC APPOINTMENTS

- Sr Research Engineer, Mechanical Engineering

#### LINKS

- My Lab Site: [hanson.stanford.edu](http://hanson.stanford.edu)

### Publications

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#### PUBLICATIONS

- **Shock tube/laser absorption measurement of the rate constant of the reaction:  $H_2O_2 + CO \rightarrow 2OH + CO_2$**  *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Shao, J., Choudhary, R., Davidson, D. F., Hanson, R. K.  
2023; 39 (1): 735-743

- **Low-temperature oxidation of n-octane and n-decane in shock tubes: Differences in time histories of key intermediates** *COMBUSTION AND FLAME*  
Choudhary, R., Clees, S., Boddapati, V., Shao, J., Davidson, D. F., Hanson, R. K.  
2023; 251
- **NO<sub>x</sub> formation from ammonia, and its effects on oxy-combustion of hydrocarbon fuels under supercritical-CO<sub>2</sub> conditions** *APPLICATIONS IN ENERGY AND COMBUSTION SCIENCE*  
Gokulakrishnan, P., Shao, J., Klassen, M. S., Davidson, D. F., Hanson, R. K.  
2023; 13
- **A mid-IR laser absorption diagnostic for measuring formaldehyde at high pressures and its demonstration in shock tubes** *COMBUSTION AND FLAME*  
Biswas, P., Choudhary, R., Panda, A., Davidson, D. F., Hanson, R. K.  
2022; 245
- **Shock Tube/Laser Absorption Measurements of Cyclopentadiene Pyrolysis.** *The journal of physical chemistry. A*  
Johnson, S. E., Davidson, D. F., Hanson, R. K.  
2022
- **Shock tube/laser absorption measurements of the isomerization rates of allene and propyne** *COMBUSTION AND FLAME*  
Johnson, S. E., Ding, Y., Davidson, D. F., Hanson, R. K.  
2022; 238
- **Shock tube study of ethanol pyrolysis II: Rate constant measurements and modeling** *COMBUSTION AND FLAME*  
Choudhary, R., Boddapati, V., Clees, S., Girard, J. J., Peng, Y., Shao, J., Davidson, D. F., Hanson, R. K.  
2021; 233
- **Shock tube study of ethanol pyrolysis I: Multi-species time-history measurements** *COMBUSTION AND FLAME*  
Choudhary, R., Boddapati, V., Clees, S., Girard, J. J., Peng, Y., Shao, J., Davidson, D. F., Hanson, R. K.  
2021; 233
- **Experimental and modeling of autoignition of gaseous hydrocarbon fuels in the presence of H<sub>2</sub> and C<sub>2</sub>H<sub>4</sub>** *FUEL*  
Gokulakrishnan, P., Fuller, C., Klassen, M., Davidson, D., Hanson, R.  
2021; 296
- **Collisional excitation kinetics for O(3s S-5(o)) and O(3p P-5(3)) states using laser absorption spectroscopy in shock-heated weakly ionized O-2-Ar mixture** *PHYSICAL REVIEW E*  
Li, Y., Wang, Y., Davidson, D. F., Hanson, R. K.  
2021; 103 (6)
- **Collisional excitation kinetics for O(3s<sup>5</sup>S<sup>o</sup>) and O(3p<sup>5</sup>P<sub>3</sub>) states using laser absorption spectroscopy in shock-heated weakly ionized O<sub>2</sub>-Ar mixture.** *Physical review. E*  
Li, Y., Wang, Y., Davidson, D. F., Hanson, R. K.  
2021; 103 (6-1): 063211
- **Scientific accomplishments and research avenues of Professor Ronald Hanson** *COMBUSTION AND FLAME*  
Davidson, D. F., Jeffries, J. B., Oehlschlaeger, M. A., Strand, C. L.  
2021; 224: 2–5
- **Measurement of time histories of stable intermediates during first stage ignition of n-heptane and its two isomers in a shock tube** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Choudhary, R., Girard, J. J., Clees, S., Johnson, S. E., Shao, J., Davidson, D. F., Hanson, R. K., Aradi, A. A.  
2021; 38 (1): 957-965
- **High-speed imaging of n-heptane ignition in a high-pressure shock tube** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Shao, J., Choudhary, R., Susa, A. J., Davidson, D. F., Hanson, R. K.  
2021; 38 (1): 911-918
- **Shock-induced ignition and pyrolysis of high-pressure methane and natural gas mixtures** *COMBUSTION AND FLAME*  
Shao, J., Ferris, A. M., Choudhary, R., Cassady, S. J., Davidson, D. F., Hanson, R. K.

2020; 221: 364–70

- **A physics-based approach to modeling real-fuel combustion chemistry - VI. Predictive kinetic models of gasoline fuels** *COMBUSTION AND FLAME*  
Xu, R., Saggese, C., Lawson, R., Movaghar, A., Parise, T., Shao, J., Choudhary, R., Park, J., Lu, T., Hanson, R. K., Davidson, D. F., Egolfopoulos, F. N., Aradi, et al  
2020; 220: 475–87
- **The pyrolysis of propane** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*  
Cassady, S. J., Choudhary, R., Boddapati, V., Pinkowski, N. H., Davidson, D. F., Hanson, R. K.  
2020
- **Spectroscopic inference of alkane, alkene, and aromatic formation during high-temperature JP8, JP5, and Jet-A pyrolysis** *FUEL*  
Pinkowski, N. H., Cassady, S. J., Davidson, D. F., Hanson, R. K.  
2020; 269
- **Shock tube/laser absorption measurements of the pyrolysis of JP-10 fuel** *COMBUSTION AND FLAME*  
Johnson, S. E., Davidson, D. F., Hanson, R. K.  
2020; 216: 161–73
- **The Thermal Decomposition of Ethane** *Fuel*  
Cassady, S. J., Choudhary, R., Pinkowski, N. H., Shao, J., Davidson, D. F., Hanson, R. K.  
2020
- **Determination of the JP10 + OH → Product Reaction Rate with Measured Fuel Concentrations in Shock Tube Experiments.** *The journal of physical chemistry. A*  
Zaczek, L. T., Davidson, D. F., Hanson, R. K.  
2020
- **Shock Tube Measurement of the CH<sub>3</sub> + C<sub>2</sub>H<sub>6</sub> CH<sub>4</sub> + C<sub>2</sub>H<sub>5</sub> Rate Constant.** *The journal of physical chemistry. A*  
Shao, J., Wei, W., Choudhary, R., Davidson, D. F., Hanson, R. K.  
2019
- **Experimental Observation of Negative Temperature Dependence in iso-Octane Burning Velocities**  
Susa, A. J., Ferris, A. M., Davidson, D. E., Hanson, R. K.  
AMER INST AERONAUTICS ASTRONAUTICS.2019: 4476–81
- **Gravity-current-induced test gas stratification and its prevention in constrained reaction volume shock-tube experiments** *SHOCK WAVES*  
Susa, A. J., Davidson, D. F., Hanson, R. K.  
2019; 29 (7): 969–84
- **High-temperature laminar flame speed measurements in a shock tube** *COMBUSTION AND FLAME*  
Ferris, A. M., Susa, A. J., Davidson, D. F., Hanson, R. K.  
2019; 205: 241–52
- **Multi-wavelength speciation of high-temperature 1-butene pyrolysis** *FUEL*  
Pinkowski, N. H., Cassady, S. J., Davidson, D. F., Hanson, R. K.  
2019; 244: 269–81
- **A shock tube study of n-heptane, iso-octane, n-dodecane and iso-octane/n-dodecane blends oxidation at elevated pressures and intermediate temperatures** *FUEL*  
Shao, J., Choudhary, R., Peng, Y., Davidson, D. F., Hanson, R. K.  
2019; 243: 541–53
- **Measurement of the reaction rate of H + O<sub>2</sub> + M → HO<sub>2</sub> + M, for M=Ar, N<sub>2</sub>, CO<sub>2</sub>, at high temperature with a sensitive OH absorption diagnostic** *COMBUSTION AND FLAME*  
Choudhary, R., Girard, J. J., Peng, Y., Shao, J., Davidson, D. F., Hanson, R. K.  
2019; 203: 265–78
- **A new method of estimating derived cetane number for hydrocarbon fuels** *FUEL*  
Wang, Y., Cao, Y., Wei, W., Davidson, D. F., Hanson, R. K.

2019; 241: 319–26

- **A multi-wavelength speciation framework for high-temperature hydrocarbon pyrolysis** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*  
Pinkowski, N. H., Ding, Y., Johnson, S. E., Wang, Y., Parise, T. C., Davidson, D. F., Hanson, R. K.  
2019; 225: 180–205
- **Shock Tube Measurement of the  $C_2H_4 + H$  double left right arrow  $C_2H_3 + H_2$  Rate Constant** *JOURNAL OF PHYSICAL CHEMISTRY A*  
Shao, J., Choudhary, R., Peng, Y., Davidson, D. F., Hanson, R. K.  
2019; 123 (1): 15–20
- **Shock tube study of the rate constants for  $H + O_2 + M \rightarrow HO_2 + M$  ( $M = Ar, H_2O, CO_2, N_2$ ) at elevated pressures** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Shao, J., Choudhary, R., Susa, A., Davidson, D. F., Hanson, R. K.  
2019; 37 (1): 145–52
- **A streamlined approach to hybrid-chemistry modeling for a low cetane-number alternative jet fuel** *Combustion and Flame*  
Pinkowski, N. H., Wang, Y., Cassady, S. J., Davidson, D. F., Hanson, R. K.  
2019; 208: 15–26
- **On estimating physical and chemical properties of hydrocarbon fuels using mid-infrared FTIR spectra and regularized linear models** *Fuel*  
Wang, Y., Ding, Y., Wei, W., Cao, Y., Davidson, D. F., Hanson, R. K.  
2019; 255: 115715
- **Ignition delay times of methane and hydrogen highly diluted in carbon dioxide at high pressures up to 300 atm** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Shao, J., Choudhary, R., Davidson, D. E., Hanson, R. K., Barak, S., Vasu, S.  
2019; 37 (4): 4555–62
- **Ignition delay time measurements and modeling for gasoline at very high pressures** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Davidson, D. F., Shao, J. K., Choudhary, R., Mehl, M., Obrecht, N., Hanson, R. K.  
2019; 37 (4): 4885–92
- **A comparative laser absorption and gas chromatography study of low-temperature n-heptane oxidation intermediates** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Ferris, A. M., Susa, A. J., Davidson, D. F., Hanson, R. K.  
2019; 37 (1): 249–57
- **Shock tube measurements of OH concentration time-histories in benzene, toluene, ethylbenzene and xylene oxidation** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Wang, S., Davidson, D. F., Hanson, R. K.  
2019; 37 (1): 163–70
- **A Physics-based approach to modeling real-fuel combustion chemistry - III. Reaction kinetic model of JP10** *COMBUSTION AND FLAME*  
Tao, Y., Xu, R., Wang, K., Shao, J., Johnson, S. E., Movaghar, A., Han, X., Park, J., Lu, T., Brezinsky, K., Egolfopoulos, F. N., Davidson, D. F., Hanson, et al  
2018; 198: 466–76
- **Shock tube study of normal heptane first-stage ignition near 3.5 atm** *COMBUSTION AND FLAME*  
Campbell, M. F., Wang, S., Davidson, D. F., Hanson, R. K.  
2018; 198: 376–92
- **A physics based approach to modeling real-fuel combustion chemistry - IV. HyChem modeling of combustion kinetics of a bio-derived jet fuel and its blends with a conventional Jet A** *COMBUSTION AND FLAME*  
Wang, K., Xu, R., Parise, T., Shao, J., Movaghar, A., Lee, D., Park, J., Gao, Y., Lu, T., Egolfopoulos, F. N., Davidson, D. F., Hanson, R. K., Bowman, et al  
2018; 198: 477–89
- **A combined laser absorption and gas chromatography sampling diagnostic for speciation in a shock tube** *COMBUSTION AND FLAME*  
Ferris, A. M., Davidson, D. E., Hanson, R. K.  
2018; 195: 40–49

- **High-speed imaging of inhomogeneous ignition in a shock tube**  
Tulgestke, A. M., Johnson, S. E., Davidson, D. F., Hanson, R. K.  
SPRINGER.2018: 1089–95
- **A shock tube study of jet fuel pyrolysis and ignition at elevated pressures and temperatures** *FUEL*  
Shao, J., Zhu, Y., Wang, S., Davidson, D. F., Hanson, R. K.  
2018; 226: 338–44
- **A shock tube study of ignition delay times in diluted methane, ethylene, propene and their blends at elevated pressures** *FUEL*  
Shao, J., Davidson, D. F., Hanson, R. K.  
2018; 225: 370–80
- **A physics-based approach to modeling real-fuel combustion chemistry - II. Reaction kinetic models of jet and rocket fuels** *COMBUSTION AND FLAME*  
Xu, R., Wang, K., Banerjee, S., Shao, J., Parise, T., Zhu, Y., Wang, S., Movaghar, A., Lee, D., Zhao, R., Han, X., Gao, Y., Lu, et al  
2018; 193: 520–37
- **A physics-based approach to modeling real-fuel combustion chemistry - I. Evidence from experiments, and thermodynamic, chemical kinetic and statistical considerations** *COMBUSTION AND FLAME*  
Wang, H., Xu, R., Wang, K., Bowman, C. T., Hanson, R. K., Davidson, D. F., Brezinsky, K., Egolfopoulos, F. N.  
2018; 193: 502–19
- **Development of a two-wavelength IR laser absorption diagnostic for propene and ethylene** *MEASUREMENT SCIENCE AND TECHNOLOGY*  
Parise, T. C., Davidson, D. F., Hanson, R. K.  
2018; 29 (5)
- **A new diagnostic for hydrocarbon fuels using 3.41- $\mu$ m diode laser absorption** *COMBUSTION AND FLAME*  
Wang, S., Parise, T., Johnson, S. E., Davidson, D. F., Hanson, R. K.  
2017; 186: 129–39
- **Shock Tube and Laser Absorption Study of CH<sub>2</sub>O Oxidation via Simultaneous Measurements of OH and CO.** *The journal of physical chemistry. A*  
Wang, S., Davidson, D. F., Hanson, R. K.  
2017; 121 (45): 8561-8568
- **Chemical kinetic modeling and shock tube study of methyl propanoate decomposition** *COMBUSTION AND FLAME*  
Ning, H., Wu, J., Ma, L., Ren, W., Davidson, D. F., Hanson, R. K.  
2017; 184: 30–40
- **Toward a better understanding of 2-butanone oxidation: Detailed species measurements and kinetic modeling** *COMBUSTION AND FLAME*  
Hemken, C., Burke, U., Lam, K., Davidson, D. F., Hanson, R. K., Heufer, K., Kohse-Hoinghaus, K.  
2017; 184: 195–207
- **Dependence of Calculated Postshock Thermodynamic Variables on Vibrational Equilibrium and Input Uncertainty** *JOURNAL OF THERMOPHYSICS AND HEAT TRANSFER*  
Campbell, M. F., Owen, K. G., Davidson, D. F., Hanson, R. K.  
2017; 31 (3): 586–608
- **Time-resolved sub-ppm CH<sub>3</sub> detection in a shock tube using cavity-enhanced absorption spectroscopy with a ps-pulsed UV laser** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Wang, S., Davidson, D. F., Jeffries, J. B., Hanson, R. K.  
2017; 36 (3): 4549-4556
- **Combined Ab Initio, Kinetic Modeling, and Shock Tube Study of the Thermal Decomposition of Ethyl Formate.** *The journal of physical chemistry. A*  
Ning, H. n., Wu, J. n., Ma, L. n., Ren, W. n., Davidson, D. F., Hanson, R. K.  
2017; 121 (35): 6568–79
- **Shock tube/laser absorption measurements of the pyrolysis of a bimodal test fuel** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Parise, T., Davidson, D. F., Hanson, R. K.

2017; 36 (1): 281-288

- **Pyrolysis and oxidation of methyl acetate in a shock tube: A multi-species time-history study** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Ren, W., Lam, K., Davidson, D. F., Hanson, R. K., Yang, X.  
2017; 36 (1): 255-264
- **Rate constants of long, branched, and unsaturated aldehydes with OH at elevated temperatures** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Wang, S., Davidson, D. F., Hanson, R. K.  
2017; 36 (1): 151-160
- **Ignition delay time correlations for distillate fuels** *FUEL*  
Davidson, D. F., Zhu, Y., Shao, J., Hanson, R. K.  
2017; 187: 26-32
- **Kinetics of Excited Oxygen Formation in Shock-Heated O-2-Ar Mixtures** *JOURNAL OF PHYSICAL CHEMISTRY A*  
Nations, M., Wang, S., Goldenstein, C. S., Davidson, D. F., Hanson, R. K.  
2016; 120 (42): 8234-8243
- **Kinetics of Excited Oxygen Formation in Shock-Heated O2-Ar Mixtures.** *journal of physical chemistry. A*  
Nations, M., Wang, S., Goldenstein, C. S., Davidson, D. F., Hanson, R. K.  
2016: -?
- **Oxygen Vibrational Relaxation Times: Shock Tube/Laser Absorption Measurements** *JOURNAL OF THERMOPHYSICS AND HEAT TRANSFER*  
Owen, K. G., Davidson, D. F., Hanson, R. K.  
2016; 30 (4): 791-798
- **Shock Tube Measurement for the Dissociation Rate Constant of Acetaldehyde Using Sensitive CO Diagnostics.** *journal of physical chemistry. A*  
Wang, S., Davidson, D. F., Hanson, R. K.  
2016; 120 (35): 6895-6901
- **Improved Shock Tube Measurement of the  $\text{CH}_4 + \text{Ar} = \text{CH}_3 + \text{H} + \text{Ar}$  Rate Constant using UV Cavity-Enhanced Absorption Spectroscopy of  $\text{CH}_3$ .** *journal of physical chemistry. A*  
Wang, S., Davidson, D. F., Hanson, R. K.  
2016; 120 (28): 5427-5434
- **AEROFROSH: a shock condition calculator for multi-component fuel aerosol-laden flows** *SHOCK WAVES*  
Campbell, M. F., Haylett, D. R., Davidson, D. F., Hanson, R. K.  
2016; 26 (4): 429-447
- **Measurements of Oxygen Dissociation Using Laser Absorption** *JOURNAL OF THERMOPHYSICS AND HEAT TRANSFER*  
Owen, K. G., Davidson, D. F., Hanson, R. K.  
2016; 30 (2): 274-278
- **High-speed OH\* chemiluminescence imaging of ignition through a shock tube end-wall** *APPLIED PHYSICS B-LASERS AND OPTICS*  
Troutman, V. A., Strand, C. L., Campbell, M. F., Tulgestke, A. M., Miller, V. A., Davidson, D. F., Hanson, R. K.  
2016; 122 (3)
- **Scaling relation for high-temperature biodiesel surrogate ignition delay times** *FUEL*  
Campbell, M. F., Davidson, D. F., Hanson, R. K.  
2016; 164: 151-159
- **Cavity-enhanced absorption spectroscopy with a ps-pulsed UV laser for sensitive, high-speed measurements in a shock tube** *OPTICS EXPRESS*  
Wang, S., Sun, K., Davidson, D. F., Jeffries, J. B., Hanson, R. K.  
2016; 24 (1): 308-318
- **Strategies for obtaining long constant-pressure test times in shock tubes** *SHOCK WAVES*

- Campbell, M. F., Parise, T., Tulgestke, A. M., Spearrin, R. M., Davidson, D. F., Hanson, R. K.  
2015; 25 (6): 651-665
- **Shock-tube measurements of excited oxygen atoms using cavity-enhanced absorption spectroscopy** *APPLIED OPTICS*  
Nations, M., Wang, S., Goldenstein, C. S., Sun, K., Davidson, D. F., Jeffries, J. B., Hanson, R. K.  
2015; 54 (29): 8766-8775
  - **Shock Tube Measurement of the High-Temperature Rate Constant for OH + CH<sub>3</sub> -> Products** *JOURNAL OF PHYSICAL CHEMISTRY A*  
Wang, S., Li, S., Davidson, D. F., Hanson, R. K.  
2015; 119 (33): 8799-8805
  - **Shock Tube Measurement of the High-Temperature Rate Constant for OH + CH<sub>3</sub> → Products.** *The journal of physical chemistry. A*  
Wang, S., Li, S., Davidson, D. F., Hanson, R. K.  
2015; 119 (33): 8799-805
  - **Shock-Tube Measurement of Acetone Dissociation Using Cavity-Enhanced Absorption Spectroscopy of CO.** *journal of physical chemistry. A*  
Wang, S., Sun, K., Davidson, D. F., Jeffries, J. B., Hanson, R. K.  
2015; 119 (28): 7257-7262
  - **High-sensitivity interference-free diagnostic for measurement of methane in shock tubes** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*  
Sur, R., Wang, S., Sun, K., Davidson, D. F., Jeffries, J. B., Hanson, R. K.  
2015; 156: 80-87
  - **Shock tube and modeling study of 2,7-dimethyloctane pyrolysis and oxidation** *COMBUSTION AND FLAME*  
Li, S., Sarathy, S. M., Davidson, D. F., Hanson, R. K., Westbrook, C. K.  
2015; 162 (5): 2296-2306
  - **An experimental and modeling study of propene oxidation. Part 2: Ignition delay time and flame speed measurements** *COMBUSTION AND FLAME*  
Burke, S. M., Burke, U., Mc Donagh, R., Mathieu, O., Osorio, I., Keesee, C., Morones, A., Petersen, E. L., Wang, W., DeVerter, T. A., Oehlschlaeger, M. A., Rhodes, B., Hanson, et al  
2015; 162 (2): 296-314
  - **Ignition delay times of conventional and alternative fuels behind reflected shock waves** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Zhu, Y., Li, S., Davidson, D. F., Hanson, R. K.  
2015; 35: 241-248
  - **Constrained reaction volume shock tube study of n-heptane oxidation: Ignition delay times and time-histories of multiple species and temperature** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Campbell, M. F., Wang, S., Goldenstein, C. S., Spearrin, R. M., Tulgestke, A. M., Zaczek, L. T., Davidson, D. F., Hanson, R. K.  
2015; 35: 231-239
  - **High-temperature iso-butene absorption diagnostic for shock tube kinetics using a pulsed quantum cascade laser near 11.3 μm** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Spearrin, R. M., Li, S., Davidson, D. F., Jeffries, J. B., Hanson, R. K.  
2015; 35: 3645-3651
  - **Shock Tube/Laser Absorption Measurements of Jet Fuel Pyrolysis and Oxidation** *53rd AIAA Aerospace Sciences Meeting*  
Zhu, Y., Hanson, R. K., Davidson, D. F.  
2015
  - **A shock tube study of CH<sub>3</sub>OH + OH -> Products using OH laser absorption** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Zaczek, L. T., Lam, K. Y., Davidson, D. F., Hanson, R. K.  
2015; 35: 377-384
  - **Shock Tube Study of Dimethylamine Oxidation** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*  
Li, S., Davidson, D. F., Hanson, R. K.  
2015; 47 (1): 19-26

- **High temperature measurements for the rate constants of C-1-C-4 aldehydes with OH in a shock tube** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*  
Wang, S., Davidson, D. F., Hanson, R. K.  
2015; 35: 473-480
- **Reaction Rate Constant of CH<sub>2</sub>O + H = HCO + H<sub>2</sub> Revisited: A Combined Study of Direct Shock Tube Measurement and Transition State Theory Calculation** *JOURNAL OF PHYSICAL CHEMISTRY A*  
Wang, S., Dames, E. E., Davidson, D. F., Hanson, R. K.  
2014; 118 (44): 10201-10209
- **Reaction rate constant of CH<sub>2</sub>O + H = HCO + H<sub>2</sub> revisited: a combined study of direct shock tube measurement and transition state theory calculation.** *The journal of physical chemistry. A*  
Wang, S., Dames, E. E., Davidson, D. F., Hanson, R. K.  
2014; 118 (44): 10201-9
- **A comparative study of the chemical kinetics of methyl and ethyl propanoate** *FUEL*  
Farooq, A., Davidson, D. F., Hanson, R. K., Westbrook, C. K.  
2014; 134: 26-38
- **Shock tube study of ethylamine pyrolysis and oxidation** *COMBUSTION AND FLAME*  
Li, S., Davidson, D. F., Hanson, R. K.  
2014; 161 (10): 2512-2518
- **Recent advances in laser absorption and shock tube methods for studies of combustion chemistry** *PROGRESS IN ENERGY AND COMBUSTION SCIENCE*  
Hanson, R. K., Davidson, D. F.  
2014; 44: 103-114
- **Pyrolysis study of conventional and alternative fuels behind reflected shock waves** *FUEL*  
Li, S., Zhu, Y., Davidson, D. F., Hanson, R. K.  
2014; 132: 170-177
- **FTIR measurements of mid-IR absorption spectra of gaseous fatty acid methyl esters at T=25-500 degrees C** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*  
Campbell, M. F., Freeman, K. G., Davidson, D. F., Hanson, R. K.  
2014; 145: 57-73
- **Shock Tube Measurements of Ignition Delay Times for the Butanol Isomers Using the Constrained-Reaction-Volume Strategy** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*  
Bec, I. L., Zhu, Y., Davidson, D. F., Hanson, R. K.  
2014; 46 (8): 433-442
- **Ignition delay times of very-low-vapor-pressure biodiesel surrogates behind reflected shock waves** *FUEL*  
Campbell, M. F., Davidson, D. F., Hanson, R. K.  
2014; 126: 271-281
- **A second-generation constrained reaction volume shock tube.** *Review of scientific instruments*  
Campbell, M. F., Tulgestke, A. M., Davidson, D. F., Hanson, R. K.  
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