Stanford



# David Davidson

Research Assistant, Mechanical Engineering - Thermosciences

## Bio

### 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

- Research Assistant, Mechanical Engineering - Thermosciences

### LINKS

- My Lab Site: hanson.stanford.edu

## Publications

### PUBLICATIONS

- **Shock tube/laser absorption measurement of the rate constant of the reaction: H 2 O 2+CO 2 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
- **NOx formation from ammonia, and its effects on oxy-combustion of hydrocarbon fuels under supercritical-CO2 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 H2 and C2H4** *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^{5}S^{o}) and O(3p^{5}P_{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 (6-1): 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
- **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
- **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
- **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
- **The Thermal Decomposition of Ethane** *Fuel*
  Cassady, S. J., Choudhary, R., Pinkowski, N. H., Shao, J., Davidson, D. F., Hanson, R. K.
  2020
- **Shock Tube Measurement of the CH3 + C2H6 CH4 + C2H5 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-2 + M -> HO2 + M, for M=Ar, N-2, CO2, 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 C2H4 + H double left right arrow C2H3 + 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 -> HO2 +M (M = Ar, H2O, CO2, 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

- **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 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

- **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 CH2O 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-Hoeinghaus, 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 CH3 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 CH4 + Ar = CH3 + H + Ar Rate Constant using UV Cavity-Enhanced Absorption Spectroscopy of CH3.** *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 + CH3 -> 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 + CH3 → 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 mu m** *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 CH3OH + 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 CH2O + H = HCO + H-2 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 CH2O + H = HCO + H2 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-VolumeStrategy** *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.
  2014; 85 (5): 055108-?
- **An improved kinetic mechanism for 3-pentanone pyrolysis and oxidation developed using multispecies time histories in shock-tubes** *COMBUSTION AND FLAME*
  Dames, E. E., Lam, K., Davidson, D. F., Hanson, R. K.
  2014; 161 (5): 1135-1145
- **Experimental and Modeling Study of the Thermal Decomposition of C3-C5 Ethyl Esters Behind Reflected Shock Waves** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Ren, W., Spearrin, R. M., Davidson, D. F., Hanson, R. K.
  2014; 118 (10): 1785-1798
- **1-Butanol ignition delay times at low temperatures: An application of the constrained-reaction-volume strategy** *COMBUSTION AND FLAME*

Zhu, Y., Davidson, D. F., Hanson, R. K.
2014; 161 (3): 634-643

- **Shock tube measurements of branched alkane ignition delay times** *FUEL*
  Li, S., Campos, A., Davidson, D. F., Hanson, R. K.
  2014; 118: 398-405
- **Pyrolysis and oxidation of decalin at elevated pressures: A shock-tube study** *COMBUSTION AND FLAME*
  Zhu, Y., Davidson, D. F., Hanson, R. K.
  2014; 161 (2): 371-383
- **High-Temperature Measurements of the Reactions of OH with Ethylamine and Dimethylamine** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Li, S., Dames, E., Davidson, D. F., Hanson, R. K.
  2014; 118 (1): 70-77
- **High-temperature measurements of the reactions of OH with ethylamine and dimethylamine.** *The journal of physical chemistry. A*
  Li, S., Dames, E., Davidson, D. F., Hanson, R. K.
  2014; 118 (1): 70-7
- **Uncertainty-quantification analysis of the effects of residual impurities on hydrogen-oxygen ignition in shock tubes** *COMBUSTION AND FLAME*
  Urzay, J., Kseib, N., Davidson, D. F., Iaccarino, G., Hanson, R. K.
  2014; 161 (1): 1-15
- **Shock tube study of the pressure dependence of monomethylhydrazine pyrolysis** *COMBUSTION AND FLAME*
  Li, S., Davidson, D. F., Hanson, R. K.
  2014; 161 (1): 16-22
- **Shock tube study of methanol, methyl formate pyrolysis: CH3OH and CO time-history measurements** *COMBUSTION AND FLAME*
  Ren, W., Dames, E., Hyland, D., Davidson, D. F., Hanson, R. K.
  2013; 160 (12): 2669-2679
- **Shock tube measurements of the rate constant for the reaction cyclohexene -> ethylene+1,3-butadiene** *CHEMICAL PHYSICS LETTERS*
  Stranic, I., Davidson, D. F., Hanson, R. K.
  2013; 584: 18-23
- **High-temperature laser absorption diagnostics for CH2O and CH3CHO and their application to shock tube kinetic studies** *COMBUSTION AND FLAME*
  Wang, S., Davidson, D. F., Hanson, R. K.
  2013; 160 (10): 1930-1938
- **Constrained reaction volume approach for studying chemical kinetics behind reflected shock waves** *COMBUSTION AND FLAME*
  Hanson, R. K., Pang, G. A., Chakraborty, S., Ren, W., Wang, S., Davidson, D. F.
  2013; 160 (9): 1550-1558
- **Shock tube measurements and model development for morpholine pyrolysis and oxidation at high pressures** *COMBUSTION AND FLAME*
  Li, S., Davidson, D. F., Hanson, R. K., Labbe, N. J., Westmoreland, P. R., Osswald, P., Kohse-Hoeinghaus, K.
  2013; 160 (9): 1559-1571
- **A Shock Tube Study of H-2+OH -> H2O+H Using OH Laser Absorption** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Lam, K., Davidson, D. F., Hanson, R. K.
  2013; 45 (6): 363-373
- **Multi-species measurements in 2-butanol and i-butanol pyrolysis behind reflected shock waves** *COMBUSTION AND FLAME*
  Stranic, I., Pyun, S. H., Davidson, D. F., Hanson, R. K.
  2013; 160 (6): 1012-1019
- **Methane and ethylene time-history measurements in n-butane and n-heptane pyrolysis behind reflected shock waves** *FUEL*
  Pyun, S. H., Ren, W., Davidson, D. F., Hanson, R. K.
  2013; 108: 557-564

- **Shock tube measurements of methane, ethylene and carbon monoxide time-histories in DME pyrolysis** *COMBUSTION AND FLAME*
  Pyun, S. H., Ren, W., Lam, K., Davidson, D. F., Hanson, R. K.
  2013; 160 (4): 747-754
- **Multi-species time-history measurements during n-hexadecane oxidation behind reflected shock waves** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Haylett, D. R., Davidson, D. F., Cook, R. D., Hong, Z., Ren, W., Pyun, S. H., Hanson, R. K.
  2013; 34: 369-376
- **Formulation of an RP-1 pyrolysis surrogate from shock tube measurements of fuel and ethylene time histories** *FUEL*
  MacDonald, M. E., Davidson, D. F., Hanson, R. K., Pitz, W. J., Mehl, M., Westbrook, C. K.
  2013; 103: 1051-1059
- **Fuel and Ethylene Measurements during n-dodecane, methylcyclohexane, and iso-cetane pyrolysis in shock tubes** *FUEL*
  MacDonald, M. E., Ren, W., Zhu, Y., Davidson, D. F., Hanson, R. K.
  2013; 103: 1060-1068
- **Shock tube/laser absorption studies of the decomposition of methyl formate** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Ren, W., Lam, K., Pyun, S. H., Farooq, A., Davidson, D. F., Hanson, R. K.
  2013; 34: 453-461
- **Ignition delay times of methyl oleate and methyl linoleate behind reflected shock waves** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Campbell, M. F., Davidson, D. F., Hanson, R. K., Westbrook, C. K.
  2013; 34: 419-425
- **Multi-species time-history measurements during high-temperature acetone and 2-butanone pyrolysis** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Lam, K., Ren, W., Pyun, S. H., Farooq, A., Davidson, D. F., Hanson, R. K.
  2013; 34: 607-615
- **On the rate constants of OH + HO2 and HO2 + HO2: A comprehensive study of H2O2 thermal decomposition using multi-species laser absorption** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Hong, Z., Lam, K., Sur, R., Wang, S., Davidson, D. F., Hanson, R. K.
  2013; 34: 565-571
- **High-Temperature Measurements of the Reactions of OH with Small Methyl Esters: Methyl Formate, Methyl Acetate, Methyl Propanoate, and Methyl Butanoate** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Lam, K., Davidson, D. F., Hanson, R. K.
  2012; 116 (50): 12229-12241
- **Shock tube studies of methyl butanoate pyrolysis with relevance to biodiesel** *COMBUSTION AND FLAME*
  Farooq, A., Ren, W., Lam, K. Y., Davidson, D. F., Hanson, R. K., Westbrook, C. K.
  2012; 159 (11): 3235-3241
- **Second-generation aerosol shock tube: an improved design** *SHOCK WAVES*
  Haylett, D. R., Davidson, D. F., Hanson, R. K.
  2012; 22 (6): 483-493
- **Multi-species measurements in 1-butanol pyrolysis behind reflected shock waves** *COMBUSTION AND FLAME*
  Stranic, I., Pyun, S. H., Davidson, D. F., Hanson, R. K.
  2012; 159 (11): 3242-3250
- **Shock tube measurements of 3-pentanone pyrolysis and oxidation** *COMBUSTION AND FLAME*
  Lam, K., Ren, W., Hong, Z., Davidson, D. F., Hanson, R. K.
  2012; 159 (11): 3251-3263
- **A shock tube study of the rate constants of HO2 and CH3 reactions** *COMBUSTION AND FLAME*
  Hong, Z., Davidson, D. F., Lam, K., Hanson, R. K.
  2012; 159 (10): 3007-3013

- **High-Temperature Measurements of the Reactions of OH with a Series of Ketones: Acetone, 2-Butanone, 3-Pentanone, and 2-Pentanone** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Lam, K., Davidson, D. F., Hanson, R. K.
  2012; 116 (23): 5549-5559
- **IR laser absorption diagnostic for C2H4 in shock tube kinetics studies** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Ren, W., Davidson, D. F., Hanson, R. K.
  2012; 44 (6): 423-432
- **CO concentration and temperature sensor for combustion gases using quantum-cascade laser absorption near 4.7 mu m** *APPLIED PHYSICS B-LASERS AND OPTICS*
  Ren, W., Farooq, A., Davidson, D. F., Hanson, R. K.
  2012; 107 (3): 849-860
- **Multispecies laser measurements of n-butanol pyrolysis behind reflected shock waves** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Cook, R. D., Davidson, D. F., Hanson, R. K.
  2012; 44 (5): 303-311
- **Shock tube measurements of ignition delay times for the butanol isomers** *COMBUSTION AND FLAME*
  Stranic, I., Chase, D. P., Harmon, J. T., Yang, S., Davidson, D. F., Hanson, R. K.
  2012; 159 (2): 516-527
- **Ignition delay times of low-vapor-pressure fuels measured using an aerosol shock tube** *COMBUSTION AND FLAME*
  Haylett, D. R., Davidson, D. F., Hanson, R. K.
  2012; 159 (2): 552-561
- **Broad-linewidth laser absorption measurements of oxygen between 211 and 235 nm at high temperatures** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*
  Hong, Z., Lam, K., Davidson, D. F., Hanson, R. K.
  2011; 112 (17): 2698-2703
- **Near-wall imaging using toluene-based planar laser-induced fluorescence in shock tube flow** *SHOCK WAVES*
  Yoo, J., Mitchell, D., Davidson, D. F., Hanson, R. K.
  2011; 21 (6): 523-532
- **Decomposition Measurements of RP-1, RP-2, JP-7, n-Dodecane, and Tetrahydroquinoline in Shock Tubes** *44th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit*
  MacDonald, M. E., Davidson, D. F., Hanson, R. K.
  AMER INST AERONAUT ASTRONAUT.2011: 981–89
- **A comparative study of the oxidation characteristics of cyclohexane, methylcyclohexane, and n-butylcyclohexane at high temperatures** *COMBUSTION AND FLAME*
  Hong, Z., Lam, K., Davidson, D. F., Hanson, R. K.
  2011; 158 (8): 1456-1468
- **An improved H-2/O-2 mechanism based on recent shock tube/laser absorption measurements** *COMBUSTION AND FLAME*
  Hong, Z., Davidson, D. F., Hanson, R. K.
  2011; 158 (4): 633-644
- **Shock tube measurements of species time-histories in monomethyl hydrazine pyrolysis** *COMBUSTION AND FLAME*
  Cook, R. D., Pyun, S. H., Cho, J., Davidson, D. F., Hanson, R. K.
  2011; 158 (4): 790-795
- **Reactions of OH with butene isomers: measurements of the overall rates and a theoretical study.** *journal of physical chemistry. A*
  Vasu, S. S., Huynh, L. K., Davidson, D. F., Hanson, R. K., Golden, D. M.
  2011; 115 (12): 2549-2556
- **Reactions of OH with Butene Isomers: Measurements of the Overall Rates and a Theoretical Study** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Vasu, S. S., Lam K Huynh, K. H., Davidson, D. F., Hanson, R. K., Golden, D. M.

2011; 115 (12): 2549-2556

- **Shock Tube Study of Syngas Ignition in Rich CO2 Mixtures and Determination of the Rate of H + O-2 + CO2 -> HO2 + CO2** *ENERGY & FUELS*
  Vasu, S. S., Davidson, D. F., Hanson, R. K.
  2011; 25 (3): 990-997
- **Interference-free mid-IR laser absorption detection of methane** *MEASUREMENT SCIENCE & TECHNOLOGY*
  Pyun, S. H., Cho, J., Davidson, D. F., Hanson, R. K.
  2011; 22 (2)
- **Shock tube ignition delay time measurements in propane/O-2/argon mixtures at near-constant-volume conditions** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Lam, K., Hong, Z., Davidson, D. F., Hanson, R. K.
  2011; 33: 251-258
- **OH and C2H4 species time-histories during hexadecane and diesel ignition behind reflected shock waves** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Haylett, D. R., Cook, R. D., Davidson, D. F., Hanson, R. K.
  2011; 33: 167-173
- **Multi-species time-history measurements during n-dodecane oxidation behind reflected shock waves** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Davidson, D. F., Hong, Z., Pilla, G. L., Farooq, A., Cook, R. D., Hanson, R. K.
  2011; 33: 151-157
- **A new shock tube study of the H + O-2 -> OH plus O reaction rate using tunable diode laser absorption of H2O near 2.5 mu m** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Hong, Z., Davidson, D. F., Barbour, E. A., Hanson, R. K.
  2011; 33: 309-316
- **Shock tube/laser absorption measurements of ethylene time-histories during ethylene and n-heptane pyrolysis** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Pilla, G. L., Davidson, D. F., Hanson, R. K.
  2011; 33: 333-340
- **Shock Tube/Laser Absorption Measurements of the Reaction Rates of OH with Ethylene and Propene** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Vasu, S. S., Hong, Z., Davidson, D. F., Hanson, R. K., Golden, D. M.
  2010; 114 (43): 11529-11537
- **Planar laser-induced fluorescence imaging in shock tube flows** *EXPERIMENTS IN FLUIDS*
  Yoo, J., Mitchell, D., Davidson, D. F., Hanson, R. K.
  2010; 49 (4): 751-759
- **Multi-species time-history measurements during n-heptane oxidation behind reflected shock waves** *COMBUSTION AND FLAME*
  Davidson, D. F., Hong, Z., Pilla, G. L., Farooq, A., Cook, R. D., Hanson, R. K.
  2010; 157 (10): 1899-1905
- **Measurements of the reaction of OH with n-butanol at high-temperatures** *CHEMICAL PHYSICS LETTERS*
  Vasu, S. S., Davidson, D. F., Hanson, R. K., Golden, D. M.
  2010; 497 (1-3): 26-29
- **High-Temperature Measurements and a Theoretical Study of the Reaction of OH with 1,3-Butadiene** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Vasu, S. S., Zador, J., Davidson, D. F., Hanson, R. K., Golden, D. M., Miller, J. A.
  2010; 114 (32): 8312-8318
- **Shock-Tube Experiments and Kinetic Modeling of Toluene Ignition** *JOURNAL OF PROPULSION AND POWER*
  Vasu, S. S., Davidson, D. F., Hanson, R. K.
  2010; 26 (4): 776-783

- **A Shock Tube Study of OH + H2O2 -> H2O + HO2 and H2O2 + M -> 2OH+M using Laser Absorption of H2O and OH** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Hong, Z., Cook, R. D., Davidson, D. F., Hanson, R. K.
  2010; 114 (18): 5718-5727
- **Experimental Study of the Rate of OH + HO2 -> H2O + O-2 at High Temperatures Using the Reverse Reaction** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Hong, Z., Vasu, S. S., Davidson, D. F., Hanson, R. K.
  2010; 114 (17): 5520-5525
- **Ignition Delay Time Measurements of Normal Alkanes and Simple Oxygenates** *JOURNAL OF PROPULSION AND POWER*
  Davidson, D. F., Ranganath, S. C., Lam, K., Liaw, M., Hong, Z., Hanson, R. K.
  2010; 26 (2): 280-287
- **Hydrogen Peroxide Decomposition Rate: A Shock Tube Study Using Tunable Laser Absorption of H2O near 2.5 mu m** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Hong, Z., Farooq, A., Barbour, E. A., Davidson, D. F., Hanson, R. K.
  2009; 113 (46): 12919-12925
- **The effect of oxygenates on soot formation in rich heptane mixtures: A shock tube study** *FUEL*
  Hong, Z., Davidson, D. F., VASU, S. S., Hanson, R. K.
  2009; 88 (10): 1901-1906
- **High-Temperature Shock Tube Measurements of Dimethyl Ether Decomposition and the Reaction of Dimethyl Ether with OH** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Cook, R. D., Davidson, D. F., Hanson, R. K.
  2009; 113 (37): 9974-9980
- **Recent advances in shock tube/laser diagnostic methods for improved chemical kinetics measurements** *SHOCK WAVES*
  Davidson, D. F., Hanson, R. K.
  2009; 19 (4): 271-283
- **Contact surface tailoring condition for shock tubes with different driver and driven section diameters** *SHOCK WAVES*
  Hong, Z., Davidson, D. F., Hanson, R. K.
  2009; 19 (4): 331-336
- **The use of driver inserts to reduce non-ideal pressure variations behind reflected shock waves** *SHOCK WAVES*
  Hong, Z., Pang, G. A., Vasu, S. S., Davidson, D. F., Hanson, R. K.
  2009; 19 (2): 113-123
- **OH time-histories during oxidation of n-heptane and methylcyclohexane at high pressures and temperatures** *COMBUSTION AND FLAME*
  Vasu, S. S., Davidson, D. F., Hanson, R. K.
  2009; 156 (4): 736-749
- **Jet fuel ignition delay times: Shock tube experiments over wide conditions and surrogate model predictions (vol 152, pg 125, 2008)** *COMBUSTION AND FLAME*
  Vasu, S. S., Davidson, D. F., Hanson, R. K.
  2009; 156 (4): 946-946
- **Shock Tube Study of Methylcyclohexane Ignition over a Wide Range of Pressure and Temperature** *ENERGY & FUELS*
  Vasu, S. S., Davidson, D. F., Hong, Z., Hanson, R. K.
  2009; 23 (1): 175-185
- **Measurements of ignition delay times and OH species concentrations in DME/O-2/Ar mixtures** *26th International Symposium on Shock Waves*
  Cook, R. D., Davidson, D. F., Hanson, R. K.
  SPRINGER-VERLAG BERLIN.2009: 763–767
- **An experimental and computational study of methyl ester decomposition pathways using shock tubes** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Farooq, A., Davidson, D. F., Hanson, R. K., Huynh, L. K., Violi, A.

2009; 32: 247-253

- **Shock tube measurements of ignition delay times and OH time-histories in dimethyl ether oxidation** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Cook, R. D., Davidson, D. F., Hanson, R. K.
  2009; 32: 189-196

- **A diode laser absorption sensor for rapid measurements of temperature and water vapor in a shock tube** *26th International Symposium on Shock Waves*
  Li, H., Farooq, A., Cook, R. D., Davidson, D. F., Jeffries, J. B., Hanson, R. K.
  SPRINGER-VERLAG BERLIN.2009: 409–414

- **High-pressure shock tube experiments and modeling of n-dodecane/air ignition** *26th International Symposium on Shock Waves*
  VASU, S. S., Davidson, D. F., Hanson, R. K.
  SPRINGER-VERLAG BERLIN.2009: 293–298

- **Application of an aerosol shock tube to the measurement of diesel ignition delay times** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Haylett, D. R., Lappas, P. P., Davidson, D. F., Hanson, R. K.
  2009; 32: 477-484

- **n-Dodecane oxidation at high-pressures: Measurements of ignition delay times and OH concentration time-histories** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Vasu, S. S., Davidson, D. F., Hong, Z., Vasudevan, V., Hanson, R. K.
  2009; 32: 173-180

- **Experimental study and modeling of shock tube ignition delay times for hydrogen-oxygen-argon mixtures at low temperatures** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Pang, G. A., Davidson, D. F., Hanson, R. K.
  2009; 32: 181-188

- **Two-wavelength mid-IR diagnostic for temperature and n-dodecane concentration in an aerosol shock tube** *APPLIED PHYSICS B-LASERS AND OPTICS*
  Klingbeil, A. E., Jeffries, J. B., Davidson, D. F., Hanson, R. K.
  2008; 93 (2-3): 627-638

- **Development of an aerosol shock tube for kinetic studies of low-vapor-pressure fuels** *COMBUSTION AND FLAME*
  Davidson, D. F., Haylett, D. R., Hanson, R. K.
  2008; 155 (1-2): 108-117

- **A simple reactive gasdynamic model for the computation of gas temperature and species concentrations behind reflected shock waves** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Li, H., Owens, Z. C., Davidson, D. F., Hanson, R. K.
  2008; 40 (4): 189-198

- **Jet fuel ignition delay times: Shock tube experiments over wide conditions and surrogate model predictions** *COMBUSTION AND FLAME*
  Vasu, S. S., Davidson, D. E., Hanson, R. K.
  2008; 152 (1-2): 125-143

- **Shock tube study of the reaction of CH with N-2: Overall rate and branching ratio** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Vasudevan, V., Hanson, R. K., Bowman, C. T., Golden, D. M., Davidson, D. F.
  2007; 111 (46): 11818-11830

- **High-temperature shock tube measurements of methyl radical decomposition** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Vasudevan, V., Hanson, R. K., Golden, D. M., Bowman, C. T., Davidson, D. F.
  2007; 111 (19): 4062-4072

- **Shock-induced behavior in micron-sized water aerosols** *PHYSICS OF FLUIDS*
  Hanson, T. C., Davidson, D. F., Hanson, R. K.
  2007; 19 (5)

- **Thermal decomposition of toluene: Overall rate and branching ratio** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*

Oehlschlaeger, M. A., Davidson, D. F., Hanson, R. K.
2007; 31: 211-219

- **Methyl concentration time-histories during iso-octane and n-heptane oxidation and pyrolysis** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Davidson, D. F., Oehlschlaeger, M. A., Hanson, R. K.
  2007; 31: 321-328
- **High-temperature measurements of the rates of the reactions CH2O+Ar -> Products and CH2O+O-2 -> Products** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
  Vasudevan, V., Davidson, D. F., Hanson, R. K., Bowman, C. T., Golden, D. M.
  2007; 31: 175-183
- **Investigation of the reaction of toluene with molecular oxygen in shock-heated gases** *COMBUSTION AND FLAME*
  Oehlschlaeger, M. A., Davidson, D. F., Hanson, R. K.
  2006; 147 (3): 195-208
- **Experimental investigation of toluene plus H -> benzyl plus H-2 at high temperatures** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Oehlschlaeger, M. A., Davidson, D. F., Hanson, R. K.
  2006; 110 (32): 9867-9873
- **High-temperature thermal decomposition of benzyl radicals** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Oehlschlaeger, M. A., Davidson, D. F., Hanson, R. K.
  2006; 110 (21): 6649-6653
- **Temperature measurement using ultraviolet laser absorption of carbon dioxide behind shock waves** *APPLIED OPTICS*
  Oehlschlaeger, M. A., Davidson, D. F., Jeffries, J. B.
  2005; 44 (31): 6599-6605
- **High-temperature UV absorption of methyl radicals behind shock waves** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*
  Oehlschlaeger, M. A., Davidson, D. F., Hanson, R. K.
  2005; 92 (4): 393-402
- **High-temperature measurements of the reactions of OH with toluene and acetone** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Vasudevan, V., Davidson, D. F., Hanson, R. K.
  2005; 109 (15): 3352-3359
- **Direct measurements of the reaction OH+CH2O -> HCO+H(2)Oat high temperatures** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Vasudevan, V., Davidson, D. F., Hanson, R. K.
  2005; 37 (2): 98-109
- **Carbon dioxide thermal decomposition: Observation of incubation** *ZEITSCHRIFT FUR PHYSIKALISCHE CHEMIE-INTERNATIONAL JOURNAL OF RESEARCH IN PHYSICAL CHEMISTRY & CHEMICAL PHYSICS*
  Oehlschlaeger, M. A., Davidson, D. F., Jeffries, J. B., Hanson, R. K.
  2005; 219 (5): 555-567
- **UV absorption of CO2 for temperature diagnostics of hydrocarbon combustion applications** *30th International Symposium on Combustion*
  Jeffries, J. B., Schulz, C., Mattison, D. W., Oehlschlaeger, M. A., Bessler, W. G., Lee, T., Davidson, D. F., Hanson, R. K.
  ELSEVIER SCIENCE INC.2005: 1591–1599
- **Shock tube ignition measurements of iso-octane/air and toluene/air at high pressures** *30th International Symposium on Combustion*
  Davidson, D. F., Gauthier, B. M., Hanson, R. K.
  ELSEVIER SCIENCE INC.2005: 1175–1182
- **Shock tube measurements of toluene ignition times and OH concentration time histories** *30th International Symposium on Combustion*
  Vasudevan, V., Davidson, D. F., Hanson, R. K.
  ELSEVIER SCIENCE INC.2005: 1155–1163
- **High-temperature ethane and propane decomposition** *30th International Symposium on Combustion*
  Oehlschlaeger, M. A., Davidson, D. F., Hanson, R. K.

ELSEVIER SCIENCE INC.2005: 1119–1127

- **Shock tube determination of ignition delay times in full-blend and surrogate fuel mixtures** *COMBUSTION AND FLAME*
  Gauthier, B. M., Davidson, D. F., Hanson, R. K.
  2004; 139 (4): 300-311
- **Ultraviolet absorption cross-sections of hot carbon dioxide** *CHEMICAL PHYSICS LETTERS*
  Oehlschlaeger, M. A., Davidson, D. F., Jeffries, J. B., Hanson, R. K.
  2004; 399 (4-6): 490-495
- **Interpreting shock tube ignition data** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Davidson, D. F., Hanson, R. K.
  2004; 36 (9): 510-523
- **Modern shock tube studies of combustion chemistry: Elementary reactions to large mechanisms.** *Meeting of the Division of Chemical Toxicology of the American-Chemical-Society held at the 228th National Meeting of the American-Chemical-Society*
  Hanson, R. K., Davidson, D. F., Herbon, J. T., Oehlschlaeger, M. A., Vasudevan, V.
  AMER CHEMICAL SOC.2004: U233–U233
- **High-temperature thermal decomposition of isobutane and n-butane behind shock waves** *JOURNAL OF PHYSICAL CHEMISTRY A*
  Oehlschlaeger, M. A., Davidson, D. F., Hanson, R. K.
  2004; 108 (19): 4247-4253
- **Validation of a thermal decomposition mechanism of formaldehyde by detection of CH2O and HCO behind shock waves** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Friedrichs, G., Davidson, D. F., Hanson, R. K.
  2004; 36 (3): 157-169
- **Shock tube measurements of branched alkane ignition times and OH concentration time histories** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Oehlschlaeger, M. A., Davidson, D. F., Herbon, J. T., Hanson, R. K.
  2004; 36 (2): 67-78
- **Direct measurements of the reaction H+CH2O -> H-2+HCO behind shock waves by means of Vis-UV detection of formaldehyde** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Friedrichs, G., Davidson, D. F., Hanson, R. K.
  2002; 34 (6): 374-386
- **Ultraviolet absorption spectra of shock-heated carbon dioxide and water between 900 and 3050 K** *CHEMICAL PHYSICS LETTERS*
  Schulz, C., Koch, J. D., Davidson, D. F., Jeffries, J. B., Hanson, R. K.
  2002; 355 (1-2): 82-88
- **Study of the high-temperature autoignition of n-alkane/O-2/Ar mixtures** *JOURNAL OF PROPULSION AND POWER*
  Horning, D. C., Davidson, D. F., Hanson, R. K.
  2002; 18 (2): 363-371
- **Shock tube measurements of iso-octane ignition times and OH concentration time histories** *29th International Combustion Symposium*
  Davidson, D. F., Oehlschlaeger, M. A., Herbon, J. T., Hanson, R. K.
  ELSEVIER SCIENCE INC.2002: 1295–1301
- **Impact of UV absorption by CO2 and H2O on NO LIF in high-pressure combustion applications** *29th International Combustion Symposium*
  Schulz, C., Jeffries, J. B., Davidson, D. F., Koch, J. D., Wolfrum, J., Hanson, R. K.
  ELSEVIER SCIENCE INC.2002: 2735–2742
- **Quantitative detection of HCO behind shock waves: The thermal decomposition of HCO** *PHYSICAL CHEMISTRY CHEMICAL PHYSICS*
  Friedrichs, G., Herbon, J. T., Davidson, D. F., Hanson, R. K.
  2002; 4 (23): 5778-5788
- **OH concentration time histories in n-alkane oxidation** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Davidson, D. F., Herbon, J. T., Horning, D. C., Hanson, R. K.
  2001; 33 (12): 775-783

- **Measurements of temperature-dependent argon-broadened half-widths of H2O transitions in the 7117 cm(-1) region** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*
  Nagali, V., Davidson, D. F., Hanson, R. K.
  2000; 64 (6): 651-655
- **Shock tube measurements of jp-10 ignition** *28th International Symposium on Combustion*
  Davidson, D. F., Horning, D. C., Herbon, J. T., Hanson, R. K.
  ELSEVIER SCIENCE INC.2000: 1687–1692
- **Shock-tube study of high-pressure H2O spectroscopy** *APPLIED OPTICS*
  Nagali, V., Herbon, J. T., Horning, D. C., Davidson, D. F., Hanson, R. K.
  1999; 38 (33): 6942-6950
- **Sensitive detection of NH2 in shock tube experiments using frequency modulation spectroscopy** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Votsmeier, M., Song, S., Davidson, D. F., Hanson, R. K.
  1999; 31 (6): 445-453
- **Shock tube study of monomethylamine thermal decomposition and NH2 high temperature absorption coefficient** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Votsmeier, M., Song, S., Davidson, D. F., Hanson, R. K.
  1999; 31 (5): 323-330
- **Kinetics modeling of shock-induced ignition in low-dilution CH4/O-2 mixtures at high pressures and intermediate temperatures** *COMBUSTION AND FLAME*
  Petersen, E. L., Davidson, D. F., Hanson, R. K.
  1999; 117 (1-2): 272-290
- **Ignition delay times of ram accelerator CH4/O-2/diluent mixtures** *AIAA/ASME/SAE/ASEE 32nd Joint Propulsion Conference*
  Petersen, E. L., Davidson, D. F., Hanson, R. K.
  AMER INST AERONAUT ASTRONAUT.1999: 82–91
- **Shock tube measurements of the equation of state of argon** *13th Symposium on Thermophysical Properties*
  Davidson, D. F., Bates, R., Petersen, E. L., Hanson, R. K.
  SPRINGER/PLENUM PUBLISHERS.1998: 1585–94
- **CH-radical concentration measurements in fuel-rich CH4/O-2/Ar and CH4/O-2/NO/Ar mixtures behind shock waves** *COMBUSTION AND FLAME*
  Woiki, D., Votsmeier, M., Davidson, D. F., Hanson, R. K., Bowman, C. T.
  1998; 113 (4): 624-626
- **GRI-MECH - A comprehensively optimized detailed reaction mechanism for natural gas combustion and no formation and reburning.**
  Frenklach, M., Goldenberg, M., Bowman, C. T., Hanson, R. K., Davidson, D. F., LISSIANSKI, V., GARDINER, W. C., Smith, G. P.
  AMER CHEMICAL SOC.1998: U164–U165
- **Measurement of the rate coefficient of the reaction CH+O-2->products in the temperature range 2200 to 2600 K** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Rohrig, M., Petersen, E. L., Davidson, D. F., Hanson, R. K., Bowman, C. T.
  1997; 29 (10): 781-789
- **A shock tube study of the pyrolysis of NO2** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Rohrig, M., Petersen, E. L., Davidson, D. F., Hanson, R. K.
  1997; 29 (7): 483-493
- **The pressure dependence of the thermal decomposition of N2O** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Rohrig, M., Petersen, E. L., Davidson, D. F., Hanson, R. K.
  1996; 28 (8): 599-608
- **Measurements of the OH A-X (0,0) 306nm absorption bandhead at 60atm and 1735K** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*
  Davidson, D. F., Roehrig, M., Petersen, E. L., DIROSA, M. D., Hanson, R. K.

1996; 55 (6): 755-762

- **High-pressure methane oxidation behind reflected shock waves** *26th International Symposium on Combustion*
  Petersen, E. L., Rohrig, M., Davidson, D. F., Hanson, R. K., Bowman, C. T.
  COMBUSTION INSTITUTE.1996: 799–806
- **Real gas corrections in shock tube studies at high pressures** *ISRAEL JOURNAL OF CHEMISTRY*
  Davidson, D. F., Hanson, R. K.
  1996; 36 (3): 321-326
- **A SHOCK-TUBE STUDY OF METHYL-METHYL REACTIONS BETWEEN 1200 AND 2400 K** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Davidson, D. F., DIROSA, M. D., Chang, E. J., Hanson, R. K., Bowman, C. T.
  1995; 27 (12): 1179-1196
- **COMMUNICATION - REVISED VALUES FOR THE RATE COEFFICIENTS OF ETHANE AND METHANE DECOMPOSITION** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Davidson, D. F., Hanson, R. K., Bowman, C. T.
  1995; 27 (3): 305-308
- **VUV ABSORPTION DIAGNOSTIC FOR SHOCK-TUBE KINETICS STUDIES OF C2H4** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*
  Zelson, L. S., Davidson, D. F., Hanson, R. K.
  1994; 52 (1): 31-43
- **A STUDY OF ETHANE DECOMPOSITION IN A SHOCK-TUBE USING LASER-ABSORPTION OF CH3** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Davidson, D. F., DIROSA, M. D., Hanson, R. K., Bowman, C. T.
  1993; 25 (11): 969-982
- **A CW LASER-ABSORPTION DIAGNOSTIC FOR METHYL RADICALS** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*
  Davidson, D. F., Chang, A. Y., DIROSA, M. D., Hanson, R. K.
  1993; 49 (5): 559-571
- **SHOCK-TUBE MEASUREMENTS OF THE REACTIONS OF CN WITH O AND O2** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Davidson, D. F., Dean, A. J., DIROSA, M. D., Hanson, R. K.
  1991; 23 (11): 1035-1050
- **RAPID TUNING CW LASER TECHNIQUE FOR MEASUREMENTS OF GAS VELOCITY, TEMPERATURE, PRESSURE, DENSITY, AND MASS FLUX USING NO** *APPLIED OPTICS*
  Chang, A. Y., DIROSA, M. D., Davidson, D. F., Hanson, R. K.
  1991; 30 (21): 3011-3022
- **CONTINUOUS WAVE LASER-ABSORPTION TECHNIQUES FOR GASDYNAMIC MEASUREMENTS IN SUPERSONIC FLOWS** *APPLIED OPTICS*
  Davidson, D. F., Chang, A. Y., DIROSA, M. D., Hanson, R. K.
  1991; 30 (18): 2598-2608
- **A SHOCK-TUBE STUDY OF REACTIONS OF C ATOMS WITH H-2 AND O2 USING EXCIMER PHOTOLYSIS OF C3O2 AND C ATOM ATOMIC RESONANCE-ABSORPTION SPECTROSCOPY** *JOURNAL OF PHYSICAL CHEMISTRY*
  Dean, A. J., Davidson, D. F., Hanson, R. K.
  1991; 95 (1): 183-191
- **HIGH-TEMPERATURE REACTION-RATE COEFFICIENTS DERIVED FROM N-ATOM ARAS MEASUREMENTS AND EXCIMER PHOTOLYSIS OF NO** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Davidson, D. F., Hanson, R. K.
  1990; 22 (8): 843-861
- **A PYROLYSIS MECHANISM FOR AMMONIA** *INTERNATIONAL JOURNAL OF CHEMICAL KINETICS*
  Davidson, D. F., KOHSEHOINGHAUS, K., Chang, A. Y., Hanson, R. K.

1990; 22 (5): 513-535

- **SHOCK-TUBE EXCIMER PHOTOLYSIS AND THE MEASUREMENT OF N ATOM KINETIC RATES** *17TH INTERNATIONAL SYMP ON SHOCK WAVES AND SHOCK TUBES*
  Davidson, D. F., Snell, D. C., Hanson, R. K.
  AIP PRESS.1990: 525–530
- **C-ATOM ARAS DIAGNOSTIC FOR SHOCK-TUBE KINETICS STUDIES** *17TH INTERNATIONAL SYMP ON SHOCK WAVES AND SHOCK TUBES*
  Dean, A. J., Davidson, D. F., Hanson, R. K.
  AIP PRESS.1990: 537–542
- **HIGH-TEMPERATURE ABSORPTION-COEFFICIENTS OF O-2, NH3, AND H2O FOR BROAD-BAND ARF EXCIMER LASER-RADIATION** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*
  Davidson, D. F., Chang, A. Y., KOHSEHOINGHAUS, K., Hanson, R. K.
  1989; 42 (4): 267-278
- **QUANTITATIVE NH2 CONCENTRATION DETERMINATION IN SHOCK-TUBE LASER-ABSORPTION EXPERIMENTS** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*
  KOHSEHOINGHAUS, K., Davidson, D. F., Chang, A. Y., Hanson, R. K.
  1989; 42 (1): 1-17
- **Laser Photolysis Shock Tube for Combustion Kinetics Studies** *Twenty-Second Symposium (International) on Combustion*
  Davidson, D. F., Chang, A. Y., Hanson, R. K.
  1988