

Stanford



Ronald Hanson

Clarence J. and Patricia R. Woodard Professor of Mechanical Engineering

CONTACT INFORMATION

- **Personal Information**

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- **Administrative Contact**

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Bio

BIO

Professor Hanson's research is in the field of laser diagnostics and sensors, shock wave physics and chemistry, laser spectroscopy, chemical kinetics and combustion, and propulsion science. He is the author of three book chapters and over archival refereed 500 refereed archival papers in these areas, and has served as a member of the editorial advisory boards of Combustion Science and Technology, Progress in Energy and Combustion Science, Shock Waves, the International Journal of Chemical Kinetics, and the Journal of Quantitative Spectroscopy and Radiative Transfer. He has served as Chair of the Gordon Conference on Combustion Diagnostics, Chair of the Western States Section of the Combustion Institute, and as the Program Co-Chair for the 30th Symposium (International) on Combustion, and he was the Chairman of the Mechanical Engineering Department at Stanford University from 1993 to 2003. Professor Hanson has been the principal advisor for more than 85 PhD graduates.

ACADEMIC APPOINTMENTS

- Professor, Mechanical Engineering
- Affiliate, Precourt Institute for Energy

HONORS AND AWARDS

- Arch T. Colwell Award, Society of Automotive Engineers (2013)
- Most-cited Paper Award, Combustion and Flame (2012)
- Fowler Lecture, Texas A&M (2011)
- Crocco Lecture, Princeton (2011)
- R.I. Soloukhin Award, Institute for the Dynamics of Explosions and Reactive Systems (2011)
- Best Paper in Propellants and Combustion, American Institute of Aeronautics and Astronautics (2011)
- Senior Scientist Award, Alexander von Humboldt Foundation (2010)
- A. Hottel Memorial Lecture, 33rd International Combustion Symposium (2010)

- Alfred Egerton Gold Medal of the Combustion Institute, Combustion Institute (2008)
- Propellants and Combustion Award, American Institute of Aeronautics and Astronautics (2005)
- Fellow, American Society of Mechanical Engineers (2004)
- Elected to National Academy of Engineering, National Academy of Engineering (2002)
- Silver Medal, Combustion Institute (2002)
- Best Paper of 2000, Journal of Measurement Science and Technology (2000)
- Best Paper Award, Ground Test Conference (AIAA) (1997)
- Fellow, American Institute of Aeronautics and Astronautics (1997)
- Aerodynamic Measurement Technology Award, American Institute of Aeronautics and Astronautics (1996)
- Clarence and Patricia Woodard Professor of Mechanical Engineering, Stanford University (1994)
- Fellow, Optical Society of America (1990)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Elected Member, National Academy of Engineering (2002 - present)

PROFESSIONAL EDUCATION

- PhD, Stanford , Aeronautics and Astronautics (1968)

LINKS

- <http://hanson.stanford.edu/>: <http://hanson.stanford.edu/>

Teaching

COURSES

2013-14

- Optical Diagnostics and Spectroscopy: ME 364 (Win)
- Optical Diagnostics and Spectroscopy Laboratory: ME 367 (Spr)

2012-13

- Nonequilibrium Processes in High-Temperature Gases: ME 362B (Win)
- Optical Diagnostics and Spectroscopy Laboratory: ME 367 (Spr)

2011-12

- Optical Diagnostics and Spectroscopy: ME 364 (Win)
- Optical Diagnostics and Spectroscopy Laboratory: ME 367 (Spr)

2010-11

- Nonequilibrium Processes in High-Temperature Gases: ME 362B (Win)
- Optical Diagnostics and Spectroscopy Laboratory: ME 367 (Spr)

POSTDOCTORAL ADVISEES

- Kai Sun

Publications

PUBLICATIONS

- **Laser-Absorption Sensing of Gas Composition of Products of Coal Combustion**
Jeffries, J., B., Sur, R., Sun, K., Hanson, R., K.
- **Transverse Jets in Supersonic Crossflows Part II: The Effect of Compressibility, Velocity Ratio and Density Ratio** *Physics of Fluids*
Ben-Yakar, A., Mungal, M., G., Hanson, R., K.
- **TDL Absorption Sensor for Rapid Temperature and H₂O Measurement in High Pressure and Temperature Gases** *AIAA-2012- 1061*.
Goldenstein, C., S., Schultz, I., A., Jeffries, J., B., Hanson, R., K.
- **Fundamental Kinetics Database Utilizing Shock Tube Measurements: Reaction Rate Measurements** *High Temperature Gasdynamics Laboratory*
Davidson, D., F., Hanson, R., K.
; 3
- **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 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
- **Diode laser measurements of linestrength and temperature-dependent lineshape parameters of H₂O-, CO₂-, and N₂-perturbed H₂O transitions near 2474 and 2482 nm** *JOURNAL OF QUANTITATIVE SPECTROSCOPY & RADIATIVE TRANSFER*
Goldenstein, C. S., Jeffries, J. B., Hanson, R. K.
2013; 130: 100-111
- **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
- **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
- **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-Hoeninghaus, K.
2013; 160 (9): 1559-1571
- **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 of the tert-Butanol + OH Reaction Rate and the tert-C₄H₈OH Radical β -Scission Branching Ratio Using Isotopic Labeling.** *journal of physical chemistry. A*
Stranic, I., Pang, G. A., Hanson, R. K., Golden, D. M., Bowman, C. T.
2013; 117 (23): 4777-4784
- **Single- and dual-band collection toluene PLIF thermometry in supersonic flows** *EXPERIMENTS IN FLUIDS*
Miller, V. A., Gamba, M., Mungal, M. G., Hanson, R. K.
2013; 54 (6)
- **A Shock Tube Study of H₂+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
- **Fiber-coupled 2.7 μ m laser absorption sensor for CO₂ in harsh combustion environments** *MEASUREMENT SCIENCE & TECHNOLOGY*
Spearrin, R. M., Goldenstein, C. S., Jeffries, J. B., Hanson, R. K.
2013; 24 (5)
- **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
- **Real-time, in situ, continuous monitoring of CO in a pulverized-coal-fired power plant with a 2.3 μ m laser absorption sensor** *APPLIED PHYSICS B-LASERS AND OPTICS*
Chao, X., Jeffries, J. B., Hanson, R. K.
2013; 110 (3): 359-365
- **Wavelength modulation diode laser absorption spectroscopy for high-pressure gas sensing** *APPLIED PHYSICS B-LASERS AND OPTICS*
Sun, K., Chao, X., Sur, R., Jeffries, J. B., Hanson, R. K.
2013; 110 (4): 497-508
- **TDL absorption sensors for gas temperature and concentrations in a high-pressure entrained-flow coal gasifier** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
Sun, K., Sur, R., Chao, X., Jeffries, J. B., Hanson, R. K., Pummill, R. J., Whitty, K. J.
2013; 34: 3593-3601
- **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
- **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
- **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
- **Development of laser absorption techniques for real-time, in-situ dual-species monitoring (NO/NH₃, CO/O₂) in combustion exhaust** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
Chao, X., Jeffries, J. B., Hanson, R. K.
2013; 34: 3583-3592
- **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
- **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

- **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
- **Laser measurements of bacterial endospore destruction from shock waves** *MICRO/NANO MATERIALS, DEVICES, AND SYSTEMS*
Lappas, P. P., McCartt, A. D., Gates, S. D., Jeffries, J. B., Hanson, R. K.
2013; 8923
- **TDLASO-based in situ Monitoring of Syngas Composition from an Oxygen-Blown, Down-Fired Coal Gasifier**
Sur, R., Sun, K., Jeffries, J., B., Hanson, R., K., Pummill, R., S., Whitty, K.
2013
- **Constrained Reaction Volume: A Strategy for Reflected Shock Wave Experiments**
Hanson, R., K., Chakraborty, S., Pang, G., A., Ren, W., Wang, S., Davidson, D., F.
2013
- **Diode-laser Measurements of Linestrength and Temperature-dependent Lineshape Parameters of H₂O, CO₂, and N₂-perturbed H₂O Transitions near 2474 and 2482nm** *JQSRT*
Goldenstein, C., S., Jeffries, J., B., Hanson, R., K.
2013; 130: 100-111
- **Shock Tube Study of Ethylamine Pyrolysis and Oxidation**
Li, S., Davidson, D., F., Hanson, R., K., Moshhammer, K., Kohse-Höinghaus, K.
2013
- **In situ Measurements of Syngas Temperature, Water Vapor and Carbon Dioxide in an Engineering Scale**
Sun, K., Sur, R., Jeffries, J., B., Hanson, R., K., Clark, T., Anthony, J.
2013
- **Experimental and Modeling Studies of JP-8, F-T and HRK Ignition under Vitiated Condition**
Gokulakrishnan, P., Fuller, C., Klassen, M., Davidson, D., Hanson, R., Kiel, B.
2013
- **Combustion Kinetic Modeling using Multispecies Time-histories in Shock Tube Pyrolysis and Oxidation of 3-pentanone**
Dames, E., Lam, K., Y., Davidson, D., F., Hanson, R., K.
2013
- **Diode Laser Measurements of Temperature and H₂O for Monitoring Pulse Detonation Combustor Performance**
Goldenstein, C., S., Schultz, I., A., Spearin, R., M., Jeffries, J., B., Hanson, R., K.
2013
- **Two-Color Absorption Spectroscopy Strategy for Measuring the Column Density and Path Average Temperature of the Absorbing Species in Nonuniform Gases** *Applied Optics*
Goldenstein, C., S., Schultz, I., A., Jeffries, J., B., Hanson, R., K.
2013; 52: 7950-7962
- **High Temperature Measurements of the Reaction of OH with a Series of Ketones: Acetone, 2-Butanone, 3-Pentanone and 2-Pentanone** *J. Phys. Chem. A*
Lam, K., Y., Davidson, D., F., Hanson, R., K.
2013; 116: 5549-5559
- **Wavelength Modulation Diode Laser Absorption Spectroscopy for High Pressure Gas Sensing** *Applied Physics B*
Sun, K., Chao, X., Sur, R., Jefries, J., B., Hanson, R., K.
2013; 110: 497-508
- **Fuel and Ethylene Measurements during n-Dodecane, Methylcyclohexane and iso Cetane Pyrolysis in Shock Tubes** *Fuel*
MacDonald, M., E., Ren, W., Davidson, D., F., Hanson, R., K., Pitz, W., Mehl, M.
2013; 103: 1060-1068
- **Ignition Delay Times of Very-Low-Vapor-Pressure Biodiesel Surrogate behind Reflected Shock Waves**
Campbell, M., A., Davidson, D., F., Hanson, R., K.

2013

- **Thermal Decomposition of C3-C5 Ethyl Esters: CO CO2 and H2O Time-history Measurements behind Reflected Shock Waves**
Ren, W., Spearin, R., M., Davidson, D., F., Hanson, R., K.
2013
- **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
- **Experimental Determination of the High-Temperature Rate Constant for the Reaction of OH with sec-Butanol** *JOURNAL OF PHYSICAL CHEMISTRY A*
Pang, G. A., Hanson, R. K., Golden, D. M., Bowman, C. T.
2012; 116 (39): 9607-9613
- **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
- **CO concentration and temperature sensor for combustion gases using quantum-cascade laser absorption near 4.7 μ m** *APPLIED PHYSICS B-LASERS AND OPTICS*
Ren, W., Farooq, A., Davidson, D. F., Hanson, R. K.
2012; 107 (3): 849-860
- **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
- **High-Temperature Rate Constant Determination for the Reaction of OH with iso-Butanol** *JOURNAL OF PHYSICAL CHEMISTRY A*
Pang, G. A., Hanson, R. K., Golden, D. M., Bowman, C. T.
2012; 116 (19): 4720-4725
- **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
- **Rate Constant Measurements for the Overall Reaction of OH+1-Butanol \rightarrow Products from 900 to 1200 K** *JOURNAL OF PHYSICAL CHEMISTRY A*
Pang, G. A., Hanson, R. K., Golden, D. M., Bowman, C. T.
2012; 116 (10): 2475-2483

- **Determination of fluorescence and non-radiative de-excitation rates of excited 3-pentanone at low pressures**
Cheung, B. H., Hanson, R. K.
SPRINGER.2012: 741-753
- **3-pentanone fluorescence yield measurements and modeling at elevated temperatures and pressures**
Cheung, B. H., Hanson, R. K.
SPRINGER.2012: 755-768
- **Wavelength-modulation-spectroscopy for real-time, in situ NO detection in combustion gases with a 5.2 μm quantum-cascade laser** *APPLIED PHYSICS B-LASERS AND OPTICS*
Chao, X., Jeffries, J. B., Hanson, R. K.
2012; 106 (4): 987-997
- **In situ optical measurements of bacterial endospore breakdown in a shock tube**
McCartt, A. D., Gates, S., Lappas, P., Jeffries, J. B., Hanson, R. K.
SPRINGER.2012: 769-774
- **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
- **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
- **Boundary Layer Effects Behind Incident and Reflected Shock Waves in a Shock Tube**
Li, S., Ren, W., Davidson, D., F., Hanson, R., K.
edited by Kontis, K.
2012
- **Hypervelocity Testing of a Dual-mode Scramjet**
Smayda, M., G., Vogel, P., D., Schultz, I., A., Hanson, R., K., Foelsche, R., Tsai, C., Y.
2012
- **A Second-generation Aerosol Shock Tube and its Use in Studying Ignition Delay Times of Large Methyl Esters**
Campbell, M., Davidson, D., F., Hanson, R., K.
edited by Kontis, K.
2012
- **Tunable Diode Laser Absorption Sensor for in situ Determination of Combustion Progress in Scramjet Ground Testing**
Schultz, I., A., Goldenstein, C., S., Jeffries, J., B., Hanson, R., K., Rockwell Jr., R., D.
2012
- **OH PLIF of the Reaction Zone in Combusting Transverse Jets in Supersonic Crossflow**
Gamba, M., Mungal, M., G., Hanson, R., K.
2012
- **Wavelength Modulation Spectroscopy for Real-time, in situ NO Detection in Combustion Gases with a 5.2 μm Quantum Cascade Laser** *Applied Physics B*
Chao, X., Jeffries, J., B., Hanson, R., K.
2012; 106: 987-997
- **Mid-infrared Laser Absorption Diagnostics for Detonation Studies**
Spearrin, R., M., Goldenstein, C., S., Jeffries, J., B., Hanson, R., K.
2012
- **Hypervelocity Testing of a Dual-Mode Scramjet**
Snyder, M., G., Vogel, P., D., Schultz, I., A., Hanson, R., K., Foelsche, R., Tsai, C., Y.
2012
- **Combustion and Propulsion Sensors Using Tunable Diode Laser Absorption**

Hanson, R., K., Jeffries, J., B.
2012

- **Multi-species Measurements of n-Butanol Pyrolysis Behind Reflected Shock Waves**
Cook, R., D., Sur, R., Stranic, I., Davidson, D., F., Hanson, R., K.
edited by Kontis, K.
2012
- **Multi-species Measurements of n-Butanol Pyrolysis behind Reflected Shock Waves** *Intl. J. Chemical Kinetics*
Cook, R., D., Davidson, D., F., Hanson, R., K.
2012; 44: 303-311
- **Experimental Database for Development of a Hi Fire JP-7 Surrogate Fuel Mechanism**
Davidson, D., F., Ren, W., Pyun, S., Hanson, R., K.
2012
- **A Second-generation Aerosol Shock Tube** *Shock Waves*
Haylett, D., R., Davidson, D., F., Hanson, R., K.
2012; 22: 483-493
- **Two-camera Dual-band Collection Toluene PLIF Thermometry in Supersonic Flows**
Miller, V., A., Gamba, M., Mungal, M., G., Hanson, R., K.
2012
- **Laser Absorption Sensor for Real-time In-situ Dual-species Monitoring (NO/NH₃, CO/O₂) in Combustion Exhaust**
Chao, X., Jeffries, J., B., Hanson, R., K.
2012
- **Supersonic Mass-Flux Measurements via Tunable Diode Laser Absorption and Nonuniform Flow Modeling**
Chang, L. S., Strand, C. L., Jeffries, J. B., Hanson, R. K., Diskin, G. S., Gaffney, R. L., Capriotti, D. P.
AMER INST AERONAUT ASTRONAUT.2011: 2783-2791
- **H₂O temperature sensor for low-pressure flames using tunable diode laser absorption near 2.9 μ m** *MEASUREMENT SCIENCE & TECHNOLOGY*
Li, S., Farooq, A., Hanson, R. K.
2011; 22 (12)
- **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
- **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
- **Measurement of Water Vapor Levels for Investigating Vitiating Effects on Scramjet Performance** *JOURNAL OF PROPULSION AND POWER*
Rockwell, R. D., Goyne, C. P., Haw, W., McDaniel, J. C., Goldenstein, C. S., Schultz, I. A., Jeffries, J. B., Hanson, R. K.
2011; 27 (6): 1315-1317
- **Extension of Bacillus endospore gas dynamic heating studies to multiple species and test conditions** *JOURNAL OF APPLIED MICROBIOLOGY*
Gates, S. D., McCart, A. D., Jeffries, J. B., Hanson, R. K., Hokama, L. A., Mortelmans, K. E.
2011; 111 (4): 925-931
- **Decomposition Measurements of RP-1, RP-2, JP-7, n-Dodecane, and Tetrahydroquinoline in Shock Tubes**
MacDonald, M. E., Davidson, D. F., Hanson, R. K.
AMER INST AERONAUT ASTRONAUT.2011: 981-989
- **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., 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
- **Mid-infrared laser-absorption diagnostic for vapor-phase fuel mole fraction and liquid fuel film thickness** *APPLIED PHYSICS B-LASERS AND OPTICS*
Porter, J. M., Jeffries, J. B., Hanson, R. K.
2011; 102 (2): 345-355
- **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)
- **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 μm** *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
- **Applications of quantitative laser sensors to kinetics, propulsion and practical energy systems** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
Hanson, R. K.
2011; 33: 1-40
- **Response of Bacillus thuringiensis Al Hakam Endospores to Gas Dynamic Heating in a Shock Tube** *ZEITSCHRIFT FUR PHYSIKALISCHE CHEMIE-INTERNATIONAL JOURNAL OF RESEARCH IN PHYSICAL CHEMISTRY & CHEMICAL PHYSICS*
McCartt, A. D., Gates, S. D., Jeffries, J. B., Hanson, R. K., Joubert, L. M., Buhr, T. L.
2011; 225 (11-12): 1367-1377
- **Multi-species time-history measurements during n-dodecane oxidation behind reflected shock waves** *PROCEEDINGS OF THE COMBUSTION INSTITUTE*
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