

Western States Section/Combustion Institute

**Western States Section/Combustion
Institute Spring Meeting
2008**

March 17-18, 2008
Los Angeles, California, USA

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571
www.proceedings.com

ISBN: 978-1-60560-987-4

Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2008) by the Western States Section/Combustion Institute
All rights reserved.

For permission requests, please contact the Western States Section/Combustion Institute
at the address below.

Western States Section/Combustion Institute
P.O. Box 969 MS 9052
Livermore, California 94551-0969

TABLE OF CONTENTS

Recent Advances in Shock Tube/Laser Diagnostic Methods for Improved Chemical Kinetics Measurements	1
<i>D.F. Davidson, R.K. Hanson</i>	
Ignition Delay in High Pressure and Low Temperature Hydrogen-Rich Syngas Combustion: Discrepancies between Experiment and Prediction	26
<i>K.N. Jasch, J.W. Daily</i>	
A Chemical Kinetics Model for the Fast Ignition of Syngas at Lower Temperatures and Higher Pressures	43
<i>J.D. Mertens, S.S. Musmann, D.M. Kalitan, E.L. Petersen</i>	
Electrical Properties of Small Diffusion Flames	58
<i>S. Karnani, M. Bennett, D. Dunn-Rankin</i>	
Wind Tunnel Study of Particulate Emissions, Fire Spread and Velocity Field Within the Flame	67
<i>H. Pan, J. Lozano, W. Tachajapong, A. Swanson, C. Kelley, S. Mahalingam, M. Princevac</i>	
Evaluation of the European PMP Methodologies During On-Road Testing	75
<i>H. Jung, K.C. Johnson, T.D. Durbin, A. Chaudhary, D.R. Cocker III, J.D. Herner, W.H. Robertson, T. Huai, A. Ayala, D.B. Kittelson</i>	
Modeling a Heated Wire Catalyst in Cross Flow	85
<i>K. Leichliter, B. Lounsbury, J. Steciak, R. Budwig, S. Beyerlein</i>	
Measurement of Binary Gas Phase Diffusion Coefficients for Combustion Applications	94
<i>J.A. Manion, W.S. McGivern</i>	
Experimental Study and Modeling of Shock Tube Ignition Delay Times for Hydrogen-Oxygen-Argon Mixtures at Low Temperatures	107
<i>G.A. Pang, D.F. Davidson, R.K. Hanson</i>	
Theoretical Study of the Thermal Decomposition of a Jet Fuel Surrogate	119
<i>B. Sirjean., O. Herbinet, P.A. Glaude, M.F. Ruiz-Lopez, R. Fournet</i>	
Preignition and Autoignition Behavior of the Xylene Isomers	138
<i>R.H. Natelson, R.O. Johnson, M.S. Kurman, N.P. Cernansky, D.L. Miller</i>	
OH Time-history Absorption Measurements at High Pressures and Temperatures Behind Reflected Shocks During Methylcyclohexane Oxidation	156
<i>S. Subith, S. Vasu, D.F. Davidson, R.K. Hanson</i>	
Development of Combustion-driven Small Thermoacoustic Engine	169
<i>N.S. Tehrany, C.S. Lin, J. Ahn, K. Matveev</i>	
Introducing Natural Gas as a Second Fuel and Reconstruction of a Diesel Engines to Use Dual Fuel Technology – Emissions, Economy	179
<i>D.M. Dimitrovski</i>	
An Active Gas Mask Using a Heat-recirculating Burner	185
<i>C-H. Chen, P.D. Ronney</i>	
A Mesoscale Fuel Reformer to Produce Syngas in Portable Power Systems	191
<i>I. Schoegl, J.L. Ellzey</i>	
Experimental Measurements of Extinction of Premixed Flames Burning High Molecular Weight Hydrocarbon Fuels	202
<i>P. Weydert, U. Niemann, K. Seshadri</i>	

Diffusion-flame Extinction on a Rotating Porous-disk Burner	210
<i>J. Urzay, V. Nayagam, F.A. Williams</i>	
Propagation and Extinction of Premixed Dimethyl-Ether/Air Flames	227
<i>Y.L. Wang, C. Ji, A.T. Holley, F.N. Egolfopoulos, T.T. Tsotsis, H.J. Curran</i>	
Propagation Rates and Stability Modes of low Lewis Number Edge-Flames in a Counterflow Slot Burner	240
<i>D.B. Clayton, M.S. Cha, P. D. Ronney</i>	
Carbon Burnout Prediction using CBK and Time-Temperature-Oxygen Trajectories through a Coal Furnace	251
<i>P. Therkelsen, M. Kebria, D. Dunn-Rankin</i>	
Detailed and Simplified Kinetic Models of n-Dodecane Oxidation: The Role of Fuel Cracking in Aliphatic Hydrocarbon Combustion	265
<i>X. You, F.N. Egolfopoulos, H. Wang</i>	
Solid State Electrochemical Pressure Sensor for Lean Direct Injection Engines	277
<i>J. Rheume, W. Hable, R. Dibble, A. Pisano</i>	
High Load Performance and Emissions Comparison in a CFR Diesel Engine Running Diesel Fuel and a Fischer-Tropsch Synthetic Fuel	283
<i>L.J. Hamilton, E.M. Sink, P.G. Slye, P.A. Caton, J.S. Cowart</i>	
Local Quenching and Recovery Phenomena of Turbulent Premixed and Non-premixed Combined Flames in an Opposite Flow	290
<i>Y. Yahagi, T. Tsunekawa, T. Yokoyama</i>	
Cellular Burning Structures in Lean Premixed Hydrogen Flames: A Work-in-progress	300
<i>M. Day</i>	
Oxidation and Combustion of the n-hexene Isomers: a Wide Range Kinetic Modeling Study	308
<i>M. Mehl, G. Vanhove, W.J. Pitz, E. Ranzi</i>	
Chemical Mechanism for High Temperature Combustion of Engine Relevant Fuels with Emphasis on Soot Precursors	351
<i>G. Blanquart, P. Pepiot-Desjardins, H. Pitsch</i>	
Application of Simultaneous Planar LIF and LII Imaging to a Turbulent Nonpremixed Ethylene Jet Flame	383
<i>J. Zhang, T.C. Williams, C.R. Shaddix, R.W. Schefer</i>	
Modeling Soot Formation in Kerosene and Fuel Surrogates Combustion	394
<i>G. Blanquart, H. Pitsch</i>	
Mass Fraction Burn Model for Characterizing CFR Engine Performance on Water-Ethanol-Gasoline Mixtures	409
<i>E. Anderson, D. Cordon, S. Beyerlein, J. Steciak</i>	
Development and Characterization of a Small IC Engine Dynamometer	420
<i>A. Jepsen, C. Miller, P. Therkelsen, J. Garman, D. Dunn-Rankin, J. Hynes</i>	
Evaluation of Emissions and Performance of Diesel Locomotives with Biodiesel Blends: Static Test Results	429
<i>D. Mckenna, C. Rowen, K. Bhatia, R. Hesketh, A.J. Marchese</i>	
The Effects of Intake Pressure, Fuel Concentration, and Bias Voltage on the Detection of Ions in a Homogeneous Charge Compression Ignition (HCCI) Engine	437
<i>G.E. Bogin Jr., J-Y. Chen, R. Dibble</i>	
Extinction of Wet and Dry Premixed Ethanol/Air and Butanol/Air Flames	452
<i>G. Schwab, P.S. Veloo, Y.L. Wang, A.T. Holley, F.N. Egolfopoulos, T.T. Tsotsis, H. Zhang</i>	

Propagation and Extinction of Premixed n-Dodecane/Air Flames	467
<i>C. Ji, X. You, A.T. Holley, Y.L. Wang, F.N. Egolfopoulos, H. Wang</i>	
Experimental and Kinetic Modeling Study of Combustion of Gasoline, Its Surrogates and Components in Laminar Nonpremixed Flows	479
<i>T. Bieleveld, A. Frassoldati, A. Cuoci, T. Faravelli, E. Ranzi</i>	
Modeling Combustion Characteristics of Components of Model-Biodiesel at High Temperatures	499
<i>Y.L. Wang, F.N. Egolfopoulos, T.T. Tsotsis, C.K. Westbrook</i>	
Study on the Presence of Nanoparticles in Near-Sooting Premixed Ethylene-Air Flat Flames	505
<i>A.D. Abid, H. Wang</i>	
Turbulent Combustion in a Curving, Contracting Channel with a Cavity Stabilized Flame	512
<i>S.V. Purana, B. Colcor, J. Aric, D. Dunn-Rankin, W.A. Sirignan</i>	
Controlled Excitation of Transverse Jet Shear Layer Instabilities	529
<i>J. Davitian, C. Hendrickson, D. Getsinger, R.T. M'Closkey, A.R. Karagozian</i>	
Formation and Growth of Nanoparticles in Non-sooting Rich Premixed Flames	555
<i>A. De Filippo, L. Sgro, G. Lanzuolo, P. Minutolo, A. D'Anna, A. D'Alessio</i>	
Extending the Method of Moments for Bimodal Soot Particle Size Distributions	564
<i>M.E. Mueller, G. Blanquart, H. Pitsch</i>	
An Experimental Study of the Autoignition Characteristics of Jet-A/Oxidizer Mixtures in a Rapid Compression Machine	576
<i>K. Kumar, C.J. Sung</i>	
Extinction of Dry and Wet Premixed H₂/Air Flames	585
<i>P.S. Veloo, Y.L. Wang, C. Ji, A.T. Holley, G. Schwab, T. Suksila, K. Kellogg, F.N. Egolfopoulos</i>	
Sensitivity of Propagation and Extinction of Large Hydrocarbon Flames to Binary Diffusion Coefficients	595
<i>A.T. Holley, X. You, E. Dames, H. Wang, F.N. Egolfopoulos</i>	
Effect of Radiation Heat Transfer on Burning Speed of Aluminum Dust Cloud	611
<i>M. Bidabadi, H. Bisadi, O. Assarehzadegan</i>	
CFD Investigation of Carbon Burnout in a Full-Scale Coal-Fired Boiler	629
<i>M.K. Tran, W. Zhou, W.R. Seeker, D. Dunn-Rankin</i>	
Identifying Sources of Low-wind/high Particulate Matter Episodes in the Imperial Valley/Mexicali Region	639
<i>K. Kelly, I.C. Jaramillo, H. Meuzeelar, J.S. Lighty</i>	
Modeling of CO₂ Gasification of Carbon for Integration with Solid Oxide Fuel Cells	648
<i>A.C. Lee, R.E. Mitchell, T.M. Gür</i>	
Author Index	