

**OS2: The Eighth International Symposium on Innovative Energy Research II:
Combustion Technology and Fundamentals**

October 28, 2020
ROOM3 (Zoom Webinar)

- OS2-1 **Comparison of 0D with Two Constraints and 1D Analyses of CH₄/air Mixture Ignition Using a Nanosecond Pulsed Discharge**
13:30-13:50 Mayu Suzuki, Youhi Morii, Hisashi Nakamura, Kaoru Maruta (Tohoku University, Japan)
- OS2-2 **Study on the Development of Detailed C₂H₄/C₃H₆ Surface Reaction Mechanism on Pt/Al₂O₃ Monolith Catalyst using Gaseous and Surface Species Measurements**
13:50-14:10 Set Naing (Hiroshima University, Japan), I Putu Angga Kristyawan (Pusat Teknologi Lingkungan BPPT, Indonesia), Daisuke Shimokuri (Hiroshima University, Japan), Satoshi Hinokuma (National Institute of Advanced Industrial Science and Technology, Japan), Hiroshi Murakami, Yuhei Matsumoto (Mazda Motor Corporation, Japan), Tomohito Omori (Hiroshima University, Japan), Michiharu Kawano, Masanobu Koutoku, Hideaki Yokohata (Mazda Motor Corporation, Japan), Akira Miyoshi (Hiroshima University, Japan)
- OS2-3 **Investigation on the Relationship between MIE Transition and Fuel Properties Part 1: Effect of Furan Addition to Base Fuel**
14:10-14:30 Taichi Mukoyama, Yoshiki Hirano, Takuya Tezuka, Youhi Morii, Hisashi Nakamura, Kaoru Maruta (Tohoku University, Japan)
- OS2-4 **Investigation on Relationship between MIE Transition and Fuel Properties Part 2: Lewis Number and Laminar Burning Velocity**
14:30-14:50 Yoshiki Hirano, Taichi Mukoyama, Takuya Tezuka, Youhi Morii, Hisashi Nakamura, Kaoru Maruta (Tohoku University, Japan)
- OS2-5 **CFD Analysis on FREI with Low-Temperature Oxidation in a Micro Flow Reactor with a Controlled Temperature Profile for *n*-Heptane/air Mixture**
15:20-15:40 Keisuke Akita, Youhi Morii, Hisashi Nakamura, Takuya Tezuka, Kaoru Maruta (Tohoku University, Japan)
- OS2-6 **Fuel Sensitivity on End-gas Autoignition Behavior during Knocking Combustion**
15:40-16:00 Hiroshi Terashima (Hokkaido University, Japan), Hisashi Nakamura (Tohoku University, Japan)
- OS2-7 **Two-dimensional Laboratory-scale DNS for Knocking Experiment using *n*-heptane Fuel**
16:00-16:20 Youhi Morii, Ajit K. Dubey, Hisashi Nakamura, Kaoru Maruta (Tohoku University, Japan)

- OS2-8 **Solving the Population Balance Equation for Non-Inertial Particles Dynamics using PDF and Machine Learning: Application to a Sooting Flame** *(Invited)*
 16:20-16:50 Andréa Seltz (INSA de Rouen Normandie / Safran Aircraft Engines, France), Luc Vervisch, Pascale Domingo (INSA de Rouen Normandie, France)
- 17:10-17:20 **Introduction**
Hong G. Im
- OS2-9 **Ammonia/Hydrogen for Zero-Carbon Power** *(Invited)*
 17:20-17:50 Agustin Valera-Medina, Syed Mashruk (Cardiff University, UK), Hua Xiao (Shenzhen University, China), Meng-Choung Chiong (Universiti Teknologi Malaysia, Malaysia), Cheng Tung Chong (Shanghai Jiao Tong University, China)
- OS2-10 **Stability Limits and Exhaust NO Emissions from Ammonia-Hydrogen-Air Flames at Elevated Pressures** *(Invited)*
 17:50-18:20 Abdulrahman A. Khateeb, Thibault F. Guiberti, William L. Roberts (King Abdullah University of Science and Technology, Kingdom of Saudi Arabia)
- OS2-11 **Laminar Flame Speeds of Ammonia Mixtures at High Pressure and Temperature Conditions: New Experimental Results and Performance of Different Kinetic Models** *(Invited)*
 18:20-18:50 Alka Karan, Guillaume Dayma (ICARE-CNRS / Université d'Orléans, France), Christian Chauveau (ICARE-CNRS, France), Fabien Halter (ICARE-CNRS / Université d'Orléans, France)
- OS2-12 **Development of a Novel Perforated Plate Based Microcombustor for Power Generation.**
 19:00-19:20 B. Aravind, Karan Hiranandani, Sudarshan Kumar (Indian Institute of Technology Bombay, India)
- OS2-13 **Mechanism of Low-Lewis-number and Near-limit Ball-like Flame Splitting in Low-speed Counterflow Field**
 19:20-19:40 Takaki Akiba, Tomoya Okuno, Hisashi Nakamura, Youhi Morii, Takuya Tezuka (Tohoku University, Japan), Roman Fursenko (Far Eastern Federal University, Russia), Sergey Minaev (Far Eastern Federal University / Far East Branch of the Russian Academy of Sciences, Russia), Masao Kikuchi (Japan Aerospace Exploration Agency, Japan), Kaoru Maruta (Tohoku University, Japan)
- OS2-14 **Numerical Investigation on Flame Dynamics in Convergent-Divergent Microtube**
 19:40-20:00 Jagnoor Singh (Punjab Engineering College, India), B. Aravind, Vasavada Vyom Jyotinhai, Harshal Kolekar, Sudarshan Kumar (Indian Institute of Technology Bombay, India)

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- OS2-15 **Potential of Novel Fuel Blends with Varying Aromatic Content in A MILD Combustor**
13:30-13:50 Saurabh Sharma, Paramvir Singh, Sudarshan Kumar (Indian Institute of Technology, Bombay, India), Bhupendra Khandelwal (The University of Alabama, USA)
- OS2-16 **Gas-phase Reactivity Difference between Dimethyl Carbonate and Diethyl Carbonate in a Micro Flow Reactor with a Controlled Temperature Profile**
13:50-14:10 Keisuke Kanayama, Shintaro Takahashi, Shota Morikura, Hisashi Nakamura, Takuya Tezuka, Kaoru Maruta (Tohoku University, Japan)
- OS2-17 **Study on Effects of F/H Ratios on the Reactivities of CH₂F₂/C₂HF₅ Refrigerant Blends using a Micro Flow Reactor with a Controlled Temperature Profile**
14:10-14:30 Shintaro Takahashi, Hisashi Nakamura, Takuya Tezuka, Kaoru Maruta (Tohoku University, Japan)
- OS2-18 **Transition to Detonation upon Free Flame Propagation**
15:20-15:40 Alexey Kiverin, Ivan Yakovneko (Russian Academy of Sciences, Russia)
- OS2-19 **Intrinsic Thermoacoustic Instability of Premixed Flame in a Tube: Combustion Theory Perspectives**
15:40-16:00 Ajit Kumar Dubey, Hisashi Nakamura, Kaoru Maruta (Tohoku University, Japan)
- OS2-20 **Investigation on Pyrolysis and Oxidation of Nitromethane using a Micro Flow Reactor with a Controlled Temperature Profile**
16:00-16:20 Yoshimichi Yamamoto, Hisashi Nakamura, Takuya Tezuka (Tohoku University, Japan)
- OS2-21 **Effects of Nitric Oxide on Methane Oxidation in a Micro Flow Reactor with a Controlled Temperature Profile**
16:20-16:40 Yuki Murakami, Hisashi Nakamura, Takuya Tezuka, Kaoru Maruta (Tohoku University, Japan)
- OS2-22 **Solar Fuels Combustion for a Circular Carbon Economy (Invited)**
17:10-17:40 S. Mani Sarathy (King Abdullah University of Science and Technology, Saudi Arabia)
- OS2-23 **Liquid Ammonia Spray Combustion in Two-Stage Gas Turbine Combustors (Invited)**
17:40-18:10 Ekenechukwu C. Okafor, Osamu Kurata (National Institute of Advanced Industrial Science and Technology, Japan), Hirofumi Yamashita (Tohoku University, Japan), Takahiro Inoue, Taku Tsujimura, Norihiko Iki (National Institute of Advanced Industrial Science and Technology, Japan), Akihiro Hayakawa (Tohoku University, Japan), Masahiro Uchida, Shintaro Ito (IHI Corporation, Japan), Hideaki Kobayashi (Tohoku University, Japan)

OS2-24 **Stability and Emissions Characteristics of Liquid Ammonia Spray Flames
Co-fired with Methane in a Swirling Flow**

Hirofumi Yamashita (Tohoku University, Japan), Ekenechukwu C. Okafor (National Institute of Advanced Industrial Science and Technology, Japan), Akihiro Hayakawa (Tohoku University, Japan), Taku Tsujimura (National Institute of Advanced Industrial Science and Technology, Japan), Shintaro Ito, Masahiro Uchida (IHI Corporation, Japan), Taku Kudo (Tohoku University, Japan), Hideaki Kobayashi (Tohoku University / National Institute of Advanced Industrial Science and Technology, Japan)

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OS2-25 **Effect of the Separating Distance on the Characteristics of Methane Flame in
a Plate Slit Burner**

Qianhao Shen, Yichi Zhang, Haoxuan Qi, Li Guo, Ming Zhai, Peng Dong (Harbin Institute of Technology, China)

OS2-26 **Genetic Programming Control of a Laminar Premixed Combustor**

13:50-14:10 Bo Yin, Yu Guan, Stephane Redonnet (The Hong Kong University of Science and Technology, Hong Kong, China), Vikrant Gupta (Southern University of Science and Technology, China), Larry K. B. Li (The Hong Kong University of Science and Technology, Hong Kong, China)

OS2-27 **Analysis of the Hydrogen Permeation in the Liquid Sodium with Titanium
Layer by Accelerated Quantum Chemical Molecular Dynamics Study**

Ai Suzuki, Masayuki Miyano, Ryuji Miura (Tohoku University, Japan), Kuniaki Ara (Japan Atomic Energy Agency, Japan)

OS2-28 **Numerical Simulation of Flow Characteristics of Micro-scale Combustor**

15:20-15:40 Qianhao Shen, Haoxuan Qi, Yichi Zhang, Li Guo, Ming Zhai, Peng Dong (Harbin Institute of Technology, China)

OS2-29 **Laminar Burning Velocity Measurements of Ethyl Acetate-Air Mixtures at
Elevated Temperatures**

Rohit Kumar, Sudarshan Kumar (Indian Institute of Technology Bombay, India)

OS2-30 **Pressure and Temperature Dependence of the Power Exponents of Laminar
Burning Velocity**

Robin John Varghese, Sudarshan Kumar (Indian Institute of Technology Bombay, India)

OS2-31 **Experimental Investigation of Laminar Burning Velocity of Ammonia/air
Premixed Flames Under Elevated Temperature Conditions (*Invited*)**

Akihiro Hayakawa, Hideaki Kobayashi (Tohoku University, Japan)

OS2-32 **Heat Release Characteristics of Ammonia/Hydrogen Flames in MILD
Combustion Conditions (*Invited*)**

Ruslan Khamedov, Wonsik Song, Francisco E. Hernández Pérez, Hong G. Im (King Abdullah University of Science and Technology, Saudi Arabia)

OS2-33 **Study of Dynamic Behavior of NH₃-H₂ Premixed Flame at Elevated Pressures**
18:10-18:30

Sadegh Tabejamaat (Amirkabir University of Technology, Iran / Tohoku University, Japan), Satoshi Kadowaki (Nagaoka University of Technology, Japan), K. D. Kunkuma A. Somarathne, Akihiro Hayakawa, Hideaki Kobayashi (Tohoku University, Japan)