Poster Session 1

18:00-20:00, B5 Lobby

P1-1001 **Study on Comparison of Japanese National Wealth Outflow between Imported LNG and Future Liquefied Hydrogen**

Masaharu Sasakura, Shigeki Iida, Ko Sakata

(Research and Development Division, The Institute of Applied Energy)

P1-1003 **NATIONAL HYDROGEN CENTRE, A FRESH AIR WITHIN THE HYDROGEN AND FUEL CELL SECTOR**

Carlos Funez Guerra, Emilio Nieto Gallego

(National Hydrogen Center, Spain.)

P1-1050 **Hydrogen Gas Bubble Behaviors on Ni Micro-Patterned Electrode during Alkaline Water Electrolysis**

Tatsuki Fujimura[1], Wakana Hikima[2], Yasuhiro Fukunaka[3], Takayuki Homma[1,2,3]

([1]Department of Advanced Science and Engineering, Waseda University, [2]Department of Applied Chemistry, Waseda University, [3]Research Organization for Nano & Life Innovation, Waseda University)

P1-1051 **A EIS Study in Polymer Electrolyte Membrane Electrolysis**

Giuseppe Monforte, Stefania Siracusano, Stefano Trocino, Nicola Briguglio, Vincenzo Baglio, Antonino Salvatore Aricò

(Consiglio Nazionale delle Ricerche (CNR), Istituto di Tecnologie Avanzate per l'Enegia Nicola Giordano (ITAE))

P2-1002 **Catalytic performance of Cs-Ru/CeO_2 spherical catalyst for NH_3 decomposition; catalyst characterization and kinetic analysis results**

Hiroki Kuribara[1], Rina Matsumoto[2], Takeshi Furusawa[1]

([1]Department of Material and Environmental Chemistry, Graduate School of Engineering, Utsunomiya University, [2]Department of Applied Chemistry, Faculty of Engineering, Utsunomiya University)

P2-1003 **Synergistic Hydrogen Production by Co-fermentation of Sewage Sludge with Fallen Leaves**

Guang Yang, Jianlong Wang

(Institute of Nuclear and New Energy Technology, Tsinghua University)

P2-1004 **The Importance of MEA Fabrication Process for Water Splitting Electrochemical Cell**

Kayo Koike, Takayo Ogawa, Satoshi Wada, Katsushi Fujii

(RIKEN Center for Advanced Photonics)

P2-1005 **Preliminary Results of The Steam Decomposition Using DBD Plasma in A PMCR at Low Steam Temperature**

Mostafa Ibrahim Elshafie[1], Shinji Kambara[1], Yukio Hayakawa[1], Tomonori Miura[2]

([1]Environmental and energy systems engineering, Gifu University, [2]Sawafuji Electric Co., Ltd.)

P2-1006 **Solid Oxide Electrolyser System operational at the H2 refueling station of Karlsruhe**

Julian Dailly[1], Annabelle Brisse[1], Maxime Zeller[1], Bastian Ludwig[1], Joerg Brabandt[2]

([1]European Institute for Energy Research EIFER, [2]Sunfire GmbH)

P2-1008 **Experimental and Theoretical Study of Photoelectrochemical Reaction Mechanism of GaN Photoanode with NiO for Water Splitting Application**

Nicolas Javahiraly[1], Kayo Koike[2], Katsushi Fujii[2]

([1]ICube Laboratory, University of Strasbourg, [2]RIKEN Institute - Advanced Photonics Technology Development Group)

P2-1009 **Development of highly selective carbon membranes for hydrogen purification**

Miki Yoshimune, Kenji Haraya

(Research Institute for Chemical Process Technology, National Institute of Advanced Industrial Science and Technology (AIST))

P2-1011 **Four Electrolyser Models to Suit All Uses, from Policy Planning to Site Assessment and Design Improvement**

James Laird Bowker Ferguson[1,2], Adam Robinson[3], Jon Clipsham[2], Dimitri Mignard[3]
([1]Industrial Doctoral Centre for Offshore Renewable Energy (IDCORE), [2]European Marine Energy Centre (EMEC), [3]University of Edinburgh)

P2-1012 **Beating Curtailment: Hydrogen Production from Multiple Electricity Sources to Maximise Renewable Generation in the Orkney Islands**

James Laird Bowker Ferguson[1,2], Adam Robinson[3], Jon Clipsham[1], Dimitri Mignard[3]
([1]European Marine Energy Centre (EMEC), [2]Industrial Doctoral Centre for Offshore Renewable Energy (IDCORE), [3]University of Edinburgh)

P2-1013 **Preparation of Sb-doped SnO_2 nanoparticle with high surface area for use as a stable anode catalyst support for PEM electrolyzers**

Xiang yang Zhou, Bing Li, Cunman Zhang
(Tongji University)

P2-1014 **Dehydrogenation of Formic Acid to H_2 Generation by Iridium Catalysts Bearing Pyridyl-Pyrazole Ligands**

Naoya Onishi, Yuichiro Himeda
(Department of Energy and Environment, National Institute of Advanced Industrial Science and Technology)

P2-1015 **Ir Complexes Bearing Picolinamide Ligands Catalyzed Hydrogen Production from Formic Acid Dehydrogenation**

Ryoichi Kanega, Yuichiro Himeda
(Department of Energy and Environment, National Institute of Advanced Industrial Science and Technology)

P2-1016 **Waste Upgrading with Photocatalytic Hydrogen Recovery. Stability of TiO_2-Based Materials**

Maria J. Rivero, Juan Corredor, Inmaculada Ortiz
(Department of Chemical and Biomolecular Engineering, University of Cantabria)

P2-1018 **Galvanic deposition of Iridium as catalyst for PEM electrolyzers**

Johannes Naether[1], Micheal Brodmann[2], Tim Huelser[3], Frank Koester[1], Ulrich Rost[2], Pascal Dragos[2], Lisa Holtkotte[2]
([1]Materials and Surface Science, University of Applied Sciences Mittweida, [2]Westphalian Energy Institute, University of Applied Sciences Gelsenkirchen, [3]Institute of Energy and Environment Technology, Duisburg)

P2-1019 **Development and Cost Analysis of Solar Micro-Reactor Arrays for Hydrogen Production**

Dino Mehanovic[1], Jean-François Dufault[1], Jean-François Peloquin[1], Paul Camus[1], Nadi Braidy[2], Luc Fréchette[1], Mathieu Picard[1]
([1]Mechanical Engineering, Universite de Sherbrooke, [2]Chemical Engineering, Universite de Sherbrooke)

P2-1021 **Overview and Operation Results of CO2-free Hydrogen Production System Using Electricity Generated from Variable Renewable Energy**

Yutaka Uchiumi[1], Hisashi Fujita[3], Kenichiro Watanabe[2], Ryoji Mizuno[1], Taketo Koyama[2], Ryo Maruyama[3]
([1]Smart City Promotion Department, Obayashi Corporation, [2]Mechanical & Electrical Design Department, Obayashi Corporation, [3]Mechanical & Electrical Technology Department, Obayashi Corporation)

P2-1023 **Influence of Catalysts on Converting N-ethylcarbazole to 12H- N-ethylcarbazole**

Xue Yang, Wei Lin
(Sinopec Research Institute of Petroleum Processing)

P2-1025 **Hydrogen Generation with Low CO Selectivity from Methanol Reforming over Photocatalyst with Tunable Oxygen Vacancies at Low Ignition Temperature**

Yuh-Jeen Huang, Hsiao-Yu Huang, Yi-Chun Liao
(Biomedical Engineering and Environmental Sciences, National Tsing-Hua University)

P2-1028 **Large scale Alkaline water electrolysis applications for Environment solutions**

Namiko Murayama[1], Koji Kawanishi[2], Yukinori Iguchi[2]
([1]Sales Department/Energy Storage & Hydrogen Group, thyssenkrupp Uhde Chorine Engineers (Japan) Ltd., [2]Product Management & Develpoment Department/Electrolyzer Development Group, thyssenkrupp Uhde Chorine Engineers (Japan) Ltd.)

P2-1029 **Hydrogen production based on formic acid decomposition with platinum nano particles dispersed by polyvinylpyrrolidone**

Yusuke Minami[1], Shusaku Ikeyama[2], Yutaka Amao[1,2]
([1]Graduate School of Science, Osaka City University, [2]The Advanced Research Institute for Natural Science and Technology, Osaka City University)

P2-1030 **Monolith Copper-based gamma-alumina Catalysts for Methanol Steam Reforming and Applied in a Microreactor**

Taotao Yang[1], Xiaoqian Deng[1], Li Zhang[2], Qi Zhang[1]
([1]Department of Chemical Engineering, East China University of Science and Technology, [2]Department of Mechanical and Power Engineering, East China University of Science and Technology)

P2-1031 **Development of anode material for high temperature water electrolysis using proton conductive solid electrolyte**

Yusuke Sato, Go Nakagawa, Naohiro Shimoda, Kazumasa Oshima, Shigeo Satokawa
(Seikei University)

P2-1032 **Photocatalytic water splitting accompanied with electric power generation**

Yugo Miseki, Kazuhiro Sayama
(Research Center for Photovoltaics (RCPV), National Institute of Advanced Industrial Science and Technology (AIST))

P2-1033 **INET's Advance in Studies on Basic Properties of HIx Solution for Iodine-sulfur Cycle**

Songzhe Chen[1,2], Ping Zhang[1,2], Laijun Wang[1,2], Jingming Xu[1,2]
([1]Institute of Nuclear and New Energy Technology, Tsinghua University, [2]Collaborative Innovation Center of Advanced Nuclear Energy Technology, Tsinghua University)

P2-1034 **Numerical Study of a Channel-Free Planar Solid Oxide Cell**

Yingtian Chi[1], Jin Lin[1], Qiang Hu[3,4], Yonghua Song[1,2]
([1]Department of Electrical Engineering, Tsinghua University, [2]Department of Electrical and Computer Engineering, University of Macau, [3]Tsinghua-Sichuan Energy Internet Research Institute, [4]Zhejiang Zhentai Energy Tech. Co., Ltd.)

P2-1036 **The investigation of hydrogen compressor cycling of $V_{20}Ti_{32}Cr_{48}$ alloy at different pressure and temperature conditions**

Fangqin Guo[1], Suganthamalar Selvaraj[1], Taiju Matsumoto[3], Ankur Jain[2], Hiroki Miyaoka[2], Takayuki Ichikawa[3]
([1]Graduate School of Integrated Arts and Science, Hiroshima University, Japan, [2]Natural Science Centre for Basic Research & Development, Hiroshima University, Japan, [3]Graduate School of Engineering, Hiroshima University, Japan)

P2-1037 **Graded (YSZ/GDC/LSCF) electrode development to enhance Solid Oxide Cells performance and durability**

Julien Vulliet[1], Pierre Coddet[1], Daniela Neacsa[3], Martin Mickan[2], Anne-Lise Thomann[2], Cécile Autret[3]
([1]CEA LE RIPAULT, [2]GREMI (Groupe de Recherches sur l'Energétique des Milieux Ionisés) – UMR7344 CNRS /Université d'Orléans, [3]GREMAN (Groupe de recherche en matériaux, microélectronique, acoustique et nanotechnologies) – UMR 7347)

P2-1038 **Simultaneous Production of Hydrogen and Butanol by *Clostridium saccharoperbutylacetonicum* DSM 14923 for Enhancement of Energy Recovery**

Vaishali Singh[1], Debabrata Das[2]
([1]School of Energy science and engineering, Indian Institute of Technology Kharagpur, [2]Department of Biotechnology, Indian Institute of Technology Kharagpur)

P2-1039 **Enhancement of Carbohydrate Recovery from Microalgal Biomass for Biohydrogen Production**

Harshita Singh[1], Debabrata Das[2]
([1]Advance Technology Development Centre, Indian Institute of Technology Kharagpur, [2]Department of Biotechnology, Indian Institute of Technology Kharagpur)

P2-1040 **Optimizing Hydrogen Generation From an Aluminum-Water Reaction Subject to Varied Temperatures and Pressures**

Peter Godart, Jason Fischman, Kelsey Seto, Douglas Hart
(Mechanical Engineering, Massachusetts Institute of Technology)

P2-1041 **Operation Model and Optimal Control of High Temperature Electrolysis System with Combined Electric and Thermal Energy Supply**

Ruomei Qi[1], Jin Lin[1,2], Qiang Hu[2,3], Jian Wu[3], Yonghua Song[1,4]
([1]Department of Electrical Engineering, Tsinghua University, [2]Tsinghua-Sichuan Energy Internet Research Institute, [3]Zhejiang Zhen-Tai Energy Technology Limited, [4]Department of Electrical and Computer Engineering, University of Macau)

P2-1042 **Steam reforming reaction and catalytic properties with butane as fuel**

Makoto Ryo Harada[1,2]
([1]Research Institute for Chemical Process Technology, National Institute of Advanced Industrial Science and Technology, [2]Course of Environment and resources, Department of Human Development, Tokai University)

P2-1043 **Anode-Graphite Corrosion Mechanism during Water Electrolysis for Oxygen Evolution Reaction**

Ryuki Tsuji[1], Yuichi Haruyama[2], Masahito Niibe[2], Seigo Ito[1]
([1]Department of Materials and Synchrotron Radiation Engineering, Graduate School of Engineering, University of Hyogo., [2]Laboratory of Advanced Science and Technology for Industry, University of Hyogo)

P2-1045 **Electrochemical treatment of aqueous NH_3 solution**

So Hamamoto[1], Ryo Ohata[2], Hiroki Miyaoka[3], Takayuki Ichikawa[1]
([1]Graduate School of Engineering, Hiroshima University, [2]Graduate School of Integrated Arts and Sciences, Hiroshima University, [3]Natural Science Center for Basic Research and Development, Hiroshima University)

P2-1047 **Evaluation of Material Balance in Hydrogen and Ammonia Synthesis from Iron and Iron Nitride at Ambient Conditions**

Yuki Masuzoe, Hiromi Eba
(Electrical Engineering and Chemistry, Graduate School of Integrative Science and Engineering,Tokyo City University)

P2-1048 **A process analysis of an integrated reforming system using heavy naphtha for on-site hydrogen filling stations**

Jaemyung Lee[1], Jaeyoung Yoo[1], Joongmyeon Bae[1], Aadesh Harale[2], Sai P. Katikaneni[2]
([1]Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology (KAIST), [2]Research & Development Center, Saudi Aramco)

P4-1007 **Investigation on Effect of Geometric Parameters of Hydrogen-fed Solid Oxide Fuel Cell for Power Generation**

Kwong Fai Fong[1], X.J. Luo[2]
([1]Division of Building Science and Technology, City University of Hong Kong, [2]Big Data Enterprise and Artificial Intelligence Laboratory, University of the West of England)

P4-1008 **Direct Numerical Simulations of Hydrogen-Oxygen Lifted Flames at Gas Turbine Engine Relevant Conditions**

Mohamed Ali Shamma, Defne Kiran, Yuki Minamoto, Masayasu Shimura, Mamoru Tanahashi
(Department of Mechanical Engineering, Tokyo Institute of Technology)

P4-1010 **Methanation of CO_2 by $LaNi_5$ alloy by using ball-milling method**

Kohei Yatagai[1], Torben Boll[2,3], Haru-Hisa Uchida[4], Kazuya Oguri[4], Ryota Gemma[1]
([1]Department of Applied Science, Graduate School of Engineering, Tokai University, [2]Institute for Applied Materials (IAM-WK), Karlsruhe Institute of Technology (KIT), [3]Karlsruhe Nano Micro Facility (KNMF), Karlsruhe Institute of Technology, [4]Department of Human Development, School of Humanity and Culture, Tokai University)

P4-1011 **The Potential Role of Hydrogen in Green Methane Production: A Comparative Life-Cycle Study**

Antonio Valente[1,2], M. Isabel Martín-Claudio[2], Diego Iribarren[1], Javier Dufour[1,2]
([1]Systems Analysis Unit, IMDEA Energy, [2]Chemical and Environmental Engineering Group, Rey Juan Carlos University)

P4-1012 **Combined effect of supercharging and water injection on backfire and performance of a hydrogen fuelled SI engine: a CFD study**

Vipin Dhyani, K.A. Subramanian
(Engines and Unconventional Fuels Laboratory, Centre for Energy Studies, Indian Institute of Technology Delhi)

P4-1013 **Ammonia Combustion Gas Turbine System and Low-NOx Combustion Technology**

Osamu Kurata[1], Norihiko Iki[1], Takahiro Inoue[1], Tadahiro Fujitani[2], Takayuki Matsunuma[1], Taku Tsujimura[3], Hirohide Furutani[3], Masato Kawano[4], Keisuke Arai[4], Ekenechukwu Chijioke Okafor[3], Akihiro Hayakawa[5], Hideaki Kobayashi[5]

([1]Research Institute for Energy Conservation, National Institute of Advanced Industrial Science and Technology (AIST), [2]National Institute of Advanced Industrial Science and Technology (AIST), [3]Fukushima Renewable Energy Institute, AIST (FREA), [4]Toyota Energy Solutions Inc., [5]Institute of Fluid Science, Tohoku University)

P5-1001 **Test Bench for Prolonged Metal Hydride Cycling at a Wide Temperature and Pressure Range extendable to Impurity Testing**

Inga Buerger, Mila Kölbig, Marc Linder

(Engineering Thermodynamics, German Aerospace Center)

P5-1002 **Development of Savoy-spinach Plant Factory for Cold Region using SOFC-photovoltaics Hybrid System**

Naoki Kikuchi, Shin'ya Obara

(Electrical and Electronic Engineering, Kitami Institute of Technology)

P5-1004 **Dissolved hydrogen sensor utilizing the function of hydrogen permeable metal**

Hirotaka Kimura[1], Jo Suzuki[2], Hiroshi Yukawa[3]

([1]Engineering Department, Suzuki Shokan Co.,Ltd., [2]Suzuki Shokan Co.,Ltd., [3]Nagoya University)

P5-1005 **A Dynamic Model for the Hybrid System of PEMFC and Battery Used in NEV**

Jiangyan Yan[1], Haijiang Wang[1], Hui Li[2,3,4]

([1]Department of Mechanical and Energy Engineering, Southern University of Science and Technology (SUSTech), [2]Department of Materials Science and Engineering, Southern University of Science and Technology (SUSTech), [3] Shenzhen Key Laboratory of Hydrogen Energy, Southern University of Science and Technology (SUSTech), [4]Guangdong Provincial Key Laboratory of Energy Materials for Electric Power, Southern University of Science and Technology (SUSTech))

P5-1006 **Reactive Separation Technology Assisted by Zeolite Membrane for Hydrogen Utilization**

Naoyuki Sakamoto, Takeshi Matsuo, Susumu Tsutsuminai, Takayuki Aoshima, Tohru Setoyama

(Science & Innovation Center, Mitsubishi Chemical Corporation)

P5-1007 **Portable DC power source with hydrogen fuel cell**

Jirina Polakova, Ales Doucek, Michal Cerny

(Hydrogen Technolgies Department, UJV Rez, a.s.)

P5-1008 **Catalytic ammonium carbamate conversion into urea for utilization of ammonia as hydrogen carrier**

Yuki Nagatsuka[1], Ken Motokura[1,2], Yuichi Manaka[1,3]

([1]School of Materials and Chemical Technology, Tokyo Institute of Technology, [2]JST PRESTO, [3]Renewable Energy Research Center, National Institute of Advanced Industrial Science and Technology)

P6-1001 **Development of AUS305-H2 Stainless Steel for Use with High-Pressure Hydrogen**

Yoshinori Watanabe, Kazumasa Kubota

(Stainless Steel Development Dept., Aichi Steel Corporation)

P6-1002 **Analysis of relationship on public acceptance and provision of risk information on hydrogen fueling stations for Japanese**

Kyoko Ono, Etsuko Kato, Kiyotaka Tsunemi

(Research Institute of Science for Safety and Sustainability (RISS), National Institute of Advanced Industrial Science and Technology (AIST))

P6-1003 **The operational results of the hydrogen warning systems equipped with the highly reliable hydrogen sensors at Japanese hydrogen filling stations**

Suzuki Kengo, Iwami Tomoaki, Tanaka Koichi

(Sales Development Department, New COSMOS Electric co., ltd.)

P6-1004 **Considering the Possibility to Revise Regulation Based on the Risk Assessment of the Hydrogen Refueling Station**

Kiyotaka Tsunemi, Etsuko Kato, Akemi Kawamoto, Tei Saburi
(Research Institute of Science for Safety and Sustainability, National Institute of Advanced Industrial Science and Technology)

P6-1005 **Risk analysis of fire accidents of fuel cell bus with hydrogen fuelled tanks**

Zhiyong Li, Ke Sun
(Jiaxing University)

P6-1006 **Surface Modification of Ti by Various Kinds of Additives**

Keita Shinzato[1], Hiroki Miyaoka[2], So Hamamoto[1], Go Tanaka[3], Takayuki Ichikawa[1]
([1]Graduate School of Engineering, Hiroshima University, [2]Natural Science Center for Basic Research and Development, Hiroshima University, [3]School of Engineering, Hiroshima University)

Poster Session 2

18:00-20:00, B5 Lobby

P3-2003 **Low temperature catalytic dehydrogenation of MCH**

Yasushi Sekine[1], Misato Kosaka[1], Takuma Higo[1], Kent Takise[1], Ayaka Sato[1], Shuhei Ogo[1], Kenichi Imagawa[2], Shigeru Kado[2]
([1]Applied Chemistry, Waseda University, [2]Chiyoda Corp.)

P3-2004 **Techno-economic analysis of 100% renewable energy system using photovoltaics and Power-to-Gas technologies**

Tatsuya Okubo[1], Teruyuki Shimizu[1,2], Kei Hasegawa[1], Manabu Ihara[1]
([1]Department of Chemical Science and Engineering, Tokyo Institute of Technology, [2]Presidential Endowed Chair for "Platinum Society", The University of Tokyo)

P3-2005 **Proposed carbon-air secondary battery (CASB) system as an electric power storage system**

Keisuke Kameda, Yuta Iida, Mankichi Hosoda, Tatsuya Matsuhira, Kei Hasegawa, Manabu Ihara
(Chemical science and engineering, Tokyo Institute of Technology)

P3-2007 **Organocatalyst for Carbon Dioxide Reduction to Formic Acid with Silanes and Its Heterogenization Approach**

Ria Ayu Pramudita[1], Chihiro Nakagawa[1], Yuichi Manaka[1,2], Ken Motokura[1]
([1]Department of Chemical Science and Engineering, Tokyo Institute of Technology, [2]Renewable Energy Research Center, National Institute of Advanced Industrial Science and Technology)

P3-2008 **Regeneration of Sodium Borohydride ($NaBH_4$) from Sodium Metaborate ($NaBO_2$) by Using Microwave Hydrogen Plasma Treatment**

Takuya Takahashi[1], Naoki Maeda[1], Masahiko Nagasaka[2], Akihisa Ogino[1]
([1]Graduate School of Integrated Science and Technology, Shizuoka University, [2]SINTOKOGIO.LTD)

P3-2009 **"Hydrogen for All": A Design Tool for Community Energy Systems, Validated with Plant Data**

Maja H. Persson[1], Dimitri Mignard[1], David Hogg[2], Gareth Harrison[1]
([1]School of Engineering, University of Edinburgh, [2]Bright Green Hydrogen, The Business Partnership Ltd.)

P3-2011 **High-Temperature Aluminum Water Reactions for *In-Situ* Hydrogen Production**

Keena A. Trowell, Sam Goroshin, David L.Frost, Jeffrey M. Bergthorson
(Mechanical Engineering, McGill University)

P3-2013 **Study on an energy supply system assuming a pipeline transportation of compressed hydrogen in China**

Jiaren Li, Shin'ya Obara
(Electrical and Electronic Engineering, Kitami Institute of Technology)

P3-2014 **Development of Intermediate-temperature Electrolysis Reactors Using a Phosphate-based Composite Electrolyte**

Naoya Fujiwara[1], Shohei Tada[1], Yasukazu Kobayashi[1], Ryuji Kikuchi[1], Shigeo Ted Oyama[1,2]
([1]Department of Chemical System Engineering, The University of Tokyo, [2]Department of Chemical Engineering, Virginia Tech)

P3-2016 **Hydrogen injection into the gas grid: Current status and future potential**

Christopher James Quarton, Sheila Samsatli
(Department of Chemical Engineering, University of Bath)

P3-2017 **A novel experimental set-up to determine hydrogen diffusion coefficients in different rock types**

Johannes Hierold, Peter Pilz
(Geoenergy, Helmholtz Centre Potsdam German Research Centre for Geosciences - GFZ)

P3-2018 **Hydrogen solubility in high saline fluids under reservoir conditions in the H_2ReacT project**

Peter Pilz, Johannes Hierold, Marco De Lucia
(Helmholtz Centre Potsdam German Research Centre for Geosciences - GFZ)

P3-2019 **Operation of anode-supported and metal-supported solid oxide fuel cell under direct ammonia-fed condition**

Kangyong Lee[1], Joongmyeon Bae[1], Kunho Lee[2], Sai P. Katikaneni[2]
([1]Mechanical engineering, Korea Advanced Institute of Science and Technology (KAIST), [2]R&D Center, Saudi Aramco)

P3-2020 **Highly active Rh-modified Pt Nanoparticle-loaded Carbon Catalysts for Electrochemical Hydrogenation Reaction of Toluene to Methylcyclohexane**

Toyoki Imada, Yusuke Iida, Masanobu Chiku, Eiji Higuchi, Hiroshi Inoue
(Department of Applied Chemistry, Graduate School of Engineering, Osaka Prefecture University)

P3-2021 **Economic comparison of electric fuels produced at excellent sites for renewable energies: A Scenario for 2035**

Philipp Wendelin Runge[1,5], Christian Sölch[2,5], Jakob Albert[3,5], Peter Wasserscheid[3,4,5], Gregor Zöttl[2,5], Veronika Grimm[1,5]
([1]Chair of Economic Theory, Friedrich-Alexander University Erlangen-Nuremberg, [2]Professorship of Industrial Organization and Energy Markets, Friedrich-Alexander University Erlangen-Nuremberg, [3]Institute of Chemical Reaction Engineering, Friedrich-Alexander University Erlangen-Nuremberg, [4]Forschungszentrum Jülich Gmbh, Helmholtz Institute Erlangen-Nürnberg for Renewable Energy, [5]Energie Campus Nürnberg)

P3-2022 **Techno-economic analysis of combined ammonia recovery and solid oxide fuel cell use at wastewater treatment plants**

Oliver Grasham[1], Valerie Dupont[1], Timothy Cockerill[1], Miller Alonso Camargo-Valero[2]
([1]SCAPE, Engineering, University of Leeds, [2]Civil Engineering, University of Leeds)

P3-2023 **Evaluation of Hydrogen Compression Performance via Vanadium-based Alloy**

Kiyotaka Goshome, Naruki Endo, Tetsuhiko Maeda
(Renewable Energy Research Center, National Institute of Advanced Industrial Science and Technology(AIST))

P3-2024 **Development of Thermochemical Hydrogen Compressor over 80MPa by Using Ti-Cr-Mn Alloy**

Nobuhito Tsurui[1], Kiyotaka Goshome[2], Satoshi Hino[1], Naruki Endo[2], Tetsuhiko Maeda[2], Hiroki Miyaoka[3], Takayuki Ichikawa[3,4]
([1]Technical Research Promotion Center, Kobe Material Testing Laboratory Co., Ltd., [2]Renewable Energy Research Center, National Institute of Advanced Industrial Science and Technology, [3]Natural Science Center for Basic Research and Development, Hiroshima University, [4]Graduate School of Engineering, Hiroshima University)

P3-2025 **Formate-catalyzed Formic Acid Synthesis from Carbon Dioxide with Silicon Based Reducing Agents**

Chihiro Nakagawa[1], Ria Ayu Pramudita[1], Yuichi Manaka[1,2], Ken Motokura[1]
([1]Department of Chemical Science and Engineering, Tokyo Institute of Technology, [2]Renewable Energy Research Center, National Institute of Advanced Industrial Science and Technology)

P3-2027 **Possibilities of Hydrogen Energy Utilization by Hydrogen Storage Alloys**

Saule Zholdayakova[1], Ryota Gemma[2], Masashi Sato[3], Yoshihito Matsumura[4], Haru-Hisa Uchida[5]
([1]Graduate School Science and Technology, Tokai University, [2]Department of Material Science, [3]Department of Applied Chemistry, [4]Department of Nuclear Engineering, [5]Department of Human Development and Environment and Resources)

P3-2028 **Economic analysis on synthetic methane by methanation as a hydrogen energy carrier**

Mamoru Suzuki
(Research and Development Division, The Institute of Applied Energy)

P3-2029 **A Numerical Investigation of the Fast Filling of On-Board Compressed Gas Hydrogen Storage Tanks**

Callum James Ramsay, K.K.J Ranga Dinesh
(Faculty of Engineering and Physical Sciences-Energy Technology Research Group, University of Southampton)

P3-2030 **Ammonium halides as new ammonia absorption materials**

Pratibha Pal[1], Keita Nakajima[2], Ankur Jain[3], Hiroki Miyaoka[3], Takayuki Ichikawa[1]
([1]Graduate school of Engineering, Hiroshima University, [2]Graduate School of Advanced Sciences of Matter, Hiroshima University, [3]Natural Science Centre for Basic Research and Development, Hiroshima University)

P3-2031 **Mechanism of Ammonia Electrosynthesis on Iron Catalyst by Deuterium Isotope Analysis**

Chien-I Li, Hiroki Matsuo, Junichiro Otomo
(Department of Environment Systems, Graduate School of Frontier Sciences, The University of Tokyo)

P3-2033 **The Effects of Thermal Stratification on the Rate of Pressure Reduction in a Liquid Hydrogen Tank**

Kazuma Tani[1], Takehiro Himeno[2], Yasunori Sakuma[2], Toshinori Watanabe[2], Hiroaki Kobayashi[3], Terukuni Toge[4], Hiroaki Kagaya[4], Shoji Kamiya[4], Osamu Muragishi[4]
([1]School of Engineering, The University of Tokyo, [2]Department of Aeronautics and Astronautics, The University of Tokyo, [3]Japan Aerospace Exploration Agency (JAXA), [4]Kawasaki Heavy Industries, Ltd.)

P3-2035 **Effect of Preparation Condition on Ammonia Synthesis Activity of Ru/CeO_2**

Tetsuya Nanba[1], Keisuke Kobayashi[1,2], Yuki Nagata[1,3], Rahat Javaid[1]
([1]Renewable Energy Research Center, National Institute of Advanced Industrial Science and Technology (AIST), [2]Yamagata University, [3]Tokyo Denki University)

P3-2036 **Search for calcium-based hydrogen occluding alloys storing heats at around 800 K**

Yuta Suzuki, Takehiro Kaneko, Yoshiyuki Kojima, Nobuyuki Nishimiya, Takeshi Toyama
(Department of Materials and Applied Chemistry, College of Science and Technology, Nihon University)

P3-2037 **Preparation of Ni-modified carbon based materials by electro spinning method**

Tomoya Takahashi, Takehiro Kaneko, Yoshiyuki Kojima, Nobuyuki Nishimiya, Takeshi Toyama
(College of Science and Technology, Nihon University)

P3-2038 **Thermo-economic modeling and optimization of the biomass gasification, solid oxide fuel cell, and chemical looping combustion integrated system**

Thanaphorn Detchusananard[1], Shivom Sharma[2], François Maréchal[2], Amornchai Arpornwichanop[1]
([1]Computational Process Engineering Research Unit, Department of Chemical Engineering, Faculty of Engineering, Chulalongkorn University, [2]Industrial Process and Energy Systems Engineering, École Polytechnique Fédérale de Lausanne, EPFL)

P3-2039 **Cs-promoted Ru Nanoparticles Supported on Mesoporous Carbon as Highly Active and Durably Catalysts for Mild Ammonia Synthesis**

Masayasu Nishi, Shih-Yuan Chen, Hideyuki Takagi
(Energy Catalyst Technology Group, Research Institute of Energy Frontier (RIEF), Department of Energy and Environment, National Institute of Advanced Industrial Science and Technology (AIST))

P3-2040 **High-Capacity Hydrogen Separation Device with Flat Membranes of Vanadium Alloy**

Hiroshi Nakagawa[1], Hideo Yoshinaga[1], Seiji Sakurai[1], Hiroshi Yukawa[2], Yoshihisa Matsumoto[3], Nobuki Yukawa[4], Tomonori Nambu[5], Chikashi Nishimura[6]
([1]TAIYO KOKO Co.,Ltd., [2]Materials Science and Engineering, Graduate School of Engineering, Nagoya University, [3]Department of Mechanical Engneering, National Institute of Technology, Oita College, [4]Research Center for Materials BackcastingTechnology, Graduate school of Engineering, Nagoya University, [5]Department of Materials science and Engneering, National Institute of Technology, Suzuka College, [6]National Institute for Materials Science)

P3-2041 **Opening of New Hydrogen Sources by Mixed Gas Hydrogenation of LOHC Systems**

Holger Jorschick[1], Patrick Preuster[1], Andreas Bösmann[2], Peter Wasserscheid[1,2]
([1]Helmholtz Institute Erlangen-Nuernberg for Renewable Energy (IEK-11), Forschungszentrum Juelich GmbH, [2]Lehrstuhl für Chemische Reaktionstechnik, Friedrich-Alexander-Universität Erlangen-Nürnberg)

P3-2042 **Study on liquid organic hydrogen carriers (LOHCs) for hydrogen energy storage systems**

Sanghun Lee, Joongmyeon Bae
(Mechanical Engineering, Korea Advanced Institute of Science and Technology)

P3-2043 **Experimental Synthesis and Multiscale Simulation of Cu-BTC/Graphene Oxide Composite for Hydrogen Storage**

Hao Liu, Zhenzhen Wei, Xudong Zhuang, Ruihuan Cheng, Song Li
(School of Energy Power and Engineering, Huazhong University of Science and Technology)

P3-2044 **Hydrogen refueling stations based on ammonia decomposition by adopting different technologies: simulation and experimental validations**

Viviana Cigolotti[1], Mariagiovanna Minutillo[2], Alessandra Perna[3], Sun Pil Yoon[4], Chang Won Yoon[4], Sun Hee Choi[4]
([1]DTE-STSN-SGRE, Energy Technologies Department, ENEA, [2]Department of Engineering, University of Naples "Parthenope", [3]Department of Civil and Mechanical Engineering, University of Cassino and Southern Lazio, [4]Center for Hydrogen & Fuel Cell Research, KIST)

P3-2045 **Optimal Design and Operation of Hydrogen Supply Chains Incorporated with Electric Network to Eliminate TWhs of Hydropower Spillage**

Jiarong Li[1], Jin Lin[1], Yonghua Song[1,2]
([1]Department of Electrical Engineering, Tsinghua University, [2]Department of Electrical and Computer Engineering, University of Macau)

P3-2046 **Investigations in the potential of local PtG installations**

Martin Tkac[1,2], Karin Stehlik[1,3]
([1]Technological experimental loops, Research Center Rez, [2]Department of Inorganic Technology, University of Chemistry and Technology in Prague, [3]Czech Hydrogen Technology Platform)

P3-2047 **Relationship between fabrication process and hydrogen capacity of Mg/Fe laminate**

Ryota Kondo, Hiroyuki T Takeshita
(Chemistry and Materials Engineering, Kansai University)

P4-2001 **Dynamics of a Thermally Self-Sustaining Integrated Solid Oxide Electrolysis Cell and Fuel Cell for Renewable Building Power**

Pegah Mottaghizadeh[1], Mahshid Fardadi[2], Matthias S.Lex[3], Faryar Jabbari[1], Jack Brouwer[1]
([1]Mechanical and Aerospace Engineering, University of California, Irvine, [2]Mechanical & Aerospace Engineering, University of California, Los Angeles, [3]Technical University of Munich)

P4-2002 **A prototype design of the portable-scale hydrogen based integrated energy conversion and storage system**

Gwangwoo Han[1], Sungbaek Cho[2], Joongmyeon Bae[1]
([1]Mechanical Engineering, KAIST, [2]Institute of Defense Advanced Technology Research, Agency for Defence Development)

P4-2006 **Quantitative Analysis Effect of the Cathode Catalyst Layer in PEMFC with Various Ionomer by Protonic Resistance**

Qiong Xue, Dai Jun Yang, Cun Man Zhang
(Tongji University)

P4-2008 **Performance Enhancement of PEM Fuel Cell System by Oxygen Injection**

Florian Becker[1], Christoph Gentner[1], Stefan Bleeck[1], Gema Montaner Rios[1], Igor Sokolov[1], J. Kallo[2]
([1]DLR e.V., Institute of Engineering Thermodynamics - Energy System Integration (Hamburg], [2]DLR e.V., Institute of Engineering Thermodynamics - Energy System Integration (Stuttgart])

P4-2011 **Valorization of Coke Oven Gas waste stream applied in a Spark Ignition Engine**

R. Ortiz-Imedio[1], A. Ortiz[1], J. C. Urroz[2], P. M. Diéguez[2], D. Gorri[1], L. M. Gandía[2], I. Ortiz[1]
([1]Chemical and Biomolecular Engineering Department, University of Cantabria, [2]School of Industrial and ICT Engineering, Public University of Navarre, Campus de Arrosadía)

P4-2012 **Consideration of operating condition and suppressing anode degradation for steep output power variation on liquid fuel direct supply solid oxide fuel cell**

Yuta Iida, Keisuke Kameda, Kei Hasegawa, Manabu Ihara
(Department of Chemical Science and Engineering, Tokyo Institute of Technology)

P4-2013 **Magnesium based hydrogen storage alloys prepared by mechanical alloying with copper or aluminum additive**

Tohru Nobuki[1,2], Minoru Hatate[1], Fermin Cuevas[2], Jean-Claude Crivello[2], Jean-Marc Joubert[2]
([1]Department of Mechanical Engineering, Faculty of Engineering, KINDAI University, [2]Université Paris Est, ICMPE (UMR 7182), CNRS, UPEC)

P4-2014 **High Performance Sulfur-Free Fe-N-C Electrocatalyst Derived from Aniline for Oxygen Reduction Reaction**

Nanhong Xie[1,2], Junfeng Rong[1]
([1]Research Institute of Petroleum Processing, Sinopec, [2]Department of Chemistry, Tsinghua University)

P4-2015 **Characterization of different composite graphites as material for bipolar plates fabrication**

Jakub Malis, Miroslav Hala, Martin Paidar, Karel Bouzek
(Department of Inorganic Technology, University of Chemistry and Technology Prague)

P4-2016 **Influence of Inertization and Purity of Nitrogen Produced by Membrane Module on Lifetime of PEM Fuel Cell**

Martin Paidar, Jakub Malis, Miroslav Smid, Karel Bouzek
(Department of Inorganic Technology, University of Chemistry and Technology, Prague)

P4-2017 **Experimental Determination of Gas-Diffusion-Layer Permeability**

Monika Drakselova, Anna Tochackova, Roman Kodym, Karel Bouzek
(Department of Inorganic Technology, University of Chemistry and Technology, Prague)

P4-2018 **Performance analysis of a PEM fuel cell-based combined heating and power system operating following the electric load**

Huawei Chang[1], Xiangxiang Xu[1], Jun Shen[2], Shuiming Shu[1], Zhengkai Tu[1,2]
([1]School of Energy and Power Engineering, Huazhong University of Science and Technology, [2]Energy Research Institute, Nanyang Technological University)

P4-2019 **System Level Modelling and Simulation of Transient Behaviour for Polymer Electrolyte Fuel Cells**

Yuanxin Qi[1], Mayken Espinoza Andaluz[2], Martin Andersson[1]
([1]Energy Sciences, Lund University, [2]Centro de Energías Renovables y Alternativas (CERA), Escuela Superior Politécnica del Litoral (ESPOL))

P4-2020 **Techno-Economic Effects of the Stack-Level Improvements on the Dynamic Operation of a Reversible-SOC Plant**

Xuetao Xing[1], Jin Lin[1], Yonghua Song[1,2], Ruomei Qi[1]
([1]Department of Electrical Engineering, Tsinghua University, [2]Department of Electrical and Computer Engineering, University of Macau)

P4-2023 **A Numerical Investigation of Hydrogen-Diesel Dual-Fuel Combustion in a Constant Volume Compression Ignition Engine**

Callum James Ramsay[1], K.K.J. Ranga Dinesh[1], William Fairney[2]
([1]Faculty of Engineering and Physical Sciences-Energy Technology Research Group, University of Southampton, [2]Covaxe Limited, Industrial Partner)

P4-2028 **System Analysis of Solid Oxide Fuel Cell Stack Integrated with Bio-oil Sorption Enhanced Steam Reforming: Effect of SOFC Temperature Gradient**

Kunlanan Wiranarongkorn[1], Olaf Deutschmann[2], Amornchai Arpornwichanop[1]
([1]Chemical Engineering, Chulalongkorn University, [2]Institue for Chemical Technology and Polymer Chemistry, Karlsruhe Institute of Technology)

P4-2030 **Temperature Control of a Water-cooled 5 kW Polymer Electrolyte Membrane Fuel Cell System**

Wenjiang Zou, Young-Bae Kim
(Department of Mechanical Engineering, Chonnam National University)

P4-2034 **New Approach for Lightweight and Versatile Low power PEMFC System Optimized to Operate in Harsh Conditions**

Eric Pinton, Christophe Kinkelin
(Univ. Grenoble Alpes, CEA, LITEN, F-38054 Grenoble, France)