

28 Oct. (Day 2)

Oral Session: Thermal energy conversion and storage (1)

13:00-15:00

Room B

Chairs: TBD

TBD

1B11

13:00-13:20

Development of sintered metal oxide pellets with enhanced heat storage kinetics and cycling stabilitySoomin CHOI¹, Gahyeon LEE¹, Hye Ri KIM¹, Jinsil LEE¹, Seong Eun KIM², Seoyoung JANG¹, Huijeong HWANG¹, Sungkook HONG², Jong Hoon JOO¹¹Department of Environment and Energy Engineering/ Gwangju Institute of Science and Technology,²Korea Institute of Energy Research, Daejeon 34129, Republic of Korea**1B12**

13:20-13:40

Demonstration of Cu-Mn composite oxides honeycomb structure module for medium-high temperature thermochemical energy storageXiaoyu CHEN^{1,2}, Mitsuhiro KUBOTA², Shigehiko FUNAYAMA¹, Hiroki TAKASU¹, Yukitaka KATO¹, Hideki KITA²¹Laboratory for Zero-Carbon Energy, Institute of Integrated Research, Institute of Science Tokyo, Japan,²Department of Chemical Systems Engineering, Graduate School of Engineering, Nagoya University, Japan**1B13**

13:40-14:00

Thermochemical reaction system for industrial heat recovery and heat transformationAldo COSQUILLO MEJIA¹, Rakesh SHARMA², Jana STENGLER³, Marc LINDER³¹Institute of Engineering Thermodynamics, German Aerospace Center (DLR), Linder Höhe, 51147 Cologne, Germany,²Department of Mechanical and Industrial Engineering, Manipal Institute of Technology, Manipal Academy of Higher Education, Manipal 576104, India,³Institute of Engineering Thermodynamics, German Aerospace Center (DLR), Pfaffenwaldring 38-40, Stuttgart, 70569, Germany**1B14**

14:00-14:20

Constant power output of salt hydrate based thermochemical reactors: simple design rulesHenk HUIJINK¹, Stan DE JONG¹, Chris VAN HAM¹, Quinten PEETERS¹, Olaf ADAN^{1,2}¹Eindhoven University of Technology, ²TNO**1B15**

14:20-14:40

Entropy generation analysis of calcium oxide hydration in an indirect fixed-bed reactor for thermochemical energy storageShigehiko FUNAYAMA, Tsuyoshi IZAKI, Hana SAEKI, Satoshi TOSHIMA, Kanta SATO, Takashi KATO, Hiroki TAKASU, Yukitaka KATO

Institute of Science Tokyo

1B16

14:40-15:00

Evaluation of advanced electrochemical techniques for improved monitoring control in sorption materials for TES systemsAngel G. FERNANDEZ, Jalel LABIDI

Department of Chemical and Environmental Engineering, University of the Basque Country

Oral Session: Thermal energy conversion and storage (2)

15:30-17:50

Room B

Chairs: TBD

TBD

1B17

15:30-15:50

A new general analytical model for microgroove-based absorbers in sorption heat transformers

Mahyar ASHOURI, Salman HASSANABADI, Callum CHHOKAR, Majid BAHRAMI

Laboratory for Alternative Energy Conversion (LAEC), School of Mechatronic Systems Engineering, Simon Fraser University

1B18

15:50-16:10

AI-Assisted High-Throughput Screening of Cement-Based Composites for Sorption Thermal Energy Storage

Alessio MONDELLO¹, Giulio BARLETTA¹, Luca LAVAGNA², Matteo FASANO¹, Matteo PAVESE², Eliodoro CHIAVAZZO^{1,3}

¹*Department of Energy, Politecnico di Torino,*

²*Department of Applied Science and Technology, Politecnico di Torino,*

³*Istituto Nazionale di Ricerca Metrologica*

1B19

16:10-16:30

Experimental screening of zeolites for application in an industrial sorption tumble dryer

Henri SCHMIT, Tobias SCHUBERT, Lävemann EBERHARD, Stefan HIEBLER

ZAE Bayern

1B20

16:30-16:50

Performance of Coated vs. Loose Grain Composite for Chiller Application

Salman HASSANABADI, Ilya S GIRNIK, Majid BAHRAMI

Laboratory for Alternative Energy Conversion (LAEC), School of Mechatronic Systems Engineering, Simon Fraser University, Canada

1B21

16:50-17:10

Enhancement of the structural and thermal properties of Al-Cu-Si phase change materials for efficient thermal energy storage

Joshua Chidiebere MBA, Takahiro NOMURA

Hokkaido University

1B22

17:10-17:30

Experimental Study of a counterflow system bench scale packed-bed latent heat storage unit with Al-Si based PCM pellets

Tomokazu NAKAMURA¹, Yusuke SATO¹, Yuto SHIMIZU¹, Cholila TAMZYSI¹, Lianying SHAN², Justin Ningwei CHIU², Shoma FUJII³, Takahiro NOMURA¹

¹*Faculty of Engineering, Hokkaido University,*

²*Department of Energy Technology, KTH Royal Institute of Technology,*

³*Institute for Future Initiatives, The University of Tokyo*

1B23

17:30-17:50

Microencapsulation of high-temperature alloy-based phase change materials utilizing oxide ion conductors for robust shell formation

Koji TAKIZAWA¹, Noritoshi YAGIHASHI¹, Yuki NAKAMA¹, Yuto SHIMIZU², Tomokazu NAKAMURA², Melbert JEEM², Takahiro NOMURA²

¹*Sekisui Chemical Co., Ltd.,*

²*Faculty of Engineering, Hokkaido University*

Oral Session: Energy Storage and Transformation/Energy Carriers

13:00-14:40

Room C

Chairs: TBD

TBD

1C11

13:00-13:20

A water-based lithium-ion solid-state battery with an easy direct-recycling system

Shintaro YASUI, Yosuke SHIRATORI

Institute of Science Tokyo

1C12

13:20-13:40

Experiments and calculations of Thermal Energy Storage (TES) with rock bed and evaluation of radiant heater effectiveness

Takashi MAWATARI¹, Masayuki SATO¹, Koichi GOTO¹, Hiroshi SAEKI¹, Masato FUKUTA¹, Chikako IWAKI¹, Hiromitsu MIKI¹, Naoya MATSUDA²

¹Toshiba Energy Systems & Solutions Corporation,

²Chubu Electric Power Co., Inc.

1C13

13:40-14:00

Temperature-Programmed and In Situ Spectroscopic Approaches to Correlate Graphitization Degree and Kinetic Behavior of Cs-Promoted Ru Catalysts in Ammonia Synthesis

Li Yu WANG¹, Shih Yuan CHEN², Takehisa MOCHIZUKI², Chia Min YANG¹

¹Department of Chemistry, National Tsing Hua University,

²Energy Catalyst Technology Group, National Institute of Advanced Industrial Science and Technology

1C14

14:00-14:20

Kinetics and reactor design of chemical looping hydrogen production process using ilmenite-based oxygen carriers

Zhuang SUN, Junichiro OTOMO

Institute of Science Tokyo

1C15

14:20-14:40

Investigating the role of defect transport in $\text{BaZr}_{0.1}\text{Ce}_{0.7}\text{Y}_{0.1}\text{Yb}_{0.1}\text{O}_{3-6}$ for electrochemical ammonia decomposition

Julian Andres ORTIZ CORRALES, Moe OKAZAKI, Shiho OTOMO, Junichiro OTOMO

Department of Transdisciplinary Science and Engineering, School of Environment and Society, Institute of Science Tokyo

Oral Session: LCA, Technoeconomic analysis, Energy system design and evaluations

15:30-16:50

Room C

Chairs: TBD

TBD

1C17

15:30-15:50

Carbon Independence Vision: Circular Transformation from Hard-to-Abate Industries

Yutaro NIIMI¹, Yoshiko TSUJI², Michihisa KOYAMA³, Yoshihiro MIZUGUCHI⁴

¹SUMITOMO MITSUI TRUST BANK,

²Environmental Science Center, The University of Tokyo,

³Institute for Aqua Regeneration, Shinshu University,

⁴JGC Holdings Corporation

1C18

15:50-16:10

Assessing greenhouse gas emissions reduction of amine-based post-combustion: impact of system boundary and energy productionKoki YAGIHARA, Tsai-Wei WU, Gakuto SO, Hajime OHNO, Yasuhiro FUKUSHIMA*Department of Frontier Sciences for Advanced Environment, Tohoku University***1C19**

16:10-16:30

Day Ahead Dispatch for CSP Plants via Reinforcement Learning: A Chilean Case Study with Metaheuristic BenchmarksCristóbal Andrés PARRADO, Jose Luis MUÑOZ*Energy Transformation Center, Andres Bello University***1C20**

16:30-16:50

Feasibility study of renewable hydrogen supply chain from India to JapanAkira NISHIMURA, Hayato NARUSE, Masataka NORO, Sentaro TOMITA*Division of Mechanical Engineering, Graduate School of Engineering, Mie University***Oral Session: Materials for Energy (1)**

13:00-15:00

Room D

Chairs: TBD

TBD

1D11

13:00-13:20

Advancing Thermochemical Energy Storage with Novel Salt HydratesCandida MILONE, Emanuela MASTRONARDO, Luigi CALABRESE, Emanuele PREVITI, Edoardo PROVERBIO*Engineering Department, University of Messina***1D12**

13:20-13:40

Solid Sorbent-Filled Sulfonated Polymer Composites: A Coating Approach for Thermochemical Energy StorageDavide PALAMARA¹, Mengistu GELAW^{1,2}, Emanuela MASTRONARDO¹, Andrea FRAZZICA³, Edoardo PROVERBIO¹, Candida MILONE¹, Luigi CALABRESE^{1,3}¹Department of Engineering, University of Messina, Contrada di Dio Sant'Agata, 98166 Messina, Italy,²Department of Mechanical Engineering, School of Mechanical, Chemical and Materials Engineering, Adama Science and Technology University, Adama, Ethiopia 1888,³CNR ITAE "Nicola Giordano" - Institute of Advanced Technologies for Energy, Via Salita S. Lucia sopra Contesse 5, 98126 Messina, Italy**1D13**

13:40-14:00

Comparative Analysis of Impregnation Techniques for CaCl₂/Silica Gel Composites in Thermal Energy StorageEmanuela MASTRONARDO¹, Antonio FOTIA², Vincenza BRANCATO², Andrea FRAZZICA², Luigi CALABRESE^{1,2}¹University of Messina, ²CNR ITAE**1D14**

14:00-14:20

Synthesis of Highly Crystalline Graphitic Carbon via Hydrothermal Carbonization of Japanese Cedarwood with Ferric Ion ImpregnationPreethi PERIANAYAGAM¹, Yuta NAKAYASU^{1,2}, Futa IMAIZUMI¹, Takashi ITOH², Masaru WATANABE¹¹Department of chemical engineering, Tohoku University,²Frontier Research Institute for Interdisciplinary Sciences (FRIS), Tohoku University

1D15

14:20-14:40

Evaluating Molten-Salt Compatibility of Waste-Based Materials for Thermal Energy Storage Applications

Halime Omur PAKSOY¹, Burcu KOCAK¹, Alejandro CALDERÓN², Camila BARRENECHE², Gulfeza KARDAS¹, Ana Ines FERNANDEZ²

¹Cukurova University,

²Universitat de Barcelona

1D16

14:40-15:00

Scaling-up Composite Phase Change Materials Manufacturing for Thermal Energy Storage: from Lab to Industrial Production Scale

Maria Elena NAVARRO RIVERO, Abdalqader AHMAD, Yelaman MASKUM, Yulong DING

University of Birmingham

Oral Session: Low carbon technologies (1)

15:30-17:30

Room D

Chairs: TBD

TBD

1D17

15:30-15:50

Analyses on Costs and Potentials of Carbon Dioxide Removal (CDR) Technologies

Keigo AKIMOTO, Fuminori SANO, Hiroshi HARADA, Noritaka MOCHIZUKI, Takahiro NAGATA

Systems Analysis Group, Research Institute of Innovative Technology for the Earth (RIITE)

1D18

15:50-16:10

Distributed energy systems based on ammonia and hydrogen utilization

Ryo YOSHII¹, Nobusuke KOBAYASHI¹, Shinji KAMBARA²

¹Gifu Renewable Energy System Research Center, Gifu University,

²Faculty of Engineering, Gifu University

1D19

16:10-16:30

CO₂ capture performance of calcium oxide-based composite over repeated carbonation and decarbonation cycles

Kenta TOMITA, Tsuyoshi IZAKI, Yue GUO, Shigehiko FUNAYAMA, Hiroki TAKASU, Kato YUKITAKA

Institute of Science Tokyo

1D20

16:30-16:50

Multi-stage structured catalyst system with powerfully converting GHG: Innovative CO₂ recycling system for carbon neutralization

Choji FUKUHARA, Yuki YAMADA, Yu NAKAZAWA, Hiroto NAIKI, Hiroshi AKAMA, Ryo WATANABE

College of Engineering, Academic Institute, Shizuoka University

1D21

16:50-17:10

Carbon-free hydrogen production test project with high temperature heat from high temperature gas-cooled reactor

Masato ONO¹, Katsunori ISHII¹, Hiroki NOGUCHI¹, Hiroyuki SATO², Nariaki SAKABA²

¹HTGR hydrogen utilization group, HTGR project management office, Japan Atomic Energy Agency,

²HTGR project management office, Japan Atomic Energy Agency

1D22

17:10-17:30

Exploring the Potential of Molten Chloride Fast Reactor as a Versatile Zero-Carbon Energy System

Andika Putra DWIJAYANTO¹, Tomohiro OKAMURA^{1,2}, Kenji NISHIHARA³,
Masahiko NAKASE^{1,2}

¹Graduate Major in Nuclear Engineering, Department of Transdisciplinary Science and Engineering, School of Environment and Society, Institute of Science Tokyo,

²Laboratory for Zero Carbon Energy, Institute of Integrated Research, Institute of Science Tokyo,

³Research Group for Nuclear Transmutation System, Japan Atomic Energy Agency

29 Oct. (Day 3)

Oral Session: Thermal energy conversion and storage (3)

9:00-10:20

Room B

Chairs: TBD

TBD

2B01

9:00-9:20

Synthesis of macro-mesoporous salt-silica composite tablets for salt heat batteries

Dasol CHOI^{1,2}, Heiner FRIEDRICH², Olaf ADAN^{1,3}, Henk HUININK¹

¹Department of Applied Physics and Science Education, Eindhoven University of Technology,

²Department of Chemical Engineering & Chemistry, Eindhoven University of Technology, The Netherlands,

³TNO Materials Solution, The Netherlands

2B02

9:20-9:40

EXPERIMENTAL PROOF OF A THERMAL SYSTEM FOR COOLING AND STORAGE APPLICATIONS EMPLOYING CaCl₂/SILICA GEL COMPOSITE ADSORBENT

Valeria PALOMBA¹, Andrea FRAZZICA¹, Vincenza BRANCATO¹, Antonino BONANNO¹, Yannan ZHANG², Matteo CALÒ^{3,4}, Gabriele PENELLO⁴, Walter MITTELBAACH⁴, Gabriel YARCE⁴

¹National Research Council of Italy – Institute for Advanced Energy Technologies (CNR-ITAE), Salita S.Lucia sopra Contesse 5, 98126 Messina, Italy,

²School of Materials and Energy, Guangdong University of Technology, Guangzhou, 510006, China,

³Politecnico di Torino, Department of Energy, Turin, 10129, Italy,

⁴Sorption Technologies GmbH, Freiburg, 79098, Germany

2B03

9:40-10:00

Integration of ionic liquid in electropun tissues for energy applications

Angela MALARA, Paolo BRUZZANITI, Patrizia FRONTERA, Chiara NUNNARI, Lucio BONACCORSI

Mediterranea University of Reggio Calabria, Dept. DICEAM

2B04

10:00-10:20

Tailored halide salt mixtures for thermochemical reactions

Jake A LOCKE, Robert E CRITOPH, George S F SHIRE, Steven J METCALF

University of Warwick

Oral Session: Thermal energy conversion and storage (4)

10:40-12:00

Room B

Chairs: TBD

TBD

2B05

10:40-11:00

Stability and adsorption performance of adsorbent composites for low temperature cooling and air conditioning applications

Angelo FREN¹, Emanuela PITZALIS¹, Francesca NARDELLI², Roberto SPINIELLO¹, Giorgio TOMAINO³, Silvia PIZZANELLI¹, Davide PALAMARA⁴, Antonio FOTIA⁵, Luigi CALABRESE^{1,4}, Vincenza BRANCATO⁵, Matteo CALO⁶, Stefano DE ANTONELLIS^{1,3}, Claudio EVANGELISTI¹, Walter MITTELBACH⁶

¹CNR ICCOM – Institute of Chemistry of Organo Metallic Compounds, Pisa, Italy,

²Department of Chemistry and Industrial Chemistry, University of Pisa,

³Department of Energy, Politecnico di Milano, Italy,

⁴Department of Engineering, University of Messina, Italy,

⁵CNR ITAE– Institute of Advanced Technologies for Energy “Nicola Giordano”, Messina, Italy,

⁶Sorption Technologies GmbH, Freiburg, Germany

2B06

11:00-11:20

Numerical model of the sand-based thermal energy storage system for an industrial process

Toshiaki FUKADA

Energy Transformation Research Laboratory, Central Research Institute of Electric Power Industry

2B07

11:20-11:40

Demonstrations conducted at a waste treatment plant of an off-grid organic Rankine cycle power generation system contributing to a decarbonised society

Satoshi ENDO¹, Tadanobu AIZAWA¹, Toshimitsu ONO¹, Isao HAYASE², Toshihiko FUKUSHIMA², Hirokatsu KOSOKABE², Naoki SHIKAZONO², Hiroshi SONE³, Keisuke URA³, Tomoko HIRAYAMA⁴, Iwa OU⁵, Tomoya HASEGAWA⁵, Yuichiro TOKUNAGA⁵, Katsuhiko OYAMA⁶

¹Mabuchi Engineering Co.,Ltd.,

²Institute of Industrial Science, The University of Tokyo,

³Industrial Technology Institute, Miyagi Prefectural Government,

⁴Kyoto University,

⁵Eagle Industry Co., LTD.,

⁶Japan Sustainable Free Powered Energy System Exploit & Promotion Association

2B08

11:40-12:00

Performance Comparison of a Heat Exchanger with Various Composite Materials in Low-Grade Sorption Desalination

Antonio FOTIA, Valeria PALOMBA, Vincenza BRANCATO, Andrea FRAZZICA

National Research Council of Italy, Institute for Advanced Energy Technologies “N.Giordano” (CNR-ITAE)

Oral Session: Electric energy conversion and storage (1)

9:00-10:20

Room C

Chairs: TBD

TBD

2C01

9:00-9:20

Mitigating Mechanical Degradation in Silicon-Based Electrodes: A Discrete Element Method Study

Magnus SO, Takeru YANO, Shusaku ASANO, Koki SATO, Gen INOUE

Department of Chemical Engineering, Faculty of Engineering, Kyushu University

2C02

9:20-9:40

High-Performance Electrolyte Membrane Exhibiting Low Ohmic Resistance for Redox Flow Batteries

Hirokazu ISHITOBI¹, Ryusuke OBATA², Naruya SUGIURA³, Hidenori OHASHI⁴, Nobuyoshi NAKAGAWA⁵

¹*Department of Applied Chemistry, Meiji University,*

²*Department of Environmental Engineering Science, Gunma University,*

³*Department of Chemical Engineering, Tokyo University of Agriculture and Technology,*

⁴*Department of Applied Physics and Chemical Engineering, Tokyo University of Agriculture and Technology,*

⁵*Program of Chemical Engineering, Gunma University*

2C03

9:40-10:00

Utilising magnetic materials and their magnetic entropy change for energy harvesting systems

Hikaru KIYOMOTO¹, Yuka SAKAI², Yasuki KANSHA²

¹*Department of Multidisciplinary Sciences, Graduate School of Arts and Sciences, The University of Tokyo,*

²*Organization for Programs on Environmental Sciences Graduate School of Arts and Sciences, The University of Tokyo*

2C04

10:00-10:20

Metamaterial Adhesives-Based Triboelectric Nanogenerator for Enhanced Electricity Generation and Adhesion

Hoon E. JEONG¹, Hee Jin LEE¹, Dong Kwan KANG¹, Moon Kyu KWAK², Hosup JUNG³, Yeonghwan SON³

¹*Department of Mechanical Engineering, UNIST,*

²*Department of Mechanical Engineering, Kyungpook National University,*

³*Department of Rural Systems Engineering, Seoul National University*

Oral Session: Electric energy conversion and storage (2)

10:40-12:00

Room C

Chairs: TBD

TBD

2C05

10:40-11:00

Support-Free Connected Nanoparticle Electrocatalysts with Enhanced Oxygen Reduction Performance in Polymer Electrolyte Fuel Cells

Hidenori KUROKI, Takeo YAMAGUCHI

Laboratory for Chemistry and Life Science, Institute of Science Tokyo

2C06

11:00-11:20

Controlling of the mass transport in the direct formic acid fuel cell using a catalyst ink with different particle distributions

Takuya TSUJIGUCHI¹, Madiah Binti MISKAN¹, Kakeru FUJIWARA², Yugo OSAKA¹,
Akio KODAMA², Mototake FURUHASHI³

¹Faculty of Mechanical Engineering, Institute of Science and Engineering, Kanazawa University,

²Institute for Frontier Science Initiative, Kanazawa University,

³Sustainable System Research Dept. Environment & Energy lab., JTEKT

2C07

11:20-11:40

Ruthenium and Copper-Doped Advanced Binary Hydroxide OER Electrocatalysts for Efficient Alkaline Water Electrolysis

Gulfeza KARDAS¹, Goncagül AKSARAY¹, Yakubu Sawadogo ADAM¹, Ender FAKI¹,
Murat FARSAK²

¹Cukurova University,

²Osmaniye Korkut Ata University

2C08

11:40-12:00

Suppression Technique of Sputtering Damage for High-Efficient Perovskite/CIGSe Tandem Solar Cells

Takahito NISHIMURA¹, Chihiro MIZUSHIMA², Ryousuke ISHIKAWA², Akira YAMADA¹

¹Department of Electrical and Electronic Engineering, Institute of Science Tokyo,

²Department of Electrical, Electronic and Communication Engineering, Tokyo City University

Oral Session: Low carbon technologies (2)

9:00-10:20

Room D

Chairs: TBD

TBD

2D01

9:00-9:20

Conversion of CO₂, water and power to CO and O₂ by the SPE electrolysis with Co-P4VPy/KB(673K) cathode

Ichiro YAMANAKA, Takahiro HASEGAWA, Jessica SAEKI, Shogo SASAKI, Ryuhei KOJIMA,
Masanori YAMAMOTO

Department of Chemical Science and Technology, Institute of Science Tokyo

2D02

9:20-9:40

Urea Production by Pulsed-DBD Plasma

Muhammad Miftahur RAHMAN, Shinji KAMBARA, Ryou YOSHII

Gifu University

2D03

9:40-10:00

Green Hydrogen Production using Photovoltaic-Electrolysis

Ryo Samuel AMANO, Hamza ALNAWAFAH

University of Wisconsin

2D04

10:00-10:20

Study on the introduction scenario of innovative fast chloride molten salt reactors for the realization of a zero-carbon society

Masahiko NAKASE, Andika Putra DWIJAYANTO, Tomohiro OKAMURA, Kenji NISHIHARA

Zero-carbon Energy Laboratory, Institute of Science Tokyo

Oral Session: Low carbon technologies (3)

10:40-12:00

Room D

Chairs: TBD

TBD

2D05 Co-generation of electricity and water: adsorptive water harvesting analyzed by a modified Mollier diagram

10:40-11:00

Yuri I. ARISTOV, Larisa G. GORDEEVA

*Boriskov Institute of Catalysis***2D06** Machine Learning Aided Prediction of CO Adsorption on Multi-elemental Nanoparticle

11:00-11:20

Susan Menez ASPERA, Gerardo VALADEZ HUERTA, Yusuke NANBA, Kaoru HISAMA, Michihisa KOYAMA

*Research Initiative for Supra-Material (RISM), Shinshu University***2D07** Phase transition-induced CO₂ capture behavior in lithium-sodium borate melts

11:20-11:40

Shiyi ZANG, Takuya HARADA

*Division of Chemical Science and Engineering, Department of Chemical Science and Engineering, Institute of Science Tokyo***2D08** Acceleration of Gas Absorption Rate by Continuously Formed Liquid Film on Spinning Cylindrical Column

11:40-12:00

Hiroshi NOGAMI¹, Naoya IZUCHI², XiangYu GAO², Kenji ISHIHARA², Akihisa ITO¹¹*Institute of Multidisciplinary Research for Advanced Materials, Tohoku University,*²*Graduate School of Engineering, Tohoku University*

30 Oct. (Day 4)

Oral Session: Energy processes and material properties (1)

9:00-10:20

Room B

Chairs: TBD

TBD

3B01

9:00-9:20

Evaluation of high entropy alloys as structural material in Gen 3 of CSP plants using high-stability molten salt storage materials

Angel G. FERNANDEZ, Teresa GURAYA

Department of Chemical and Environmental Engineering, University of the Basque Country

3B02

9:20-9:40

Microstructural change in Fe-Cr-Ni alloys by high-temperature hydrogen exposure

Satoru KOBAYASHI, Yuki TSUDA

School of Materials and Chemical Technology, Institute of Science Tokyo

3B03

9:40-10:00

Kinetics of smelting reduction process of iron oxide by CO gas

Yoshinao KOBAYASHI, Kentaro URATA

Laboratory for Zero Carbon Energy, Institute of Integrated Research, Institute of Science Tokyo

3B04

10:00-10:20

Experimental and numerical analysis of calcium hydroxide dehydration under microwave heating in a single-mode resonant cavity

Massimiliano ZAMENGO, Junko MORIKAWA

Department of Materials Science and Engineering, Institute of Science Tokyo

Oral Session: Energy processes and material properties (2)

10:40-12:20

Room B

Chairs: TBD

TBD

3B05

10:40-11:00

Experimental determination of melting enthalpies of semicongruent salt hydrates for latent heat thermal energy storage

Henri SCHMIT, Stefanie TAFELMEIER, Christoph RATHGEBER, Stefan HIEBLER

ZAE Bayern

3B06

11:00-11:20

Effect of liquid subcooling on bubble formation in low-pressure pool boiling of water on a single tube

Dominika KACZMAREK, Tomasz HALON, Bartosz ZAJACZKOWSKI

Wroclaw University of Science and Technology, Department of Thermal Sciences

3B07

11:20-11:40

Insight into selective permeability of polymeric hollow fibres for lightweight heat exchangers

Frantisek MIKSIK¹, Yoshiaki KAWAJIRI¹, Kyaw THU², Takahiko MIYAZAKI², Erik BARTULI³, Katerina MAYEROVA³, Jaroslav LONGAUER⁴

¹Institute of Innovation for Future Society, Nagoya University,

²Interdisciplinary Graduate School of Engineering Sciences, Kyushu University,

³Faculty of Mechanical Engineering, Brno University of Technology,

⁴Institute of Materials and Machine Mechanics, Slovak Academy of Sciences

3B08

11:40-12:00

Numerical Analysis of the Denitration Reaction under Microwave Heating in a Single Mode Resonant Cavity

Junko MORIKAWA¹, Massimiliano ZAMENGO¹, Hidetoshi KAWABATA², Makoto DOI², Takashi NAKAYAMA², Yuji WADA³

¹School of Materials and Chemical Technology, Institute of Science Tokyo,

²JFE Engineering,

³General Incorporated Association ZeroC

3B09

12:00-12:00

A Combined GRRM/MC/MD Simulation Study on Bond Exchange in Epoxy Vitrimers

Kaiwen LI¹, Yingxiao XI³, Naoki KISHIMOTO³, Gota KIKUGAWA²

¹Department of Finemechanics, Graduate School of Engineering, Tohoku University,

²Institute of Fluid Science, Tohoku University,

³Department of Chemistry, Tohoku University

Oral Session: Materials DX (digital transformation), Data-driven approach, Materials informatics (1)

9:00-10:20

Room C

Chairs: TBD

TBD

3C01

9:00-9:20

Mapping Thermoelectric Materials Using Machine Learning on Integrated Computational and Experimental Datasets

Yusuke HASHIMOTO, Xue JIA, Hao LI, Takaaki TOMAI

Tohoku University

3C02

9:20-9:40

Theoretical study of amine-CO₂ system with kinetics simulations utilizing DFT calculations

Toru YAMAGUCHI¹, Hidetaka YAMADA², Syohei SANADA¹, Kenji HORI^{1,3,4}

¹Division of Computational Chemistry, Transition State Technology Co. Ltd.,

²Frontier Science and Social Co-creation Initiative, Kanazawa University,

³Interdisciplinary Research Center for Catalytic Chemistry, National Institute of Advanced Industrial Science and Technology,

⁴Faculty of Engineering, Yamaguchi University

3C03

9:40-10:00

CO Adsorption on Supported Monometallic Nanoparticles: Influence of the Support Effect

Gerardo VALADEZ HUERTA, Susan Meñez ASPERA, Yusuke NANBA, Kaoru HISAMA, Michihisa KOYAMA

Shinshu University

3C04

10:00-10:20

Estimation of Kinematic Viscosity for Multicomponent Mixtures using Neural Network with Gradient Constraints

Yuya MURAKAMI, Atsushi HATOYAMA

Department of Applied Chemistry and Biochemical Engineering, Faculty of Engineering, Shizuoka University

Oral Session: Materials DX (digital transformation), Data-driven approach, Materials informatics (2)/Environment and Biomass energy technologies

10:40-12:20

Room C

Chairs: TBD

TBD

3C05

10:40-11:00

A Data-Driven Model for Forecasting Thermal Load in District Energy Networks

Naghme KHEYRIKOOCHAKSARAYEE¹, Mina ROUHANI², Majid BAHRAMI¹

¹*School of Mechatronic Systems Engineering, Simon Fraser University, Surrey, BC, Canada,*

²*City of Surrey, Surrey, BC, Canada*

3C06

11:00-11:20

High-Throughput Computational Discovery of Stable Multi-Component Ni-Rich Cathodes Enabled by Universal Neural Network Potentials

Tien Quang NGUYEN¹, Nobuyuki ZETTSU^{1,2}, Michihisa KOYAMA¹

¹*Institute for Aqua Regeneration, Shinshu University,*

²*Department of Materials Chemistry, Faculty of Engineering, Shinshu University*

3C07

11:20-11:40

Practical Application of Gold Extraction Solvents with High Extractability and Low Water Solubility by Machine Learning

Takuto TSUNEMI¹, Tatsuya OSHIMA², Hiromasa KANEKO¹

¹*Department of Applied Chemistry, Graduate School of Science and Technology, Meiji University,*

²*Department of Applied Chemistry, Faculty of Engineering, University of Miyazaki*

3C08

11:40-12:00

Investigation of Descriptors for the Development of a High-Precision Cocrystal Prediction Model

Manato TAKEUCHI, Hiromasa KANEKO

Graduate School of Science and Technology, Meiji University

3C09

12:00-12:20

Development of an Energy-Positive Electrolysis System for Recycling Waste from Vegetable Oil Refining

Kousuke HIROMORI, Atsushi TAKAHASHI, Naomi SHIBASAKI-KITAKAWA

Department of Chemical Engineering, Tohoku University,

Oral Session: Materials for Energy (2)

9:00-10:20

Room D

Chairs: TBD

TBD

3D01

9:00-9:20

Learnings and shortcomings of nano-enhanced PCM and solid-solid PCM. Case studies

Ana Ines FERNANDEZ, Rebeca SALGADO-PIZARRO, Camila BARRENECHE,
Adela SVOBODOVA-SEDLAKOVA

Department of Materials Science and Physical Chemistry, Universitat de Barcelona

3D02

9:20-9:40

Material-Based Design of Thermal Energy Storage: A Database of Sustainable Solid Particles

Adela SVOBODOVA, Marc MAJÓ, Alejandro CALDERÓN, Mercè SEGARRA,
A. Inés FERNÁNDEZ, Camila BARRENECHE

Department of Material Science and Physical Chemistry, Chemistry Faculty, Barcelona University

3D03

9:40-10:00

Screening hydroxide/oxide reactive pairs for thermochemical energy storage at medium temperatures

Aleksandr SHKATULOV¹, Ionut TRANCA², Marc LINDER³

¹Iberian Center for Research in Energy Storage,

²Vrije Universiteit Brussel,

³German Aerospace Center, Institute of Engineering Thermodynamics

3D04

10:00-10:20

Highly efficient atmospheric water harvesting enabled by hygroscopic zwitterionic hydrogel sponge

Xinge YANG, He SHAN, Zhihui CHEN, Ruzhu WANG

*Institute of Refrigeration and Cryogenics, MOE Engineering Research Center of Solar Power and Refrigeration,
Shanghai Jiao Tong University*

Oral Session: Materials for Energy (3)

10:40-12:00

Room D

Chairs: TBD

TBD

3D05

10:40-11:00

The quest for power and stability – salt hydrates and thermochemical energy storage

Henk HUIJINK¹, Hartmut FISCHER², Olaf ADAN^{1,2}

¹Eindhoven University of Technology,

²TNO

3D06

11:00-11:20

Calculating the matrix flood point to avoid salt leakage in sorption composites

Ilya S. GIRNIK, Claire MCCAGUE, Majid BAHRAMI

Simon Fraser University

3D08

11:20-11:40

Electrochemically prepared efficient and durable oxygen evolution reaction catalyst for anion exchange membrane water electrolysis

Sreekanth NARAYANARU¹, Hidenori KUROKI¹, Takanori TAMAKI¹,
Anilkumar M GOPINATHAN^{1,2}, Takeo YAMAGUCHI¹

¹*Institute of Science Tokyo,*

²*Noritake*

3D09

11:40-12:00

Production of LiFePO₄ from Steelmaking Slag

Takayuki IWAMA¹, Junyi DENG¹, Huafang YU², Yasushi SASAKI¹, Ryo INOUE¹,
Shigeru UEDA¹

¹*IMRAM, Tohoku University,*

²*State Key Laboratory of Advanced Metallurgy, University of Science and Technology Beijing*