

## Symposium G : Materials for Energy Storage and Generation

November 20 (Mon.), 2023

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Session Title : Materials for Energy Storage and Generation 1

Time : 10:50 - 12:25, Nov. 20

Room # : 303A, 3F

Session Chair : Young-Bum Chun, Korea Atomic Energy Research Institute  
Ji-woon Lee, Kongju National University

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**10:50 – 11:20**    **Keynote** K-G0242

**Development of Advanced Materials for Future Nuclear Systems**

Changheui Jang, Korea Advanced Institute of Science and Technology, Korea

**11:20 – 11:40**    **Invited** I-G1112

**Cr-coated accident tolerant nuclear fuel cladding and hydride embrittlement of Zirconium-based alloys: status, implications, and remaining challenges**

Youho Lee, Seoul National University, Korea

**11:40 – 11:55** O-G0495

**Development of advanced neutron absorbing structural materials for spent nuclear fuel storage and transportation applications**

Young-Bum Chun, Korea Atomic Energy Research Institute, Korea

**11:55 – 12:10** O-G0489

**Revealing the mechanism of irradiation-induced swelling in chromium through investigation of many types of defect structures -Through investigation of many types of defect structures**

Lijuan Cui, The University of Tokyo, Japan

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Session Title : Materials for Energy Storage and Generation 2

Time : 14:00 - 15:25, Nov. 20

Room # : 303A, 3F

Session Chair : Ji-woon Lee, Kongju National University  
Young-Bum Chun, Korea Atomic Energy Research Institute

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**14:00 – 14:30**    **Keynote** K-G0756

**Development of Metal-Coated Zircaloy for Accident-Tolerant Fuels**

Hiroaki ABE, The University of Tokyo, Japan

**14:30 – 14:50**    **Invited** I-G1014

**The development of interatomic potentials and simulations of primary radiation damage for vanadium alloy**

Huiqiu Deng, Hunan University, China

14:50 – 15:10 **Invited**

I-G0881

**Distinct irradiation resistance mechanisms of high entropy alloys**

Chenyang Lu, Xi'an Jiaotong University, China

15:10 – 15:25

O-G0551

**Study on Phase Stability and Mechanical Properties in Mn-Ni-Si Model Alloys under Thermal Aging and Irradiation**

XINRUN CHEN, Nagaoka University of Technology, Japan

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Session Title : Materials for Energy Storage and Generation 3

Time : 16:00 - 18:05, Nov. 20

Room # : 303A, 3F

Session Chair : Nokeun Park, Yeungnam University

Young-Bum Chun, Korea Atomic Energy Research Institute

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16:00 – 16:30 **Keynote**

K-G0854

**Temperature-dependent synergistic evolution mechanism of rhenium and irradiation defects in tungsten**

Hong-Bo Zhou, Beihang University, China

16:30 – 16:50 **Invited**

I-G0814

**Rectifying and antiport of cations by metal-organic framework-based nanochannel membrane for osmotic energy harvesting**

Jun Lu, Monash University, Australia

16:50 – 17:05

O-G0974

**Effects of Crystallite Size on the Water Intercalation and Heat Storage Properties of Layered Manganese Dioxide**

Hiroki Yoshisako, Tohoku University, Japan

17:05 – 17:20

O-G0356

**Preparation of Porous Iron Whisker and its Evaluation for Cyclic Oxidation/Reduction Property by H<sub>2</sub>-H<sub>2</sub>O**

Anri Suzumura, Tohoku University, Japan

17:20 – 17:35

O-G0230

**Effect of Mg grain size on formation of MgH<sub>2</sub>**

Wataru Kitano, Kansai University, Japan

17:35 – 17:50

O-G0917

**Mechanisms of hydrogen transportation and hydrogen-induced damage in tungsten as an armour material for fusion devices**

Long Cheng, Beihang University, China

17:50 – 18:05

O-G0862

**Heterointerface engineering of NiFe/Y<sub>2</sub>O<sub>3</sub> hybrids for high-efficient alkaline water splitting**

Zhen Xin Hui, Jilin University, China

**November 21 (Tue.), 2023**

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Session Title : Materials for Energy Storage and Generation 4

Time : 10:50 - 12:25, Nov. 21

Room # : 303A, 3F

Session Chair

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10:50 – 11:20

Keynote

K-G0719

**Thermochemical Hydrogen Production via modified Na-Redox reactions**

Takayuki ICHIKAWA, Hiroshima University, Japan

11:20 – 11:40

Invited

I-G0795

**Nanostructured hydrides for Hydrogen/Lithium Storage**

Xuebin Yu, Fudan University, China

11:40 – 11:55

O-G0521

**Regeneration and synthesis of Metal Borohydrides - Integration of hydrogen production and storage**

Liuzhang Ouyang, South China University of Technology, China

11:55 – 12:10

O-G0954

**Evaluation of Hydrogen Embrittlement of High Strength Steels in Hydrogen Gas at 0.7 MPa**

Nobuyuki Takahashi, Daido Steel Co., Ltd., Japan

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Session Title : Materials for Energy Storage and Generation 5

Time : 14:00 - 15:30, Nov. 21

Room # : 303A, 3F

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**Session Chair**

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- 14:00 – 14:30**    **Keynote**    **K-G0541**  
**Hydrides for energy storage and conversion**  
Ping Chen, Dalian Institute of Chemical Physics, China
- 14:30 – 14:45**    **O-G0522**  
**The synergistic effect of Ni and Pd for Boosting the hydrogen storage performance of MgH<sub>2</sub>**  
Shaoyang Shen, South China University of Technology, China
- 14:45 – 15:00**    **O-G0543**  
**Surface structures and hydrogenation properties of Ti-Pd alloys immersed in hydrogen peroxide**  
Ryota Kondo, Kansai University, Japan
- 15:00 – 15:15**    **O-G0718**  
**Disproportionation of Ti<sub>4</sub>Ni<sub>2</sub>O<sub>x</sub> (x=0-1) in H<sub>2</sub> atmosphere**  
Yuki Kashiyama, Kasai University, Japan
- 15:15 – 15:30**    **O-G0726**  
**LaNi<sub>5</sub> Metal Hydride as a Catalyst for Liquid Organic Hydrogen Carrier**  
Sung Ju Han, Korea Institute of Science and Technology, Korea

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**Session Title : Materials for Energy Storage and Generation 6**

**Time : 16:00 - 18:00, Nov. 21**

**Room # : 303A, 3F**

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**Session Chair**

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- 16:00 – 16:20**    **Invited**    **I-G0297**  
**Critical Factors Affecting Fill Factor in All Polymer Solar Cells**  
Hyung Do Kim, Kyoto University, Japan
- 16:20 – 16:40**    **Invited**    **I-G1104**  
**Toward efficient, stable and reproducible metal halide perovskite solar cells**  
Jin-Wook Lee, Sungkyunkwan University, Korea
- 16:40 – 17:00**    **Invited**    **I-G1133**  
**Phase Stabilization Strategies for Efficient Perovskite Solar Cells**  
Peng Chen, The University of Queensland, Australia
- 17:00 – 17:15**    **O-G0018**  
**Recent progresses and remaining issues on the catalyst layer design strategy for high-performance proton exchange membrane fuel cell with further reduced Pt loadings**  
Xiang Deng, Sinosteel Nanjing Advanced Materials Research Institute Co., Ltd., Australia
- 17:15 – 17:30**    **O-G0154**  
**Cu doped NiFe double-layered hydroxide electrocatalyst for oxygen evolution reaction in anion exchange membrane water electrolysis**

Debabrata Chanda, Kumoh National Institute of Technology, Korea

17:30 – 17:45

O-G0840

**Synchronous bi-modulation by nanoclusters and single atoms for high-efficient oxygen reduction electrocatalysis**

Ying Zhang, Jilin University, China

17:45 – 18:00

O-G0841

**CeO<sub>2</sub> nanoparticles decorated on porous Ni-Fe bimetallic phosphide nanosheets for high-efficient overall water splitting**

Li Du, Jilin University, China

## November 22 (Wed.), 2023

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Session Title : Materials for Energy Storage and Generation 7

Time : 10:50 - 12:30, Nov. 22

Room # : 303A, 3F

Session Chair : Dong-Hwa Seo, Korea Advanced Institute of Science and Technology

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10:50 – 11:20

Keynote

K-G0245

**Enabling scalable high-areal-capacity Li battery cathodes by coupled ion/electron transport**

Sang-Young Lee, Yonsei University, Korea

11:20 – 11:40

Invited

I-G1065

**How interfaces control lithium (de)insertion pathway**

Jongwoo Lim, Seoul National University, Korea

11:40 – 12:00

Invited

I-G0784

**Advanced Metal-Based Anode Materials for Li Storage**

Renzong Hu, South China University of Technology, China

12:00 – 12:15

O-G0990

**The synergy between cation and ligand tailors in layered cathodes for highly reversible Li intercalation**

Jiliang Zhang, Dalian Jiaotong University, China

12:15 – 12:30

O-G0962

**Nanoporous Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub> as anode material of Li-ion batteries for excellent high-rate performance**

Zhangjie Xu, Dalian Jiaotong University, China

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Session Title : Materials for Energy Storage and Generation 8

Time : 14:00 - 15:35, Nov. 22

Room # : 303A, 3F

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Session Chair : Dong-Hwa Seo, Korea Advanced Institute of Science and Technology

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14:00 – 14:20      **Invited** I-G0420

**Ammonia Synthesis via Chemical Looping of Li based Materials**

Hiroki MIYAOKA, Hiroshima University, Japan

14:20 – 14:35 O-G0073

**Heterostructure of Molybdenum Disulfide Zinc Iron Sulfide Hybrid as High Capacity and Long Life Anode Materials for Lithium Ion Batteries**

Jagadis Gautam, Kumoh National Institute of Technology, Korea

14:35 – 14:50 O-G0389

**High-Performance Anode Materials for Sodium/Potassium Ion Batteries**

Chuncheng Yang, Jilin University, China

14:50 – 15:05 O-G0845

**In-situ construction of array structured Bi/N-CNS composite as high-performance sodium-ion battery anode**

Jian Hui Jia, Jilin University, China

15:05 – 15:20 O-G0288

**Phase Field Simulation for Defluoridation of  $\text{CuPb}_2\text{F}_6$  Electrode Material**

Ikubo Satoshi, Kyushu University, Japan

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Session Title : Materials for Energy Storage and Generation 9

Time : 16:00 - 17:00, Nov. 22

Room # : 303A, 3F

Session Chair : Dong-Hwa Seo, Korea Advanced Institute of Science and Technology

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16:00 – 16:30      **Keynote** K-G1180

**Rational design of porous carbon composites for energy storage and conversion**

Hao Liu, University of Technology Sydney, Australia

16:30 – 16:45 O-G0960

**Non-dendritic Electrodeposition of Alkali-Metal Anodes by Solvation Structure Modification in Dual-Cation Electrolytes**

Hongyi Li, Tohoku University, Japan

16:45 – 17:00 O-G0975

**Facilitating Multivalent Cation Diffusion in Cathode Materials by Concomitant Intercalation in Dual-Cation Electrolytes**

YUE QI, Tohoku University, Japan