

## Program Overview

	Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
<b>November 14, 2022 (Monday)</b>				
12:00-	Registration			
14:00-15:30	Refractory Metals and Hard Materials (RMH) I (14:00-15:15)	Advanced Powder Metallurgy (APM) I (14:30-15:30)	Computer-aided Materials Engineering (CME) I (14:00-15:25)	
Coffee Break				
15:30-17:20	Refractory Metals and Hard Materials (RMH) II (15:30-17:15)	Advanced Powder Metallurgy (APM) II (15:50-16:50)	Computer-aided Materials Engineering (CME) II (15:40-17:20)	
<b>November 15, 2022 (Tuesday)</b>				
09:00-	Registration			
09:30-10:00	Plenary Lecture I (Prof. H. Danninger)			
10:00-10:30	Plenary Lecture II (Prof. Hyoung Seop Kim)			
Coffee Break				
10:40-12:00	Additive Manufacturing and Printing Technology (AMT) I (11:00-12:00)	Rare Metals and Recycling (RMR) I (10:40-11:55)	Integrated Computer-aided Process Engineering (ICAPE) I (10:40-12:00)	Energy and Environmental Materials (EEM) I (10:40-11:45)
12:00-13:00	Lunch			
13:30-15:10	Additive Manufacturing and Printing Technology (AMT) II (13:30-15:05)	Rare Metals and Recycling (RMR) II (13:30-15:10)	Integrated Computer-aided Process Engineering (ICAPE) II (13:30-14:30)	Energy and Environmental Materials (EEM) II (13:30-15:10)
Coffee Break				
15:00-16:50	Additive Manufacturing and Printing Technology (AMT) III (15:25-16:30)	Rare Metals and Recycling (RMR) III (15:30-16:50)	Advanced Materials Processing (AMP) I (15:00-16:50)	Energy and Environmental Materials (EEM) III (15:30-16:15)



## Program Overview

	Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
<b>November 16, 2022 (Wednesday)</b>				
09:00-	Registration			
10:00-10:30	Plenary Lecture III (Prof. Jingyang Wang)			
Coffee Break				
10:40-12:05	Advanced Materials Processing (AMP) II (11:00-12:00)	Nanoceramics (NCM) I (10:40-11:55)	Electric and Magnetic Materials (EMM) I (10:40-12:05)	
12:00-13:00	Lunch			
13:30-16:00	Advanced Materials Processing (AMP) III (13:30-15:50)	Nanoceramics (NCM) II (13:30-14:40)	Electric and Magnetic Materials (EMM) II (13:30-15:00)	Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF) I (14:00-16:00)
Coffee Break				
14:50-17:40	Advanced Materials Processing (AMP) IV (16:00-17:40)	Nanoceramics (NCM) III (14:50-16:05)	Electric and Magnetic Materials (EMM) III (15:20-16:45)	Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF) II (16:20-17:20)
		Rare Metals and Recycling (RMR) IV (16:15-17:30)		
<b>November 17, 2022 (Thursday)</b>				
09:00-	Registration			
09:30-11:00	Plenary Lecture IV (Prof. Z. Zak Fang) (09:30-10:00)			Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF) III (10:00-11:00)
	Plenary Lecture V (Prof. Paulo Bartolo) (10:00-10:30)			
Coffee Break				
11:15-12:20				Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF) IV (11:15-12:20)
12:00-13:00	Lunch			
13:30-15:00	Poster Presentation (Online) and Evaluation			
Coffee Break				
17:30-18:00	KPMI Meeting (Stone Hall)			
18:00-20:00	Conference Dinner (Island Ballroom)			
<b>November 18, 2022 (Friday)</b>				
09:00-	Registration			
10:00-12:00	Panel Discussion			

## Scientific Program

### ▶ November 14, Monday (14:00-15:30)

Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
<p><b>Refractory Metals and Hard Materials (RMH) I</b> (14:00-15:15)</p> <p>Chair : Sung-Soo Ryu (KICET)</p> <p>RMH-I1 Seongwon Kim RMH-I2 Dang-Hyok Yoon RMH-O1 Hyeondeok Jeong RMH-O2 Yong-Kwan Lee RMH-O3 Jong-Il Kim</p>	<p><b>Advanced Powder Metallurgy (APM) I</b> (14:30-15:30)</p> <p>Chair : Sangsun Yang (KIMS)</p> <p>APM-O1 Jong-Min Park APM-O2 Yeong Gyun Nam APM-O3 Jaehyoung Lim APM-O4 K. C. Nayak</p>	<p><b>Computer-aided Materials Engineering (CME) I</b> (14:00-15:25)</p> <p>Chair : T. Mizoguchi (Univ of Tokyo)</p> <p>CME-K1 Teruyasu Mizoguchi CME-O1 Haksung Lee CME-O2 Seok-Jae Lee CME-I1 Lawrence Cho</p>	

### ▶ November 14, Monday (15:30-17:20)

Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
<p><b>Refractory Metals and Hard Materials (RMH) II</b> (15:30-17:15)</p> <p>Chair : Seongwon Kim (KICET) Hojin Ryu (KAIST)</p> <p>RMH-I3 Tamás Csanádi RMH-I4 Laura Silvestroni RMH-O4 Piyush Kumar RMH-O5 S. K. Dewangan RMH-O6 Sandeep Jain RMH-O7 Namhun Kwon RMH-O8 Won June Choi</p>	<p><b>Advanced Powder Metallurgy (APM) II</b> (15:50-16:50)</p> <p>Chair : Jongmin Byun (SEOULTECH)</p> <p>APM-I1 Hoonsung Cho APM-I2 Tae-Shik Yoon APM-I3 Mathias Englund</p>	<p><b>Computer-aided Materials Engineering (CME) II</b> (15:40-17:20)</p> <p>Chair : Yong Joo Kim (Kookmin Univ)</p> <p>CME-O3 DongEung Kim CME-I2 Anders Engström CME-O4 R. Narayan Hajra CME-O5 Won-Seok Ko CME-I3 S. Bhattacharyya</p>	



## Scientific Program

### ▶ November 15, Tuesday (09:30-10:00)

Island Ballroom 1&2
<b>Plenary Lecture I</b>
Chair : Prof. Herbert Danninger (TU Wien, Austria)

### ▶ November 15, Tuesday (10:00-10:30)

Island Ballroom 1&2
<b>Plenary Lecture II</b>
Chair : Prof. Hyoung Seop Kim (POSTECH, Republic of Korea)

### ▶ November 15, Tuesday (10:40-12:00)

Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
<b>Additive Manufacturing and Printing Technology (AMT) I</b> (11:00-12:00)	<b>Rare Metals and Recycling (RMR) I</b> (10:40-11:55)	<b>Integrated Computer-aided Process Engineering (ICAPE) I</b> (10:40-12:00)	<b>Energy and Environmental Materials (EEM) I</b> (10:40-11:45)
Chair : AMT-I1 Par Arumskog AMT-I2 H. Le Ferrand AMT-I3 Seung Ki Moon	Chair : RMR-K1 Jürgen Eckert RMR-K2 Julia Hufenbach RMR-K3 Odilkhuja Parpiev	Chair : Hyunjoo Choi (Kookmin Univ) ICAPE-O1 Pil-Ryung Cha ICAPE-O2 Ji Hoon Kim ICAPE-O3 Jaewook Nam ICAPE-O4 Hyun Wook Jung	Chair : EEM-K1 Nosang Myung EEM-I1 Jaeyoung Jeong EEM-I2 Jaeyun Moon

### ▶ November 15, Tuesday (13:30-15:10)

Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
<b>Additive Manufacturing and Printing Technology (AMT) II</b> (13:30-15:05)	<b>Rare Metals and Recycling (RMR) II</b> (13:30-15:10)	<b>Integrated Computer-aided Process Engineering (ICAPE) II</b> (13:30-14:30)	<b>Energy and Environmental Materials (EEM) II</b> (13:30-15:10)
Chair : AMT-I4 Clodualdo Aranas AMT-O1 Joon Phil Choi AMT-O2 Haeum Park AMT-O3 Kwang Kyu Ko AMT-O4 SeungHyeok Chung AMT-O5 Joowon Suh	Chair : RMR-I1 S. Mamatkulov RMR-I2 Elyorjon Jumaev RMR-I3 O. N. Ruzimuradov RMR-I4 Amir Abidov RMR-I5 Konrad Kosiba	Chair : Yong Joo Kim (Kookmin Univ) ICAPE-O5 Yongwoo Kwon ICAPE-O6 Kunok Chang ICAPE-O7 Donghwan Ahn	Chair : EEM-I3 Min Hwan Lee EEM-I4 Hyojong Yoo EEM-O1 Jong Soo Byeon EEM-O2 Ji Young Park EEM-O3 Seung-Hwan Lee EEM-O4 C. Loka

## Scientific Program

### ► November 15, Tuesday (15:00-16:50)

Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
<b>Additive Manufacturing and Printing Technology (AMT) III</b> (15:25-16:30) Chair : AMT-I5 Swee Leong Sing AMT-O6 Chang Woo Gal AMT-O7 Taegyul Lee AMT-O8 Wonjong Jeong	<b>Rare Metals and Recycling (RMR) III</b> (15:30-16:50) Chair : RMR-I6 Yongho Sohn RMR-I7 Yongxiu Li RMR-I8 Ming Yue RMR-I9 W. Sheng Chen	<b>Advanced Materials Processing (AMP) I</b> (15:00-16:50) Chair :Kee-Ahn Lee (Inha Univ) AMP-K1 Hidemi Kato AMP-I1 Hak Soo Choi AMP-I2 Zhiming Li AMP-O1 M. Sabotakin Rizi AMP-O2 S. Grandhi AMP-O3 Cong Van Dinh	<b>Energy and Environmental Materials (EEM) III</b> (15:30-16:15) Chair : EEM-O5 K. K. Kaszyca EEM-O6 Rafal Zybała EEM-O7 Bartosz Bucholc



## Scientific Program

### ▶ November 16, Wednesday (10:00-10:30)

Island Ballroom 1&2	
<b>Plenary Lecture III</b>	
Chair : In-Hyuck Song (KIMS) Prof. Jingyang Wang (Chinese Academy of Sciences, China)	

### ▶ November 16, Wednesday (10:40-12:05)

Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
<b>Advanced Materials Processing (AMP) II</b> (11:00-12:00)	<b>Nanoceramics (NCM) I</b> (10:40-11:55)	<b>Electric and Magnetic Materials (EMM) I</b> (10:40-12:05)	
Chair : Hidemi Kato (Tohoku Univ) Jongmin Byun (SEOULTECH)	Chair : In-Hyuck Song (KIMS)	Chair : Han Eol Lee (Jeonbuk Natl Univ)	
AMP-K2 Hongju Rhee AMP-I3 Wonmo Kang AMP-O4 Jia Lee	NCM-I1 Alberto Ortons NCM-I2 Shikhar Misra NCM-I3 Michele Chen NCM-O1 Hong-Baek Cho	EMM-K1 Yoon-Hong Yeo EMM-I1 Xiandong Xu EMM-I2 Yong Zhang EMM-I3 Dong-Myeong Shin	

### ▶ November 16, Wednesday (13:30-16:00)

Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
<b>Advanced Materials Processing (AMP) III</b> (13:30-15:50)	<b>Nanoceramics (NCM) II</b> (13:30-14:40)	<b>Electric and Magnetic Materials (EMM) II</b> (13:30-15:00)	<b>Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF) I</b> (14:00-16:00)
Chair : Du Hejun (Nanyang Tech Univ) Jeoung Han Kim (Hanbat Natl Univ)	Chair : Ha-Neul Kim (KIMS)	Chair : Geon Tae Hwang (Pukyong Natl Univ)	Chair : Sung-Tag Oh (SEOULTECH)
AMP-K3 Equo Kobayashi AMP-K4 Junichi Matsushita AMP-O5 Javid Hussain AMP-O6 Jin Wook Park AMP-O7 Yu-Jin Hwang AMP-O8 Seulgi Kim AMP-O9 Han Kim AMP-O10 Haishen Shen	NCM-O2 Babu Madavali NCM-O3 Jangsoo Kim NCM-I3 Lin Gan NCM-I4 Lin-Lin Zhu	EMM-I4 Youn-Kyoung Baek EMM-I5 Han Eol Lee EMM-I6 Chang Kyu Jeong EMM-O1 Lachida Lamouri EMM-O2 Jae Young Choi	ESNRF-O1 Kee-Ahn Lee ESNRF-O2 Jung-Wook Cho ESNRF-O3 Hyunjoo Choi ESNRF-O4 Seok Su Sohn

## Scientific Program

### ► November 16, Wednesday (14:50-17:40)

Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
<p><b>Advanced Materials Processing (AMP) IV</b> (16:50-17:40)</p> <p>Chair : Jae Bok Seol (Gyeongsang Natl Univ)</p> <p>AMP-I4 Du Hejun AMP-I5 Sea Hoon Lee AMP-O11 Min Hyeok Lee AMP-O12 Keonhee Cho AMP-O13 Hyung Jin Mun AMP-O14 Kreethi Ravi</p>	<p><b>Nanoceramics (NCM) III</b> (14:50-16:05)</p> <p>Chair : Hong-Baek Cho (Hanyang Univ)</p> <p>NCM-O4 Ha-Neul Kim NCM-O5 M. T. Ayman NCM-O6 Hong Joo Lee NCM-O7 A. S. Muhammad NCM-O8 Cheng-Cai Zhao</p> <p><b>Rare Metals and Recycling (RMR) IV</b> (16:15-17:30)</p> <p>Chair :</p> <p>RMR-O1 Yoseb Song RMR-O2 Ammad Ali RMR-O3 Jeung-Jai Yun RMR-O4 Hyunchul Kim RMR-O5 Basudev Swain</p>	<p><b>Electric and Magnetic Materials (EMM) III</b> (15:20-16:45)</p> <p>Chair : Chang Kyu Jeong (Jeonbuk Natl Univ)</p> <p>EMM-I7 Geon-Tae Hwang EMM-I8 Yiseul Park EMM-O3 Mi-Jin Jin EMM-O4 Dong Yeol Hyeon EMM-O5 Seung-Jae Jeong</p>	<p><b>Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF) II</b> (16:20-17:20)</p> <p>Chair : Sung-Tag Oh (SEOULTECH)</p> <p>ESNRF-O5 Byoungchul Hwang ESNRF-O6 Byung Joon Choi ESNRF-O7 Jongmin Byun</p>



## Scientific Program

### ▶ November 17, Thursday (09:30-10:00)

Island Ballroom 1&2
<b>Plenary Lecture IV</b>
Chair : Prof. Zhigang Zak Fang (University of Utah, USA)

### ▶ November 17, Thursday (10:00-10:30)

Island Ballroom 1&2
<b>Plenary Lecture V</b>
Chair : Prof. Paulo Bartolo (Nanyang Technological University, Singapore)

### ▶ November 17, Thursday (10:00-11:00)

Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
			<p style="text-align: center;"><b>Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF) III</b> (10:00-11:00)</p> <p>Chair : Sung-Tag Oh (SEOULTECH)</p> <p>ESNRF-O8 Se Hun Kwon ESNRF-O9 Jung Woo Lee ESNRF-O10 Seung-Ki Lee</p>

### ▶ November 17, Thursday (11:15-12:20)

Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
			<p style="text-align: center;"><b>Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF) IV</b> (11:15-12:20)</p> <p>Chair : Sung-Tag Oh (SEOULTECH)</p> <p>ESNRF-I1 Hyung-Ho Park ESNRF-O11 Haejin Hwang ESNRF-O12 Jeong Gil Seo</p>



## Scientific Program

### ▶ November 17, Thursday (13:30-15:00)

Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
Poster Presentation (Online) and Evaluation			

### ▶ November 18, Friday (10:00-12:00)

Island Ballroom 1&2	Island Ballroom 3	Stone Hall	Wind Hall
Panel Discussion			



Room A (Island Ballroom 1&2)

► Refractory Metals and Hard Materials (RMH) I

Chair: Sung-Soo Ryu (KICET)

- 14:00 RMH-I1 Fabrication and Characteristics of W-ZrC Composites**  
Seongwon Kim\*, Min-Soo Nam, Yoonsoo Han, Sung-Soo Ryu, and Sung-Min Lee  
Korea Institute of Ceramic Engineering and Technology Icheon Institute
- 14:15 RMH-I2 Fabrication of Porous Calcium-Hexaluminate Aggregate for Refractory Applications**  
Hyeon-Mo Bae and Dang-Hyok Yoon\*  
Yeungnam University
- 14:30 RMH-O1 WC-Co alloy-based tool manufacturing by three-dimensional printing with a high solid loading slurry**  
Hyeondeok Jeong<sup>1,\*</sup>, Jong-Il Kim<sup>2</sup>, and Sung-Soo Ryu<sup>2</sup>  
<sup>1</sup>Korea Institute of Science and Technology, <sup>2</sup>Korea Institute of Ceramic Engineering and Technology
- 14:45 RMH-O2 Effects of reduction temperature and diluent content on the properties of high-purity tantalum powder prepared using the Hunter process**  
Yong-Kwan Lee<sup>1,2\*</sup>, Jae-Jin Sim<sup>1,3</sup>, MiHye Lee<sup>1</sup>, Soong Ju Oh<sup>2</sup>, JaeHong Shin<sup>1\*</sup>, and Kyoung-Tae Park<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup> Korea University, <sup>3</sup>Inha University
- 15:00 RMH-O3 Fabrication of triply periodic minimal surfaces carbon through the carbonization of 3D printed polymer**  
Jong-Il Kim<sup>1\*</sup>, Hyeondeok Jeong<sup>2</sup>, and Sung-Soo Ryu<sup>1</sup>  
<sup>1</sup>Korea Institute of Ceramic Engineering and Technology, <sup>2</sup>Korea Institute of Science and Technology

## Oral Session

Monday, November 14

### ► Refractory Metals and Hard Materials (RMH) II

**Chairs:** Seongwon Kim (KICET)  
Hojin Ryu (KAIST)

- 15:30 RMH-I3** **Strengthening and plasticity of high-entropy carbide grains at the micro-scale**  
Tamás Csanádi<sup>†</sup>  
Slovak Academy of Sciences
- 15:45 RMM-I4** **Key microstructural features for super-strong ceramics above 2000°C**  
L. Silvestroni<sup>1\*</sup>, N. Gilli<sup>2</sup>, J. Watts<sup>3</sup> and W. G. Fahrenholtz<sup>3</sup>  
<sup>1</sup>CNR-ISTEC, <sup>2</sup>CNR-IMM, <sup>3</sup>Missouri University of Science and Technology
- 16:00 RMH-O4** **Microstructural and Mechanical properties of the Fe-Co-Cr-Ni-V-Zr<sub>x</sub> Eutectic high entropy alloys**  
Piyush Kumar<sup>†</sup>, Abhijit Ghosh, and Sumanta Samal  
Indian Institute of Technology Indore
- 16:15 RMH-O5** **Surface Oxidation Behavior of Spark Plasma Sintered AlCrCuFeMnW<sub>x</sub> (x = 0, 0.05, 0.1, 0.5) High-Entropy Alloys at an Elevated Isothermal Temperature**  
Sheetal Kumar Dewangan<sup>1,2</sup>, Devesh Kumar<sup>3,4</sup>, Ashutosh Sharma<sup>1</sup>, Vinod Kumar<sup>2,4,\*</sup>, and Byungmin Ahn<sup>1,5,\*</sup>  
<sup>1,5</sup>Ajou University, <sup>2</sup>Indian Institute of Technology, <sup>3</sup>Poornima University, <sup>4</sup>National Institute of Technology
- 16:30 RMH-O6** **Prediction the effect of Ta and experimental validation in novel 6 components Fe-Co-Ni-Cr-V-Ta eutectic high entropy alloys**  
Sandeep Jain, Vinod Kumar, and Sumanta Samal<sup>†</sup>  
Indian Institute of Technology Indore
- 16:45 RMH-O7** **Recycling and Manufacturing of Deoxidated High-Purity Ti-Ingots from Off-Grade Ti-Scraps through Molten Salt Electrolysis and Electron Beam Melting**  
Namhun Kwon<sup>1,2</sup>, Hyun Chul Kim<sup>1,2</sup>, Yong-Kwan Lee<sup>1,2</sup>, Soong Ju Oh<sup>2</sup>, Mi Hye Lee<sup>1</sup>, Seok-Jun Seo<sup>1</sup>, and Kyoung-Tae Park<sup>1,\*</sup>  
<sup>1</sup>Korean Institute of Industrial Technology, <sup>2</sup>Korea University
- 17:00 RMH-O8** **Electro-thermo-mechanical characterization of microscale Ti-6Al-4V wire**  
Won June Choi<sup>1</sup>, Mawell J. Kulak<sup>1</sup>, Chunghwan Kim<sup>1</sup>, Eric J. Payton<sup>2</sup>, Christopher Rudolf<sup>3</sup>, and Wonmo Kang<sup>1\*</sup>  
<sup>1</sup>Arizona State University, <sup>2</sup>University of Cincinnati, <sup>3</sup>Naval Research Laboratory



Oral Session

Monday, November 14

Room B (Island Ballroom 3)

▶ **Advanced Powder Metallurgy (APM) I**

Chair: Sangsun Yang (KIMS)

- 14:30 APM-O1 Unprecedented permeability and low core loss of soft magnetic composites realized using Fe-Si chips**  
Jong-Min Park<sup>1,2</sup>, Min-Sun Jang<sup>1</sup>, Bonuk Koo<sup>1,2</sup>, Hea-Ran Kim<sup>1,3</sup>,  
Young-Tae Kwon<sup>1</sup>, Sangsun Yang<sup>1</sup>, Jung Woo Lee<sup>2</sup>, and Jae Won Jeong<sup>1,\*</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Pusan National University, <sup>3</sup>Sungkyunkwan University
- 14:45 APM-O2 Effect of carbon addition on glass forming ability of Fe<sub>73</sub>Si<sub>9</sub>-x<sub>B10</sub>P<sub>5</sub>C<sub>x</sub> amorphous alloy for gas atomization**  
Yeong Gyun Nam<sup>1\*</sup>, Hearn Kim<sup>1,3</sup>, Hyun Ah Im<sup>1</sup>, Su Bong An<sup>1</sup>, Jung Woo Lee<sup>2</sup>,  
Sangsun Yang<sup>1</sup>, and Jae Won Jeong<sup>1,\*</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Pusan National University, <sup>3</sup>Sungkyunkwan University
- 15:00 APM-O3 Effect of Acid Treatment to Improve Flowability/Spreadability of 3D printed Ni-based Alloy powder**  
Jaehyoung Lim<sup>1</sup>, Gnanaprakasam Janani<sup>1</sup>, Jungho Choe<sup>3</sup>, Mi-Kyung Han<sup>2</sup>,  
Joon Young Kim<sup>1</sup>, Dae Jun Moon<sup>1</sup>, Hoonsung Cho<sup>2</sup>, Tae-Hoon Kim<sup>2\*</sup>,  
Sangsun Yang<sup>3\*</sup>, and Uk Sim<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Energy Technology <sup>2</sup>Chonnam National University, <sup>3</sup>Korea Institute of Materials Science
- 15:15 APM-O4 Mechanical characterization of Al/SiC metal matrix composite sheet developed by powder rolling under different milling conditions**  
K. C. Nayak<sup>1</sup>, J. Y. Han<sup>1</sup>, C. H. Jung<sup>1</sup>, M. R. Joo<sup>2</sup>, K. B. Lee<sup>1\*</sup>, D. H. Bae<sup>2</sup>,  
and H. J. Choi<sup>1\*</sup>  
<sup>1</sup>Kookmin University, <sup>2</sup>Yonsei University

## Oral Session

Monday, November 14

### ▶ Advanced Powder Metallurgy (APM) II

Chair: Jongmin Byun (SEOULTECH)

- 15:50 APM-I1** **Direct Deposition of Graphene Oxide(GO) and reduced Graphene Oxide(rGO) for Biological Applications**  
Hoonsung Cho<sup>1</sup>  
Chonnam National University
- 16:10 APM-I2** **High Performance Alloy Powders by Plasma-Gas Hybrid Atomization (PGHA) and Sintered Properties**  
Tae-Shik Yoon<sup>1\*</sup>, Kwang-Chul Jung<sup>1</sup>, Joong-Gyeong Lim<sup>1</sup>, Kee-Ahn Lee<sup>2</sup>,  
and Hwi-Jun Kim<sup>3</sup>  
<sup>1</sup>Daeshin Co, Ltd., <sup>2</sup>Inha University, <sup>3</sup>Korea Institute of Industrial Technology
- 16:30 APM-I3** **High Pressure Heat Treatment of Additive Manufactured Components**  
Mathias Englund<sup>1</sup>  
Quintus Technologies AB

### Room C (Stone Hall)

### ▶ Computer-aided Materials Engineering (CME) I

Chair: Teruyasu Mizoguchi (University of Tokyo)

- 14:00 CME-K1** **Machine learning approach for interface and surface**  
Teruyasu Mizoguchi  
The University of Tokyo
- 14:25 CME-O1** **Additive manufacturing of manifold and simulation of release agent injection for hot forging**  
Hak-Sung Lee<sup>1\*</sup>, Ye-rim Kim<sup>1,2</sup>, Eun-Ah Kim<sup>2</sup> and Hyorim Kim<sup>3</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Pusan National University, <sup>3</sup>Pukyong National University
- 14:45 CME-O2** **A Comparative Study of the Accuracy of Machine Learning Models for Predicting Tempered Martensite Hardness According to Model Complexity**  
Junhyub Jeon<sup>1</sup>, DongEung Kim<sup>2</sup>, Jun-Ho Hong<sup>2</sup>, Hwi-Jun Kim<sup>2</sup>, and Seok-Jae Lee<sup>1\*</sup>  
<sup>1</sup>Jeonbuk National University, <sup>2</sup>Korea Institute of Industrial Technology
- 15:05 CME-I1** **Metallurgical Design of High Strength Steels to Resist Hydrogen Embrittlement**  
Lawrence Cho<sup>1</sup>, Yuran Kong, Pawan Kathayat, John G. Speer, and Kip O. Findley  
Colorado School of Mines



► **Computer-aided Materials Engineering (CME) II**

Chair: Yong Joo Kim (Kookmin University)

- 15:40 CME-03 Thermodynamic Modeling of Ni-Cr-Nb-C System for Analysis of Fracture Behavior of Heat-resistant Casting Alloys**  
DongEung Kim<sup>\*</sup>  
Korea Institute of Industrial Technology
- 16:00 CME-I2 Computational tools and data to advance the design of powder-based materials and processes**  
A. Engström<sup>\*</sup>, A. Markström, and C.-M. Lancelot  
Thermo-Calc Software
- 16:20 CME-O4 Identification of a new phase transformation of C36 → C14 for NbCr<sub>2</sub> alloy: A First Principle calculation study**  
R. N. Hajra, and Jeoung Han Kim<sup>\*</sup>  
Hanbat National University
- 16:40 CME-O5 Molecular dynamics simulations of nickel-titanium shape memory alloys at the nanoscale**  
Won-Seok Ko<sup>\*</sup>  
Inha University
- 17:00 CME-I3 Microstructure selection in bimetallic nanoparticles: a phase-field study**  
Pankaj, Subhradeep Chatterjee, Saswata Bhattacharyya  
Indian Institute of Technology

## Oral Session

Tuesday, November 15

### Room A (Island Ballroom 1&2)

#### ► Plenary Lecture

- 09:30 PL01**     **Development of microstructure and properties in ferrous powder metallurgy compacts through different stages of sintering**  
Herbert Danningger  
Technische Universität Wien, Vienna, Austria
- 10:00 PL02**     **Mechanical Behavior and Constitutive Modeling of Cellular Structured Metal Additive Manufactured Materials**  
Hyoung Seop Kim  
POSTECH, Republic of Korea

#### ► Additive Manufacturing and Printing Technology (AMT) I

Chair:

- 11:00 AMT-I1**     **Metal AM of Hard and Wear-Resistant Materials**  
Pär Arumskog<sup>\*</sup>, and Ulrik Beste  
VBN Components AB
- 11:20 AMT-I2**     **Magnetic 3D printing of microstructured materials with tunable and enhanced properties**  
Hortense Le Ferrand<sup>\*</sup>  
Nanyang Technological University
- 11:40 AMT-I3**     **In-situ acoustic monitoring of direct energy deposition process using machine learning**  
Seung Ki Moon<sup>\*</sup>  
Nanyang Technological University



## ► Additive Manufacturing and Printing Technology (AMT) II

Chair:

- 13:30 **AMT-I4** **High-temperature mechanical response of an additively manufactured hybrid alloy by means of laser powder bed fusion**  
Clodualdo Aranas Jr.<sup>\*</sup>, Kudakwashe Nyamuchiwa, Jubert Pasco and Kanwal Chadha  
University of New Brunswick
- 13:50 **AMT-O1** **Design of multimodal powder feedstock for powder-based net-shape technologies**  
Joon Phil Choi<sup>1\*</sup>, Taeho Ha<sup>1</sup>, Ji-Hun Yu<sup>2</sup>, and Jai-Sung Lee<sup>3</sup>  
<sup>1</sup>Korea Institute of Machinery & Materials, <sup>2</sup>Korea Institute of Materials Science, <sup>3</sup>Hanyang University
- 14:05 **AMT-O2** **Cryogenic tensile behavior of carbon-doped CoCrFeMnNi high-entropy alloys additively manufactured by selective laser melting**  
Haem Park<sup>1</sup>, Jungho Choe<sup>1</sup>, Kyung Tae Kim<sup>1</sup>, Ji-Hun Yu<sup>1</sup>, Hyokyung Sung<sup>2</sup>, Jeong Min Park<sup>1,\*</sup>, Jung Gi Kim<sup>2,\*</sup> and Hyoung Seop Kim<sup>3</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Gyeongsang National University, <sup>3</sup>Pohang University of Science and Technology
- 14:20 **AMT-O3** **Direct energy deposition produced Fe-Mn-Al-C lightweight steel**  
Kwang Kyu Ko<sup>1,2</sup>, Eun Seong Kim<sup>3</sup>, Cha hee Jung<sup>4</sup>, Hyo Ju Bae<sup>1,2</sup>, Eun Hye Park<sup>1,2</sup>, Jung Gi Kim<sup>1,2</sup>, Hyunjoo Choi<sup>4</sup>, Hyoung Seop Kim<sup>3,5</sup>, and Jae Bok Seol<sup>1,2,\*</sup>  
<sup>1,2</sup>Gyeongsang National University, <sup>3,5</sup>Pohang University of Science and Technology, <sup>4</sup>Kookmin University
- 14:35 **AMT-O4** **In-situ Dispersoid Synthesis of Oxide Dispersion-Strengthened CoCrNi Medium-Entropy Alloy via Direct Energy Deposition**  
SeungHyeok Chung<sup>1</sup>, Taegy Lee<sup>2</sup>, Wonjong Jeong<sup>1</sup> and Ho Jin Ryu<sup>1,2</sup>  
<sup>1,2</sup>Korea Advanced Institute of Science and Technology
- 14:50 **AMT-O5** **Microstructure Investigation of Stellite 6 Oxide Dispersion Strengthened (Y<sub>2</sub>O<sub>3</sub>) Alloy using Directed Energy Deposition**  
Joowon Suh<sup>1,2</sup>, Young-Bum Chun<sup>1</sup>, Heung Nam Han<sup>2</sup>, Sangyeob Lim<sup>1</sup>, and Suk Hoon Kang<sup>1\*</sup>  
<sup>1</sup>Korea Atomic Energy Research Institute, <sup>2</sup>Seoul National University



## Oral Session

Tuesday, November 15

### ► Additive Manufacturing and Printing Technology (AMT) III

Chair:

- 15:25 AMT-I5** **Creating “Plug and Play” Approach to Metal Additive Manufacturing**  
Swee Leong SING  
National University of Singapore
- 15:45 AMT-O6** **Digital light processing 3D printing of Ti-6Al-4V**  
Chang Woo Gal<sup>1</sup>, Jeehwan Kim<sup>2</sup>, Yeong-Jin Choi<sup>1</sup>, Honghyun Park<sup>1</sup>, Aram Sung<sup>1</sup>,  
and Hui-suk Yun<sup>1,3\*</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Pusan National University, <sup>3</sup>Korea University  
of Science and Technology
- 16:00 AMT-O7** **Additively Manufacturing of Particle Reinforced Metal Matrix Composites and  
Fabrication of Their Feedstock Composite Powders**  
Taegy Lee<sup>1</sup>, Wonjong Jeong<sup>2</sup>, SeungHyeok Chung<sup>2</sup>, and Ho Jin Ryu<sup>1,2\*</sup>  
<sup>1,2</sup> Korea Advanced Institute of Science and Technology
- 16:15 AMT-O8** **Additively Manufactured SA508 Gr.3 for Nuclear Reactor Applications**  
Wonjong Jeong<sup>1</sup>, Young-Bum Chun<sup>2</sup>, Suk Hoon Kang<sup>2</sup>, Chang Kyu Rhee<sup>2</sup>, Taegy Lee<sup>3</sup>,  
Hongmul Kim<sup>4</sup>, Seongjin Yoo<sup>4</sup>, Chang Hyoung Yoo<sup>4</sup>, and Ho Jin Ryu<sup>1,3,\*</sup>  
<sup>1,3</sup>Korea Advanced Institute of Science and Technology, <sup>2</sup>Korea Atomic Energy  
Research Institute, <sup>4</sup>HANA AMT

### Room B (Island Ballroom 3)

### ► Rare Metals and Recycling (RMR) I

Chair:

- 10:40 RMR-K1** **Hydrogen Activity, Electrocatalysis and Corrosion Behavior of Transition Metal-  
Based High Entropy Alloys**  
Jürgen Eckert<sup>1,2,\*</sup>  
<sup>1</sup>Austrian Academy of Sciences, <sup>2</sup>Montanuniversität Leoben
- 11:05 RMR-K2** **Designing tool steels for laser powder bed fusion**  
J. Hufenbach<sup>1\*</sup>, U. Kühn<sup>2</sup>, and K. Kosiba<sup>3</sup>  
<sup>1,2,3</sup>Institute for Complex Materials, Leibniz Institute for Solid State and Materials  
Research Dresden
- 11:30 RMR-K3** **Extraction of metals from techno-made waste by a concentrated stream of solar  
radiation with preliminary ultrasonic treatment**  
O. R. Parpiev, M. S. Payzullakhanov\*, R. Akbarov  
Institute Materials Science of Uzbekistan Academy of Science

**► Rare Metals and Recycling (RMR) II**
**Chair:**

- 13:30 RMR-I1 Structural studies of calcium and strontium doped lanthanum manganites**  
 Shavkat Mamatkulov<sup>1</sup>, Sukhrob Ibodullaev<sup>1</sup>, Maria Pecherskaya<sup>1</sup>, Khakim Butanov<sup>1</sup>,  
 Olim Ruzimuradov<sup>1,2</sup>, and Odilkhuja Parpiev<sup>1</sup>  
<sup>1</sup>Institute of Material Sciences Uzbekistan Academy of Sciences, <sup>2</sup>Turin Polytechnic  
 University in Tashkent
- 13:50 RMR-I2 Development of Ni-based Medium Entropy Alloys Using THERMOCALC Software**  
 Elyorjon Jumaev\*, Amir Abidov, Farkhad Maksumov, and Ulugbek Ruziev  
 Almalyk Mining and Metallurgical Combine Joint Stock Company
- 14:10 RMR-I3 Highly selective adsorbents for Lithium extraction based on Li-Mn spinel**  
 Olim Ruzimuradov<sup>1,2</sup>, Andrei Ivanets<sup>3</sup>, Shavkat Mamatkulov<sup>2</sup>, Odilkhuja Parpiev<sup>2</sup>  
<sup>1</sup>Turin Polytechnic University in Tashkent, <sup>2</sup>Institute of Material Sciences  
 Uzbekistan Academy of Sciences, <sup>3</sup>Institute of General and Inorganic Chemistry  
 of National Academy of Sciences of Belarus
- 14:30 RMR-I4 Industrial scale fabrication and characterization of ammonium octamolybdate for fire and smoke retardant purposes**  
 A. Abidov\*, E. Jumaev, G. Parmanov, U. Ruziev, G. Donskoy and F. Shonazarov  
 Almalyk Mining and Metallurgical Combine Joint Stock Company
- 14:50 RMR-I5 A machine learning model for data-driven material synthesis via metal additive manufacturing**  
 K. Kosiba<sup>1\*</sup>, D. Chernyavsky<sup>2</sup>, J. Han<sup>3</sup>, H. J. Kim<sup>4</sup>, J. van den Brink<sup>5</sup>, and D.  
 Y. Kononenko<sup>6</sup>  
<sup>1,2,5,6</sup>Leibniz Institute for Solid State and Materials Research Dresden, <sup>3,4</sup>Korea  
 Institute of Industrial Technology

**► Rare Metals and Recycling (RMR) III**
**Chair:**

- 15:30 RMR-I6 Alloy Design, Powder Feedstock Atomization and Laser Powder Bed Fusion Process Optimization by Experiments and Machine Learning**  
 Y. H. Sohn, T. Huynh, K. Graydon, N. Ayers, and J. Woo  
 University of Central Florida

## Oral Session

Tuesday, November 15

- 15:50 RMR-17** **Organizational structure and soft magnetic properties of rare earth modified iron-based nanocrystalline materials**  
Yongxiu Li<sup>1</sup>, Zhenghou Zhu<sup>2\*</sup>, and Rongyu Liu<sup>2</sup>  
<sup>1,2</sup>Nanchang University
- 16:10 RMR-18** **Recycling of Nd-Fe-B sintered magnet scraps: technique, production, and LCA evaluation**  
M. Yue<sup>\*</sup>, Q. M. Lu, Q. Wu, and W. Q. Liu  
Beijing University of Technology
- 16:30 RMR-19** **Recovery of Boron from Desalination Brine through Solvent Extraction (TMPD/ 2-ethylhexanol with Kerosene) and Ionic-Liquid Extraction (ALiCy/Kerosene) Methods**  
Cheng-Han Lee, and Wei-Sheng Chen<sup>\*</sup>  
National Cheng Kung University

### Room C (Stone Hall)

#### ► Integrated Computer-aided Process Engineering (IACPE) I

Chair: Hyunjoo Choi (Kookmin University)

- 10:40 ICAPE-01** **Combined Approach of Integrated Computer-Aided Process Engineering (ICAPE) and Machine Learning for New Materials/Processes Design: focused on Microstructure Prediction**  
Pil-Ryung Cha<sup>\*</sup>  
Kookmin University
- 11:00 ICAPE-02** **Metaheuristic optimization of powder size distribution in powder forming process using multi-particle finite element method coupled with artificial neural network**  
Parviz Kahhal<sup>1,2</sup>, Jaebong Jung<sup>1</sup>, Majid Mohammad Hosseinzadeh<sup>1</sup>, Hwi-Jun Kim<sup>3</sup>, Hyunjoo Choi<sup>4</sup>, Pil-Ryung Cha<sup>4</sup>, and Ji Hoon Kim<sup>1,\*</sup>  
<sup>1</sup>Pusan National University, <sup>2</sup>Ayatollah Boroujerdi University, <sup>3</sup>Korea Institute of Industrial Technology, <sup>4</sup>Kookmin University
- 11:20 ICAPE-03** **Computational analysis of slot coating flows of shear-thinning fluids**  
Jaewook Nam  
Seoul National University
- 11:40 ICAPE-04** **Particle Dynamics in Coating and Drying Processes of Particulate Suspensions**  
Byoungjin Chun, Jin Seok Park, Jin Seong Yun, and Hyun Wook Jung<sup>\*</sup>  
Korea University



► **Integrated Computer-aided Process Engineering (IACPE) II**

Chair: Yong Joo Kim (Kookmin University)

- 13:30 ICAPE-05 Phase-field Modeling of Thin Film Microstructure and its Experimental Validation**  
Ahmad Nadeem<sup>1</sup>, Hwanwook Lee<sup>1</sup>, Sungjae Cho<sup>2</sup>, Kyung Song<sup>3</sup>, Yongwoo Kwon<sup>1\*</sup>  
<sup>1</sup>Hongik University, <sup>2</sup>Gachon University, <sup>3</sup>Korea Institute of Materials Science
- 13:50 ICAPE-06 Effect of excess elastic energy in interfacial energy depending on the interpolation schemes**  
Kunok Chang<sup>\*</sup>  
Kyung Hee University
- 14:10 ICAPE-07 Development of Polycrystalline Germanium Thin Film Aided by Integrated Computer-Aided Process Engineering (ICAPE)**  
Donghwan Ahn<sup>\*</sup>  
Kookmin University

► **Advanced Materials Processing (AMP) I**

Chair: Kee-Ahn Lee (Inha University)

- 15:00 AMP-K1 Liquid Metal Dealloying for Functional/Structural Materials**  
Ruirui Song<sup>1\*</sup>, Yeombom Jeong<sup>1</sup>, and Hidemi Kato<sup>2\*</sup>  
<sup>1,2</sup>Tohoku University
- 15:25 AMP-I1 Surgical Navigation of Gastric Cancer Using Image-Guided Drug Delivery of Nanotheranostics**  
Hak Soo Choi<sup>1,2\*</sup>  
<sup>1</sup>Harvard Medical School, <sup>2</sup>Massachusetts General Hospital
- 15:45 AMP-I2 Enhancing performance of selective laser melted high-entropy alloys**  
Zhiming Li<sup>1,2\*</sup>, Ruidi Li<sup>2</sup>, Zhenghong Fu<sup>1</sup>, and Dingshun Yan<sup>1</sup>  
<sup>1,2</sup>Central South University
- 16:05 AMP-O1 High temperature deformation behavior and dynamic recrystallization in Mo containing FeMnCoCrC high entropy alloys**  
Marzieh Ebrahimian, Mohsen Saboktakin Rizi, and Jeoung Han Kim<sup>\*</sup>  
Hanbat National University

## Oral Session

Tuesday, November 15

- 16:20 AMP-O2** **In-situ surface analysis of the effect of Al coating on the wettability of advanced high-strength steels**  
Srinivasulu Grandhi, and Min-Suk Oh\*  
Jeonbuk National University
- 16:35 AMP-O3** **The effects of powder size and sintering temperature on microstructure and properties of MA6000 Alloy produced by Spark Plasma Sintering**  
Dinh Van Cong<sup>1</sup>, Dong-Wan Lee<sup>1</sup>, Su-Gwan Lee<sup>1</sup>, Jin-Woo Kim<sup>1</sup>, Jin-Chun Kim<sup>1,\*</sup>, Hwi-Jun Kim<sup>2</sup>, Joong-Gyeong Lim<sup>3</sup>, and Tae-Sik Yoon<sup>3</sup>  
<sup>1</sup>University of Ulsan, <sup>2</sup>Korea Institute of Industrial Technology, <sup>3</sup>DaiShinKangup Co., Ltd

### Room D (Wind Hall)

#### ▶ Energy and Environmental Materials (EEM) I

Chair:

- 10:40 EEM-K1** **Nanomaterials Enabled Electronic Nano System**  
Nosang Vincent Myung\*  
University of Notre Dame
- 11:05 EEM-I1** **Heat transfer in low dimensional materials characterized by micro/nanoscale thermometry**  
Jaeyoung Jeong<sup>1,2</sup>, and Tae-Youl Choi<sup>2\*</sup>  
<sup>1</sup>Intel Corporation, <sup>2</sup>University of North Texas
- 11:25 EEM-I2** **Biomass-derived Porous Carbonaceous Materials for Groundwater Remediation**  
Jaeyun Moon<sup>1\*</sup>, Soroosh Mortazavian<sup>2</sup>, Suraj Pochampally<sup>1</sup>, Padmanabhan Krishnaswamy<sup>3</sup>, and Erica Marti<sup>3</sup>  
<sup>1,3</sup>University of Nevada, <sup>2</sup>University of Toronto

#### ▶ Energy and Environmental Materials (EEM) II

Chair:

- 13:30 EEM-I3** **Atomic layer deposition for activity and stability of oxygen electrocatalysis**  
Haoyu Li, Ziqi Liu, Simranjit Grewal, Angela Macedo Andrade, and Min Hwan Lee\*  
University of California

- 13:50 EEM-I4 Nanospace Engineering<sup>†</sup> by the Fabrication of Nano Metal-Organic Framework-derived Inorganic Hybrid Nanosystems**  
Hyojong Yoo<sup>\*</sup>  
Hanyang University
- 14:10 EEM-O1 A study on the barrier-type AAO thin film with nanoscale thickness for tunneling insulator**  
Jong-Soo Byeon<sup>1</sup>, Jae Ho Lee<sup>2</sup>, Ji Young Park<sup>3</sup> and Yong-Ho Choa<sup>\*</sup>  
<sup>1,2,3</sup>Hanyang University
- 14:25 EEM-O2 Ultra-sensitive methanol gas sensor with ZnO quantum dot at room temperature**  
Ji Young Park, and Yong-Ho Choa<sup>\*</sup>  
Hanyang University
- 14:40 EEM-O3 Development of a Water Circulation System for Cellulose Sponge-Based Hydrovotatic Power Generator and Green Hydrogen Using the Generator**  
Seung-Hwan Lee<sup>1,2</sup>, Yongbum Kwon<sup>1</sup>, Sungsoon Kim<sup>3</sup>, Jeungjai Yun<sup>1</sup>, Bum Sung Kim<sup>4</sup>, Yong-Ho Choa<sup>2</sup>, Jong Hyeok Park<sup>3</sup>, and Da-Woon Jeong<sup>1\*</sup>  
<sup>1,4</sup>Korea Institute of Industrial Technology, <sup>2</sup>Hanyang University, <sup>3</sup>Yonsei University
- 14:55 EEM-O4 Surface plasmon-driven highly efficient WO<sub>3</sub>-based hybrid heterojunction photocatalysts**  
Chadraseskhar Loka, Gyurim Hong, and Kee-Sun Lee<sup>\*</sup>  
Kongju National University

### ► Energy and Environmental Materials (EEM) III

Chair:

- 15:30 EEM-O5 Joining thermoelectric material with the metallic electrode**  
K. Kaszyca<sup>1,2\*</sup>, B. Bucholc<sup>1</sup>, M. Chmielewski<sup>1</sup>, K. Kowiorski<sup>1</sup>, K. Krzyżak<sup>1</sup>, and R. Zybala<sup>1,3</sup>  
<sup>1</sup>Institute of Microelectronics and Photonics, <sup>2</sup>AGH University of Science and Technology, <sup>3</sup>Warsaw University of Technology
- 15:45 EEM-O6 Introduction to waste energy harvesting using thermoelectric phenomenon- The COTEG project**  
Rafał Zybala<sup>1,2</sup>, Bartosz Bucholc<sup>1</sup>, Marcin Chmielewski<sup>1</sup>, Krystian Kowiorski<sup>1</sup>, Konrad Krzyżak<sup>1</sup>, Adrian Chlanda<sup>1</sup>, and Kamil Kaszyca<sup>1,3</sup>  
<sup>1</sup>Institute of Microelectronics and Photonics, <sup>2</sup>Warsaw University of Technology, <sup>3</sup>AGH University of Science and Technology
- 16:00 EEM-O7 The influence of the consolidation method on thermoelectric properties of selenium-doped bismuth telluride obtained by the self-propagating high-temperature synthesis**  
B. Bucholc<sup>1\*</sup>, K. Kaszyca<sup>1,2</sup>, K. Mars<sup>3</sup>, M. Chmielewski<sup>1</sup>, K. Kowiorski<sup>1</sup>, A. Strojny-Nędza<sup>1</sup>, K. Krzyżak<sup>1</sup>, and R. Zybala<sup>1</sup>  
<sup>1</sup>Institute of Microelectronics and Photonics, <sup>2</sup>AGH University of Science and Technology, <sup>3</sup>AGH University of Science and Technology

## Oral Session

Wednesday, November 16

### Room A (Island Ballroom 1&2)

#### ► Plenary Lecture

- 10:00 PL03 Strategic Advancements on Environmental Barrier Coatings for SiC<sub>f</sub>/SiC Composite**  
Jingyang Wang  
Chinese Academy of Sciences, China

#### ► Advanced Materials Processing (AMP) II

**Chair:** Hidemi Kato (Tohoku University)  
Jongmin Byun (SEOULTECH)

- 11:00 AMP-K2 Study of In-situ Resource Utilization with Ionic Liquids Harvested Iron and Bosch Process Carbon for Martian Surface Manufacturing**  
B. C. Stewart<sup>1,2</sup>, H. R. Doude<sup>1</sup>, S. Mujahid<sup>1</sup>, M. B. Abney<sup>3</sup>, J. E. Edmunson<sup>4</sup>,  
E. T. Fox<sup>4</sup>, P. E. Hintze<sup>4</sup>, and H. Rhee<sup>1,2,\*</sup>  
<sup>1,2</sup>Mississippi State University, <sup>3,4</sup>National Aeronautics and Space Administration
- 11:25 AMP-I3 An innovative graphene-copper composite conductor—the effect of graphene continuity**  
Wonmo Kang\*, Hamzeh Kashani, and Chunghwan Kim  
Arizona State University
- 11:45 AMP-O4 Evaluation of Classification Possibility of Coke Breeze by Drag Force**  
Ji-A Lee\*, Bong-Min Jin, and Jeong-Whan Han  
Inha University

**▶ Advanced Materials Processing (AMP) III**

**Chair:** Du Hejun (Nanyang Tech University)  
Jeoung Han Kim (Hanbat National University)

- 13:30 AMP-K3 Development of biomedical Ti-Zr based alloys – Phase stability, microstructure and mechanical properties –**  
Equo Kobayashi<sup>\*</sup>  
Tokyo Institute of Technology
- 13:55 AMP-K4 Blue Luminescence Ceramics by Sea Food Shell**  
Junichi Matsushita<sup>\*</sup>  
Tokai University
- 14:20 AMP-O5 Optimization of GDL properties by 3D Modeling and Simulation and its Fabrication via Tape Casting**  
Javid Hussain<sup>1,2</sup>, DaeKyeom kim<sup>3</sup>, Sangmin Park<sup>1,2</sup>, Myunksuk Song<sup>3</sup>,  
and Taek Soo Kim<sup>1,2\*</sup>  
<sup>1,3</sup>Korea Institute of Industrial Technology, <sup>2</sup>Korea University of Science and Technology
- 14:35 AMP-O6 Development magnetic-flexible micro array with field induced injection molding**  
Jin Wook Park<sup>1</sup>, Jong Hyun Kim<sup>2</sup>, Kwang Seok Lee<sup>1</sup>, Sang Min Park<sup>3</sup>  
and Da Seul Shin<sup>1\*</sup>  
<sup>1</sup>Korea Insititute of Materials Science, <sup>2</sup>Pohang University of Science and Technology, <sup>3</sup>Pusan National University
- 14:50 AMP-O7 Microstructure and wear properties of newly Fe metamorphic alloy manufactured by high velocity oxygen fuel thermal spray process**  
Yu-Jin Hwang<sup>1</sup>, Yong-Hoon Cho<sup>1</sup>, Gi-Su Ham<sup>2</sup>, Choongnyun Paul Kim<sup>2</sup>,  
and Kee-Ahn Lee<sup>1\*</sup>  
<sup>1</sup>Inha University, <sup>2</sup>KOLON Industries
- 15:05 AMP-O8 Tungsten nanoparticle decorated boron nitride nanosheets/polyethylene nanocomposites for complex radiation shielding**  
Seulgi Kim, Yunhee Ahn, and Dongju Lee<sup>\*</sup>  
Chungbuk National University
- 15:20 AMP-O9 Facile fabrication of Polyvinylidene fluoride (PVDF) – Graphite nanoplate (GNP) composite film for capacitive-based pressure sensor**  
Han Kim, Minseob Lim, Byungkwon Jang, Si-woo Park, Hai Shan Shen,  
and Yong-Ho Choa<sup>\*</sup>  
Hanyang University
- 15:35 AMP-O10 3D structure of nanocomposite for pressure sensors**  
Haishan Shen<sup>\*</sup>, Han Kim, Minseob Lim, Byungkwon Jang and Yong-Ho Choa<sup>\*</sup>  
Hanyang University



## Oral Session

Wednesday, November 16

### ▶ Advanced Materials Processing (AMP) IV

Chair: Jae Bok Seol (Gyeongsang National University)

- 16:00 AMP-I4 Effect of Processing Parameters on the Mechanical Properties of Polyamide 12 Parts Printed by Multi Jet Fusion**  
Hejun Du<sup>1,2,3</sup>, Kaijuan Chen<sup>1</sup>, Zhi Hui Koh<sup>2</sup>, Kun Zhou<sup>1,2,3</sup>, and Jun Zeng<sup>1,4</sup>  
<sup>1,2,3</sup>Nanyang Technological University, 3D Lab, HP Labs, HP Inc
- 16:20 AMP-I5 Synthesis of UHTC powders using wet or dry process**  
S. Lee<sup>1\*</sup>, H. Lee<sup>2</sup>, and Y. Zou<sup>1</sup>  
<sup>1,2</sup>Korea Institute of Materials Science
- 16:40 AMP-O11 Fabrication of Plasma Boron nitride nanotube-Ultra High Temperature Ceramic (ZrB<sub>2</sub>) matrix composite and its properties**  
Minhyeok Lee<sup>1,2</sup>, Sung-Soo Ryu<sup>3</sup>, Hyeondeok Jeong<sup>4</sup>, Unseok Jeong<sup>1</sup>, Jong-Il Kim<sup>3</sup>, Dageong Lee<sup>3</sup>, Seong Yun Kim<sup>2\*</sup>, and Hunsu Lee<sup>1\*\*</sup>  
<sup>1,4</sup>Korea Institute of Science and Technology, <sup>2</sup>Jeonbuk National University, <sup>3</sup>Korea Institute of Ceramic Engineering and Technology
- 16:55 AMP-O12 Analysis on the change of lattice structure according to residual oxygen in aluminum nitride**  
Keonhee Cho<sup>1,2</sup>, Jaegyem Kim<sup>1</sup>, Heewon Ahn<sup>1</sup>, Junghun Kim<sup>1</sup>  
and Jae-Hwan Pee<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Ceramic Engineering And Technology, <sup>2</sup>Hanyang University
- 17:10 AMP-O13 Preparation of Spherical-like Boron Nitride and Synergistic Effect on Through-plane Thermal Conductivity of PDMS Composites with Hybrid Filler Network Systems**  
Hyung Jin Mun<sup>\*</sup>, Hong-Baek Cho, and Yong-Ho Choa  
Hanyang University
- 17:25 AMP-O14 Surface Analysis of Air Plasma Sprayed Yttrium Oxyfluoride for Erosion Resistance Coating under NF<sub>3</sub> Plasma**  
R. Kreethi<sup>1</sup>, Yu-Jin Hwang<sup>1</sup>, Ho-Young Lee<sup>2</sup>, Jae-Hyuk Park<sup>3</sup>, and Kee-Ahn Lee<sup>1\*</sup>  
<sup>1</sup>Inha University, <sup>2</sup>EST, <sup>3</sup>Sungkyunkwan University



## Room B (Island Ballroom 3)

## ▶ Nanoceramics (NCM) I

Chair: In-Hyuck Song (KIMS)

- 10:40 **NCM-I1** **Additive Manufacturing of ceramics: towards high precision in complex structures**  
Alice Rosa<sup>1,2</sup>, Marco Pelanconi<sup>1,2</sup>, and Alberto Ortona<sup>1</sup>  
<sup>1</sup>University of Applied Sciences(SUPSI), <sup>2</sup>University of Padova
- 11:00 **NCM-I2** **Self-assembled ordered three-phase Au-BaTiO<sub>3</sub>-ZnO vertically aligned nanocomposites achieved by a templating method**  
Shikhar Misra<sup>1\*</sup>, Leigang Li<sup>2</sup>, Di Zhang<sup>2</sup>, Jie Jian<sup>2</sup>, Zhimin Qi<sup>2</sup>, Meng Fan<sup>2</sup>, Hou-Toung Chen<sup>3</sup>, Xinghang Zhang<sup>2</sup>, and Haiyan Wang<sup>2</sup>  
<sup>1</sup>IIT Kanpur, <sup>2</sup>Purdue University, <sup>3</sup>Los Alamos National Laboratory
- 11:20 **NCM-I3** **Depolarized Light Sheet Microscopy for the Concentration Measurement of Amorphous and Crystalline Mesoscopic Species and Nanocrystals**  
Michele Chen<sup>1\*</sup>, Byeongho Ahn<sup>1,2</sup>, and Marco Mazzotti<sup>1</sup>  
<sup>1</sup>Institute of Energy and Process Engineering, <sup>2</sup>Korea Institute of Ceramic Engineering and Technology
- 11:40 **NCM-O1** **Quasi-isotropic High Thermal Conductive Polymer-nanocomposites by Incorporation of BN**  
Hong-Baek Cho<sup>\*</sup>, Jongsik Lee<sup>\*</sup>, Minseob Lim, and Yong-Ho Choa  
Hanyang University

## ▶ Nanoceramics (NCM) II

Chair: Ha-Neul Kim (KIMS)

- 13:30 **NCM-O2** **Enhancement of the thermoelectric performance and mechanical strength of Bi-Sb-Te based alloys through nanocomposite approach**  
Babu Madavali, Jin-Gu Kwon, Eun-Ha Go, Jihyeon Park, Jiwoon Lee, MinJe Kang, Soon-Jik Hong<sup>\*</sup>  
Kongju National University
- 13:45 **NCM-O3** **Effect of BNNT on the Properties of AlN Ceramics for Substrate in Power Modules**  
Jangsoo Kim<sup>1,2</sup>, Dageong Lee<sup>1</sup>, Jong-Il Kim<sup>1</sup>, Byeongho Ahn<sup>1</sup>, Hyeondeok Jeong<sup>3</sup>, and Sung-Soo Ryu<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Ceramic Engineering and Technology, <sup>2</sup>Korea Aerospace University, <sup>3</sup>Korea Institute of Science and Technology

## Oral Session

Wednesday, November 16

**14:00 NCM-I4 Highly Transparent Cerium-Doped Ytria Ceramics for Full-Band UV-Shielding Window Applications**  
Chengrui Liu<sup>1,2</sup>, Juan Jiang<sup>1</sup>, Guohong Zhou<sup>2,3,4</sup>, Tianjin Zhang<sup>1</sup>, Song Hu<sup>2,4</sup>, Lin Gan<sup>1\*</sup>, Xianpeng Qin<sup>2\*</sup>  
<sup>1</sup>Hubei University, <sup>2</sup>Chinese Academy of Sciences, <sup>3</sup>University of Chinese Academy of Sciences, <sup>4</sup>Chinese Academy of Sciences

**14:20 NCM-I5 Fabrication and Properties of Y<sub>2</sub>O<sub>3</sub> Transparent Ceramics via Various Sintering Methods**  
Lin-Lin Zhu<sup>\*</sup>  
Guangdong University of Technology

## ► Nanoceramics (NCM) III

Chair: Hong-Baek Cho (Hanyang University)

**14:50 NCM-O4 Optimization of Ca additive and sintering condition in the transparent MgAl<sub>2</sub>O<sub>4</sub> ceramics**  
Sun-Young Kim<sup>1,2</sup>, Young-Jo Park<sup>1</sup>, Ho-Jin Ma<sup>1</sup>, Jae-Woong Ko<sup>1</sup>, Jae-Wook Lee<sup>1</sup>, Sung-Hwan Bae<sup>2</sup>, and Ha-Neul Kim<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Kyungnam University

**15:05 NCM-O5 Fabrication of transparent polycrystalline Y<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub> via direct solid-state reaction using a hot press**  
Muhammad Tsabit Ayman, and Dang-Hyok Yoon<sup>\*</sup>  
Yeungnam University

**15:20 NCM-O6 Development of Ceramic Membranes for Removal of Environmental Pollutants**  
Hong Joo Lee<sup>\*</sup>, Jang-Hoon Ha, Jongman Lee, and In-Hyuck Song  
Korea Institute of Materials Science

**15:35 NCM-O7 Mullite-bonded Porous SiC-based Ceramics: Control of Electrical Resistivity, Flexural Strength, and Extrusion**  
Muhammad Shoaib Anwar<sup>1,2</sup>, Syed Zaighum Abbas Bukhari<sup>1</sup>, Hong Ju Lee<sup>1</sup>, Jang-Hoon Ha<sup>1</sup>, Jongman Lee<sup>1,2</sup>, and In-Hyuck Song<sup>1,2\*</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>University of Science and Technology

**15:50 NCM-O8 The Effect of Milling Process on Densification of YAG Ceramics**  
Cheng-Cai Zhao, Eun-Bi Kim, Young-Jo Park, Mi-Ju Kim, Ho-Jin Ma, Ha-Neul Kim, Jae-Woong Ko, Jae-Wook Lee<sup>\*</sup>  
Korea Institute of Materials Science

**► Rare Metals and Recycling IV**
**Chair:**

- 16:15 RMR-O1 Qualitative Analysis of Li<sup>+</sup> Ions in Seawater Concentrate Using ATR Method**  
 Yoseb Song<sup>1</sup>, Ali Ammad<sup>2</sup>, Sooyeon Choi<sup>1</sup>, Seunghwan Lee<sup>3</sup>, JeungJai Yun<sup>3</sup>,  
 Mihye Lee<sup>1</sup>, Da Woon Jeong<sup>3</sup>, and Bum Sung Kim<sup>1,2\*</sup>  
<sup>1,3</sup>Korea Institute of Industrial Technology, <sup>2</sup>University of Science and Technology
- 16:30 RMR-O2 Hydrogen Reduction Mechanism and Kinetics of Molybdenum (VI) Oxide using Hygrometry Analysis**  
 Ali Ammad<sup>1,2</sup>, Choi Sooyeon<sup>1,4</sup>, Yoseb Song<sup>1</sup>, Da-Woon Jeong<sup>3</sup>, and Bum Sung Kim<sup>1,2\*</sup>  
<sup>1,3</sup>Korea Institute of Industrial Technology, <sup>2</sup>University of Science and Technology,  
<sup>4</sup>Incheon National University
- 16:45 RMR-O3 Study on the fabrication of a lithium ion solid electrolyte with a perovskite particle structure synthesized by sol-gel method**  
 Jeung-Jai Yun<sup>1,2</sup>, Seung-Hwan Lee<sup>1</sup>, Yongbum Kwon<sup>1</sup>, Bum Sung Kim<sup>1</sup>,  
 Inhee Cho<sup>1</sup>, Rhokyun Kwak<sup>2</sup>, and Da-Woon Jeong<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Hanyang University
- 17:00 RMR-O4 Optimization of electron-beam melting technique for fabrication of high purity homogeneous rare metals**  
 Hyun Chul Kim<sup>1,2</sup>, Jieun Kim<sup>1,2</sup>, JaeHong Shin<sup>1</sup>, Mihye Lee<sup>1</sup>, Soong Ju Oh<sup>2</sup>,  
 Seok-Jun Seo<sup>1</sup>, and Kyoung-Tae Park<sup>1,\*</sup>  
<sup>1</sup>Korean Institute of Industrial Technology, <sup>2</sup>Korea University
- 17:15 RMR-O5 Strategic mechano-chemical process development for selective ITO enrichment and Indium leaching from concentrates**  
 Basudev Swain<sup>1</sup>, Jae Ryang Park<sup>1</sup>, Jong Hyun Park<sup>1</sup>, Chan Gi Lee<sup>1</sup>,  
 and Eun Duck Park<sup>2</sup>  
<sup>1</sup>Institute for Advanced Engineering, <sup>2</sup>Ajou University

## Oral Session

Wednesday, November 16

### Room C (Stone Hall)

#### ► Electric and Magnetic Materials (EMM) I

Chair: Han Eol Lee (Jeonbuk National University)

- 10:40 EMM-K1 Soft Materials and Nanomanufacturing for Wearable Bioelectronics and Human Healthcare**  
Yoon-Hong Yeo\*  
Georgia Institute of Technology
- 11:05 EMM-I1 Structural origins of anomalous magnetic properties in a Ce-substituted sintered magnet**  
Xiandong Xu<sup>1\*</sup>, Guomeng Li<sup>1</sup>, and Jianghua Chen<sup>1,2</sup>  
<sup>1</sup>Hunan University, <sup>2</sup>Hainan University
- 11:25 EMM-I2 Hydrogel Ionic Diodes toward Harvesting Ultralow-Frequency Mechanical Energy**  
Yong Zhang<sup>1\*</sup>, and Chang Kyu Jeong<sup>2</sup>  
<sup>1</sup>Wuhan University of Technology, <sup>2</sup>Jeonbuk National University
- 11:45 EMM-I3 Mechanical energy scavenging using flexible piezoelectric and triboelectric nanogenerators**  
Dong-Myeong Shin\*  
The University of Hong Kong

#### ► Electric and Magnetic Materials (EMM) II

Chair: Geon Tae Hwang (Pukyong National University)

- 13:30 EMM-I4 Synthesis of Hard ferrites for Millimeter-wave Absorption**  
Youn-Kyoung Baek\*, and Jung Goo Lee  
Korea Institute of Materials Science
- 13:50 EMM-I5 Compound semiconductor-based microLEDs for wearable display and biomedical applications**  
Han Eol Lee\*  
Jeonbuk National University
- 14:10 EMM-I6 Optimization Studies on Piezoelectric Nanoparticles and Matrix Polymers**  
Chang Kyu Jeong<sup>1,2\*</sup>  
<sup>1,2</sup>Jeonbuk National University

**14:30 EMM-O1 Solvothermal synthesis of ferrites-based nanocomposite with optimized self-heat generation**  
 Rachida Lamouri, Dongyoon Kim, and Ki Hyeon Kim\*  
 Yeungnam University

**14:45 EMM-O2 Phase formation and magnetic properties of strontium hexaferrite nanoparticles using various alkali salts**  
 Jae Young Choi<sup>1,2</sup>, Youn Kyoung Baek<sup>2</sup>, Jung Goo Lee<sup>2</sup>, Yang Do Kim<sup>1</sup>,  
 and Young Kuk Kim<sup>2</sup>  
<sup>1</sup>Pusan National University, <sup>2</sup>Korea Institute of Materials Science

► **Electric and Magnetic Materials (EMM) III**

**Chair:** Chang Kyu Jeong (Jeonbuk National University)

**15:20 EMM-I7 Magneto-mechano-electric conversion for harvesting and sensing**  
 Geon-Tae Hwang<sup>1</sup>, Woon-Ha Yoon<sup>2</sup>, and Jungho Ryu<sup>3</sup>  
<sup>1</sup>Pukyong National University, <sup>2</sup>Korea Institute of Materials Science, <sup>3</sup>Yeungnam University

**15:40 EMM-I8 Spontaneous Oxidative/Reductive Degradation of Pollutants on Iron Oxide Nanorods/CNF**  
 Yiseul Park<sup>1</sup>, Chuhyung Kim<sup>2</sup>, Soonhyun Kim<sup>3</sup>, and Wonyong Choi<sup>2</sup>  
<sup>1</sup>Pukyong National University, <sup>2</sup>Korea Institute of Energy Technology, <sup>3</sup>Daegu Gyeongbuk Institute of Science and Technology

**16:00 EMM-O3 Crossover from weak anti-localization to weak localization in inkjet-printed  $Ti_3C_2T_x$  MXene thin-film**  
 Mi-Jin Jin<sup>1,2</sup>, Doo-Seung Um<sup>3,4\*</sup>, Osarenkhoe Ogbeide<sup>3</sup>, Chang-Il Kim<sup>5</sup>,  
 Jung-Woo Yoo<sup>6</sup>, and J. W. A. Robinson<sup>1\*</sup>  
<sup>1,3</sup>University of Cambridge, <sup>2</sup>Institute for Basic Science, <sup>4</sup>Sejong University,  
<sup>5</sup>Chung-Ang University, <sup>6</sup>Ulsan National Institute of Science and Technology

**16:15 EMM-O4 Lead-free composite-based flexible piezoelectric energy harvesters for self-powered sensor applications**  
 Dong Yeol Hyeon and Kwi-Il Park\*  
 Kyungpook National University

**16:30 EMM-O5 Rheometric and Mechanical Properties of Multimodal Magnetic Material Magnetorheological Fluids**  
 Seung-Jae Jeong, Mi-Se Chang, Jae-Won Jeong, Sang-Sun Yang,  
 and Young-Tae Kwon\*  
 Korea Institute of Materials Science

## Oral Session

Wednesday, November 16

### Room D (Wind Hall)

#### ► Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF) I

Chair: Sung-Tag Oh (SEOULTECH)

14:00 Registration

14:30 **ESNRF-O1** **Fabrication, Microstructure and Mechanical Properties of In-situ Reinforced CrMnFeCoNi High Entropy Alloy Matrix Composite Manufactured by Laser Powder Bed Fusion**

Kee-Ahn Lee<sup>1\*</sup>, and Young-Kyun Kim<sup>1,2</sup>

<sup>1</sup>Inha University, <sup>2</sup>Korea Institute of Materials Science

14:55 **ESNRF-O2** **Numerical modeling for oxide particles evolution in AISI316L during the additive manufacturing process**

Jung-Wook Cho<sup>1\*</sup>, and Du-Rim Eo<sup>2</sup>

<sup>1</sup>Pohang University of Science and Technology, <sup>2</sup>Korea Institute of Industrial Technology

15:20 **ESNRF-O3** **Development of heterogenous entropic alloys by metal additive manufacturing**

Hansol Son, Chahee Jung, and Hyunjoo Choi<sup>†</sup>

Kookmin University

15:40 **ESNRF-O4** **Synergetic roles of multiscale defects in yield strength improvement of medium-entropy alloy fabricated via laser-powder bed fusion**

Heechan Jung<sup>1</sup>, Jungwan Lee<sup>2,3</sup>, Gang Hee Gu<sup>2,3</sup>, Hyungsoo Lee<sup>4</sup>,

Seong-Moon Seo<sup>4</sup>, Alireza Zargaran<sup>5</sup>, Hyoung Seop Kim<sup>2,5</sup>, and Seok Su Sohn<sup>1,2\*</sup>

<sup>1</sup>Korea University, <sup>2,3,5</sup>Pohang University of Science and Technology, <sup>4</sup>Korea Institute of Materials



## Oral Session

Wednesday, November 16

### ▶ Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF) II

Chair: Sung-Tag Oh (SEOULTECH)

- 16:20 ESNRF-05 Basic Research Laboratory for Refractory Alloys with Ultra-high Heat Resistance Based on Microstructure Control Convergence Technology**  
Byoungchul Hwang<sup>1</sup>, Byung Joon Choi, Young-In Lee, and Jongmin Byun  
Seoul National University of Science and Technology
- 16:40 ESNRF-06 Atomic Layer Deposition for Powder Technology**  
Byung Joon Choi<sup>1</sup>  
Seoul National University of Science and Technology
- 17:00 ESNRF-07 Hydrogen reduction behavior of WO<sub>3</sub>/Y<sub>2</sub>O<sub>3</sub> powder synthesized by ultrasonic spray pyrolysis for fabrication of oxide dispersion strengthened refractory alloys**  
Jongmin Byun<sup>1,2\*</sup>, Jeong Hyun Kim<sup>1</sup>, Won June Choi<sup>3</sup>,  
and Young-In Lee<sup>1,2\*</sup>  
<sup>1,2</sup>Seoul National University of Science and Technology, <sup>3</sup>Hanyang University



## Oral Session

Thursday, November 17

### Room A (Island Ballroom 1&2)

#### ► Plenary Lecture

- 09:30**   **PL04**   **Title**  
Name  
Organization
- 10:00**   **PL05**   **Title**  
Name  
Organization

### Room D (Wind Hall)

#### ► Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF) III

**Chair:** Sung-Tag Oh (SEOULTECH)

- 09:30**   **Registration**
- 10:00**   **ESNRF-08**   **Atomic Scale Control Strategies to Boost Catalytic Activities toward High Performance Miniaturized Fuel Cells**  
Ji-Hu Baek, and Se-Hun Kwon  
Pusan National University
- 10:20**   **ESNRF-09**   **Materials and Designs for Renewable & Clean Energy Society**  
Jung Woo Lee  
Pusan National University
- 10:40**   **ESNRF-010**   **Structure Modulation of Laser-induced Graphene and Its Application**  
Jin Woo An, and Seoung-Ki Lee\*  
Pusan National University



## Oral Session

Thursday, November 17

### ▶ Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF) IV

Chair: Sung-Tag Oh (SEOULTECH)

- 11:15 **ESNRF-I1** **Outstanding Achievements of Aerogel Materials Research Center (AMRC)**  
Hyung-Ho Park\*  
Yonsei University
- 11:40 **ESNRF-O11** **Fabrication of Spherical Silica Aerogels and Composites for Energy Applications**  
Ki Sun Nam, Kapadnis Pratik, and Haejin Hwang\*  
Inha University
- 12:00 **ESNRF-O12** **Understanding Electrode-Intermediate Interaction of a Highly Active and Cyclable FeCoS<sub>y</sub> Aerogel for Oxygen Evolution and Pseudocapacitive Applications**  
Jeong Gil Seo<sup>1\*</sup>, Bezawit Z. Desalegn<sup>1</sup>, and Hyung-Ho Park<sup>2</sup>  
<sup>1</sup>Hanyang University, <sup>2</sup>Yonsei University

## Poster Session (Online)

### ▶ Additive Manufacturing and Printing Technology (AMT)

- AMT-P01**     **Time-constrained LPBF process parameter optimization for thin-walled maraging steel specimens**  
Yeo-Ui Song<sup>1\*</sup>, Byeong Uk Song<sup>2</sup>, Joon Phil Choi<sup>1</sup>, Min-Kyo Jung<sup>1</sup> and Pil-Ho Lee<sup>1</sup>  
<sup>1</sup>Korea Institute of Machinery & Materials, <sup>2</sup>Korea Advanced Institute of Science and Technology
- AMT-P02**     **A customized temperature sensor via aerosol jet printing**  
Haining Zhang<sup>1</sup>, Seung Ki Moon<sup>2</sup>, Taeho Ha<sup>3</sup>, and Joon Phil Choi<sup>3\*</sup>  
<sup>1</sup>Suzhou University, <sup>2</sup>Nanyang Technological University <sup>3</sup>Korea Institute of Machinery & Materials
- AMT-P03**     **Effect of output conditions on microstructure and properties of SKD61 laser cladding**  
Hyo-Sang Yoo, and Cheol Woo Kim<sup>\*</sup>  
Korea Institute of Industrial Technology
- AMT-P04**     **Microstructure and Hardness Distribution of Pure Mo coated Austenitic Stainless Steel Fabricated by a Direct Energy Deposition Process**  
Sumin Lee, Jaeyoon Bae, Seunghyun Lee, and Sanghoon Noh<sup>\*</sup>  
Pukyong National University
- AMT-P05**     **A machine learning approach for rapid process parameter optimization in laser powder bed fusion of Fe-Si soft magnetic alloys**  
Byeong Uk Song<sup>1,2</sup>, Yongrae Kim<sup>1</sup>, Min-Kyo Jung<sup>1</sup>, Taeho Ha<sup>1</sup>, Segon Heo<sup>1</sup>, Yeo-Ui Song<sup>1</sup>, Pil-Ho Lee<sup>1</sup>, Changwoo Lee<sup>1</sup>, and Joon Phil Choi<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Machinery & Materials, <sup>2</sup>Advanced Institute of Science and Technology
- AMT-P06**     **The cryogenic tensile properties of in-situ formed carbides reinforced NiCoCr medium entropy alloy fabricated via laser powder bed fusion**  
So-Yeon Park and Kee-Ahn Lee<sup>\*</sup>  
Inha University
- AMT-P07**     **Optimization for additive manufacturing of Fe-based soft magnetic alloy by metal fused deposition modeling**  
Bitna Bae<sup>1</sup>, Kwangsu Choi<sup>1,2</sup>, and Hyo Yun Jung<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Kyungpook National University
- AMT-P08**     **Evaluation and Optimization for Laser Speckle contrast in Optical Lithography System**  
Juyoung Jung<sup>1,2</sup>, Jin-Hwan Hong<sup>3</sup>, and Byoungdeog Choi<sup>4,\*</sup>  
<sup>1</sup>Samsung Co. Ltd., <sup>2,3,4</sup>Sungkyunkwan University

## Poster Session (Online)

- AMT-P09**     **Analysis of Process Variable for Metal-based Feedstock Extrusion Additive Manufacturing with Screw-Type Extruder**  
 JinSu Park, JinMan Jang, and WonSik Lee\*  
 Korea Institute of Industrial Technology
- AMT-P10**     **Microstructure and Mechanical Properties of H13 Tool steel Additively Manufactured by Selective Laser Melting**  
 Yeon Woo Kim<sup>1,2</sup>, Haeum Park<sup>1</sup>, Young Seong Eom<sup>1</sup>, JungHo Choe<sup>1</sup>, Kyung Tae Kim<sup>1</sup>, Ji-hun Yu<sup>1</sup>, Jeong Min Park<sup>1,\*</sup>, Yoon Suk Choi<sup>2,\*</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Pusan National University
- AMT-P11**     **Effect of hot isostatic pressing and solution heat treatment on the microstructure and mechanical properties of Ti-6Al-4V alloy manufactured by selective laser melting**  
 Dohoon Lee<sup>1</sup>, Tae-Yeong So<sup>1</sup>, Ha-Young Yu<sup>1</sup>, Gyunsub Kim<sup>2</sup>, Eushin Moon<sup>2</sup>, and Se-Hyun Ko<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Huneed Technologies
- AMT-P12**     **Densification and Properties of ODS Ni-super alloy powders fabricated by L-Powder bed fusion process**  
 Dong Wan Lee<sup>1</sup>, Jin Woo Kim<sup>1</sup>, Su Gwan Lee<sup>1</sup>, Dhin Van Cong<sup>1</sup>, Jin Chun Kim<sup>1\*</sup>, Hwi Jun Kim<sup>2</sup>, Joong Gyeong Lim<sup>3</sup>, and Tae Sik Yoon<sup>3</sup>  
<sup>1</sup>University of Ulsan <sup>2</sup>Institute of Industrial Technology, <sup>3</sup>DaiShinKangup Co.,Ltd
- AMT-P13**     **Spark Plasma Sintering and Microstructures of Inconel 738 Powder Materials Mixed with Ceramic Powders**  
 Jin-Woo Kim, Dong-Wan Lee, Su-Gwan Lee, Dinh Van Cong, and Jin-Chun Kim\*  
 University of Ulsan
- AMT-P14**     **Taguchi based Evaluation between Mechanical Property and Quantified Intermetallic Phase in Additive Manufactured SUS316L with Boron by Image Processing**  
 Hyeon Jeong Park, Yoon Sun Lee, and Dong Yong Park\*  
 Korea Institute of Industrial Technology
- AMT-P15**     **A study on the microstructure and mechanical properties of Ti-Nb-Zr alloy fabricated via laser powder bed fusion**  
 Dae-Kyeom Kim  
 Korea Institute of Industrial Technology
- AMT-P16**     **A systematic study on the connectivity of additive manufactured finger joints with simulation of distortion**  
 Ye-rim Kim<sup>1,2\*</sup>, Eun-Ah Kim<sup>2</sup>, Hyorim Kim<sup>3</sup>, and Hak-Sung Lee<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Pusan National University, <sup>3</sup>Pukyong National University

## Poster Session (Online)

### ▶ Advanced Materials Processing (AMP)

- AMP-P01**     **Effect of Mechanical Alloying Process on the Microstructure and Mechanical Properties of ODS Ni Alloy for Molten Salt Reactor Components**  
Jaeyoon Bae, Sumin Lee, Juwook Lee, Nahyung Kim, and Sanghoon Noh<sup>\*</sup>  
Pukyong National University
- AMP-P02**     **Microstructural evolution of FCD700 cast iron with different Sn contents during solidification**  
Jae-Gu Choi<sup>1\*</sup>, Dong-Hyuk Kim<sup>1</sup>, Jae-Il Jeong<sup>1</sup>, Seong-Ho Ha<sup>2</sup>, and Sang-Yun Shin<sup>3</sup>  
<sup>1,2</sup>Korea Institute of Industrial Technology, <sup>3</sup>SBB TECH Co., Ltd
- AMP-P03**     **Effect of Cu addition above the solubility limit on microstructure formation of FCD700 cast iron during solidification**  
Sang-Yun Shin<sup>1\*</sup>, Seong-Ho Ha<sup>2</sup>, Dong-Hyuk Kim<sup>3</sup>, Jae-Il Jeong<sup>3</sup>, and Jae-Gu Choi<sup>3</sup>  
<sup>1</sup>Technical Center, SBB TECH Co., Ltd, Gimpo, Korea, <sup>2,3</sup>Korea Institute of Industrial Technology
- AMP-P04**     **Microstructural characterization of FCD700 cast iron solidified at different cooling rates**  
Dong-Hyuk Kim<sup>1\*</sup>, Jae-Gu Choi<sup>1</sup>, Jae-Il Jeong<sup>1</sup>, Seong-Ho Ha<sup>2</sup>, and Sang-Yun Shin<sup>3</sup>  
<sup>1,2</sup>Korea Institute of Industrial Technology, <sup>3</sup>SBB TECH Co., Ltd
- AMP-P05**     **Bonding process of thermoplastic composites using induction welding**  
Bo-Kyung Choi<sup>\*</sup> and Chang-Soo Kang  
Carbon Industry Promotion Agency
- AMP-P06**     **Influence of Mg Additions on the Microstructure, Mechanical Properties, and Electrical Conductivity of Al Alloy**  
Hyo-Sang Yoo, Yong-Ho Kim Byoung-Kwon Lee, Eun-Chan Ko, and Hyeon-Taek Son<sup>\*</sup>  
Korea Institute of Industrial Technology
- AMP-P07**     **Improvement of strength and oxidation resistance at high temperature in AISI 4140 steel by micro-alloying chromium and tungsten for automotive engine applications**  
Hyo-Seong Kim<sup>1,2</sup>, Moonseok Kang<sup>1</sup>, Minha Park<sup>1</sup>, Byung Jun Kim<sup>1</sup>, Yong-sik Ahn<sup>2\*</sup> and Byoungkoo Kim<sup>1\*</sup>  
<sup>1</sup>Korea Institute of industrial Technology <sup>2</sup> Pukyong National University
- AMP-P08**     **Effect of heat treatment temperatures on microstructure and mechanical properties of nickel alloy for large-sized flange compartments**  
Jaeyoon Bae<sup>1</sup>, Juwook Lee<sup>1</sup>, Dogyun Kwon<sup>1</sup>, Youna Hwang<sup>1</sup>, Seunghyun Lee<sup>1</sup>, Daesik Kim<sup>1</sup>, Nahyung Kim<sup>1</sup>, Gang Ho Lee<sup>2</sup>, Byung Jun Kim<sup>2</sup>, and Sanghoon Noh<sup>1,\*</sup>  
<sup>1</sup>Pukyong National University <sup>2</sup> Korea Institute of Industrial Technology

## Poster Session (Online)

- AMP-P09** **Two dimensional metallic phase WS<sub>2</sub> and WSe<sub>2</sub> quantum dots changing optical properties by protonation and oxidation**  
 Jun Yong Yang<sup>1</sup>, Bo-Hyun Kim<sup>1</sup>, Kwang Hyun Park<sup>1</sup>, Chengai Li<sup>1</sup>, Nam Chul Kim<sup>1</sup>, Kwang Yong Jeong<sup>2</sup>, and Sung Ho Song<sup>1\*</sup>  
<sup>1,2</sup>Kongju National University
- AMP-P10** **Transparency change of smart wood by thermochromic liquid crystals**  
 Jae Gyu Ahn<sup>1</sup>, Bo Hyun Kim<sup>1</sup>, Kwang Hyun Park<sup>1</sup>, Chengai Li<sup>1</sup>, Nam Chul Kim<sup>1</sup>, Kwang Young Jeong<sup>2</sup>, Sung Ho Song<sup>1\*</sup>  
<sup>1,2</sup>Kongju National University
- AMP-P11** **MoS<sub>2</sub> Quantum Dots with different size and Utilization in Organic Solar Cells**  
 Beom Jin Ko<sup>1</sup>, Bo-Hyun Kim<sup>1</sup>, Kwang Hyun Park<sup>1</sup>, Chengai Li<sup>1</sup>, Nam Chul Kim<sup>1</sup>, Kwang yong Jeong<sup>2</sup> and Sung Ho Song<sup>1\*</sup>  
<sup>1,2</sup>Kongju National University
- AMP-P12** **Hydrophobic modification through silane surface treatment to improve flowability and spreadability of AlSi10Mg powder for additive manufacturing**  
 Sang Cheol Park<sup>1,2</sup>, In Yeong Kim<sup>1</sup>, Young Il Kim<sup>1</sup>, Dae-Kyeom Kim<sup>3</sup>, Kee-Ahn Lee<sup>2</sup>, and Bin Lee<sup>1,4,\*</sup>  
<sup>1,3</sup>Korea Institute of Industrial Technology, <sup>2</sup>Inha University, <sup>4</sup>University of Science & Technology
- AMP-P13** **Microstructure and Mechanical Properties of Austenitic Fe-15Mn-10Al-5Ni-0.86C Lightweight Steel Manufactured by Laser Powder Bed Fusion Process**  
 Tae-Hoon Kang<sup>1</sup>, Amol Kale<sup>1</sup>, Hansoo Kim<sup>2</sup>, and Kee-Ahn Lee<sup>1\*</sup>  
<sup>1</sup>Inha University, <sup>2</sup>Korea University
- AMP-P14** **Microstructure and corrosion properties of novel Fe-Cr-B based metamorphic alloy coating layer manufactured by HVOF spray process**  
 Yong-Hoon Cho<sup>1</sup>, So-Yeon Park<sup>1</sup>, Gi-Su Ham<sup>1,2</sup>, Choongnyun Paul Kim<sup>2</sup>, and Kee-Ahn Lee<sup>1\*</sup>  
<sup>1</sup>Inha University, <sup>2</sup>KOLON Industries Inc
- AMP-P15** **Phase Transition and Morphology of Molybdenum Oxide Microspheres in Polymer-assisted Synthesis Process**  
 Jonghoon Lee, Seyoung Lee, Jaeseok Roh, Jeongha Lee, and Kun-Jae Lee<sup>\*</sup>  
 Dankook University
- AMP-P16** **Synthesis of High-Purity Alumina from Aluminum Black Dross**  
 Boram Kim<sup>1</sup>, Yubin Kang<sup>2</sup>, and Dae-Guen Kim<sup>2\*</sup>  
<sup>1,2</sup>Institute for Advanced Engineering

## Poster Session (Online)

- AMP-P17**     **Optimization of Atmospheric Plasma Treatment Parameters for Hydrophilic surface functionalization of non-woven fabrics through Design of Experiment**  
Mi Jeong Park<sup>1</sup>, Myeongjun Ji<sup>1</sup>, Hee Yeon Jeon<sup>1</sup>, and Young-In Lee<sup>1,2\*</sup>  
<sup>1</sup>Seoul National University of Science and Technology, <sup>2</sup>The Institute of Powder Technology
- AMP-P18**     **Effect of cooling rate on microstructure and mechanical properties according to heat treatment temperature of Inconel 625**  
Minha Park<sup>1,2</sup>, Gang Ho Lee<sup>1,3</sup>, Moonseok Kang<sup>1</sup>, Hyo-Seong Kim<sup>1,3</sup>, Byoungkoo Kim<sup>1</sup>, Sanghoon Noh<sup>3</sup> and Byung Jun Kim<sup>1,\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Pusan National University, <sup>3</sup>Pukyong National University
- AMP-P19**     **The effects of post weld heat treatment on microstructure and mechanical properties of API X70 pipeline using Submerged Arc Welding**  
Minha Park<sup>1,2</sup>, Gang Ho Lee<sup>1,3</sup>, Gwangjoo Jang<sup>1</sup>, Hyoung Chan Kim<sup>1</sup>, Byoungkoo Kim<sup>1</sup> and Byung Jun Kim<sup>1,\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Pusan National University, <sup>3</sup>Pukyong National University
- AMP-P20**     **Changes of Microstructure and Texture of a Multi-Stack ARB Processed Complex Aluminum Alloy with Annealing**  
Sang-Hyeon Jo and Seong-Hee Lee<sup>\*</sup>  
Mokpo National University
- AMP-P21**     **Effects of hot rolling reduction on microstructural evolution and mechanical properties of 1.25Cr-1Mo-0.5V-0.3C steel for high-speed rail brake discs**  
Hyo-Seong Kim<sup>1,2</sup>, Moonseok Kang<sup>1</sup>, Minha Park<sup>1</sup>, Byung Jun Kim<sup>1</sup>, Yong-shin Kim<sup>3</sup>, Tae Young Lee<sup>3</sup>, Byoungkoo Kim<sup>1\*</sup>, and Yong-sik Ahn<sup>2\*</sup>  
<sup>1</sup>Korea Institute of industrial Technology, <sup>2</sup>Pukyong National University, <sup>3</sup>KATEM
- AMP-P22**     **Engineering of precipitates in 7xxx series aluminum alloys for future mobility applications**  
Suwon Park<sup>1</sup>, Dae Cheol Yang<sup>2</sup>, Min Sang Kim<sup>3</sup>, Heon Kang<sup>1</sup>, Seok Su Sohn<sup>2</sup>, Se Hoon Kim<sup>3</sup>, Jungjoon Kim<sup>1</sup>, Songyun Han<sup>1</sup>, Jiyeon Yeo<sup>1</sup>, and Hyunjoon Choi<sup>1\*</sup>  
<sup>1</sup>Kookmin University, <sup>2</sup>Korea University, <sup>3</sup>Korea Automotive Technology Institute
- AMP-P23**     **Precipitated Silica Particles from Sodium Silicate by Carbonation Method**  
Hoai Han Nguyen<sup>1</sup>, Thi Thu Hien Nguyen<sup>1</sup>, Hyung-Rok Kim<sup>2</sup>, Jong-Kil Kim<sup>2</sup>, and Young-Sang Cho<sup>1\*</sup>  
<sup>1</sup>Tech University of Korea, <sup>2</sup>Bio Nano Korea Co. Ltd

## Poster Session (Online)

- AMP-P24**      **Effect of surface thin metal film on the heat resistance of aluminized steel sheet**  
 Jae-Hyeon Kim, Srinivasulu Grandhi, and Min-Suk Oh\*  
 Jeonbuk National University
- AMP-P25**      **Evaluation of electropolishing characteristics of stainless steel 316L tube surface in contaminated electrolyte**  
 Woo-Chul Jung, Hyunseok Yang and Man-Sik Kong\*  
 Institute for Advanced Engineering
- AMP-P26**      **Electropolishing characteristics of 316L stainless steel tubes with different surface roughness**  
 Hyunseok Yang\*, Woo-Chul Jung, and Man-Sik Kong  
 Institute for Advanced Engineering
- AMP-P27**      **Characterization of high manganese steel powder manufactured by water atomization process**  
 Sungjae Jo<sup>1</sup>, Yeeun Lee<sup>1</sup>, Jingu Kwon<sup>1</sup>, Minwoo Shin<sup>1</sup>, Minje Kang<sup>1</sup>, Jaehong Kim, Sungsoo Park<sup>2</sup>, Raechael Kang<sup>2</sup>, Yongrai Kim<sup>2</sup>, and Soon-Jik Hong<sup>1\*</sup>  
<sup>1</sup>Kongju National University, <sup>2</sup>YS SPECIAL STEEL Co., Ltd.
- AMP-P28**      **Interfacial reaction between spark plasma sintered high-entropy alloys and cast aluminum**  
 Min Sang Kim<sup>1,2</sup>, Hansol Son<sup>3</sup>, Chahee Jung<sup>3</sup>, Juyeon Han<sup>3</sup>, Jung Joon Kim<sup>3</sup>, Young-Do Kim<sup>2</sup>, Hyunjoo Choi<sup>3</sup>, and Se-Hun Kim<sup>1\*</sup>  
<sup>1</sup>Korea Automotive Technology Institute, <sup>2</sup>Hanyang University, <sup>3</sup>Kookmin University
- AMP-P29**      **Development of Palladium Iron-based Inorganic Glucose Sensor towards Non-invasive Monitoring**  
 Do Youn Kim<sup>1</sup>, Chang Hoon Ha<sup>1</sup>, Chae Yeon Hong<sup>2</sup>, and Hyo-Ryoung Lim<sup>3,\*</sup>  
<sup>1,2,3</sup>Pukyong National University
- AMP-P30**      **Influence of Mg additions on the mechanical properties and microstructure of Al-Li-Ce alloys**  
 Byeong-Kwon Lee<sup>1,2</sup>, Yong-Ho Kim<sup>1</sup>, Eun-Chan Ko<sup>1,2</sup>, Hyo-Sang Yoo<sup>1</sup>, Hyeon-Taek Son<sup>1\*</sup>, and Sung-Kil Hong<sup>2</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Chonnam National University
- AMP-P31**      **Effect of Sr addition of Al-Zn-Mg-Mn alloy on microstructure, mechanical properties and thermal conductivity**  
 Eun-Chan Ko<sup>1,2</sup>, Yong-Ho Kim<sup>1</sup>, Hyo-Sang Yoo<sup>1</sup>, Byoung-Kwon Lee<sup>1,2</sup>, Hyeon-Taek Son<sup>1\*</sup> and Kwangmin Lee<sup>2\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Chonnam National University



## Poster Session (Online)

- AMP-P32**     **Microstructural characterizations and properties of Bimetal depending on heat treatment temperature**  
Juree Jung<sup>1</sup>, Jongtae Kim<sup>1</sup>, Jaeyeol Jeon<sup>1</sup>, Hyosang Yoo<sup>1</sup>, Jinkyu Lee<sup>2</sup>, Daegeun Kim<sup>3</sup>, and Junhee Han<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology <sup>2</sup>Kongju National University, <sup>3</sup>Institute for Advanced Engineering
- AMP-P33**     **Effects of the active friction force condition between billet and extrusion container on extrusion characteristics**  
Young-Chul Shin<sup>\*</sup>  
Korea Institute of Industrial Technology
- AMP-P34**     **Formation of Wrinkled MoS<sub>2</sub> Structure via Laser based Selective Photothermal Process**  
Min-Ji Jeon<sup>1</sup>, Seoungwoong Park<sup>2</sup>, Byung Hee Hong<sup>1,\*</sup> and Seoung-Ki Lee<sup>2,\*</sup>  
<sup>1</sup>Pusan National University, <sup>2</sup>Seoul National University
- AMP-P35**     **Enhanced Performance of Sm<sub>2</sub>Fe<sub>17</sub>N<sub>3</sub> Nanomagnet by Self-Combustion: Control of Particle Size with Additive CaO**  
Kangmo Koo, Jimin Lee, Eun Jae Lee, and Yong-Ho Choa<sup>\*</sup>  
Hanyang University
- AMP-P36**     **Manufacturing Process of Hydrogen Combustion Catalyst based on Pt Nanoparticles for Hydrogen Gas Sensing Application**  
Jun Young Kim, Byungkwon Jang, Yong-Ho Choa<sup>\*</sup>  
Hanyang University
- AMP-P37**     **The study on the sintering conditions for manufacturing of copper foam metal**  
Im-Nam Jang<sup>\*</sup>, and Yong-Sik Ahn  
Pukyong National University
- AMP-P38**     **Microstructure and Properties Investigation of WC-Fe alloy composite Fabricated by Spark Plasma Sintering**  
Dinh Van Cong<sup>1</sup>, Dong-Wan Lee<sup>1</sup>, Tae-Sik Yoon<sup>2</sup>, and Jin-Chun Kim<sup>1\*</sup>  
<sup>1</sup>University of Ulsan, Ulsan, <sup>2</sup>DaiShinKangup Co., Ltd
- AMP-P39**     **Contact-Resistance-Free, Millimeter-Scale Gas Sensor Compatible with Surface Mount Process: Towards Wearable Flexible Electronics**  
Hyo-Ryoung Lim<sup>1</sup>, Yomin Choi<sup>2</sup>, Young Gon Yu<sup>3</sup>, Nosang Vincent Myung<sup>4</sup>, and Yong-Ho Choa<sup>5</sup>  
<sup>1,3</sup>Pukyong National University, <sup>2</sup>Korea Testing Laboratory, <sup>4</sup>University of Notre Dame, <sup>5</sup>Hanyang University

## Poster Session (Online)

- AMP-P40**     **Effect of Cu, Mn, and Mg on Mechanical Properties and Thermal Conductivity in Al-Mn Alloys**  
 Nam S. Kim, Kweon H. Choi, Seung Y. Yang, Seong H. Ha, Hyun K. Lim, Shae Kim, and Young O. Yoon<sup>\*</sup>  
 Korea Institute of Industrial Technology
- AMP-P41**     **Microstructure and mechanical property of diffusion bonded Fe-Ni-Mn-Mo/Invar42 bimetal materials**  
 Jin Gyu Lee<sup>1</sup>, Jeong Pyo Lee<sup>1</sup>, Hyeok Jae Choi<sup>1</sup>, Jun Hee Han<sup>2</sup>, Jae Yeol Jeon<sup>3</sup>, Dae Geun Kim<sup>4</sup>, and Jin Kyu Lee<sup>1,\*</sup>  
<sup>1</sup>Kongju National University, Cheonan, <sup>2,3</sup>Korea Institute of Industrial Technology, <sup>4</sup>Institute for Advanced Engineering
- AMP-P42**     **Influence of CVD TiCN/ $\kappa$ -Al<sub>2</sub>O<sub>3</sub> coating applied to dies on the change of extrusion characteristics during the micro-channel tube extrusion**  
 Young-Chul Shin<sup>\*</sup>  
 Korea Institute of Industrial Technology
- AMP-P43**     **Rapid synthesis of nanocarbon hybridmaterials with Pt/Co alloy via solution plasma**  
 JaeWon Lee<sup>1,2</sup>, Yong-Ho Choa<sup>2</sup>, and Sook Young Moon<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Science and Technology (KIST), <sup>2</sup>Hanyang University
- AMP-P44**     **Effect of sulfur on the morphology of nickel nanoparticles prepared by chemical vapor synthesis**  
 Hyeon-Woo Choo<sup>1,2</sup>, Chan Bin Mo<sup>1\*</sup> and Seung-Min Yang<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Hanyang University
- AMP-P45**     **Preparation of metal-ceramic composite powder by thermal decomposition**  
 Hae-Jeong Shin<sup>1,3</sup>, Chan Bin Mo<sup>1\*</sup> and Seung-Min Yang<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Hanyang University, <sup>3</sup>Korea University
- AMP-P46**     **Machine learning assisted composition effective design for developed aluminum alloys**  
 Seungkook Bang<sup>1,2</sup>, Sung-Jae Won<sup>1,2</sup>, Donghee Ryu<sup>1,2</sup>, Sahn Nahm<sup>2</sup>, and Leeseung Kang<sup>1,\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Korea University
- AMP-P47**     **Effect of impurity level on deformation behavior of pure aluminum severely deformed by biaxial alternate forging**  
 Jin-Kyu Lee<sup>1\*</sup>, Seong-Ho Ha<sup>2</sup>, and Young-Chul Shin<sup>3</sup>  
<sup>1</sup>NICE LMS Co., Ltd., <sup>2,3</sup>Korea Institute of Industrial Technology

## Poster Session (Online)

- AMP-P48 Characterization of eutectic solidification in Ca-modified eutectic Al-Si alloys**  
Young-Ok Yoon\*, Seong-Ho Ha, Bong-Hwan Kim, Hyun-Kyu Lim, and Shae K. Kim  
Korea Institute of Industrial Technology
- AMP-P49 TEM investigation on precipitate formation by trace impurities in Al-Mg alloy castings**  
Seong-Ho Ha<sup>1\*</sup>, Young-Ok Yoon<sup>1</sup>, Bong-Hwan Kim<sup>1</sup>, Hyun-Kyu Lim<sup>1</sup>, Shae K. Kim<sup>1</sup>,  
Sung-Hwan Lim<sup>2</sup>, and Young-Chul Shin<sup>3</sup>  
<sup>1,3</sup>Korea Institute of Industrial Technology, <sup>2</sup>Kangwon National University
- AMP-P50 Effect of Be on the mechanical and thermal properties of 6000 series Al Alloys**  
UiJun Go<sup>1</sup>, Taek Won Jung<sup>1</sup>, Dong Hyun Kim<sup>2</sup> and Jeoung Han Kim<sup>1\*</sup>  
<sup>1</sup>Hanbat National University, <sup>2</sup>SAMKEE Corp
- AMP-P51 Mechanical behaviors and microstructure of ODS Ni-Cr-Al based alloys during progressive liquid sintering process**  
YeonJoo Lee<sup>1,2</sup>, DoHun Kwon<sup>1</sup>, EunJi Cha<sup>1</sup>, SungMin Kim<sup>1</sup>, HyunJoo Choi<sup>2</sup>,  
and HwiJun Kim<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Kookmin University
- AMP-P52 Oxidation of TiN with ZrO<sub>2</sub> powder**  
Ye Wang\*, and Jun-ichi Matsushita  
Tokai University
- **Advanced Powder Metallurgy (APM)**
- APM-P01 Mechanical alloying synthesis and spark plasma sintering consolidation of Al-Ti-Si-W multicomponent alloy: Microstructural evolution, densification, and mechanical property**  
Jeong-Han Lee, Bum-soon Park, So-Yeon Choi, Hyun-Kuk Park, and Jae-Cheol Park\*  
Korea Institute of Industrial Technology
- APM-P02 Fabrication and shape memory characteristics of Poros Ti-Zr-Nb-Sn biomaterials**  
Yeon-wook Kim  
Keimyung University
- APM-P03 Synthesis of Tin Oxide Nanopowders by Spark Discharge Method**  
C. K. Rhee<sup>1\*</sup>, A. D. Maksimov<sup>2</sup>, I. V. Beketov<sup>2,3</sup>, A. I. Medvedev<sup>2,3</sup> and A. M. Murzakaev<sup>2,3</sup>  
<sup>1</sup>Korea Atomic Energy Research Institute, <sup>2</sup>Institute of Electrophysics UB of RAS, <sup>3</sup>Ural Federal University
- APM-P04 Development of NdYO<sub>3</sub> powder fabrication as a reaction preventing raw material for the metal fuel casting**  
Sang-Gyu Park\*, Ki-Hwan Kim, and Jun-Hwan Kim  
Korea Atomic Energy Research Institute

## Poster Session (Online)

- APM-P05**     **Investigation of milling time effect on powder morphology and microstructure of Nb alloy by Mechanical Alloying**  
 Sang Min Yoon, Deok Hyun Han, Young Kyun Kim\*  
 Institute for Advanced Engineering
- APM-P06**     **Phase formation and densification behavior of LaYO<sub>3</sub> pellets after sintering process**  
 Seong-Jun Ha<sup>1,2</sup>, Yong-Wook Choe<sup>1,2</sup>, Sang-Gyu Park<sup>2</sup>, Jeong-Hwan Joo<sup>3</sup>,  
 Jeong-Yong Park<sup>4</sup>, Young-Kuk Lee<sup>1</sup>, and Seung-Woo Kuk<sup>3\*</sup>  
<sup>1</sup>Yonsei University, <sup>2,3,4</sup>Korea Atomic Energy Research Institute
- APM-P07**     **Fabrication and Characterization of Reaction-resistant LaYO<sub>3</sub> Material for Melting Crucible of Metal Fuels**  
 Ki-Hwan Kim<sup>1\*</sup>, Yong-Wook Choe<sup>2</sup>, Hoon Song<sup>1</sup>, Sang-Gyu Park<sup>1</sup>, and Jun-Hwan Kim<sup>1</sup>  
<sup>1</sup>Atomic Energy Research Institute, <sup>2</sup>Yonsei University
- APM-P08**     **Study of Friction Surfaces Treated with Nanodiamond-Dispersed Oil**  
 Chang K. Rhee<sup>1\*</sup>, G. E. Selutin<sup>2</sup>, Yu. L. Mihlin<sup>2</sup>, A. P. Puzyr<sup>3</sup>, and A. E. Burov<sup>4</sup>  
<sup>1</sup>Korea Atomic Energy Research Institute, <sup>2,3</sup>Federal Research Center “Krasnoyarsk Science Center SB RAS”, <sup>4</sup>Federal Research Center for Information and Computational Technologies
- APM-P09**     **A basic study on the nickel distribution ratio through equilibrium distribution experiment between Fe-Ni matte and FeO-MgO-SiO<sub>2</sub> slag**  
 Jong-Deok Lim<sup>1</sup>, Jei-Pil Wang<sup>2\*</sup> and Hyun-Jong Kim<sup>1</sup>  
<sup>1,2</sup>Pukyong National University
- APM-P10**     **Fabrication of Metal Gas Filter by Continuous Material Extrusion Process**  
 Yu-jeong Yi<sup>1,2</sup>, Su-Jin Yun<sup>1,2</sup>, Hyun-Ju Kim<sup>1</sup>, Eun-chaee Seo<sup>1</sup>, Min-ji Kim<sup>1</sup>, Man-ho Park<sup>3</sup>,  
 Ju-yong Kim<sup>4</sup>, and Jung-yeul Yun<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Pusan National University, <sup>3</sup>ASFLOW, <sup>4</sup>REPROTECH
- APM-P11**     **Morphology transformation of STS316L powder from spheres to flakes using high-energy ball milling and process control agent**  
 Dong Hoon Lee<sup>1</sup>, Myeongjun Ji<sup>1</sup>, Man-Ho Park<sup>3</sup>, Jung-yeul Yun<sup>4</sup> and Young-In Lee<sup>2\*</sup>  
<sup>1</sup>Seoul National University of Science and Technology, <sup>2</sup>The Institute of Powder Technology, <sup>3</sup>ASFLOW Co. Ltd, <sup>4</sup>Korea Institute of Materials Science
- APM-P12**     **Simultaneous enhancement of strength and ductility of aluminum by incorporation of high-entropy particles**  
 Chahee Jung<sup>1</sup>, Hansol Son<sup>1</sup>, Joohak Kim<sup>1</sup>, Jaewon Jeong<sup>2</sup>, and Hyunjoo Choi<sup>1\*</sup>  
<sup>1</sup>Kookmin University, <sup>2</sup>Korea Institute of Materials Science

## Poster Session (Online)

- APM-P13**     **Sintering of PZT fabricated by Powder Injection Molding**  
Jin Man Jang, and Wonsik Lee\*  
Korea Institute of Industrial Technology
- APM-P14**     **Fabrication of Open Cell Porous Titanium by Powder Injection Molding**  
Jin Man Jang, and Wonsik Lee\*  
Korea Institute of Industrial Technology
- APM-P15**     **Development of Cu-B based Neutron Absorber for Nuclear Spent Fuel Storage Applications**  
Young-Bum Chun<sup>1,\*</sup>, Ji-Hoon Kang<sup>1</sup>, Sunyoung Park<sup>1</sup>, Ho Jin Ryu<sup>2</sup> and Chang-Kyu Rhee<sup>1</sup>  
<sup>1</sup>Korea Atomic Energy Research Institute, <sup>2</sup>KAIST
- APM-P16**     **The gradient microstructure Fe-6Mn alloy with different size powder stacking prepared by powder metallurgy**  
Namhyuk Seo, Junho Lee, Woocheol Shin, Junhyub Jeon, Jungbin Park, Seung Bae Son, Jae-Gil Jung and Seok-Jae Lee\*  
Jeonbuk National University
- APM-P17**     **Sintering behavior of molybdenum-tungsten alloys using ultrafine molybdenum and tungsten powders**  
Suyeon Kim<sup>1</sup>, Taehyun Kwon<sup>2</sup>, Seulgi Kim<sup>2</sup>, and Dongju Lee<sup>1\*</sup>  
<sup>1,2</sup>Chungbuk National University
- APM-P18**     **Bimodal structure design and enhanced mechanical properties of CoCrFeMnNi high entropy alloy by spark plasma sintering**  
Taehyun Kwon<sup>1</sup>, Suyeon Kim<sup>2</sup>, and Dongju Lee<sup>1,2\*</sup>  
<sup>1,2</sup>Chungbuk National University
- APM-P19**     **Effect of Zr addition on the microstructure and mechanical properties of ultrafine-grained Al-Zn-Mg-Cu alloy**  
Junho Lee\*, Namhyuk Seo, Junhyub Jeon, Seok-Jae Lee, Seung Bae Son and Jae-Gil Jung  
Jeonbuk National University
- APM-P20**     **Effect of interfacial properties on the strengthening behavior of B<sub>4</sub>C/Al composites as a radiation shielding material**  
Juyeon Han, Hansol Son, Yoonjung Won, Kisub Cho, and Hyunjoon Choi\*  
Kookmin University
- APM-P21**     **Microstructure and Micro Hardness of Spark plasma sintered Ti-Al-Dy alloy at high temperature**  
Hyunseung Lee<sup>1</sup>, Seungho Han<sup>1</sup>, Hoseong Rhee<sup>2</sup>, Sangsoo Lee<sup>2</sup>, and Si Young Chang<sup>1\*</sup>  
<sup>1,2</sup>Korea Aerospace University

## Poster Session (Online)

- APM-P22** **Powder metallurgy processing of TiC reinforced NbTaVTi refractory high entropy alloy**  
Hyeok Jae Choi, Jin Gyu Lee, Jeong Pyo Lee, and Jin Kyu Lee\*  
Kongju National University
- APM-P23** **A Study on Mechanical Alloying according to PCA Content using a High-energy Milling of Nb Powder**  
DeokHyun Han, SangMin Yoon, and YoungKyun Kim\*  
Institute for Advanced Engineering
- APM-P24** **Effect of Mo addition on the austenite stability and mechanical properties of sintered Fe-5%Mn alloy**  
Woocheol Shin, Junho Lee, Jungbin Park, Seung Bae Son, Jae-Gil Jung, and Seok-Jae Lee\*  
Jeonbuk National University
- APM-P25** **Phase Separation Behavior of AlFeMnTiSi<sub>0.75</sub>Cu<sub>x</sub> High Entropy Alloy Fabricated via Powder Metallurgy**  
Hansung Lee<sup>1</sup>, Ashutosh Sharma<sup>2</sup>, Minsu Kim<sup>1</sup>, and Byungmin Ahn<sup>1,2,\*</sup>  
<sup>1,2</sup>Ajou University
- APM-P26** **Reciprocating Dry Sliding Wear Behavior of Powder Metallurgy Produced AlCu<sub>x</sub>FeMnTiSi<sub>0.75</sub> (x = 0, 0.25, 0.5) High Entropy Alloy**  
Ashutosh Sharma<sup>1</sup>, Hansung Lee<sup>2</sup>, Minsu Kim<sup>2</sup>, and Byungmin Ahn<sup>1,2,\*</sup>  
<sup>1,2</sup> Ajou University
- APM-P27** **Superior Strength and Wear Resistance of AlCrFeNiTi High Entropy Alloy Prepared via Powder Metallurgy Route**  
Cheenepalli Nagarjuna<sup>1,2</sup>, Ashutosh Sharma<sup>1</sup>, Kwan Lee<sup>2</sup>, Sangyeob Lee<sup>3</sup>, and Byungmin Ahn<sup>1,4,\*</sup>  
<sup>1,4</sup>Ajou University, <sup>2</sup>Kyungsung University, <sup>3</sup>Hanbat National University
- APM-P28** **Interaction Characterization between Rare-earth Metal and Reaction-resistant LaYO<sub>3</sub> Materials at Elevated Temperature**  
Seung-Uk Mun<sup>1,2</sup>, Ki-Hwan Kim<sup>1</sup>, Sang-Gyu Park<sup>1</sup>, Jun-Hwan Kim<sup>1</sup>, and Byung-Mook Weon<sup>2,\*</sup>  
<sup>1</sup>Korea Atomic Energy Research Institute, <sup>2</sup>Sungkyunkwan University
- APM-P29** **Preparation of sintering-inhibited copper nanoparticles by coating assisted chemical vapor synthesis**  
Gwang-Hwa Jin<sup>1,2</sup>, Hae-Jung Shin<sup>1,2</sup>, Chan Bin Mo<sup>1\*</sup> and Seung-Min Yang<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Korea University

## Poster Session (Online)

- APM-P30**     **The Viscous Effect on Particle Diameter in Gas atomization Simulator**  
Eunggyun Kim<sup>1,2\*</sup>, Hyeonsik Kim<sup>1</sup>, Seounguk Bae<sup>1</sup>, Jae-Hong Shin<sup>1</sup>, Kee-Ahn Lee<sup>2</sup>,  
and Inhee Cho<sup>1</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Inha University
- APM-P31**     **Effect of interface control parameters on thermal conductivity of diamond/Al composites**  
Eunji Cha, Yeonjoo Lee, Junho Hong, and Hwijun Kim<sup>1</sup>  
Korea Institute of Industrial Technology
- APM-P32**     **Optimization of VIGA process parameters for soft magnetic properties of Fe-Si-Al-P Powders using machine learning**  
Sung-Min Kim<sup>1,2</sup>, Eun-Ji Cha<sup>1</sup>, Do-Hun Kwon<sup>1,2</sup>, Sung-Uk Hong<sup>3</sup>, Kee-Ahn Lee<sup>2</sup>,  
and Hwi-Jun Kim<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Inha University, <sup>3</sup>MetalMate
- **Computer-aided Materials Engineering (CME)**
- CME-P01**     **Fixed point iteration for incremental time integration in the analysis of plastic deformation**  
Seung-Yong Yang<sup>1</sup>, Jeong-Han Kim<sup>2\*</sup>, and Doo-Han Jin<sup>3\*</sup>  
<sup>1</sup>Korea University of Technology and Education, <sup>2</sup>Hanbat National University, <sup>3</sup>TAAD Corporation
- CME-P02**     **Prediction and mechanism explain of austenite-grain growth during reheating of alloy steel using XAI**  
Junhyub Jeon<sup>1</sup>, Namhyuk Seo<sup>1</sup>, Jae-Gil Jung<sup>1</sup>, Seung Bae Son<sup>1</sup>, Hee-Soo Kim<sup>2</sup>,  
and Seok-Jae Lee<sup>1\*</sup>  
<sup>1</sup>Jeonbuk National University, <sup>2</sup>Chosun University
- CME-P03**     **Study of flow equations based on strain rate potential for anisotropic plasticity**  
Doo-Han Jin<sup>1\*</sup> and Seung-Yong Yang<sup>2\*</sup>  
<sup>1</sup>TAAD Corporation, <sup>2</sup> Korea University of Technology and Education
- CME-P04**     **Flow formulation based on strain rate potential for anisotropic plasticity**  
Seung-Yong Yang<sup>1\*</sup> and Doo-Han Jin<sup>2\*</sup>  
<sup>1</sup>Korea University of Technology and Education, <sup>2</sup>TAAD Corporation



## Poster Session (Online)

### ► Energy and Environmental Materials (EEM)

- EEM-P01**     **Study on the behavior of fine particles by the vibration of the medium with polluted air inside the rigid housing**  
Hai-Joong Lee<sup>1</sup>, Tae-Hoon Park<sup>2</sup> and Hyo-Soo Lee<sup>3\*</sup>  
<sup>1,2,3</sup>Korea Institute of Industrial Technology
- EEM-P02**     **Uncertainty Evaluation of TGA data**  
Kweonho Kang<sup>\*</sup>, Byungjoo Yoon, and Changhwa Lee  
Korea Atomic Energy Research Institute
- EEM-P03**     **In-Situ Synthesis of Carbon Encapsulated Silicon Nano Powders as an Anode for Lithium Ion Battery by Pulsed Wire Evaporation Method**  
Dongjin Lee<sup>1,2\*</sup>, Ye Eun Lee<sup>2</sup>, Chang Kyu Rhee<sup>3</sup>, Soon-Jik Hong<sup>2</sup>  
<sup>1</sup>ECM, Eumseong, <sup>2</sup>Kongju National University <sup>3</sup>Korea Atomic Energy Research Institute
- EEM-P04**     **Microstructural evolution and mechanical properties of dissimilar friction welded commercially pure titanium to Ti-6Al-4V alloy**  
Gyeong-Woo Kim<sup>1</sup>, Se-Min Jeong<sup>1</sup>, and Kuk-Hyun Song<sup>2\*</sup>  
<sup>1</sup>Chosun University, <sup>2</sup>S-Welds Inc
- EEM-P05**     **Stress corrosion crack growth of 20% cold worked austenitic stainless steel in PWR primary water**  
H. P. Kim<sup>\*</sup>, J. Y Lee, M. J. Choi, S. H. Cho, S. W. Kim, D. J. Kim, S. S. Hwang, and Y. S. Lim  
Korea Atomic Energy Research Institute
- EEM-P06**     **Effect of Enhanced Grain Refinement in Friction Welded SUS316L Alloy**  
Youngkyu Kim and Kukhyun Song<sup>\*</sup>  
S-WELDS Inc
- EEM-P07**     **Thermal Diffusivity of a Zr Alloy**  
Kweonho Kang<sup>\*</sup>, Byungjoo Yoon, and Changhwa Lee  
Korea Atomic Energy Research Institute
- EEM-P08**     **Growth and Device Characteristics of CZTSSe Thin-Film Solar Cells**  
Dae-Ho Son, Kee-Jeong Yang, Jin-Kyu Kang and Dae-Hwan Kim<sup>\*</sup>  
DGIST
- EEM-P09**     **Effect of Te addition on the performance of Bi-Te-based thermoelectric materials**  
Hyo Jeong Kim<sup>1, 2</sup>, Min Soo Park<sup>1</sup>, Gook Hyun Ha<sup>1</sup>, Kyung Mi Jang<sup>1</sup>, and Nam Hyun Kang<sup>2\*</sup>  
<sup>1</sup>Korea Institute of Materials Science (KIMS), <sup>2</sup>Pusan National University



## Poster Session (Online)

- EEM-P10** **Simultaneous Surface Modification with the Synthesis of Hydroxyapatite for Deodorizing Harmful Substances**  
Myungsuk Kim, Jaeseok Roh, Jeongha Lee, Haein Shin, and Kun-Jae Lee<sup>\*</sup>  
Dankook University
- EEM-P11** **Stabilization of Lithium Metal Anode by Using a Protecting Layer with Aluminum Nitride**  
Byoung Rok Nah<sup>1</sup>, Yoon Myung<sup>2</sup>, Chan Woong Na<sup>2</sup> and MinHo Yang<sup>1\*</sup>  
<sup>1</sup>Dankook University, <sup>2</sup>Korea Institute of Industrial Technology
- EEM-P12** **Effects of mother powder on overall properties of  $\text{Li}_{1.3}\text{Al}_{0.3}\text{Ti}_{1.7}(\text{PO}_4)_3$**   
Seul Ki Choi<sup>1</sup>, Joo Won Kim<sup>1</sup>, Chan Woong Na<sup>2</sup>, Yoon Myung<sup>2</sup>, and MinHo Yang<sup>1\*</sup>  
<sup>1</sup>Dankook University, <sup>2</sup>Korea Institute of Industrial Technology
- EEM-P13** **Improving the Performance of NMC622 Cathode by Surface Modification of Polyaniline**  
Seo Yun Jung<sup>1</sup>, Young Hoon Jeon<sup>1</sup>, Chan Woong Na<sup>2</sup>, Yoon Myung<sup>2</sup>, and MinHo Yang<sup>1\*</sup>  
<sup>1</sup>Dankook University, <sup>2</sup>Korea Institute of Industrial Technology
- EEM-P14** **Facile synthesis of oxygen-deficient black  $\text{TiO}_{2-x}$  microspheres with excellent photothermal conversion efficiency through ultrasonic spray pyrolysis**  
Seunghoon Han<sup>1</sup>, Myeongjun Ji<sup>1</sup>, Jeong Hyun Kim<sup>1</sup>, Cheol-Hui Ryu<sup>1</sup>, Hee Yeon Jeon<sup>1</sup>, Young-Keun Jeong<sup>3</sup>, and Young-In Lee<sup>1,2\*</sup>  
<sup>1</sup>Seoul National University of Science and Technology, <sup>2</sup>The Institute of Powder Technology, <sup>3</sup>Pusan National University
- EEM-P15** **Fabrication of stainless steel 316L porous body using plate-shaped powder manufactured by high-energy ball milling**  
Woocheol Kim<sup>1</sup>, Jin Kwang Jang<sup>1</sup>, Siyeon Kim<sup>1</sup>, Eunho Ma<sup>1</sup>, and Jongmin Byun<sup>1,2\*</sup>  
<sup>1</sup>Seoul National University of Science and Technology, <sup>2</sup>The Institute of Powder Technology
- EEM-P16** **Investigation of photocatalytic properties of two-dimensional  $\text{TiO}_2/\text{ZnO}$  heterojunction fabricated by atomic layer deposition**  
Ji Young Park, Su Min Eun, and Byung Joon Choi<sup>\*</sup>  
Seoul National University of Science and Technology
- EEM-P17** **Fabrication of Bi doped polycrystalline SnSe by Hydrogen reduction of  $\text{Bi}_2\text{O}_3$**   
Jin Kwang Jang<sup>1</sup>, WooCheol Kim<sup>1</sup>, Jun Su Lee<sup>1</sup>, Seong Won Jang<sup>1</sup>, and Jongmin Byun<sup>1,2\*</sup>  
<sup>1</sup>Seoul National University of Science and Technology, <sup>2</sup>The Institute of Powder Technology
- EEM-P18** **Enhanced high-temperature thermoelectric performance of n-type  $\text{Cu}_{0.008}\text{Bi}_2(\text{Te,Se})_3$  compounds via suppressing bipolar contribution**  
Seungki Jo<sup>1</sup>, Hyun-Sik Kim<sup>2</sup>, Sang-il Kim<sup>2\*</sup>, and Kyu Hyoung Lee<sup>3\*</sup>



<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>University of Seoul, <sup>3</sup>Yonsei University

## Poster Session (Online)

- EEM-P19** **RuO<sub>x</sub>-coated Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> MXene/carbon nanofiber composite electrodes for enhanced pseudocapacitive energy storage**  
Seoyeon Yuk<sup>1</sup>, Segi Byun<sup>2</sup> and Dongju Lee<sup>1\*</sup>  
<sup>1</sup>Chungbuk National University, <sup>2</sup>Korea Institute of Energy Research
- EEM-P20** **Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> MXene conductive additive for high power density lithium-ion batteries**  
Yunhee Ahn<sup>1</sup>, Seoyeon Yuk<sup>1</sup>, Seulgi Kim<sup>1</sup>, Seokjae Hong<sup>2,3</sup>, Hyungsub Kim<sup>2</sup>, and Dongju Lee<sup>1\*</sup>  
<sup>1</sup>Chungbuk National University, <sup>2</sup>Korea Atomic Energy Research Institute, <sup>3</sup>Korea University
- EEM-P21** **NiCoP grown on Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> MXene coated Ni foam for alkaline overall water splitting**  
Minsol Kwon, Seoyeon Yuk, and Dongju Lee<sup>\*</sup>  
Chungbuk National University
- EEM-P22** **Synthesis of Laser-Induced Graphene: Bamboo-shaped Carbon Nanotubes Composite for Transformable Energy Storage Electrodes**  
Jin Woo An<sup>1</sup>, Seok-Ki Hyeong<sup>2,3</sup>, Sukang Bae<sup>2</sup>, Jae-Hyun Lee<sup>3\*</sup> and Seoung-Ki Lee<sup>1\*</sup>  
<sup>1</sup>Pusan National University, <sup>2</sup>Korea Institute of Science and Technology, <sup>3</sup>Ajou University
- EEM-P23** **Improvement of Photoelectrochemical Properties of Sb<sub>2</sub>Se<sub>3</sub> nanowires Photocathode for High-Efficiency Water Splitting Hydrogen Production**  
Jaebum Jeong<sup>1</sup>, Seungyeon Han<sup>1,2</sup>, Woohyeon Jo<sup>1</sup>, Taegeon Kim<sup>1,3</sup>, Hyunsung Jung<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Ceramic Engineering and Technology <sup>2</sup>Pusan National University, <sup>3</sup>Hanyang University
- EEM-P24** **Pulse-reversed electrodeposition of Ni-P thin film for electrocatalytic water splitting**  
Woohyeon Jo<sup>1</sup>, Jaebum Jeong<sup>1</sup>, Taegeon Kim<sup>1,2</sup>, Seungyeon Han<sup>1,3</sup>, Min-Kyu Son<sup>1</sup>, and Hyunsung Jung<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Ceramic Engineering and Technology <sup>2</sup>Hanyang University, <sup>3</sup>Pusan National University
- EEM-P25** **Synergetic Effects of Edge Formation and Sulfur Doping in Graphene-Based Catalyst for an Efficient Oxygen Reduction Reaction**  
SeKwon Oh<sup>\*</sup>  
Korea Institute of Industrial Technology
- EEM-P26** **Development and challenge of batteries for the popularization of electric vehicles**  
Dong Jae Park<sup>1</sup>, and Hyo-Ryoung Lim<sup>2,\*</sup>  
<sup>1,2</sup>Pukyong National University
- EEM-P27** **Recent Advancement of Wireless and Battery-free Approach in Soft Implantable Electronics**  
Hanbyeol Son<sup>1</sup>, Hyo-Ryoung Lim<sup>2\*</sup>  
<sup>1,2</sup>Pukyong National University

## Poster Session (Online)

### ▶ Electric and Magnetic Materials (EMM)

- EMM-P01**    **Atomic layer deposition of ZnO on Ge substrate and its passivation effect on the interfacial characteristics of metal/Ge junctions**  
 Myeong Jun Jung<sup>1</sup>, Byung Joon Choi<sup>1</sup>, and Hogyoung Kim<sup>2\*</sup>  
<sup>1,2</sup>Seoul National University of Science and Technology
- EMM-P02**    **ALD growth of ZnO at low temperatures and electrical investigation of Pt/ZnO/Al junctions formed on glass substrate**  
 Ye Bin Weon<sup>1</sup>, Byung Joon Choi<sup>1</sup>, and Hogyoung Kim<sup>2\*</sup>  
<sup>1,2</sup>Seoul National University of Science and Technology
- EMM-P03**    **The Effect of Bi and Zn Additives on Sn-Ag-Cu Lead-Free Solder Alloys for Ag Reduction**  
 Yubin Kang, Jin-Ju Choi, Dae-Guen Kim, and Hyun-Woo Shim<sup>\*</sup>  
 Institute for Advanced Engineering
- EMM-P04**    **Additive-free sintering of fine Nd-Fe-B powder prepared by reduction-diffusion and wet ball milling washing process**  
 Vitalii Galkin<sup>1,2</sup>, Jong-Ryul Jeong<sup>2</sup>, Youn-Kyoung Baek<sup>1</sup>, and Dongsoo Kim<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Chungnam National University
- EMM-P05**    **Magnetic Composite Powders for Widening mmWave Absorption Bandwidth**  
 Min-Byeol Yun<sup>1,2</sup>, Young-Guk Son<sup>2</sup>, and Youn-Kyoung Baek<sup>1,\*</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Pusan National University
- EMM-P06**    **Systematization of critical parameters in the additive manufacturing of FeSi soft magnetic materials through design of experiments**  
 Hyun-Jun Shim<sup>1</sup>, Myeongjun Ji<sup>1</sup>, Joon Phil Choi<sup>3</sup>, and Young-In Lee<sup>1,2</sup>  
<sup>1</sup>Seoul National University of Science and Technology, <sup>2</sup>The Institute of Powder Technology, <sup>3</sup>Korea Institute of Machinery & Materials
- EMM-P07**    **Reliability analysis on repetitive deformation of metal thin film on polyimide substrate for flexible electronics**  
 Sangwoong Baek, Keumhwan Park, Chan-Jae Lee<sup>\*</sup>  
 Korea Electronics Technology Institute
- EMM-P08**    **Low Loss Magneto-Dielectric Composite Enabled by Isolating High-density, High-permeability Nanowire Arrays in Porous Alumina**  
 Hyun-Jun Kim<sup>1</sup>, Hyo-Ryoung Lim<sup>2</sup>, Yong-Ho Choa<sup>3\*</sup>  
<sup>1</sup>Pukyong National University, <sup>2</sup>Pukyong National University, <sup>3</sup>Hanyang University

## Poster Session (Online)

- EMM-P09**     **Liquid state phase separation and magnetic properties in Gd-based metallic glass**  
Song-Yi Kim<sup>1</sup>, and Jun-Hee Han<sup>2\*</sup>  
<sup>1,2</sup>Korea Institute of Industrial Technology
- EMM-P10**     **Electrical and Interfacial Properties of Silicon Reclaim Wafer Manufactured by Wafer Recycling**  
Dong Hyeok Seo, Hyeonmin Yim, Won Jin Kim and Woo-Byoung Kim<sup>\*</sup>  
Dankook University
- EMM-P11**     **Investigation of thermoelectric properties in p-type Bi<sub>0.5</sub>Sb<sub>1.5</sub>Te<sub>3</sub> materials fabricated by combining magnetic pulsed compaction (MPC) and spark plasma sintering (SPS)**  
Eun-Ha Go, Peyale Dharmiah, Babu Madavali, Jin-Gu Gwon, Min-Woo Shin, Sung-Jae Jo, Gian Song, Ji Woon Lee and Soon-Jik Hong<sup>\*</sup>  
Kongju National University
- EMM-P12**     **Synergetically enhanced thermoelectrical properties of N-type Bi-Te thick film with Edge Oxidized Graphene**  
Soo-ho Jung<sup>1</sup>, Kyung Tae Kim<sup>1\*</sup>, Yong Uk Kim<sup>1</sup>, Jeong-Yun Sun<sup>2</sup>, Jong Min Park<sup>3</sup>, Dong Yeol Hyeon<sup>3</sup>, and Kwi-Il Park<sup>3</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Seoul National University, <sup>3</sup>Kyungpook National University
- EMM-P13**     **Ultrafine-grained anisotropic hot-deformed magnets fabricated from (Nd<sub>1-x</sub>Ce<sub>x</sub>)-Fe-B HDDR powders**  
Jae-Gyeong Yoo<sup>1,2</sup>, Tae-Hoon Kim<sup>1</sup>, Hee-Ryoung Cha<sup>1</sup>, Yang-Do Kim<sup>2</sup>, Jung-Goo Lee<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Pusan National University
- EMM-P14**     **Magnetic and electronic properties of YGe<sub>2</sub> superconductor**  
Myungsuk Song<sup>\*</sup>  
Korea Institute of Industrial Technology
- EMM-P15**     **Electronic properties of high conductive nanomaterials based on molybdenum ditelluride**  
Kamoladdin Saidov<sup>1,2</sup>, Shavkat Mamatkulov<sup>1</sup>, Odilkhuja Parpiev<sup>1</sup>, and Olim Ruzimuradov<sup>3\*</sup>  
<sup>1</sup>Academy of Sciences of the Republic of Uzbekistan, <sup>2</sup>Tashkent University of Information Technologies, <sup>3</sup>Turin Polytechnic University in Tashkent
- EMM-P16**     **Crystallization behaviors of Fe-Si-B-S based amorphous soft magnetic ribbons**  
Young-Sin Choi<sup>1</sup>, Do-Hun Kwon<sup>1</sup>, Eun-Ji Cha<sup>1</sup>, Min-Woo Lee<sup>2</sup>, Jongryoul Kim<sup>3</sup>, and Hwi-Jun Kim<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Daeshingangub, <sup>3</sup>Hanyang University

## Poster Session (Online)

- EMM-P17 Optimization of consolidation parameters for soft magnetic properties of Fe-Si-Al-P/Fe-P composite cores**  
 Dae Won Jung<sup>1,2</sup>, Min Woo Lee<sup>1</sup>, Young Sin Choi<sup>1</sup>, Do Hun Kwon<sup>1</sup>, Eun Ji Cha<sup>1</sup>, Kee Ahn Lee<sup>2</sup>, and Hwi Jun Kim<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Inha University
- EMM-P18 Effect of mixed powder on soft magnetic properties of Fe-Si-B-C based amorphous composite cores**  
 Minwoo Lee<sup>1</sup>, Youngsin Choi<sup>1</sup>, Dohun Kwon<sup>1</sup>, Eunji Cha<sup>1</sup>, Daewon Jeong<sup>1</sup>, Taesuk Jang<sup>2</sup>, and Hwijun Kim<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>SunMoon University
- ▶ **Exchange Seminar on Outstanding Achievement in Group Research Program of NRF (ESNRF)**
- ESNRF-P01 Monolith Precious Metal – Doped TiO<sub>2</sub> Aerogel with Continuous Gas-Phase Photocatalytic Oxidation of Formaldehyde**  
 Jinkyong Kim, and Jeong Gil Seo<sup>\*</sup>  
<sup>1,2</sup>Hanyang University
- ESNRF-P02 Development of TiO<sub>2</sub>-based aerogels with controlled crystallinity and their application to dye degradation**  
 Ja Yun Heo<sup>1</sup>, Vishwanath Hiremath<sup>1,2</sup>, and Jeong Gil Seo<sup>1,\*</sup>  
<sup>1,2</sup>Hanyang University
- ESNRF-P03 Fabrication of silver-impregnated silica aerogel composite**  
 Pratik Kapadnis, Youngseon Park, and Hae Jin Hwang<sup>\*</sup>  
 Inha University
- ESNRF-P04 The pore structure improvement of sodium silicate-based aerogel by adding acetonitrile as drying control chemical additive**  
 Younghun Kim, Taehee Kim, Haryeong Choi, and Hyung-Ho Park<sup>\*</sup>  
 Yonsei University
- ESNRF-P05 A Study about Silylation with Various Silylating agents for Silica Aerogels**  
 Ha-Yoon Nah, Taehee Kim, Haryeong Choi, and Hyung-Ho Park<sup>\*</sup>  
 Yonsei University
- ESNRF-P06 Effect of Fluorine doping to tin oxide aerogel with Pt nanocomposite for electrocatalytic metal oxide support**  
 Taehee Kim, Haryeong Choi, and Hyung-Ho Park<sup>\*</sup>  
 Yonsei University

## Poster Session (Online)

- ESNRF-P07** **Ultralow-k silica aerogel films for nanodevice interconnect technology**  
Haryeong Choi, Taehee Kim, and Hyung-Ho Park<sup>\*</sup>  
Yonsei University
- ESNRF-P08** **Machine-Learning for Predicting the High-Temperature Strength of Nb-Based Alloys**  
Seung-Hyeok Shin, Dong-Kyu Oh, Jong-Min Byun, and Byoungchul Hwang<sup>\*</sup>  
Seoul National University of Science and Technology
- ESNRF-P09** **Synthesis and sintering behavior of fine molybdenum powder by ultrasonic spray pyrolysis and subsequent hydrogen reduction**  
Yong-Seong Lee<sup>1</sup>, Jeong Hyun Kim<sup>1</sup>, Jongmin Byun<sup>1,2</sup>, Young-Keun Jeong<sup>3</sup>,  
and Young-In Lee<sup>1,2\*</sup>  
<sup>1</sup>Seoul National University of Science and Technology, <sup>2</sup>The Institute of Powder Technology, <sup>3</sup>Pusan National University
- ESNRF-P10** **Enhanced Self-rectifying Behavior of Oxide Based Bilayer Device**  
Min Gyoo Cho<sup>\*</sup>, Jae Hee Go, and Byung Joon Choi  
Seoul National University of Science and Technology
- ESNRF-P11** **Investigation of electrical properties of ZnO based flexible memristors**  
Ye Bin Weon and Byung Joon Choi<sup>\*</sup>  
Seoul National University of Science and Technology
- ESNRF-P12** **Fabrication of Spherical Hydrophilic Silica Aerogel**  
Ki-Sun Nam, Jae-min Lee, and Haejin Hwang<sup>\*</sup>  
Inha University
- ESNRF-P13** **Activation-passivation layers of Ag/SiO<sub>2</sub> aerogel for Lithium-free anode in All-Solid-State Battery**  
Kangsanin Kim, Haejin Hwang<sup>\*</sup>  
Inha University
- **Integrated Computer-aided Process Engineering (ICAPE)**
- ICAPE-P01** **Effect of Aging Time on the Hydrogen Embrittlement of Hastelloy X and Haynes 617 Alloys**  
Jae-Yun Kim, Sang-Gyu Kim, Byoungchul Hwang<sup>\*</sup>  
Seoul National University of Science and Technology

## Poster Session (Online)

### ► Nanoceramics (NCM)

- NCM-P01** **Effect of surface-modified graphitic carbon nitride nanosheets adsorption to the yttria-stabilized zirconia microbeads**  
 Dong Won Kim<sup>1</sup>, Eun-Jeong Kim<sup>2</sup>, Si Eun Han<sup>3</sup>, Chul-Lee Lee<sup>3</sup>, and Kyoung-Seok Moon<sup>3\*</sup>  
<sup>1,3</sup>Gyeongsang National University, <sup>2</sup>Korea Institute of Ceramic Engineering and Technology
- NCM-P02** **Pore Formation by according to Polymer Species to Improve Specific Surface Area of Hydroxyapatite**  
 Haein Shin, Jeongha Lee, Myungsuk Kim, Seyoung Lee, Jonghoon Lee, and Kun-Jae Lee<sup>\*</sup>  
 Dankook University
- NCM-P03** **Synthesis of Na<sub>2</sub>Ti<sub>6</sub>O<sub>13</sub> nanorods by Ultrasonic Spray Pyrolysis combined with Molten Salt Synthesis and their sorption capacity**  
 Hajin Kim<sup>1</sup>, Seungheon Han<sup>1</sup>, Dong Hoon Lee<sup>1</sup>, and Young-In Lee<sup>1,2\*</sup>  
<sup>1</sup>Seoul National University of Science and Technology, <sup>2</sup>The Institute of Powder Technology
- NCM-P04** **Facile and gram-scale synthesis of Cu<sub>2</sub>-xS nanoparticles for photothermal application by sonochemical-assisted reaction based on high-concentration copper ion complex precursor**  
 Hee Yeon Jeon<sup>1</sup>, Cheol-Hui Ryu<sup>1</sup>, MiJeong Park<sup>1</sup>, Jin Gyeong Park<sup>3</sup>, and Young-In Lee<sup>1,2\*</sup>  
<sup>1</sup>Seoul National University of Science and Technology, <sup>2</sup>The Institute of Powder Technology, <sup>3</sup>LG Innotek
- NCM-P05** **Synthesis of low-oxygen Ti<sub>3</sub>AlC<sub>2</sub> powders by hydrogenation-dehydrogenation and deoxidation from titanium scraps**  
 Taeheon Kim, and Jae-Won Lim<sup>\*</sup>  
 Jeonbuk National University
- NCM-P06** **Mass production of Cu<sub>2</sub>-xSe nanoparticle for thermoelectric bulk materials with nanosized grains via high concentration metal complex precursor**  
 Cheol-Hui Ryu<sup>1</sup>, Myeongjun Ji<sup>1</sup>, Jeong Hyun Kim<sup>1</sup>, and Young-In Lee<sup>1,2\*</sup>  
<sup>1</sup>Seoul National University of Science and Technology, <sup>2</sup>The Institute of Powder Technology
- NCM-P07** **The study on Formation Mechanisms of Ti-based MAX Phase by Using Ti-Al Intermetallic Compound**  
 Siyeon Kim<sup>1</sup>, Jin Kwang Jang<sup>1</sup>, Seong Won Jang<sup>1</sup>, Jun Su Lee<sup>1</sup>, Eunho Ma<sup>1</sup>, and Jongmin Byun<sup>1,2\*</sup>  
<sup>1</sup>Seoul National University of Science and Technology, <sup>2</sup>The Institute of Powder Technology
- NCM-P08** **Ex-situ Raman spectroscopic studies of carbon coated sulfur nanowires**  
 Hye-Ji Eun<sup>1</sup>, Mihye Wu<sup>1</sup>, Joo-Hyung Kim<sup>2\*</sup>, and San Moon<sup>1\*</sup>  
<sup>1</sup>Korea Research Institute of Chemical Technology, <sup>2</sup>Gyeongsang National University



## Poster Session (Online)

- NCM-P09**     **Effects of Process Parameters on Microstructure and Physical Properties of Alumina for Insulators**  
Geum Ji Back<sup>1</sup>, Ye Ji Son<sup>2</sup>, So Yeon Si<sup>2</sup>, Hyun Seon Hong<sup>2\*</sup>, Sang Ki Ko<sup>3</sup>  
<sup>1,2</sup>Sungshin University, Seoul, <sup>3</sup>Konics
- NCM-P10**     **Two dimensional SnO nanosheets formed by the liquid to solid exfoliation method**  
Dong Jin Lee<sup>1\*</sup>, Deuk Young Kim<sup>1,2</sup>  
<sup>1,2</sup>Dongguk University
- NCM-P11**     **Hollow Carbon Sphere with Conductive Polymer Coating for Lithium-Sulfur Batteries**  
Hye-Ji Eun<sup>1</sup>, Joo-Hyung Kim<sup>2\*</sup>, and San Moon<sup>1\*</sup>  
<sup>1</sup>Korea Research Institute of Chemical Technology, <sup>2</sup>Gyeongsang National University
- NCM-P12**     **A Study on Zinc Oxide Nanopowder Manufacturing from Zinc nitrate by Taylor Reaction**  
Boram Kim, Dae-Hwan Jang, and Dae-Weon Kim<sup>\*</sup>  
Institute for Advanced Engineering
- NCM-P13**     **TiO<sub>2</sub> nanocone arrays formed by Ar ion beam etching and their optical and photoelectrochemical properties**  
Duhyeon Yoon, Dang-Thanh Nguyen, Eui-Chol Shin, Jong-Sook Lee<sup>\*</sup>, and Kwangmin Lee<sup>\*</sup>  
Chonnam National University
- NCM-P14**     **The properties of Bi<sub>2</sub>Te<sub>3</sub>-Cu joints obtained by SPS/FAST technique**  
K. Kowiorski<sup>1\*</sup>, K. Kaszyca<sup>1,2</sup>, B. Bucholc<sup>1</sup>, M. Chmielewski<sup>1</sup>, K. Krzyzak<sup>1</sup>, and R. Zybala<sup>1,3</sup>  
<sup>1</sup>Institute of Microelectronics and Photonics, <sup>2</sup>AGH University of Science and Technology, <sup>3</sup>Warsaw University of Technology
- **Refractory Metals and Hard Materials (RMH)**
- RMH-P01**     **The synthesis and consolidation of novel VC-AlCrSi hard materials by spark plasma sintering**  
Jeong-Han Lee, Bum-soon Park, Hyun-Kuk Park, and Jae-Cheol Park<sup>\*</sup>  
Korea Institute of Industrial Technology
- RMH-P02**     **Hydrogen Reduction Behavior and Microstructure Characteristics of WO<sub>3</sub>-NiO-CuO Powder Mixture**  
Youn Ji Heo<sup>1</sup>, Eui Seon Lee<sup>1,2</sup>, Ji Young Kim<sup>1,2</sup>, Young-In Lee<sup>1,2</sup>, and Sung-Tag Oh<sup>1,2\*</sup>  
<sup>1</sup>Seoul National University of Science and Technology, <sup>2</sup>The Institute of Powder Technology
- RMH-P03**     **Spark Plasma Sintering and Hot Isostatic Pressing of W-La<sub>2</sub>O<sub>3</sub>-Y<sub>2</sub>O<sub>3</sub> Composite Powders Prepared by Ultrasonic Spray Pyrolysis**  
Eui Seon Lee, Youn Ji Heo, Ji Young Kim, Jongmin Byun, and Sung-Tag Oh<sup>\*</sup>  
Seoul National University of Science and Technology

## Poster Session (Online)

- RMH-P04**     **Effect of the Initial Powder Characteristics on the Microstructure of Tungsten Densified by Spark Plasma Sintering and Hot Isostatic Pressing**  
 Ji Young Kim, Eui Seon Lee, Youn Ji Heo, Jongmin Byun, and Sung-Tag Oh<sup>\*</sup>  
 Seoul National University of Science and Technology
- RMH-P05**     **TRIP Behavior of Co-rich Co<sub>40</sub>Cr<sub>20</sub>Ni<sub>15</sub>Fe<sub>15</sub>Mo<sub>10</sub> High Entropy Alloys for Biomedical Application**  
 Gwnaghyo Choi<sup>1</sup> and, Moonkyu Lee<sup>2</sup>, Kwangmin Lee<sup>2\*</sup>  
<sup>1</sup>Korea Advanced Institute of Science and Technology, <sup>2</sup>Chonnam National University
- RMH-P06**     **Equiatomic CoCrNiMoW and Non-equiatomic Co-rich Co<sub>50</sub>Cr<sub>12.5</sub>Ni<sub>12.5</sub>Mo<sub>12.5</sub>W<sub>12.5</sub> HEA Alloys Designed for Metallic Biomaterials: Microstructure, Compressive properties and Electrochemical Behaviors**  
 Doori Kang and Kwangmin Lee<sup>\*</sup>  
 Chonnam National University
- RMH-P07**     **Fabrication Process and Mechanical Properties Characterization of Boron Nitride Nanosheet(BNNS) reinforced 3Y-TZP Nanocomposite**  
 Bin Lee<sup>1,2\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>University of Science & Technology
- RMH-P08**     **Effects of Si content in raw materials for preparation of SiC powders on the properties of SiC sintered by spark plasma sintering**  
 Hanjung Kwon<sup>\*</sup>, Jaemin Song, Gunwoo Jung, Jungi Seo, Minhee Kim, Eunchae Kim, Jiwon Kim, Jihyun Park, Yerim Han, Jiwhan Yoon, and Hyojung Nam  
 Jeonbuk National University
- RMH-P09**     **Mechanical Properties of Nano-composite Films Using Multi-component Mo-Zr-Ti-Si Target**  
 Byeong Uk Min<sup>1</sup>, Byung Un Lee<sup>1</sup>, Ji Yeon Ku<sup>1</sup>, Ju Ho Lee<sup>1</sup>, Myung Hwan Byun<sup>2</sup>  
 and Eun Soo Park<sup>1\*</sup>  
<sup>1</sup>Eloi Materials (EML) Co., Ltd, <sup>2</sup>Keimyung University
- RMH-P10**     **Investigation of the formation of hydride and the effect of carbon vacancies on the mechanical properties of TiC<sub>1-x</sub> and its hydride**  
 Hyokyeong Kim<sup>1</sup>, Sohyun Park<sup>1</sup>, Haeun Lee<sup>1</sup>, Myungjae Kim<sup>1</sup>, Jiwoo Kim<sup>1</sup>,  
 and Jiwoong Kim<sup>1,2\*</sup>  
<sup>1,2</sup>Soongsil University
- RMH-P11**     **Characterization of Direct Energy Deposited Structures Using W-based Alloy Powder**  
 Jong Uk Hwang<sup>1</sup>, Juho Lee<sup>1</sup>, ByungUn Lee<sup>1</sup>, Jung-Soo Ko<sup>1</sup>, Goo-Won Roh<sup>1</sup>,  
 Sang-Ha Park<sup>2</sup>, and Eun Soo Park<sup>1\*</sup>  
<sup>1</sup>Eloi Materials (EML) Co., Ltd, <sup>2</sup>Daegu Mechatronics & Materials Institute

## Poster Session (Online)

- RMH-P12**    **Comparison of microstructure and mechanical properties of high-entropy carbides with different compositions**  
Junwoo Song<sup>1</sup>, Jinwoo Seok<sup>1</sup>, Song-Yi Kim<sup>1</sup>, Jiwoon Lee<sup>2</sup>, Moonjo Kim<sup>1</sup>, Junhee Han<sup>1</sup>, and Hyoseop Kim<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, Incheon, <sup>2</sup> Kongju National University
- RMH-P13**    **Investigation on Additive Manufacturing of Tungsten Carbide by Fused Deposition Modeling (FDM) method**  
Junwoo Song<sup>1</sup>, Jinwoo Seok<sup>1</sup>, Song-Yi Kim<sup>1</sup>, Jiwoon Lee<sup>2</sup>, Moonjo Kim<sup>1</sup>, Junhee Han<sup>1</sup> and Hyoseop Kim<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup> Kongju National University
- RMH-P14**    **Al<sub>2</sub>O<sub>3</sub> and Al<sub>2</sub>O<sub>3</sub>-ZrO<sub>2</sub> Multilayer Tape-casts Consolidated by Microwave Sintering and Conventional Sintering**  
Muhammad Waqas Khalid<sup>1,2</sup>, and Bin Lee<sup>1,2\*</sup>  
<sup>1</sup>University of Science and Technology, <sup>2</sup>Korea Institute of Industrial Technology
- RMH-P15**    **Effect of Heat Treatment on Oxidation Behavior of WC-Co Hardmetal Scrap**  
Min Soo Park, Jong-Min Gwak, Hyo-Jeong Kim, Kyung-Mi Jang, and Gook-Hyun Ha<sup>\*</sup>  
Korea Institute of Materials Science
- RMH-P16**    **Microstructural Evolution and oxidation behavior of Al<sub>0.75</sub>V<sub>2.82</sub>CrZr Lightweight Refractory High Entropy Alloy Fabricated by Powder Metallurgy**  
Minsu Kim<sup>1</sup>, Sheetal Kumar Dewangan<sup>2</sup>, Hansung Lee<sup>1</sup>, and Byungmin Ahn<sup>1,2\*</sup>  
<sup>1,2</sup>Ajou University
- ▶ **Rare Metals and Recycling (RMR)**
- RMR-P01**    **Synthesis and precipitation behavior of nickel metal powder from energy storage system waste through continuous liquid reduction process**  
So Yeong Joo, Byoungyong Im, Hyun-Woo Shim, and Dae-Guen Kim<sup>\*</sup>  
Institute for Advanced Engineering
- RMR-P02**    **Synthesis and characterization of cobalt oxide using resources recovered from waste lithium-ion batteries**  
Byoungyong Im, Soyeong Joo, Hyun-Woo Shim, and Dae-Guen Kim<sup>\*</sup>  
Institute for Advanced Engineering
- RMR-P03**    **Effects of hydrogenation treatment for recycling of Nd-Fe-B Magnets**  
Hong Min<sup>1</sup>, Minhye Seo<sup>2</sup>, and SooYoung Lee<sup>3\*</sup>  
<sup>1,2,3</sup>Institute for Advanced Engineering

## Poster Session (Online)

- RMR-P04**     **A study on recovery of valuable metals (silicon and silver) from solar cells using acid leaching and substitution reactions**  
 Hyun-Jong Kim<sup>1</sup>, Do-Hee Kim<sup>1</sup>, and Jei-Pil Wang<sup>2\*</sup>  
<sup>1,2</sup>Pukyong National University
- RMR-P05**     **A study on the phase separation of lithium and the reduction of valuable metals through hydrogen from spent NCA(Li(NiCoAl)O<sub>2</sub>)**  
 Jong-Ha Hwang<sup>1</sup>, Do-Hee Kim<sup>1</sup>, and Jei-Pil Wang<sup>2\*</sup>  
<sup>1,2</sup>Pukyong National University
- RMR-P06**     **Research on manufacturing lithium phosphate from spent LFP(LiFePO<sub>4</sub>)**  
 Do-Hee Kim<sup>1</sup>, Jong-Ha Hwang<sup>1</sup>, and Jei-Pil Wang<sup>2\*</sup>  
<sup>1,2</sup>Pukyong National University
- RMR-P07**     **Effect of fine precipitates on the microstructure and mechanical properties of lightweight Magnesium alloy with rare earth addition**  
 Yong-Ho Kim<sup>1,2</sup>, Hyo-Sang Yoo<sup>1</sup>, Byeong-Kwon Lee<sup>1</sup>, Eun-Chan Ko<sup>1</sup>, Hyeon-Taek Son<sup>1\*</sup>, and Jong-Hyeon Lee<sup>2\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Chungnam National University
- RMR-P08**     **Evaluation of Fe-Ni-Cr based alloys in carburizing for reforming system**  
 Sung Gue Heo<sup>1,2</sup>, Jae-Jin Sim<sup>1</sup>, Kyoung-Tae Park<sup>1</sup>, Soong Ju Oh<sup>2</sup>, and Seok-Jun Seo<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Korea University
- RMR-P09**     **Lithium Recovery and Decarbonization Behavior of Black Powder from end-of-life Lithium Ion Batteries**  
 Eunmi Park, Minwook Pin, and Yong Hwan Kim<sup>\*</sup>  
 Korea Institute of Industrial Technology
- RMR-P10**     **Study on the recovery of rare metal from Nd-Fe-B magnet scrap using liquid phase separation**  
 Song-Yi Kim<sup>1</sup>, Jin-Woo Seok<sup>1,2</sup>, Gian Song<sup>3</sup>, Junwoo Song<sup>1</sup>, Hyo-Seop Kim<sup>1</sup>, Junhee Han<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Inha University, <sup>3</sup>Kongju National University
- RMR-P11**     **Luminescent characteristics of Cu – and Mn – doped ZnSe Quantum dots by hydrothermal method**  
 Geum Ji Back<sup>1</sup> and Hyun Seon Hong<sup>2\*</sup>  
<sup>1,2</sup>Sungshin Women's University
- RMR-P12**     **High purity tantalum powder manufacturing by external continuous Na reductants feeding**  
 Jae-Jin Sim<sup>1,2</sup>, Sung-Gue Heo<sup>3</sup>, Yong-Kwan Lee<sup>1,3</sup>, Hyun-Chul Kim<sup>3</sup>, Mi-Hye Lee<sup>1</sup>, Kyoung-Tae Park<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Inha University, <sup>3</sup>Korea University

## Poster Session (Online)

- RMR-P13**     **Development of LaYO<sub>3</sub> as a reaction-preventing material for metal fuel casting**  
SeoungWoo Kuk<sup>1\*</sup>, Seong-Jun Ha<sup>2</sup>, YongWook Choe<sup>2</sup>, Jeong-Yong Park<sup>3</sup>,  
Kyungchai Jeong<sup>2</sup>, Seokjin Oh<sup>2</sup>, Kihwan Kim<sup>2</sup>, Sang-Gyu Park<sup>2</sup>, JeongHwan Joo<sup>1</sup>,  
WooSeob Shin<sup>4</sup>, and Kunok Chang<sup>4</sup>  
<sup>1,2,3</sup>Korea Atomic Energy Research Institute, <sup>4</sup>KyungHee University
- RMR-P14**     **Study of the pyrometallurgical recycling process to the recovery of zinc and manganese oxide from spent alkaline and Zn-C batteries**  
Seoung Uk Bae<sup>1,2</sup>, MiHye Lee<sup>1</sup>, Kyoung-Tae Park<sup>1</sup>, and Jae Hong Shin<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Incheon National University
- RMR-P15**     **Effects of Ti addition on magnetic and microstructural properties of Ce-substituted Nd-Fe-B hot-deformed magnets**  
Ga-Yeong Kim<sup>1,2\*</sup>, Hee-Ryoung Cha<sup>1</sup>, Tae-Hoon Kim<sup>1</sup>, Yang-Do Kim<sup>2\*</sup>  
and Jung-Goo Lee<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Materials Science, <sup>2</sup>Pusan National University
- RMR-P16**     **Research on the separation of rare earths from magnesium-rare earths alloy based on the evaluation of sublimation behavior**  
Sangmin Park<sup>1,2</sup>, Dae-Kyeom Kim<sup>3</sup>, Jaeyun Jeong<sup>1</sup>, Myungsuk Song<sup>3\*</sup>, Taek-Soo Kim<sup>1,2\*</sup>  
<sup>1,3</sup>Korea Institute of Industrial Technology, <sup>2</sup>Korea University of Science and Technology
- RMR-P17**     **Refining behavior in Electron Beam Melting focused on impurity vaporization**  
Jieun Kim<sup>1,2</sup>, Hyunchul Kim<sup>1,2</sup>, MiHye Lee<sup>1</sup>, SoongJu Oh<sup>2</sup>, JaeHong Shin<sup>1\*</sup>,  
Kyoung-Tae Park<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Korea University
- RMR-P18**     **A Study on Addition of Rare Earth Element in the Spent Permanent Magnet Scrap to Gray Cast Iron**  
Seung-Yeon Park<sup>\*</sup>  
Korea Institute of Industrial Technology
- RMR-P19**     **Influence of combustion temperature on SHS in an WO<sub>3</sub>-Mg-C System**  
Shin-Young Choi<sup>1,2</sup>, Jae-Jin Sim<sup>1,3</sup>, Yong-Kwan Lee<sup>1,4</sup>, Namhun Kwon<sup>1,4</sup>, Mi Hye Lee<sup>1</sup>,  
Kyoung-Tae Park<sup>1\*</sup>, and Jae Hong Shin<sup>1\*</sup>  
<sup>1</sup>Korea Institute of Industrial Technology, <sup>2</sup>Yonsei University, <sup>3</sup>Inha University, <sup>4</sup>Korea University
- RMR-P20**     **A Study on the Electrolyte Characteristics of Electrowinning for Recovery of Valuable Metal from Spent Lithium ion Battery**  
Sung Cheol Park<sup>1</sup>, Yong Hwan Kim<sup>2</sup>, Man Seung Lee<sup>3</sup>, and Seong Ho Son<sup>1\*</sup>  
<sup>1,2</sup>Korea Institute of Industrial Technology, <sup>3</sup>Mokpo National University