

Program Overview

(East Tower)

	Diamond Hall	Emerald Hall	Ruby Hall	Sapphire Hall
October 26, 2021 (Tuesday)				
12:00-	Registration			
14:00-16:10	Integrated Computer Aided Process Engineering I (14:00-16:10)	Linking Basic Knowledge and Industrialization Technology I (14:30-16:00)	-	
Coffee Break				
16:10-17:50	Integrated Computer Aided Process Engineering II (16:20-17:50)	Linking Basic Knowledge and Industrialization Technology II (16:10-17:30)		
October 27, 2021 (Wednesday)				
08:30-	Registration			
09:00-	-	Advanced Functional Materials I (-10:20)	Powder Materials Processing I (-10:00)	High Performance Structural Materials I (-10:20)
09:30-10:20	Integrated Computer Aided Process Engineering III			
Coffee Break				
10:10-12:00	Integrated Computer Aided Process Engineering IV (10:45-11:45)	Advanced Functional Materials II (10:30-12:00)	Powder Materials Processing II (10:10-11:10)	High Performance Structural Materials II & Biomaterials (10:30-12:00)
12:00-13:00	Lunch Break			
13:00-15:30	Additive Manufacturing of Functional Materials I (13:30-15:30)	Recycling and Industrial Technology of Rare Metals I (13:30-15:20)	Artificial Intelligence in Materials and Manufacturing I (13:30-14:50)	Advanced Powder Processing and Applications I (13:00-15:00)
Coffee Break				
15:00-18:00	Additive Manufacturing of Functional Materials II (15:40-17:50)	Recycling and Industrial Technology of Rare Metals II (15:40-17:40)	Artificial Intelligence in Materials and Manufacturing II (15:00-16:20)	Advanced Powder Processing and Applications II (15:10-17:40)
			Advanced Functional Materials III (16:30-18:00)	

	Diamond Hall	Emerald Hall	Ruby Hall	Sapphire Hall
October 28, 2021 (Thursday)				
08:30-	Registration			
09:00-10:20	Advanced Functional Materials IV (09:00-10:20)	Rare Earth and Energy Materials I (09:00-10:00)	Process and Characterization of Powder Materials I (09:00-09:45)	Presentation Competition for Shinhan Diamond Award I (09:00-10:15)
Coffee Break				
09:55-11:50	Advanced Functional Materials V (10:30-11:50)	Rare Earth and Energy Materials II (10:10-10:50)	Process and Characterization of Powder Materials II (09:55-10:40)	Presentation Competition for Shinhan Diamond Award II (10:25-11:40)
12:00-13:00	Lunch			
13:00-13:40	Plenary Lecture - Dr. Jung-Hwan Lee			
13:40-14:10	Keynote Lecture – Dr. Chang Sup Shim			
14:20-16:20	Porous Materials I (14:20-15:50)	Nanoscale Materials and Coating I (14:20-15:50)	Display Target I (14:20-16:00)	K-Powder Materials Innovation (14:20-16:20)
Coffee Break				
16:00-18:00	Porous Materials II (16:00-17:30)	Nanoscale Materials and Coating II (16:00-17:30)	Display Target II (16:10-17:30)	Functional Materials (16:30-18:00)
17:40-18:10	KPMI Meeting (Diamond Hall)			
October 29, 2021 (Friday)				
09:00-	Registration			
09:30-10:30	Powder Materials Processing III (09:30-10:30)	Advanced Functional Materials VI (09:30-10:30)	Sintered Materials (09:30-10:15)	
Coffee Break				
10:25-11:40	Powder Materials Processing IV (10:40-11:20)	Advanced Functional Materials VII (10:40-11:40)	Characterization and Modeling (10:25-11:25)	

Diamond Hall

► Integrated Computer-Aided Process Engineering I

Chair: Hyunjoo Choi (Kookmin Univ)

- 14:10 SA01 Integrated Computer-Aided Process Engineering (ICAPE)**
Pil-Ryung Cha
Kookmin University
- 14:30 SA02 Phase-field Simulation of Solidification with Relaxation of Partition Coefficients**
S. G. Kim^{1*}, W. T. Kim^{2*}, P-R. Cha³, B. J. Lee⁴ and J. S. Lee⁵
¹Kunsan National University, ²Cheongju University, ³Kookmin University, ^{4,5}POSTECH
- 14:55 SA03 A Computational Modelling for Polycrystalline Metallic Materials based on Multi-scale Mechanical Behavior and Microstructure Evolution**
Kyung Mun Min¹, Hyukjae Lee¹, Pil-Ryung Cha², Myoung-Gyu Lee¹, and Heung Nam Han^{1*}
¹Seoul National University, ²Kookmin University
- 15:20 SA04 Micromechanical Analysis of Powder Compaction using Crystal Plasticity Multi-particle Finite Element Method**
Parviz Kahhal^{1,2}, Jaebong Jung¹, Hyunjoo Choi³, Pil-Ryung Cha³, and Ji Hoon Kim^{1*}
¹Pusan National University, ²Ayatollah Boroujerdi University, ³Kookmin University
- 15:45 SA05 Modified embedded-atom method interatomic potentials for Mg-Mn and Mg-Cu binary systems**
Hyo-Sun Jang^{1*} and Byeong-Joo Lee²
¹Korea Institute of Materials Science, ²Pohang University of Science and Technology

► Integrated Computer-Aided Process Engineering II

Chair: Kyoungdoc Kim (POSTECH)

- 16:20 SA06 Analysis of Recrystallization Effect During Switching Operation in Phase-change Memory Using Phase-field Simulation**
Hwanwook Lee, Ho Thi Thu Trang, and Yongwoo Kwon^{*}
Hongik University
- 16:50 SA07 Effect of Inhomogeneous Elasticity on Microstructure Evolution in Fe-Cr-Al System**
Jeonghwan Lee, and Kunok Chang^{*}
Kyung Hee University
- 17:20 SA08 Phase-Field Model of Oxidation Kinetics**
Kyoungdoc Kim^{*}
Pohang University of Science and Technology

Emerald Hall

▶ Linking Basic Knowledge and Industrialization Technology I

Chair: Young-In Lee (SEOULTECH)

- 14:30 SB01(I) Nanomaterials and Sensor Integration in Wearable and Implantable Hybrid Devices**
Hyo-Ryoung Lim^{1*}, Young-Tae Kwon², Herbert Robert³, W. Hong Yeo³, and Yong-Ho Choa⁴
¹Pukyong National University, ²Institute of Materials Science, ³Georgia Institute of Technology, ⁴Hanyang University
- 15:00 SB02(I) Analysis of Densification and Grain-growth during Hybrid-microwave-sintering of Alumina and Alumina-based Composites**
Muhammad Waqas Khalid^{1,2}, Inyeong Kim^{1,3}, Dongil Jung¹, Dae-Kyeom Kim¹, Sang Chul Park¹, Bum Sung Kim^{1,2}, and Bin Lee^{1*}
¹Korea Institute of Industrial Technology, ²University of Science and Technology, ³Korea University
- 15:30 SB03(I) Novel Approach to Phosphor-in-glass (PiG) Technology for Application in Automotive Lighting**
Jin Gyeong Park^{1*}, Myeongjun Ji², Young-in Lee², and Yong-Ho Choa³
¹LG Innotek, ²Seoul National University of Science and Technology, ³Hanyang University

▶ Linking Basic Knowledge and Industrialization Technology II

Chair: Jongmin Byun (SEOULTECH)

- 16:10 SB04 Effect of Pre-strain on Hydrogen Embrittlement of Intercritically Annealed Fe-6.5Mn-0.08C Medium-Mn steels**
Sang-Gyu Kim, Young-Chul Yoon, Seok-Woo Ko, and Byoungchul Hwang^{*}
Seoul National University of Science and Technology
- 16:30 SB05 Changes of thermoelectric characteristics of SnSe powder materials by atomic-layer- deposited ZnO thin films**
Myeong Jun Jung¹, Ye Bin Weon¹, Ji Young Park¹, Ye Jun Yun¹, Jong Min Byun^{1,2}, and Byung Joon Choi^{1,2*}
^{1,2}Seoul National University of Science and Technology
- 16:50 SB06 Defect engineering of metal oxides for the improvement of piezocatalysis and piezo-photocatalysis performance**
Myeongjun Ji¹, Jeong Hyun Kim¹, Cheol-Hui Ryu¹, and Young-In Lee^{1,2*}
^{1,2}Seoul National University of Science and Technology
- 17:10 SB07 Synthesis of Ti₃AlC₂ MAX Phase by Using Ti-based Intermetallic Compound and Carbide**
Hojun Lee¹, Ye Jun Yun¹, Jinkwang Jang¹, Woo cheol Kim¹, and Jongmin Byun^{1,2*}
^{1,2}Seoul National University of Science and Technology

Diamond Hall

► Integrated Computer-Aided Process Engineering III

Chair: Yong Ju Kim (Kookmin Univ)

- 09:30 SA09 **Coating Research for Mass Production of Energy Storage Devices**
Jaewook Nam*
Seoul National University
- 10:00 SA10 **Electrochemical Calculations and Crystallographic Microstructure Analysis at Feature Scale**
Hyo-Jong Lee*, Sang-Hyeok Kim, Seong-Jin Kim, Han-Kyun Shin, and Yeon-Soo Jung
Dong-A University

► Integrated Computer-Aided Process Engineering IV

Chair: Jaewook Nam (Seoul Natl Univ)

- 10:45 SA11 **Technical Issues in Battery Manufacturing**
Kyung Hyun Ahn
Seoul National University
- 11:15 SA12 **Manufacturing Process and Materials for Thick Electrode in High-Energy-Density Lithium-ion Batteries**
Jung-Keun Yoo*
Korea Institute of Materials Science

► Additive Manufacturing of Functional Materials I

Chair: Ji-Hun Yu (KIMS), Hak-Sung Lee (KIMS)

- 13:30 SA13 **Technical issues and applications of copper and its alloys for additive manufacturing**
Mincheol Kang^{1*}, Woojong Kim², Sungmin Kang², and Victo Lee³
¹3D Printing Research Organization, ²Daegun Tech Ltd., ³Seoul Air Cargo
- 14:00 SA14 **Progress in additive manufacturing of Al-Cu alloys via Laser Powder Bed Fusion route**
Mathieu Brochu*, Satish Kumar Tumulu, Zhen Li, Jose Alberto Muniz Lerma,
and Jason Milligan
McGill University
- 14:30 SA15 **Current Research and Challenges in Additive Manufacturing of Magnetic Materials**
Joon Phil Choi¹, Segon Heo¹, Pil-Ho Lee¹, Yeo-UI Song¹, Min-Kyo Jung¹, Chang-Woo Lee¹,
Hak-Sung Lee², and Taeho Ha^{1*}
¹Korea Institute of Machinery & Materials, ²Korea Institute of Material Science
- 15:00 SA16 **Multi-material laser powder bed fusion of cobalt- and iron-based alloys**
Clodualdo Aranas Jr.^{1*}, Yuan Tian², Jubert Pasco¹ and Kanwal Chadha^{1,3}
¹University of New Brunswick, ²Voestalpine Additive Manufacturing Centre Ltd., ³University of
New Brunswick

▶ Additive Manufacturing of Functional Materials II

Chair: Kee-Ahn Lee (Inha Univ), Suk-Hoon Kang (KAERI)

- 15:40 SA17 Additive Manufacturing and Prospect of Bismuth Telluride Based Thermoelectric Materials**
Kyung Tae Kim^{1*}, Soho Jung¹, and Jae Sung Son²
¹Korea Institute of Materials Science, ²Ulsan National Institute of Science and Technology
- 16:10 SA18 A data driven design strategy to predict and optimize the performance of additive manufactured parts**
Yongjie Zhang, and Seung Ki Moon*
Nanyang Technological University
- 16:40 SA19 High Performance Li-ion Battery fabricated by Ceramic Additive Manufacturing**
Chang-Jun Bae*
Korea Institute of Materials Science
- 17:10 SA20 Analysis of structural hierarchy and anisotropic fracture behavior of 3D-printed fiber-reinforced composites**
Siwon Yu^{1,3}, Kang Taek Lee², Soon Hyung Hong¹, and Jun Yeon Hwang^{3*}
^{1,2}Korea Advanced Institute of Science and Technology, ³Korea Institute of Science and Technology

Emerald Hall

► Advanced Functional Materials (AFM) I

Chair: Bin Lee (KITECH)

- 09:00 SB08 Constructing Three-Dimensional (3-D) Thermal Networks in Boron Nitride-Epoxy- Based Composite for High Thermal Conductivity**
Minseob Lim, Jong-sik Lee, Hong-Baek Cho, and Yong-Ho Choa*
Hanyang University
- 09:20 SB09 Development of TPU/Hybrid filler contained 3d printable composites**
Kyoung-ho Song, Hansol Son, Suwon Park, Mi jung Lee, and Hyunjoo Choi*
Kookmin University
- 09:40 SB10 Graphite nanoplate (GNP) – polyvinylidene fluoride (PVDF) composite coating film for anti-corrosive electrothermal layer**
Han Kim, Byungkwon Jang, Si-woo park, Jimin Lee, and Yong-Ho Choa*
Hanyang University
- 10:00 SB11 The Formation of the HAp/Cu Complex Decorated Electrospun Nylon 6 Nanofiber for Antimicrobial Air Filters**
Jaeseok Roh¹, Myungsuk Kim¹, Seyoung Lee¹, Yun-Gu Hwang², and Kun-Jae Lee^{1*}
¹Dankook University, ²SM NANO BIO CO., LTD.

► Advanced Functional Materials (AFM) II

Chair: Sang Hoon Choi (IAE)

- 10:30 SB12(K) Progress in Multifunctional Metal Matrix Nanocomposites**
Sung Chan Yoo¹, Dongju Lee², Seong Woo Ryu³, Ho Jin Ryu^{4*}, and Soon Hyung Hong^{4*}
¹Korea Atomic Energy Research Institute, ²Chungbuk National University, ³University of Suwon, ⁴KAIST
- 11:00 SB13 High temperature endurable metal matrix composite reinforced with continuously networked TiN**
Seong-Beum Kim^{1*}, Soo-Hyun Kim¹, and Jung-Wook Cho^{1,2}
^{1,2}Pohang University of Science and Technology
- 11:20 SB14 CANCEL**
- 11:40 SB15 Effect of Nb/Zr co-addition on the soft magnetic properties of Fe_{77.5}Si_{11.5}B_{7.5}Nb_x Zr_{3-x}Cu₁ nanocrystalline alloys**
Hyun Ah Im^{1,2}, Subong An^{1,2}, Yeong Gyun Nam^{1,2}, Sangsun Yang¹, Jung Woo Lee², and Jae Won Jeong^{1*}
¹Korea Institute of Materials Science, ²Pusan National University

► Recycling and Industrial Technology of Rare Metals I

Chair: Seok-Jun Seo (KITECH)

- 13:30 SB16 Evaluation of solvent extraction for Co and Eu separation from dissolved concrete liquor**
Maengkyo Oh^{1,2}, Keunyoung Lee^{1*}, Richard I. Foster¹, Ik-Su Kim¹, and Chang-Ha Lee²
¹Korea Atomic Energy Research Institute, ²Yonsei University
- 13:50 SB17 Recycling of WC-Co soft scrap via mechanochemical ball milling**
Dongju Lee^{*}, Jaesoung Lee
Chungbuk National University
- 14:20 SB18 Recent advances in molten salt electrolysis of magnesium oxide using a liquid-metal cathode for the production of high-purity magnesium metal**
Jungshin Kang^{1,2*}, Tae-Hyuk Lee¹, Hyeong-Jun Jeoung^{1,3}, Dong-Hee Lee¹, Young Min Kim^{2,4}, Kyung-Woo Yi³, Toru H. Okabe⁵, and Jin-Young Lee^{1,2}
¹Korea Institute of Geoscience and Mineral Resources, ²University of Science and Technology, ³Seoul National University, ⁴Korea Institute of Materials Science, ⁵The University of Tokyo
- 14:50 SB19 Selection of Crucible for Reduction of Titanium Oxide in Molten Salts**
Sang Hoon Choi, Nak-Kyoon Ahn, Chan Gi Lee, and Hyun-Woo Shim^{*}
Institute for Advanced Engineering

► Recycling and Industrial Technology of Rare Metals II

Chair: Dongju Lee (Chungbuk Natl Univ)

- 15:40 SB20(I) Development of High-Strength Refractory High Entropy Alloys via Controlling Lattice/ Shear Modulus Mismatch**
Gian Song^{1*}, Kangjin Lee¹, Yunjong Jung¹, Junhee Han², Chanho Lee³, and Peter K. Liaw⁴
¹Kongju National University, ²Korea Institute of Industrial Technology, ³Los Alamos National Laboratory, ⁴The University of Tennessee
- 16:10 SB21 Electrochemical Deoxidation of Titanium and Its Alloy Using Molten Magnesium Chloride**
Go Ui Jun¹, Hamid¹, K.T. Park², and Jeoung Han Kim¹
¹Hanbat National University, ²Korea Institute of Industrial Technology
- 16:40 SB22 Rare Earth Extraction from NdFeB Magnets Using Molten Magnesium Chloride and Fluoride**
Seok-Jun Seo^{1*}, Yong-Tak Lee^{1,2}, Sung Gue Heo^{1,3}, Yeong-Woo Cho^{1,2}, Kee-Ahn Lee², and Kyoung-Tae Park^{1*}
¹Korea Institute of Industrial Technology, ²Inha University, ³Korea University
- 17:10 SB23 Preparation of High Purity refractory metals by Electron beam melting technique**
Hyun Chul Kim^{1,2}, Jae Jin-Sim^{1,3}, YongKwan Lee^{1,3}, Seok-Jun Seo^{1*}, and Kyoung-Tae Park^{1*}
¹Korea Institute of Industrial Technology, ²Korea University, ³Inha University

Ruby Hall

► Powder Materials Processing (PMP) I

Chair: Ji Woon Lee (Kongju Natl Univ)

- 09:00 SC01 Effect of Microwave-hybrid Sintering and Conventional Sintering on Grain-growth Kinetics, Grain Size Distribution and Densification of Al₂O₃ Slip Casts**
Muhammad Waqas Khalid^{1,2}, Young Il Kim^{2,3}, Muhammad Aneeq Haq^{1,2}, InYeong Kim^{2,4}, Dongju Lee³, Bum Sung Kim^{1,2}, and Bin Lee^{2*}
¹University of Science and Technology, ²Korea Institute of Industrial Technology ³Chungbuk National University, ⁴Korea University
- 09:20 SC02 Superior room and cryogenic tensile properties in CoCrFeNi medium-entropy alloy obtained through a powder-metallurgy-based fabrication route**
Sujung Son^{1*}, Peyman Asghari-Rad¹, Alireza Zagan², and Hyoung Seop Kim^{1,2*}
^{1,2}Pohang University of Science and Technology
- 09:40 SC03 Compressive Properties and Energy Absorption Characteristics of CoCrMo Shape- Optimized Lattices Fabricated by Laser Powder Bed Fusion**
So-Yeon Park¹, Kyu-Sik Kim¹, Bandar AlMangour², and Kee-Ahn Lee^{1*}
¹Inha University, ²King Fahd University of Petroleum & Minerals

► Powder Materials Processing (PMP) II

Chair: Chan Gi Lee (IAE)

- 10:10 SC04 Double-layer-insulated iron powders for high-temperature-resistant soft magnetic composites**
Min-Sun Jang¹, Jong Min Park^{1,2}, Bonuk Koo^{1,2}, Hea-Ran Kim^{1,3}, Young-Tae Kwon¹, Sangsun Yang¹ and Jae Won Jeong^{1*}
¹Korea Institute of Materials, ²Pusan National University, ³Sungkyunkwan University
- 10:30 SC05 The quantitative study on hetero-structure parameters to overcome a strength- ductility dilemma**
SeungHyeok Chung, and Ho Jin Ryu^{*}
Korea Advanced Institute of Science and Technology
- 10:50 SC06 Understanding the Phase Stability and Twinning in Nano-Oxide Dispersion Strengthened High Entropy Alloy**
Ashutosh Sharma¹, Hansung Lee², and Byungmin Ahn^{1,2*}
^{1,2}Ajou University
- 11:10 SC07 CANCEL**

▶ Artificial Intelligence in Materials and Manufacturing I

Chair: Hwi-Jun Kim (KITECH)

- 13:30 SC08 Applications of Machine Learning in Microstructure, Imaging, and Properties**
Hyoung Seop Kim^{1*}, Yongju Kim², and Jaimyun Jung³
¹Pohang University of Science and Technology ²Korea Institute of Materials Science
- 13:50 SC09 Powder XRD Pattern is All You Need**
Kee-Sun Sohn^{1*}, Jin-Woong Lee¹, Byung Do Lee¹, Joon Seo Park¹, Chaewon Park¹,
Myoungho Pyo², and Woon Bae Park²
¹Sejong University, ²Sunchon National University
- 14:10 SC10 A Study on The Design of a Cyclone Separator Through Fluid Simulation**
Yin Song¹, Whi-Jun Kim², and Ho-Young Hwang^{2*}
¹University of Science and Technology, ²Korea Institute of Industrial Technology
- 14:30 SC11 Development of optimal atomization process conditions using AI machine learning technology**
Jun Ho Hong^{*}, and Hwi Jun Kim
Korea Institute of Industrial Technology

▶ Artificial Intelligence in Materials and Manufacturing II

Chair: Hyunjoo Choi (Kookmin Univ)

- 15:00 SC12 Prediction and optimization of carburizing process by a combination of finite element method and machine learning**
Seok-Jae Lee^{1*}, and Minsu Jung²
¹Jeonbuk National University ²Korea Institute of Industrial Technology
- 15:20 SC13 Microstructure classification of Aluminum alloys based on deep learning approach**
DongEung Kim^{1*}, Moon-Jo Kim¹, Sangwoo Kim¹, and Chan bin Mo²
^{1,2}Korea Institute of Industrial Technology
- 15:40 SC14 Optimization of packing fraction of amorphous soft magnetic powders by machine learning**
Jungjoon Kim¹, Sungyeom Kim¹, Youngkyun Kim², Hwi-jun Kim³, Yongjin Kim⁴,
and Hyunjoo Choi^{1*}
¹Kookmin University, ²Institute of Advanced Engineering, ³Korea Institute of Industrial Technology,
Incheon, ⁴Korea Institute of Materials Science
- 16:00 SC15 The prediction of optimized metalloid content in Fe-Si-B-P amorphous alloys using artificial intelligence algorithm**
Min-Woo Lee¹, Young-Sin Choi¹, Do-Hun Kwon¹, Eun-Ji Cha¹, Hee-Bok Kang², Jae-In Jeong²,
and Hwi-Jun Kim^{1*}
¹Korea Institute of Industrial Technology, ²YOUNGIN ELECTRONIC

▶ Advanced Functional Materials (AFM) III

Chair: Bin Lee (KITECH)

- 16:30 SC-K1 Improvement of Thermal Conductivity of Epoxy Composites by Dispersion of Polyhedral BN Fillers**
Takafumi Kusunose^{*}
Kagawa University
- 17:00 SC-K2 Nanostructure and Function Tuning of Low-dimensional Titania for Photochemical Application**
Tohru Sekino
Osaka University
- 17:30 SC-K3 New ceramic processes by nanosecond pulsed electric fields**
Tadachika Nakayama
Nagaoka University of Technology

Sapphire Hall

► High Performance Structural Materials (HPSM) I

Chair: Dongju Lee (Chungbuk Natl Univ)

- 09:00 SD01 Oxidation Resistance and Microstructure Evolution of Aluminide Coated Stainless Steel at High Temperature Exposure**
Cheol Hong Hwang¹, Hyo Min Lee¹, Jeong Seok Oh¹, Dong Hyeon Hwang¹, Yu Seok Hwang¹, Jong won lee¹, Jeong Mook Choi², and Joon Sik Park^{1*}
¹Hanbat National University, ²Jinhap Corp.
- 09:20 SD02 Excellent strength-ductility synergy with delayed deformation-induced martensitic transformation at cryogenic temperature in laser processed 316L stainless steel**
Eun Seong Kim¹, G.M. Karthik¹, Praveen Sathiyamoorthi¹, Alireza Zargaran², Sang Guk Jeong¹, Renlong Xiong¹, Suk Hoon Kang³, Jung-Wook Cho², and Hyoung Seop Kim^{1,2*}
^{1,2}Pohang University of Science and Technology, ³Korea Atomic Energy Research Institute
- 09:40 SD03 Effect of heat treatment on the microstructure and mechanical properties of high chromium tool steel (AISI D2) fabricated by direct energy deposition**
Jung-Hyun Park¹, Kyu-Sik Kim¹, Jin-Young Kim², Yong-Mo Koo³, and Kee-Ahn Lee^{1*}
¹Inha University, ²Maxrotech Corp, ³Changsung Corp
- 10:00 SD04 Superplastic behavior of Al_{0.3}CoCrNi medium entropy alloy with multi-phase structure**
Nhung Thi-Cam Nguyen^{1,2}, Peyman Asghari-Rad^{1,2}, Praveen Sathiyamoorthi^{1,2}, Eun Seung Kim¹, Alireza Zargaran³, and Hyoung Seop Kim^{1,2,3,4*}
^{1,2,3}Pohang University of Science and Technology, ⁴Tohoku University

► High Performance Structural Materials (HPSM) II & Biomaterials

Chair: Kyung Tae Kim (KIMS)

- 10:30 SD-K1 Sintering of Silicon Boride Ceramics**
Junichi Matsushita^{*}
Tokai University
- 11:00 SD05 Fabrication and Characteristics of YSZ-WC Composite Ceramics**
Seongwon Kim^{*}, Hyeondeok Jeong, Yoonsoo Han, Sung-Soo Ryu, and Sung-Min Lee
Korea Institute of Ceramic Engineering and Technology
- 11:20 SD06 Evaluation of Heat-shield Property on TB-coated Ti6Al4V alloy**
Seong Lee^{*}, SangHoon Kim, DongHoon Kim, JeongHyo Park, and YoungMoo Kim
Agency for Defense Development
- 11:40 SD07 Reinforcing Equiatomic High Entropy Alloy in Low Elastic Modulus Ti-Nb-Zr Alloy using Powder Metallurgy Route for Biomedical Implants**
Muhammad Akmal¹, Aamir Malik¹, Wonjong Jeong², and Ho Jin Ryu^{1,2*}
^{1,2}Korea Advanced Institute of Science and Technology

► **Advanced Powder Processing and Applications I**

Chair: Soon-Jik Hong (Kongju Natl Univ), Bin Lee (KITECH)

- 13:00 SD-K2 Mechanical Alloying to Synthesize Advanced Materials**
C. Suryanarayana
University of Central Florida
- 13:30 SD08 Trend and strategic foresight of advanced powder metallurgy**
DaeKyoem Kim¹, Myung-Suk Song¹, and Taek-soo Kim^{1,2*}
¹Korea Institute of Industrial Technology, ²University of Science and Technology
- 14:00 SD09 Development and application of newly-designed Fe-Cr-B based metamorphic alloy powders**
Choongnyun Paul Kim^{1*}, Gi-Su Ham¹, and Kee-Ahn Lee²
¹Kolon Industries, ²Inha University
- 14:30 SD10 Advanced powder metallurgy to develop mass production parts, unique materials and outstanding materials**
José M. Torralba^{1,2*}, Raquel de Oro³, Elena Bernardo⁴, Andrea García-Junceda²,
Marta Cartón-Cordero^{1,2}, Venkatesh Kumaran S.^{1,2}, Soon-Jik Hong⁵, Dariusz Garbiec⁶,
and Mónica Campos¹
¹Universidad Carlos III de Madrid, ²IMDEA Materials Institute, ³TU Wien, ⁴Universität der
Bundeswehr München, ⁵Kongju National University, ⁶Zakład Zaawansowanych Technologii
Kształowania

► **Advanced Powder Processing and Applications II**

Chair: Paul Kim (KOLON Industry), Myung Seok Song (KITECH)

- 15:10 SD11 Development of metal-alloy powder for low-cost conductive paste for crystalline silicon solar cells**
Dae Hyun Kim*
Poongsan Holdings
- 15:40 SD12 Manufacturing research and characterization of 3D printing aluminum alloy powder for mobility applications**
Hongmoul Kim*, Jiwon Park, and Changhyung Yoo
HanaAMT Co., Ltd
- 16:10 SD13 Characterization of the Martensite Phase in Ti-6Al-4V Alloy Fabricated by Selective Laser Melting (SLM)**
Jaiyoung Cho
Hankook tire & Technology LTD., CO
- 16:40 SD14 Analytical modeling of geometric characteristics in polycaprolactone (PCL) scaffolds produced by materials extrusion-based additive manufacturing**
Ji-Woon Lee^{1*}, and Sung Yi²
¹Kongju National University, ²Portland State University
- 17:10 SD15 Preparation of Nanostructured TiO₂ Photocatalysts with Different Morphologies using Ammonium Hexafluorotitanate by Solution Routes**
Duk-Hee Lee, Chan-Gi Lee, and Kyung-Soo Park*
Institute for Advanced Engineering

Diamond Hall

► Advanced Functional Materials (AFM) IV

Chair: Jung Gu Lee (Univ of Ulsan)

- 09:00 SA21 Core-shell Structured Hard Ferrites for Wideband Absorption of Millimeter-wave**
Youn-Kyoung Baek^{1*}, Gi-Ryeon Jo^{1,2}, and Jung-Goo Lee¹
¹Korea Institute of Materials Science, ²Pusan National University
- 09:20 SA22 Selective Laser Melting Process for Sensor Embedding into SUS316L with Heat Dissipative Inner Cavity Design**
Hayeol Kim¹, Min Sik Lee¹, Young Tak Koo¹, Ji-Hun Yu², Hayoung Chung¹, Namhun Kim¹, Hyokyung Sung^{3*}, and Im Doo Jung^{1*}
¹Ulsan National Institute of Science and Technology, ²Korea Institute of Materials Science, ³Gyeongsang National University
- 09:40 SA23 Pd Deposition on Au via Electrochemical-Atomic Layer Deposition and Pd Film Properties**
Soo-Jin Kim¹, Sang-Hwa Yoon¹, Jinhyun Lee¹, Jinyong Shim¹, Soobin Park², and Bongyoung Yoo^{1*}
^{1,2}Hanyang University
- 10:00 SA24 The Effect of Si/B Ratio on the Glass Forming Ability of Fe_{80+x}(Si, B)_{15-x}C₁Cu₁Nb₃ Nanocrystalline Soft Magnetic Alloy**
Su Bong An^{1,2}, Hyun Ah Im^{1,2}, Yeong Gyun Nam^{1,2}, Sangsun Yang¹, Jung Woo Lee², and Jae Won Jeong^{1*}
¹Korea Institute of Materials Science, ²Pusan National University

► Advanced Functional Materials (AFM) V

Chair: Hyunjoo Choi (Kookmin Univ)

- 10:30 SA25 Effects of Different Heat Treatment on the Tensile, Impact Toughness and High Cycle Fatigue Properties of the AlSi10Mg Alloy Produced by Selective Laser Melting**
R. Kreethi, and Kee-Ahn Lee^{*}
Inha University
- 10:50 SA26 Simple Design of Nanostructured Chemi-capacitive Gas Sensor with Switchable Selectivity Triggered by Frequency Change**
Ji Young Park, Min Seob Lim, Byungkwon Jang, and Yong-Ho Choa^{*}
Hanyang University
- 11:10 SA27 Electrodeposition of Zinc Telluride Nanofilm on Non-conductive Substrate by Chemical Reaction of Tellurium Ions**
Jinmyeong Seo, Jungjoon Park, Fan Yang, Insung Hwang, and Bongyoung Yoo^{*}
Hanyang University
- 11:30 SA28 Accelerated design of high-efficiency lead-free tin perovskite solar cells via machine learning**
Taeju Bak¹, Kyusun Kim², Eunhyeok Seo¹, Jiye Han^{2,3}, Hyokyung Sung⁴, Il Jeon^{2,3*}, and Im Doo Jung^{1*}
¹Ulsan National Institute of Science and Technology, ²Sungkyunkwan University, ³Pusan National University, ⁴Gyeongsang National University

▶ Plenary Lecture

- 13:00-13:40 Carbon Neutral related to Material Industries**
Jung-Hwan Lee
President of Korea Institute of Materials Science

▶ Keynote Lecture

- 13:40-14:10 Diffusion Strategy of 3D Printing Technology and Industry**
Chang Sup Shim*
Korea Evaluation Institute of Industrial Technology (KEIT)

▶ Porous Materials I

Chair: Man Sik Kong (IAE)

- 14:20 SA29(I) Metallic Foam for Applications in the Field of Catalysis and Electrolysis**
G. Walther¹, T. Büttner¹, T. Rauscher¹, T. Weißgärber¹, J.S. Bae² and A. Tillmann³
¹IFAM, Dresden, ²Alantum Corporation, ³Alantum Europe GmbH
- 14:50 SA30 Manufacturing, Structural characteristic and Mechanical properties of Additively Manufactured CoCrMo Triply Periodic Minimal Surface Sheet Lattices**
Kee-Ahn Lee^{1*}, So-Yeon Park¹, Kyu-Sik Kim¹, and Bandar AlMangour²
¹Inha University, ²King Fahd University of Petroleum & Minerals
- 15:20 SA31(I) Current Trends and Future Directions of Ceramic Membrane Technology for Water Treatment**
In-Hyuck Song*, Jang-Hoon Ha, and Jongman Lee
Korea Institute of Materials Science

▶ Porous Materials II

Chair: Insung Lee (E&KOA)

- 16:00 SA32 Single-step Prepared Porous Li₂S-P₂S₅-C Cathode for All-solid-state Lithium Ion Batteries**
Hyung-Tae Lim^{1,2*}, Gi Hwan Chang¹, and Sung Kang³
^{1,2}Changwon National University, ³Research Institute of Industrial and Science Technology
- 16:30 SA33 Nano-porous Seed Layer to Electrodeposit Ultrathin Li-metal for all Solid-state Battery's Anode**
Boyun Jang^{1*}, Hyungjin Lee^{1,2}, Daeil Kim¹, and Joonsoo Kim¹
¹Korea Institute of Energy Research, ²Korea University
- 17:00 SA34 Gas Transport in Anode-supported Solid Oxide Fuel Cells**
Haewon Seo^{1*}, Insung Lee², and Kyung Joong Yoon¹
¹Korea Institute of Science and Technology, ²E&KOA

Emerald Hall

► Rare Earth and Energy Materials (REEM) I

Chair: Hyeondeok Jeong (KICET)

- 09:00 SB24 Synthesis of Mesoporous Copper Cobalt Oxide (CuCo₂O₄) Using Inverse Micelle Method for Supercapacitors**
Sung Gue Heo^{1,2}, Kyoung-Tae Park¹, Soong Ju Oh², and Seok-Jun Seo^{1*}
¹Korea Institute of Industrial Technology, ²Korea University
- 09:20 SB25 Consolidation of fine-grained anisotropic HDDR powders aligned by a pulsed magnetic field during hot-pressing**
Jae-Gyeong Yoo^{1,2}, Tae-Hoon Kim¹, Hee-Ryoung Cha¹, Yang-Do Kim^{2*}, and Jung-Goo Lee^{1*}
¹Korea Institute of Materials Science, ²Pusan National University
- 09:40 SB26 Efficient Titanium Deoxidation Process through Molten Salt Electrolytic and Surface Modification**
Namhun Kwon^{1,2}, Jongsu Byun^{1,3}, Soong Ju Oh², Seok-Jun Seo¹,
and Kyoung-tae Park^{1*}
¹Korea Institute of Industrial Technology, ²Korea University, ³Inha University

► Rare Earth and Energy Materials (REEM) II

Chair: Myung Seok Song (KITECH)

- 10:10 SB27 Analysis of heat-affected-zone in rare metals by electron-beam melting technique**
HyunChul Kim^{1,2}, Young-Kwan Lee^{1,3}, JaeJin-Sim^{1,3}, Seok-Jun Seo¹, SoongJu Oh²,
and Kyoung-Tae Park^{1*}
¹Korea Institute of Industrial Technology, ²Korea University, ³Inha University
- 10:30 SB28 Optimization of grain boundary structure on Cu content of multi-main phase Nd-Ce-Fe-B sintered magnet**
Kyoung-Hoon Bae¹, Jung-Goo Lee^{1*}, Sang-Hyup Lee², and Dong-Hwan Kim²
¹Korea Institute of Materials Science, ²Star Group

► Plenary Lecture (Diamond Hall)

- 13:00-13:40 Carbon Neutral related to Material Industries**
Jung-Hwan Lee
President of Korea Institute of Materials Science

► Keynote Lecture (Diamond Hall)

- 13:40-14:10 Diffusion Strategy of 3D Printing Technology and Industry**
Chang Sup Shim*
Korea Evaluation Institute of Industrial Technology (KEIT)

► Nanoscale Materials and Coating I

Chair: Tae-Joo Park (Hanyang Univ)

- 14:20 SB29 Composition and Properties Control Growth of High-Quality GaON Film by One-Step Plasma-Enhanced Atomic Layer Deposition**
Hong-Ping Ma^{1*}, Yu-Hang Liu², Hong-Liang Lu², David Wei Zhang², and Qingchun Zhang¹
^{1,2}Fudan University
- 14:50 SB30 Atomic Layer Deposition of ZnO/Ga₂O₃ Heterostructure for Formation of Quasi-Two-Dimensional Electron Gas and Resistive Switching Memory**
Xing Li¹, Xuefeng Zhao¹, Kai Liu², Dengbang Guo³, and Yuhang Liu^{3*}
¹Fudan University, ²Southern University of Science and Technology, ³Shenzhen University
- 15:20 SB31 Atomic Layer Deposition Enabled Surface Functionalization of Nanomaterials**
Woo-Jae Lee^{1,2}, Susanta Bera^{1,2}, Hyun-Jae Woo¹, and Se-Hun Kwon^{1,2*}
^{1,2}Pusan National University

► Nanoscale Materials and Coating II

Chair: Byung Joon Choi (SEOULTECH)

- 16:00 SB32 Structure Engineering of Bi_{2-x}Sb_xTe₃ via Atomic Layer Deposition for High Thermoelectric Performance**
Seong Keun Kim^{1,2*}
¹Korea Institute of Science and Technology, ²Korea University
- 16:30 SB33 Area Selective Atomic Layer Deposition with Chemo-selective Adsorption of Short-chain Alkylating Inhibitors**
Woo-Hee Kim^{*}
Hanyang University
- 17:00 SB34 Large-area Synthesis of Two-dimensional Materials and Various Applications**
Ji-Hoon Ahn^{*}
Hanyang University

Ruby Hall

► Process and Characterization of Powder Materials I

Chair: Jin-Kyu Lee (Kongju Natl Univ)

- 09:00 SC16 A fabrication route based on powder metallurgy to achieve TiC-reinforced CoCrFeMnNi composite through cold-consolidation and subsequent annealing**
Peyman Asghari-Rad^{1,2}, Nhung Thi-Cam Nguyen^{1,2}, Praveen Sathiyamoorthi^{1,2}, Yongju Kim¹, Alireza Zargaran³, and Hyoung Seop Kim^{1,2,3*}
^{1,2,3}Pohang University of Science and Technology
- 09:15 SC17 Tensile Properties of Metal Injection Molded Parts of Plasma-Gas Hybrid Atomized and Water Atomized 17-4PH Powders**
Tae-Shik Yoon^{1*}, Jin-Chun Kim², Joong-Gyeong Lim³, and Hwi-Jun Kim⁴
¹Be Global Co. Ltd., ²University of Ulsan, ³Daeshin Co, Ltd., ⁴Korea Institute of Industrial Technology
- 09:30 SC18 Development of additive manufacturing process using material extrusion technology**
Ju Yong Kim^{1*}, and Jung-Yeul Yun²
¹REPROTECH, ²Korea Institute of Materials Science

► Process and Characterization of Powder Materials II

Chair: Jae Bok Seol (Gyeongsang Natl Univ)

- 09:55 SC19 Effect of Post-heat Treatment on Microstructure and Mechanical Properties of AlSi10Mg Alloys Additively Manufactured by Selective Laser Melting**
Jung Woo Nam^{1,2}, Jeong Min Park¹, Yeong Seong Eom^{1,2}, Ji-Hun Yu¹, and Kyung Tae Kim^{1*}
¹Korea Institute of Materials Science, ²Kyungpook National University
- 10:10 SC20 Manufacturing of MoO₃ coating layer by using thermal spray processes and its microstructure and mechanical properties**
Yu-Jin Hwang^{1*}, Kyu-Sik Kim¹, Jae-Sung Park², and Kee-Ahn Lee¹
¹Inha University, ²LT Metal
- 10:25 SC21 Study on Additive Manufacturing Process to Improve Dynamic Properties of Ti-6Al-4V Alloy**
Dong-Geun Lee^{1*}, Hyung-Giun Kim², and Chang-Woo Lee²
¹Sunchon National University, ²Korea Institute of Industrial Technology

► Plenary Lecture (Diamond Hall)

- 13:00-13:40 Carbon Neutral related to Material Industries**
Jung-Hwan Lee
President of Korea Institute of Materials Science

► Keynote Lecture (Diamond Hall)

- 13:40-14:10 Diffusion Strategy of 3D Printing Technology and Industry**
Chang Sup Shim^{*}
Korea Evaluation Institute of Industrial Technology (KEIT)

► Display Target I

Chair: Eun Soo Park (EML)

- 14:20 SC22 The Study on the Effect of Extrusion Condition on the Texture in Al Alloys**
Jinkyu Lee*, and Sunki Kim
NICELMS Co., Ltd
- 14:40 SC23 Examination of Purification Effect by Impurity Segregation in Aluminum**
Seong-Ho Ha¹, Young-Kyun Kim², Sun-Ki Kim³, and Jin-Kyu Lee³
¹Korea Institute of Industrial Technology, ²Institute for Advanced Engineering, ³NICE LMS Co., Ltd
- 15:00 SC24 Effect of Additive Elements on Electrical Resistivity of Al Thin Films for TFT-LCS**
Young-Kyun Kim¹*, Sang-min Yoon¹, Bo-ram Kim¹, Seong-Ho Ha², Sun-Ki Kim³, and Jin-Kyu Lee³
¹Institute for Advanced Engineering, ²Korea Institute of Industrial Technology, ³NICE LMS Co., Ltd
- 15:20 SC25 Evaluation Method of High-purity Forged Ti for Display and Semiconductor Sputtering Target**
Junseock Park, Duri Park, Gyeongseok Seo, and SeongHui Han*
GO Element Co., Ltd
- 15:40 SC26 Development of High-purity Titanium Billet for Display and Semiconductor Sputtering Target**
Jin-ju Choi, Chan Gi Lee, and Jiwon Kim*
Institute for Advanced Engineering

► Display Target II

Chair: Dong-Hyun Kim (KITECH)

- 16:10 SC27 Cold Rolling Behavior of Highly (103) Oriented High Purity Ti Plate for Display and Semiconductor Sputtering Target**
Seungkook Bang^{1,2}, Ro Woon Lee¹, Sung Taek Hong¹, Sahn Nahm², and Leeseung Kang¹*
¹Korea Institute of Industrial Technology ²Korea University
- 16:30 SC28 Evolution of Microstructure and Texture in Mo Sheets during Hot Rolling and Recrystallization**
Goo Won Noh¹, Jongmin Byun², Seung Gyeom Kim³, and Eun Soo Park¹*
¹Eloi Materials Lab (EML) Co. Ltd., ²Seoul National University of Science and Technology, ³Sewon Advanced Metals Co. Ltd
- 16:50 SC29 Study on Grain Growth behavior according to the Sintering Process of nano-Mo Powder Manufactured by Mechanochemical Process**
Chun Woong Park¹, Jongmin Byun², and Young Do Kim¹*
¹Hanyang University, ²Seoul National University of Science and Technology
- 17:10 SC30 Mechanical Properties of Molybdenum based Thin Films for Flexible Display**
Hyun-Ji Lee, and Chan-Jae Lee*
Korea Electronics Technology Institute

Sapphire Hall

► Presentation Competition for Shinhan Diamond Award I

Chair: Gian Song (Kongju Natl Univ)

- 09:00 SD16 The Morphology Control of the Porous Hydroxyapatite via Ultrasonic Spray Pyrolysis**
Myungsuk Kim, Seyoung Lee, Jaeseok Roh, and Kun-Jae Lee^{*}
¹Dankook University
- 09:15 SD17 Study on microstructural, mechanical and thermal characteristics of Fe-10Cu alloy fabricated by selective laser melting with hot isostatic press**
Young Jae Hwang^{1,2}, Gyung Bae Bang¹, Gun Hee Kim¹, Won Rae Kim¹, Taeg Woo Lee¹, Hyuk Su Han², Kwangchoon Lee³, and Hyung Giun Kim^{1*}
¹Korea Institute of Industrial Technology, ²Konkuk University, ³MTA CO.LTD
- 09:30 SD18 A study on the change of microstructure and mechanical properties according to the stress relief heat treatment temperature of pure titanium manufactured by SLM**
Seung Jun Han^{1,2}, Gyung Bae Bang¹, Won Rae Kim¹, Gun Hee Kim¹, Taeg Woo Lee¹, Hyuk Soo Han², and Hyung Giun Kim¹
¹Korea Institute of Industrial Technology, ²Konkuk University
- 09:45 SD19 Effect of pressure on electrical and structural properties of Al₂O₃ fabricated by hot isostatic pressing**
Tae Wan Ko^{1,2}, Min Tae Kim², Hyung Giun Kim², Oh Hyung Kwon², DaeHa Kim³, Heechae Choi⁴, Taeg Woo Lee^{2*}, and HyukSu Han^{1*}
¹Konkuk University, ²Korea Institute of Industrial Technology, ³DAT Advanced Material Co., Ltd., ⁴Materials Lab
- 10:00 SD20 Fabrication, microstructure and mechanical properties of Ni based superalloy CM247LC using selective laser melting**
Jung-Uk Lee¹, Young-Kyun Kim^{1,2}, and Kee-Ahn Lee^{1*}
¹Inha University, ²Korea Institute of Materials Science

► Presentation Competition for Shinhan Diamond Award II

Chair: Young Keun Jeong (Pusan Natl Univ)

- 10:25 SD21 Effect of heat treatment on microstructural, mechanical and electrical characteristics of AlSi7Mg and AlSi10Mg alloys manufactured by SLM**
Gyung Bae Bang^{1,2}, Young Jae Hwang¹, Won Rae Kim¹, Gun Hee Kim¹, Kyung Hwan Jung¹, Soong-Keun Hyun², Eun Sun Jung³, Woo Jin Hwang³, Byung Joo Yoo³, and Hyung Giun Kim^{1*}
¹Korea Institute of Industrial Technology, ²Inha University, ³TAE SUNG S&E, Inc.
- 10:40 SD22 Effects of WC particle shapes on laser-exposed microstructures during the directed energy deposition process**
Woo-Jin Lee^{1,2}, Eun-Ah Kim^{1,2}, Yeong-Jin Woo^{1,2}, Jungho Choe¹, Dong-Yeol Yang¹, Ji-Hun Yu¹, Tae-Ho Ha³, Yoon Suk Choi², and Hak-Sung Lee^{1*}
¹Korea Institute of Materials Science, ²Pusan National University, ³Korea Institute of Machinery & Materials
- 10:55 SD23 Chemical vapor synthesis of non-agglomerated copper nanoparticles by in-flight encapsulation**
Hye-Min Park¹, Yong-Su Jo², Gwang-Hwa Jin², and Seung-Min Yang^{3*}
¹Kyonggi University, ²Korea University, ³Korea Institute of Industrial Technology
- 11:10 SD24 Development of High Performance Carbon-Cellulose Based Transpiration Generator with Column Structure for Operating Electrodialysis Desalination System**
Seung-Hwan Lee^{1,2}, Yong-Ho Choa², Inhee Cho¹, Bum Sung Kim³, and Da-Woon Jeong^{1*}
^{1,3}Korea Institute of Industrial Technology, ²Hanyang University
- 11:25 SD25 Efficient recycling process of cobalt and tungsten carbide from waste cemented carbide sludge**
Jaesoung Lee¹, Mingoo Kim², and Dongju Lee^{1,2*}
^{1,2}Chungbuk National University

▶ Plenary Lecture (Diamond Hall)

13:00-13:40 **Carbon Neutral related to Material Industries**
Jung-Hwan Lee
President of Korea Institute of Materials Science

▶ Keynote Lecture (Diamond Hall)

13:40-14:10 **Diffusion Strategy of 3D Printing Technology and Industry**
Chang Sup Shim*
Korea Evaluation Institute of Industrial Technology (KEIT)

▶ K-Powder Materials Innovation

Chair: Sangsun Yang (KIMS)

- 14:20** **SD26** **Chemical vapor synthesis of non-agglomerated nickel powder for electrode in multilayer ceramic capacitors**
Seung-Min Yang^{1*}, Yong-Su Jo^{1,2}, Hye-Min Park^{1,3}, Gwang-Hwa Jin^{1,2}, Hui-Jung Lee^{1,4}, Jun-Hee Kim⁴, and Jai-Joon Lee⁴
¹Korea Institute of Industrial Technology, ²Korea University, ³Kyonggi University ⁴Kaon Technology
- 14:40** **SD27** **Development of high-grade Cu powder and paste preparing process for MLCC external electrodes**
Hye Young Koo^{1*}, Yun Chan Kang², and Byoung-Yoon Lee³
¹Korea Institute of Materials Science, ²Korea University Seoul, ³Chang Sung Corporation
- 15:00** **SD28** **A study on the manufacturing process of high strength hardmetal material for ultra high pressure nozzles**
Gook-Hyun Ha^{1*}, Min-Soo Park¹, Yeon-Woo Kim^{1,2}, Seung-Woo Lee^{1,3}, and Kyung Mi Jang¹
¹Korea Institute of Materials Science, ²Pusan National University, ³Korea University
- 15:20** **SD29** **Development of grain boundary diffusion process in Nd-Fe-B based permanent magnets**
Tae-Hoon Kim^{1*}, Jung-Goo Lee¹, Sang-Hyub Lee², and Dong-Hwan Kim²
¹Korea Institute of Materials Science, ²Star Group Ind. Co., Ltd
- 15:40** **SD30** **Development of Solid Freeform Soft Magnetic Composites for a Servo-motor Stator**
Young-Tae Kwon¹, Jae-Won Jeong¹, Yong-Jin Kim¹, Yong-Gun Cho², Yunseok Kim³, and Sangsun Yang^{1*}
¹Korea Institute of Materials Science, ²YUSEUNG Co., Ltd, ³Sungkyunkwan University
- 16:00** **SD31** **Development of heat-resistant insulation coatings for pure iron SMCs (Soft Magnetic Composites)**
Kwangdeok Choi^{1,2}, SoYeon Lee^{1,3}, Hyunyoung Kim¹, Jong-seung Hwang⁴, Joo-youl Huh³, Kyung-Woo Yi², and Ji Young Byun^{1*}
¹Korea Institute of Science and Technology, ²Seoul National University, ³Korea University, ⁴Korea Polytechnic University

► Functional Materials

Chair: Youn Kyoung Baek (KIMS)

- 16:30 SD32 Effect of TiC addition and milling condition on the microstructure and mechanical properties of Nb-Ta-V-Ti high entropy alloy**
Jeong Pyo Lee¹, Jin Gyu Lee¹, Jong-Hyeon Lee², Gian Song¹, Soon-Jik Hong¹, and Jin Kyu Lee^{1*}
¹Kongju National University, ²Chungnam National University
- 16:45 SD33 Compositional optimization of Fe_{82.5}(B_{15-x})Si₂C_{0.5}Mo_x alloys for stable formation of high-M_s amorphous soft magnetic powders**
Yeong Gyun Nam^{1,2*}, Hyun Ah Im^{1,2}, Su Bong An^{1,2}, Hwaran Kim^{1,3}, Jung Woo Lee², Sangsun Yang¹, and Jae Won Jeong^{1*}
¹Korea Institute of Materials Science, ²Pusan National University, ³Sungkyunkwan University
- 17:00 SD34 Development of heat-resistant insulation coatings for pure iron SMCs (Soft Magnetic Composites)**
Kwangdeok Choi^{1,2}, SoYeon Lee^{1,3}, Hyunyoung Kim¹, Jong-seung Hwang⁴, Joo-youl Huh³, Kyung-Woo Yi², and Ji Young Byun^{1*}
¹Korea Institute of Science and Technology, ²Seoul National University, ³Korea University, ⁴Korea Polytechnic University
- 17:15 SD35 Study on Ni-Fe-Co Based Metal Composites as a Bifunctional Electrocatalyst For Overall Water Splitting**
Dahee Park^{*}
Korea Institute of Materials Science
- 17:30 SD36 Synergetically enhanced thermoelectric power generation of Edge Oxidized graphene bridged Cu doped N-type Bi-Te thick film**
Soo-ho Jung¹, Kyung Tae Kim^{1*}, Yong Uk Kim¹, Jeong-Yun Sun², Jong Min Park³, Dong Yeol Hyeon³, and Kwi-Il Park³
¹Korea Institute of Materials Science, ²Seoul National University, ³Kyungpook National University
- 17:45 SD37 Microstructure and mechanical properties of Ti-SUS304 dissimilar joints by diffusion bonding**
Jin Gyu Lee, Bo Hoon Jang, Jeong Pyo Lee, and Jin Kyu Lee^{*}
Kongju National University

Diamond Hall

► Powder Materials Processing (PMP) III

Chair: Kun-Jae Lee (Dankook Univ)

- 09:30 SA35 **Effect of Heat Treatment on Microstructure and Microhardness of Ti-6Al-4V Fabricated by Selective Laser Melting**
Hyeongwoo Lee¹, June Bae Lee¹, Hansung Lee², and Byungmin Ahn^{1,2*}
^{1,2}Ajou University
- 09:50 SA36 **Chemical vapor synthesis of non-agglomerated nickel nanoparticles by in-flight coating**
Yong-Su Jo¹, Hye-Min Park², Gwang-Hwa Jin¹, and Seung-Min Yang^{3*}
¹Korea University, ²Kyonggi University, ³Korea Institute of Industrial Technology
- 10:10 SA37 **New route to synthesize FeCo nano-chained particles with high permeability and their electromagnetic wave absorption properties**
Mi Se Chang^{1,2}, Min-Sun Jang¹, Sang-Sun Yang¹, Chong Rae Park², Byeongjin Park³,
Jae Won Jeong¹, and Young-Tae Kwon^{1*}
^{1,3}Korea Institute of Material Science, ²Seoul National University, Seoul, Republic of Korea

► Powder Materials Processing (PMP) IV

Chair: Myung Seok Song (KITECH)

- 10:40 SA38 **Cold sintering and canning package of Bi-Te based thermoelectric powders for recycling of waste scraps**
Haishan Shen¹, Kun-Jae Lee², Hong-Baek Cho¹, and Yong-Ho Choa^{1*}
¹Hanyang University, ²Dankook University
- 11:00 SA39 **Fabrication of ultrafine powder using processing control agent, and investigation of their effect on microstructure and thermoelectric properties of p-type (Bi, Sb)₂Te₃ alloys**
Babu Madavali¹, Pathan Sharief¹, Jun-woo Song², C. Suryanarayana³, Sung Ho Song¹,
and Soon-Jik Hong^{1*}
¹Kongju National University, ²Korea Institute of Industrial Technology, ³University of Central Florida

Emerald Hall

► Advanced Functional Materials VI

Chair: Sangsun Yang (KIMS)

- 09:30 SB35 **Synergistic effects of conductive exfoliated graphite and carbon black in ethylene-vinyl acetate-based composites to enhance resistance-temperature behavior**
Gwang-Myeong Go, Siwoo Park, Hong-Baek Cho, and Hong-Ho Choa*
Hanyang University
- 09:50 SB36 **Synthesis of Spherical Boron Nitride Particles via Spray Drying and Application for the Enhanced Thermal Conductivity of PDMS-based Composites**
Hyung Jin Mun, Minseob Lim, Hong-Baek Cho, and Yong-Ho Choa*
Hanyang University
- 09:50 SB37 **Electrochemical Exfoliation of Graphite for Highly Water-Dispersible Graphene Nanosheets**
Byungkwon Jang, Si-Woo Park, Han Kim, Sung Soo Park and Yong-Ho Choa*
Hanyang University

► Advanced Functional Materials VII

Chair: Bin Lee (KITECH)

- 10:40 SB38 **Effect of reaction parameters on stereoselective hydrogenation of biphenyl-4,4'-diol over Pd/C nanocatalyst**
Hong-Baek Cho[†], Jai-Hyun Park[†], Yong-Ho Choa^{*}, and Yeung-Ho Park^{*}
Hanyang University
- 11:00 SB39 **AI Augmented Digital Metal Component**
Eunhyeok Seo¹, Hyokyung Sung², Hyeol Kim¹, Taekyeong Kim¹, Sangeun Park², Minsik Lee², Seung Ki Moon³, Jung Gi Kim², Hayoung Chung¹, Seong-Kyum Choi⁴, Namhun Kim¹, and Im Doo Jung^{1*}
¹Ulsan National Institute of Science and Technology, ²Gyeongsang National University, ³Nanyang Technological University, ⁴Georgia Institute of Technology
- 11:20 SB40 **Cobalt and Nitrogen-Doped Carbon-Based Electrocatalyst for Hydrogen Evolution Reaction**
Bayaraa Sukhbaatar, Byungkwan Kwak, Haneul Han, Yunha Song, and Bongyoung Yoo*
Hanyang University

Ruby Hall

► Sintered Materials

Chair: Young Tae Kwon (KIMS)

- 09:30 SC31 Analysis of Thermal Conductivity of Nickel-based superalloy CM247LC Fabricated by SLM**
Kyomin Kim¹, Jageon Koo², Eunju Park², Namhun Kim², and Woochul Kim^{1*}
¹Yonsei University, ²Ulsan National Institute of Science and Technology
- 09:45 SC32 Development Strategy of a powder-based Fe-6.5%Si steel for traction motors of EV**
Ki Hyuk Kwon^{1*}, Do Hee Kim¹, Eon Sik Lee², Taeg Woo Lee³, Tae-Wook Na³,
Yong Seok Choi⁴, and Min Ho Kwon⁴
¹Research Institute of Industrial Science and Technology, ²Pohang University of Science and
Technology, ³Korea Institute of Industrial Technology, ⁴ZENIX Co., Ltd.
- 10:00 SC33 Massive Phase Transformation of Additive Manufactured Ti-6Al-4V**
Eung Ryul Baek^{*}, and Desrilia Nursyifaulkhair
Yeungnam University

► Characterization and Modeling (CAM)

Chair: Seok-Jun Seo (KITECH)

- 10:40 SC34 Artificial intelligence for aluminum alloys design**
Seobin Park^{1*}, Saif Haider Kayani^{2*}, Kwangjun Euh³, Eunhyeok Seo¹, Hyeol Kim¹,
Sangeun Park², Bishnu Nand Yadav¹, Seong Jin Park⁴, Hyokyung Sung^{2*}, and Im Doo Jung^{1*}
¹Ulsan National Institute of Science and Technology, ²Gyeongsang National University, ³Korea
Institute of Materials Science ⁴Pohang University of Science and Technology
- 11:00 SC35 AI prediction of 3D printed metal mesh structure via wifi signal disturbance**
Young Tak Koo, and Im Doo Jung^{*}
Ulsan National Institute of Science and Technology
- 11:20 SC36 Convolutional Neural Network for Surface Roughness Prediction in Direct Energy Deposition of Ti-6Al-4V Powder**
Taekyeong Kim¹, Sangeun Park², Jung Gi Kim², Hyokyung Sung², Hyoung Seop Kim³,
and Im Doo Jung^{1*}
¹Ulsan National Institute of Science and Technology, ²Gyeongsang National University, ³Pohang
University of Science and Technology