

## Symposium D : Light Metals and Alloys

November 20 (Mon.), 2023

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Session Title : Light Metals and Alloys 1

Time : 10:50 - 12:40, Nov. 20

Room # : Samda Hall A, 3F

Session Chair : Nagaumi Hiromi, Soochow University

Yong Hee Jo, Korea Institute of Materials Science

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10:50 – 11:20    **Keynote** K-D1114

**No-tradeoff of Strength and Ductility of Al-Mg Alloys**

Shae Kwang KIM, Korea Institute of Industrial Technology, Korea

11:20 – 11:35 O-D0563

**Enhancement of high-temperature strength in Al-Si alloys by microalloying with transition elements**

Jinxian Huang, Tohoku University, Japan

11:35 – 11:55    **Invited** I-D0449

**Hot deformation behavior of lightweight metals using hot torsion tests**

Soong-Keun Hyun, Inha University, Korea

11:55 – 12:10 O-D0429

**Investigation of the surface pattern formation mechanism of twin-roll cast strip by residual stress measurement**

Yusuke Takayama, National Institute Of Technology (KOSEN) , Gunma College, Japan

12:10 – 12:25 O-D0370

**Effects of Cooling Rates on Eutectic Structure and Mechanical Properties of Al-Cu-Si-Mg Quaternary Eutectic Alloy**

Byung-Joo Kim, Korea Institute of Materials Science, Korea

12:25 – 12:40 O-D0272

**Characterization of the effect of Cu-Mg cluster on Al-Cu-Mg alloy hardness**

Shin Fukuda, Hokkaido University, Japan

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Session Title : Light Metals and Alloys 2

Time : 14:00 - 15:35, Nov. 20

Room # : Samda Hall A, 3F

Session Chair : Hyunjoo Choi, Kookmin University

Bernard Rolfe, Deakin University

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14:00 – 14:20    **Invited** I-D1050

**Effect of Cu on precipitation of  $\alpha$ -Al(Mn,Cr)Si dispersoids in Al-Mg-Si-Mn-Cr alloys**

Nagaumi Hiromi, Soochow University, China

14:20 – 14:35

O-D0524

**Microstructure and tensile properties of Al-Mg- Si alloy fabricated by horizontal and vertical twin-roll casting**

Jo YongHee, Korea Institute of Materials Science, Korea

14:35 – 14:50

O-D0259

**Improvement of formability of silicon-containing recycled wrought aluminum alloy by hot stamping after rapid heating**

Ryohei Kawana, Yokohama National University, Japan

14:50 – 15:05

O-D0192

**Optimization of heat treatment process to improve mechanical properties and thermal stability of extruded Al-Mg-Si Alloy**

Jisu Kim, Korea Institute of Materials Science, Korea

15:05 – 15:20

O-D0394

**In-situ nanostructure analysis of 7000 series aluminum alloys aging at low temperature**

Tomomi Suzuki, Hokkaido University, Japan

15:20 – 15:35

O-D0532

**Enhanced strength and conductivity of Al-Mg-Si alloys with optimized Mg/Si ratio and artificial aging treatment**

Qipeng Dong, Soochow University, China

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Session Title : Light Metals and Alloys 3

Time : 16:00 -18:10, Nov. 20

Room # : Samda Hall A, 3F

Session Chair : Shinji Kumai, Tokyo Institute of Technology

Soong-Keun Hyun, Inha Unviersity

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16:00 – 16:20

Invited

I-D0409

**A new Al-Si casting alloy with high elastic modulus**

Young-Hee Cho, Korea Institute of Materials Science, Korea

16:20 – 16:35

O-D0904

**Effect of Friction Stir Processessing On MIG Welded 5083 Alloy**

Jyoti Menghani, SVNIT SURAT, India

16:35 – 16:50

O-D0557

**A general framework for tension-compression asymmetry: theory and validation**

Yong Hou, Seoul National University, Korea

16:50 – 17:05

O-D0404

**Elucidation of wetting mechanism of aluminum brazing on silicon nitride by high-temperature wettability measurements**

Takumi Kusumoto, Yokohama National University, Japan

17:05 – 17:20

O-D0383

**Effect of initial microstructure on age-hardenability and thermal conductivity of Al-7Si-0.35Mg alloy**

Saif Kayani, Korea Institute of Materials Science, Korea

17:20 – 17:35

O-D0782

**The Effect of Solute Clusters on Dynamic Recovery of Al Alloys**

Yixin Wang, Monash University, Australia

17:35 – 17:50

O-D0193

**Effect of pre-deformation process on aging response and mechanical properties of Al-Zn-Mg-Cu alloys**

Cheon Hyunseok, Korea Institute of Materials Science, Korea

17:50 – 18:10

O-D1141

**Atomic-scale analysis of hydrogen embrittlement in high-strength Al alloys**

Huan Zhao, Xi'an Jiaotong University, China

## November 21 (Tue.), 2023

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Session Title : Light Metals and Alloys 4

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

Room # : Samda Hall A, 3F

Session Chair : Jian-Feng Nie, Monash University

Shae Kwang KIM, Korea Institute of Industrial Technology

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10:50 – 11:20

Keynote

K-D0381

**Aluminium upgrade recycling for carbon neutrality**

Shinji Kumai, Tokyo Institute of Technology, Japan

11:20 – 11:35

O-D0013

**Study on determination method of rare earth elements in aluminum alloy**

Zhang Jie, Iron & Steel Research Institute of Ansteel Group, China

11:35 – 11:55

Invited

I-D0335

**Improvement of battery performance by applying iron-containing recycled aluminium to current collector-free anode of lithium-ion batteries**

Shoichi Hirose, Yokohama National University, Japan

11:55 – 12:10

O-D0008

**Dual heterogeneous precipitates promoting an excellent high-temperature strength-ductility synergy in TiB<sub>2</sub>/Al-4.5Cu composites via multi-trace alloying strategy and dynamic**

**permeability molten salt approach**

Yanqing Xue, Xi'an University of Posts and Telecommunications, China

**12:10 – 12:25**

**O-D0066**

**Simultaneous improvement of strength and ductility aluminum matrix composites containing sub-micron high-entropy alloy (HEA) particles**

Chahee Jung, Kookmin University, Korea

**12:25 – 12:40**

**O-D0592**

**Thermal Stability and Mechanical Response in Segregation-Engineered Nanocrystalline Al-TM-RE Alloys: A Combinatorial Study**

Jungho Shin, Gangneung-Wonju National University, Korea

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Session Title : Light Metals and Alloys 5

Time : 14:00 - 15:35, Nov. 21

Room # : Samda Hall A, 3F

Session Chair : Shoichi Hirose, Yokohama National University

Young-Hee Cho, Korea Institute Of Materials Science

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**14:00 – 14:30**

**Keynote**

**K-D1137**

**Modelling the influence of hot forging-aging on the multi scale microstructure of Al-Cu alloys using PINNS**

Bernard Rolfe, Deakin University, Australia

**14:30 – 14:50**

**Invited**

**I-D1079**

**D3Square: A User-Friendly, Data-Driven Machine Learning Platform for Aluminum Alloy Discovery**

Minkyu Park, Virtual Lab, Korea

**14:50 – 15:05**

**O-D0302**

**First-principles and experimental study of T1 precipitates in Al-Cu-Li alloys**

MAYA PUTRI AGUSTIANINGRUM, Pohang University of Science and Technology, Korea

**15:05 – 15:20**

**O-D0788**

**TEM observation of Al-7%Si-0.3%Mg casting alloy in T5 condition**

Taiki Tsuchiya, University of Toyama, Japan

**15:20 – 15:35**

**O-D0838**

**Design of high-strength 7xxx series aluminum alloys via machine learning**

Hyo-Sun Jang, Korea Institute of Materials Science, Korea

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Session Title : Light Metals and Alloys 6

Time : 16:00 -17:55, Nov. 21

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Room # : Samda Hall A, 3F

Session Chair : Young Min Kim, Korea Institute of Materials Science

Eiji Abe, University of Tokyo

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16:00 – 16:30 **Keynote** O-D0128

**Recent evolutions and new applications of SEN Mg alloys**

Bong Sun You, Korea Institute of Materials Science, Korea

16:30 – 17:00 **Keynote** K-D1105

**Development of Rare-earth Free High Strength Magnesium Alloys**

Yuansheng Yang, Chinese Academy of Sciences, China

17:00 – 17:20 **Invited** I-D0322

**Magnesium Alloy Sheet for Front Hood Project in Japan**

Kazumasa Yamazaki, Nippon Kinzoku Co.,Ltd., Japan

17:20 – 17:40 **Invited** I-D1142

**Research and development of Ti particle reinforced Mg composites with enhanced strength and ductility**

Xianhua Chen, Chongqing University, China

17:40 – 17:55 O-D0927

**Effect of addition of Ca in liquid Mg on the formation of Mg/Ti composites fabricated by liquid metal dealloying**

Jee Eun Jang, Kyungpook National University, Korea

## November 22 (Wed.), 2023

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Session Title : Light Metals and Alloys 7

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

Room # : Samda Hall A, 3F

Session Chair : Mingzhe Bian, AIST

Jun Ho Bae, Korea Institute of Materials Science

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10:50 – 11:10 **Invited** I-D0561

**Additive Manufacturing of Mg alloy WE43 by Directed Energy Deposition**

Cherry Chen, CSIRO Manufacturing, Australia

11:10 – 11:25 O-D0189

**Effects of different wrought processes on microstructure evolution and mechanical properties of AZ31 magnesium alloy**

Hiromasa Yoshizumi, Doshisha University, Japan

11:25 – 11:40 O-D0656

**Micro backward extrusion of Light weight Magnesium alloys**

VENKATESH BEHERA, Indian Institute Of Technology Madras, India

11:40 – 11:55

O-D0921

**Simultaneous improvement in strength and ductility of extruded AZ91 alloy by utilizing ultrasonic nano-crystalline surface modification (UNSM) treatment**

Hyun Ji Kim, Kyungpook National University, Korea

11:55 – 12:10

O-D0071

**Effect of extrusion temperature on the microstructure, mechanical properties, and cavitation behavior of Mg-0.8Mn (wt%) alloy**

ChongChao Li, Pohang University of Science and Technology, Korea

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Session Title : Light Metals and Alloys 8

Time : 14:00 - 15:35, Nov. 21

Room # : Samda Hall A, 3F

Session Chair : Kazumasa Yamazaki, Nippon Kinzoku Co., Ltd

TBD

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14:00 – 14:20

Invited

I-D0790

**Overview of Advancement and Development Trend on Magnesium Alloys based on 《Journal of Magnesium and Alloys》**

Xiaodong Peng, Chongqing University, China

14:20 – 14:35

O-D0765

**STEM Characterization of Solute Segregation and Segregation-induced/associated Precipitation in Light Alloys**

Jian-Feng Nie, Monash University, Australia

14:35 – 14:50

O-D0875

**Study of kink formation mechanism in compressed Mg alloys with LPSO phase with CPFEM simulations**

Yu Shen, University of Tokyo, Japan

14:50 – 15:05

O-D0345

**Persistent homology and 3D strain analyses of Mg/LPSO two-phase alloys**

Daiki Kuriki, The University of Tokyo, Japan

15:05 – 15:20

O-D0580

**Establishing role of microstructural engineering on strain gradient plasticity of a rare earth containing magnesium alloy**

Sourav Mishra, Indian Institute of Technology Madras, India

15:20 – 15:35

O-D0619

**The multi-solute solid solution behavior of magnesium alloys and their application on materials design**

Yuan Yuan, Chongqing University, China

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Session Title : Light Metals and Alloys 9

Time : 16:00 -18:00, Nov. 22

Room # : Samda Hall A, 3F

Session Chair : Jong-Taek Yeom, Korea Institute of Materials Science

Yoko Mitarai, University of Tokyo

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**16:00 – 16:30**     **Keynote** **K-D1066**

**Low-density, high-strength metal mechanical metamaterials beyond the Gibson-Ashby model**

Ma Qian, RMIT University, Australia

**16:30 – 16:45** **O-D0652**

**Stable strain hardening mechanism of Ti-4Al-5Mo-5V-5Cr-1Nb alloy during room temperature compression**

Chuanyun Wang, Northwestern Polytechnical University, China

**16:45 – 17:00** **O-D0289**

**The study of crack initiation of Ti-6Al-4V alloys subjected to dwell-fatigue loadings through high resolution digital image correlation**

HAO-YU HU, The University Of Tokyo, Japan

**17:00 – 17:15** **O-D0233**

**Temperature dependence of deformation and fracture in a beta titanium alloy of Ti-22V-4Al**

Rei Yano, Kyushu University, Japan

**17:15 – 17:30** **O-D0510**

**Globularization behavior of the lamellar alpha in Ti-17 alloy and its effect on mechanical properties**

Jianwei Xu, Northwestern Polytechnical University, China

**17:30 – 17:45** **O-D0197**

**Investigation of kink band formation mechanism on layered  $\alpha/\beta$  two-phase Ti-9Cr alloy with CPFEM simulations**

Junyu Zhu, University Of Tokyo, Japan

## November 23 (Thurs.), 2023

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Session Title : Light Metals and Alloys 10

Time : 09:00 -10:15, Nov. 23

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Room # : Samda Hall A, 3F

Session Chair : Xiaodong Peng, Chongqing University

Byeong-Chan Suh, Korea Institute of Materials Science

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**09:00 – 09:30**     **Keynote** **K-D0357**

**Kink strengthening of layer-structured Mg alloys**

Eiji Abe, University of Tokyo, Japan

**09:30 – 10:00**     **Invited** **I-D0343**

**Kink Strengthening of Mille-Feuille-Structured Mg-Zn-Y Alloys with  $\alpha$ -Mg Single Phase**

Yoshihito Kawamura, Kumamoto University, Japan

**10:00 – 10:15** **O-D0185**

**Ball indentation behavior in magnesium single crystals**

Hiramoto Kitahara, Kumamoto University, Japan

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**Session Title** : Light Metals and Alloys 11-1

**Time** : 10:50 -12:25, Nov. 23

**Room #** : Samda Hall A, 3F

**Session Chair** : Yoshihito Kawamura, Kumamoto University

Yan Yang, Chongqing University

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**10:50 – 11:10**     **Invited** **I-D0677**

**TD-split Texture Evolution during Thermo-Mechanical Treatment in Mg Alloy Sheets**

Byeong-Chan Suh, Korea Institute of Materials Science, Korea

**11:10 – 11:25** **O-D0024**

**Towards the development of room temperature formable magnesium alloy sheets**

Mingzhe Bian, National Institute Of Advanced Industrial Science And Technology (AIST), Japan

**11:25 – 11:40** **O-D0610**

**Twinning and detwinning in AZ31 alloy at 20K studied by in-situ neutron diffraction**

Wu Gong, Japan Atomic Energy Agency, Japan

**11:40 – 11:55** **O-D0125**

**Orientation dependence of active non-basal slips in pure magnesium single crystals**

Shinji Ando, Kumamoto University, Japan

**11:55 – 12:10** **O-D0708**

**Three-dimensional Shape and Stress Field of a Deformation Twin in Magnesium**

Hong Liu, Shanghai Jiao Tong University, China

**12:10 – 12:25** **O-D0802**



**Multi-Step processing approach to tailor texture for achieving ultrahigh strength and ductility in 2Al-1Zn-1Ca Magnesium Alloy**

HAFIZ MUHAMMAD REHAN TARIQ, Incheon National University, Korea

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Session Title : Light Metals and Alloys 11-2

Time : 10:50 -12:25, Nov. 23

Room # : 301, 3F

Session Chair : Ma Qian, RMIT University

Young-Bum Chun, Korea Atomic Energy Research Institute

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**10:50 – 11:20    Keynote** K-D0211

**Enhanced superplastic formability of a ( $\alpha+\beta$ ) Ti alloy with the metastable fine microstructure**

Hiroaki Matsumoto, Kagawa University, Japan

**11:20 – 11:50    Keynote** K-D0629

**Microstructural dependence of strength and toughness of a high-strength metastable beta titanium alloy**

Qiaoyan Sun, Xi'an Jiaotong University, China

**11:50 – 12:10    Invited** I-D0255

**Mechanical properties and twinning-induced plasticity of metastable  $\beta$ -type Ti alloys**

Ken Cho, Osaka University, Japan

**12:10 – 12:25** O-D0511

**Microstructure evolution and strength-toughness of Ti<sub>2</sub>AlNb based alloy during across B2 forging**

Jianwei Xu, Northwestern Polytechnical University, China

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Session Title : Light Metals and Alloys 12-1

Time : 14:00 -15:20, Nov. 23

Room # : Samda Hall A, 3F

Session Chair : TBD

Jae Yeon Kim, Korea Institute of Materials Science

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**14:00 – 14:20    Invited** I-D0789

**Research on the microstructure and properties of ultralight Mg-Li-X Alloys**

Yan Yang, Chongqing University, China

14:20 – 14:35

O-D0162

**Effect of cooling rate on corrosion behavior of Mg alloy containing high Al**

HONGXIU LIU, Korea Institute of Materials Science, Korea

14:35 – 14:50

O-D0750

**Tribocorrosion behavior of Mg alloys in Hank's solution**

Eri Miura-Fujiwara, University of Hyogo, Japan

14:50 – 15:05

O-D0699

**Effect of microstructure on tensile properties of Mg-Al-Zn alloy in humid air**

Toshiaki Manaka, National Institute Of Technology(KOSEN), Niihama, USA

15:05 – 15:20

O-D0143

**The influence of mischmetal (Ce, La) on the corrosion properties of AZ91 - Ca - Y alloy**

Wen Ding, Korea Institute of Materials Science, Korea

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Session Title : Light Metals and Alloys 12-2

Time : 14:00 -15:25, Nov. 23

Room # : 301, 3F

Session Chair : Qiaoyan Sun, Xi'an Jiaotong University

Nokeun Park, Yeungnam University

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14:00 – 14:20

Invited

I-D0168

**R & D of Some New High Strength Titanium Alloys in China**

Yongqing Zhao, Northwest Institute for Nonferrous Metal Research, China

14:20 – 14:40

Invited

I-D0414

**Synergistic relationship on the microstructure evolution and strength-toughening mechanism in a newly developed Ti-5321 Alloy**

Cong Wu, Shaanxi University of Science and Technology, China

14:40 – 14:55

O-D0627

**Effects of solute hydrogen, hydride phase formation and strain rate on hydrogen embrittlement in Ti6Al4V alloy**

Tien-Dung Nguyen, Chungnam National University, Korea

14:55 – 15:10

O-D0229

**Formation and annihilation of twinning in Ti35 alloy applied in nuclear industry during high temperature straining and annealing**

Jianping Xu, Xi'an Rare Metal Materials Institute Co. Ltd., China

15:10 – 15:25

O-D0519

**Fretting wear mechanism and anti-fretting wear by laser cladding of the titanium alloys**

Ke Hua, Northwestern Polytechnical University, China