

Symposium O : Materials for Sustainability (Green Steel, Recycling, and Corrosion)

November 20 (Mon.), 2023

Session Title : Materials for Sustainability (Green Steel, Recycling, and Corrosion) 1

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

Room # : 401, 4F

Session Chair

10:50 – 11:20 **Keynote** **K-O0798**

Turquoise Hydrogen Production Route for Green Steel

Youn-Bae Kang, Pohang University of Science and Technology, Korea

11:20 – 11:40 **Invited** **I-O0800**

Thermodynamics of Sulfide phase in Molten Fe–Cr–Mn Alloy

Takahiro MIKI, Tohoku University, Japan

11:40 – 11:55 **O-O0029**

Study on the optimum thickness of fine grain layer on the surface of continuous casting slab based on hot charging pretreatment process

Yang Liu, Shougang Group Co., Ltd., China

11:55 – 12:10 **O-O0032**

Study on Reuse Technology of Cold Casting Residue in the Refining

Hao Ning, Research Institute of Technology, Shougang Group Co., Ltd., China

12:10 – 12:25 **O-O0308**

New Carbon Recycling Ironmaking Process using Carbon-Iron Ore Composite

Taichi Murakami, Tohoku University, Japan

Session Title : Materials for Sustainability (Green Steel, Recycling, and Corrosion) 2

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

Room # : 401, 4F

Session Chair

14:00 – 14:30 **Keynote** **K-O0895**

Strategies of the Japanese Steel Industry to Achieve Carbon Neutrality

Takeo HOSHINO, The University of Tokyo, Japan

14:30 – 14:50 **Invited** **I-O0637**

Environment induced degradation behavior of multicomponent alloys

Hong Luo, University of Science and Technology Beijing, China

14:50 – 15:05

O-00526

Sensing of Multiphase Melts utilizing AC Electric Fields for Sustainable High-Temperature Metals Production

Noritaka SAITO, Kyushu University, Japan

15:05 – 15:20

O-00632

Thermodynamics analysis of slag-metal reactions in steel refining considering interactions of tramp elements for green steelmaking

Hideki Ono, University of Toyama, Japan

Session Title : Materials for Sustainability (Green Steel, Recycling, and Corrosion) 3

Time : 16:00 - 17:10, Nov. 20

Room # : 401, 4F

Session Chair

16:00 – 16:20 **Invited**

I-O0374

Development of hydrogen embrittlement resistant high-strength steel based on deep hydrogen trap design

Jing Liu, Wuhan University of Science and Technology/ ShenZhen University, China

16:20– 16:40 **Invited**

I-O0771

The use of secondary resources in steel manufacturing

Samane Maroufi, University of New South Wales, Australia

16:40 – 16:55

O-00639

Effect of ratio of scrap to iron source on slag-metal reactions in smelting and reduction process of iron ore

Kengo Kato, University of Toyama, Japan

16:55 – 17:10

O-00763

Effect of gangue oxide in HBI on dephosphorization in the EAF process

Minjoo Lee, Hanyang University, Korea

November 21 (Tue.), 2023

Session Title : Materials for Sustainability (Green Steel, Recycling, and Corrosion) 4

Time : 10:50 - 12:15, Nov. 21

Room # : 401, 4F

Session Chair

10:50 – 11:20 **Keynote** K-O1164

Fundamentals of Chemical Metallurgy for Sustainable Recycling

Il Sohn, Yonsei University, Korea

11:20 – 11:40 **Invited** I-O1051

Preferential Dissolution Behavior of Super Duplex Stainless Steel in an Acidic Solution

Jun-Seob Lee, Changwon National University, Korea

11:40 – 12:00 **Invited** I-O0760

Mechanisms of alloy and inclusions modulation on corrosion resistance of steels

Chao Liu, University of Science and Technology Beijing, China

12:00 – 12:15 O-O0915

Quorum-Sensing Driven Inhibitors for Mitigating Microbial Influenced Corrosion

Asma Lamin, RMIT University, Australia

Session Title : Materials for Sustainability (Green Steel, Recycling, and Corrosion) 5

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

Room # : 401, 4F

Session Chair

14:00 – 14:30 **Keynote** K-O0542

Spent EV Battery Recycling for Securing Critical Raw Materials

Jeong-Soo Sohn, Korea Institute of Geoscience and Mineral Resources, Korea

14:30 – 14:45 O-O0623

Recovery of Lithium and Valuable Metals from the Waste Secondary Battery by Eco-friendly

Pyrometallurgical Process of Molten Carbonate Electrolysis

Namhun Kwon, Korea Institution of Industrial Technology, Korea

14:45 – 15:00 O-O0745

A Study of the Recovery Process of Lithium from Waste Lithium-Ion Battery (LIB) Black Powder Using Self-Propagating High-Temperature Synthesis (SHS) Process

YONGKWAN LEE, Korea Institute of Industrial Technology, Korea

15:00 – 15:15 O-O0766

Thermodynamics of MgO solubility in slag for pyrometallurgical treatment of spent LIB

Se Hyeon Nam, Hanyang University, Korea

Session Title : Materials for Sustainability (Green Steel, Recycling, and Corrosion) 6

Time : 16:00 -17:45, Nov. 21

Room # : 401, 4F

Session Chair

16:00 – 16:20 **Invited** **I-O0739**

Trends of rare earths recycling and materialization for a circular economy

Taek-soo Kim, Korea Institute of Industrial Technology, Korea

16:20 – 16:40 **Invited** **I-O0308**

New Carbon Recycling Ironmaking Process using Carbon-Iron Ore Composite

Taichi Murakami, Tohoku University, Japan

16:40 – 17:00 **Invited** **I-O0413**

Challenges and Potential Solutions for Steel Recycling with Tramp Element

Ichiro Daigo, The University of Tokyo, Japan

17:00 – 17:15 **O-O0638**

Production of High purity rare metals by Electron Beam Melting

Kyoung-Tae Park, Korea Institute of Industrial Technology, Korea

17:15 – 17:30 **O-O0618**

Extraction of neodymium halide from NdFeB scrap

Jaeyeol Yang, Korea Institute of Industrial Technology, Korea

17:30 – 17:45 **O-O0793**

Pyrometallurgical processing of industrial wastes for recovery of precious metals

HyunJu Kim, Hanyang University, Korea

November 22 (Wed.), 2023

Session Title : Materials for Sustainability (Green Steel, Recycling, and Corrosion) 7

Time : 10:50 - 11:55, Nov. 22

Room # : 401, 4F

Session Chair

10:50 – 11:10 **Invited** **I-O0617**

The role of molten salt for sustainable rare metal smelting technology

Jong-Hyeon Lee, Chungnam National University, Korea

11:10 – 11:25

O-00666

Development of an ESR (Electroslag Remelting) simulator to predict chemical reactions during the ESR process for the recycling of high-quality steel scraps

Jae Hong Shin, Korea Institute of Industrial Technology, Korea

11:25 – 11:40

O-00734

Microstructural Analysis and Corrosion Properties of Ni Cladded STS-316H in NaCl+MgCl₂ Molten Salt

Jin Woong Park, Hanbat National University, Korea

11:40 – 11:55

O-00754

Recycling titanium scrap via deoxidation of Ti-Ni alloy by Ca and CaCl₂-LiF fluxes

Yao Su, Hanyang University, Korea

Session Title : Materials for Sustainability (Green Steel, Recycling, and Corrosion) 8

Time : 14:00 - 15:25, Nov. 22

Room # : 401, 4F

Session Chair

14:00 – 14:20

Invited

I-00860

Validating Agar as an Analog of Soil to Monitor Corrosion of Pipeline Steel

Xiaobo Chen, RMIT University, Australia

14:40 – 14:55

O-00292

Machine learning-based localized corrosion prediction considering local microstructural features in AA5083 alloy

Kaige Wu, The University of Tokyo, Japan

14:55 – 15:10

O-00331

Analysis of localized corrosion behavior of Mg₈₉Zn₄Y₇ alloy through acoustic emission with high-speed microscopic imaging

Nobu Yatagai, The University of Tokyo, Japan

15:10 – 15:25

O-00361

Effects of microstructural factors on corrosion properties of magnesium alloys processed by different wrought processing

Suda Masataka, Doshisha University, Japan

Session Title : Materials for Sustainability (Green Steel, Recycling, and Corrosion) 9

Time : 16:00 -17:35, Nov. 22

Room # : 401, 4F

Session Chair

16:00 – 16:20 **Invited** **I-O1143**

Upgrading low-grade Cu scrap by the oxidation refining of various impurities

YOUNG JO KANG, Dong-A University, Korea

16:20 – 16:35 **O-O0549**

Efficient deoxidation of off-grade titanium sponge using magnesium metal under an argon and hydrogen mixed gas atmosphere

Sung-Hun Park, Korea Institute of Geoscience and Mineral Resources, Korea

16:35 – 16:50 **O-O0936**

Toward an eco-friendly and cost-effective titanium production process

Jungshin Kang, Pusan National University, Korea

16:50 – 17:05 **O-O0651**

Manufacture of CuTi Alloy via Self-propagation High Temperature Synthesis (SHS) and Thermal Reduction Process from TiO₂ Raw Material

MYUNGSUK KIM, Korea Institute of Industrial Technology, Korea

17:05 – 17:20 **O-O1039**

Low-carbon cementitious binders with waste bricks, steel slag and fly ash

Janitha Migunthanna, Swinburne University of Technology, Australia

17:20 – 17:35 **O-O1098**

Can you have your cake and eat it too?—Simultaneous improvement of strength and corrosion resistance via the microstructure regulation of magnesium alloys

Mei-Xuan Li, Jilin University, China