

Symposia - G01

Advanced Manufacturing Technology for Materials

Oct. 15 (Sunday), 2023

Conference Room: 5602, 6# floor

8:30-10:25 Session I

Welding and Joining for Materials-Part 1

Chair: Huaping Xiong

8:30-8:35

Opening ceremony: Welcome speech

Huaping Xiong

8:35-9:00 (G01-01)

Laser Welding of Additive Manufactured 304L Stainless Steel (Keynote)

Stephen Liu, Colorado School of Mines Golden, U.S.A.

9:00-9:20 (G01-02)

Novel underwater welding methods for optimizing the process stability and joint quality (Keynote)

Chuanbao Jia, Shandong University, China

9:20-9:40 (G01-03)

Influence of strength match and strain aging of high strength pipeline girth weld metal on its service safety (Inv. Lect.)

Xueda Li, China University of Petroleum (East China), China

9:40-9:55 (G01-04)

Enhancement of NiTi-stainless steel resistance spot welded joints through a sandwich structure achieved by the Nb interlayer

Kaiping Zhang, University of Waterloo, Canada

9:55-10:15 (G01-05)

Study on dehydrogenation performance of aluminum hydride and its application for portable fuel cell

Yue Mao, Northwestern Polytechnical University, China

10:15-10:25 Coffee Break

10:25-12:05 Session II

Material Manufacturing-Part 1

Chair: Chuanbao Jia

10:25-10:45 (G01-06)

Enhancing formability of FeSi6.5 steel by anodic polarization (Inv. Lect.)

Feng Ye, University of Science and Technology Beijing, China

10:45-11:05 (G01-07)

Structural Control and Strengthening Effect of Nitride Coatings

with Gradient Structure (Inv. Lect.)

Chuanbin Wang, Wuhan University of Technology, Chaozhou Branch of Chemistry and Chemical Engineering Guangdong Laboratory, China

11:05-11:25 (G01-08)

Loss-free Tensile Ductility of Pelleted Hetero-structure Titanium Matrix Composites via Interdiffusion and Self-organization Strategy

Lei Liu, Xi'an University of Technology, China; Osaka University, Japan

11:25-11:45 (G01-09)

Preparation and properties of low-temperature co-fired ceramics via digital light processing technology (Inv. Lect.)

Zhifeng Huang, Wuhan University of Technology, China

11:45-12:05 (G01-10)

Improvement of bending toughness of a low alloy press hardening steel through in-line quenching and non-isothermal partitioning

Wei Ding, Shanghai Jiao Tong University, China

12:05-13:00 Lunch

13:00-17:50 Session III

Brazing, Soldering and Diffusion Bonding

Joint meeting with the 10th Intermediate meeting of Commission XVII, IIW, in Qingdao city, China

Chairs: Huaping Xiong and Hong Li

13:00-13:20 (G01-11) (Doc XVIIIB-0066-23)

Recent developments in equipment for diffusion bonding, process setup and applications (Inv. Lect.)

Simon Jahn, IFW, Germany

13:20-13:40 (G01-12) (Doc XVIIIB-0067-23)

Effect of CoFeCuMnCr HEA/pure metal composite interlayer on alleviating residual stress of vacuum brazed Inconel 718/SiC joints (Inv. Lect.)

Hong Li, Beijing University of Technology, China

13:40-14:00 (G01-13) (Doc XVIIIA-0285-23)

Flash Joining and Flash Brazing of Ceramic Materials

Chun Li, Harbin Institute of Technology, China

14:00-14:20 (G01-14) (Doc XVIIIB-0068-23)
Study on the welding process of Ti-6Al-4V diffusion bonding and its fracture behavior of the joint with typical interfacial voids

Zhaoxi Li, Northwestern Polytechnical University, China

14:20-14:40 (G01-15) (Doc XVIIIA-0286-23)
Electron beam brazing of stainless steel and copper (Inv. Lect.)

Erika Hodúlová, Slovak Academy of Science, Institute of Materials and Machine Mechanics, Slovakia

14:40-15:00 (G01-16) (Doc XVIIIA-0287-23)
Study on properties of AgCuInTi filler metal for active bonding of alumina ceramics

Linlin Yuan, Beijing Non-ferrous Metals and Rare Earth Research Institute Co. Ltd, China

15:00-15:20 (G01-17) (Doc XVIIIA-0288-23)
Research progress in Zr-based amorphous brazing filler metals

Huyang Li, Beihang University, China

15:20-15:40 (G01-18) (Doc XVIIIB-0069-23)
Effect of bonding temperature on microstructure and mechanical properties of Ti₂AlNb diffusion bonded joint

Jiafen Song, Northwestern Polytechnical University, China

15:40-15:50 Coffee break

15:50-16:10 (G01-19) (Doc XVIIIA-0289-23)
Constituent phases analysis in a braze joint of nickel alloy 738LC using MPEA filler(Inv. Lect.)

Zhenzhen Yu, Colorado School of Mines, U.S.A.

16:10-16:30 (G01-20) (Doc XVIIIB-0070-23)
Microstructural Evolution and Mechanical Properties of Diffusion Bonding Inconel 617 Superalloy

Shiwei Li, Northwestern Polytechnical University, China

16:30-16:50 (G01-21) (Doc XVIIIA-0290-23)
Rare earth oxide CeO₂ enhanced reactive air brazing of YSZ ceramics

Chenghao Zhang, Harbin Institute of Technology, Harbin University of Science and Technology, China

16:50-17:10 (G01-22) (Doc XVIIIB-0071-23)
Ultrastrong and ductile transient liquid phase (TLP) bonding joints reinforced by ordered multi-precipitates

Lin Yuan, Northwestern Polytechnical University, China

17:10-17:30 (G01-23) (Doc XVIIIB-0072-23)
Microstructure and mechanical characterization of diffusion bonded CoCrCuFeNi HEA/TC4 joints utilizing a Ni interlayer

Li Juan, Key Laboratory of Light Metal Materials Processing Technology of Guizhou Province, China

17:30-17:50 (G01-24) (Doc XVIIIA-0291-23)
Joining of TiAl alloy with Ti-Zr-V-Nb-Cu-Ni-Mn system filler alloy

Hongliang Feng, Beijing Institute of Aeronautical Materials, China

18:00 Dinner

Symposia - G01
Advanced Manufacturing Technology for Materials
Oct. 16 (Monday), 2023

8:30-10:15 Session IV
Material Manufacturing-Part 2
Chairs: Binbin Liu and Qiuying Yu

8:30-8:55 (G01-25)
Microstructure, Mechanical Properties and Wear Behavior of Thermally Sprayed Quasicrystalline (QC) Al-Cu-Fe Coatings (Keynote)
Wolfgang Tillmann, Technische Universität Dortmund, Germany

8:55-9:15 (G01-26)
Mechanism of stress relaxation and long-term stability of the residual stress improving treatments with water jet peening and buffing (Inv. Lect.)
Lina Yu, Osaka University, Japan

9:15-9:35 (G01-27)
Design, Additive Manufacturing, and Extreme Service Applications of Functionally Graded Materials (Inv. Lect.)
Fei Chen, Wuhan University of Technology, China

9:35-9:55 (G01-28)
Resistance of composite Ni-WC layers of specially modified structure onto the various forms of mechanical wear
Mariusz Bober, Warsaw University of Technology, Poland

9:55-10:15 (G01-29)
Preparation of polycarbosilane-derived 3D-SiC ceramics via direct ink writing
Lianzhong Zhao, Central South University, China

10:15-10:25 Coffee Break

10:25-12:05 Session V
Welding and Joining for Materials-Part 2
Chairs: Wei Liu and Huaping Xiong

10:25-10:45 (G01-30)
Microstructure, forming mechanism and mechanical properties of GH5188 + TiC system gradient materials fabricated by laser additive manufacturing (Inv. Lect.)
Neng Li, Beijing Institute of Aeronautical Materials, China

10:45-11:05 (G01-31)
Effects of Microstructure Composition and

Orientation on Micro Mechanical Property of Linear Friction Welding Joint Weld Zone for Heteromorphic TC17 Titanium Alloy
Xuan Xiao, Northwestern Polytechnical University, China

11:05-11:25 (G01-32)
Joining graphite with ZrHfNbTa and TiZrHfTa high entropy alloy interlayers by spark plasma sintering
Xincheng Wang, Northwestern Polytechnical University, China

11:25-11:45 (G01-33)
Revealing the key mechanisms of metal transfer and cavity evolution during submerged arc welding with X-ray imaging technology
Yanfei Han, Shandong University, China

11:45-12:05 (G01-34)
Study of microstructure characteristics and corrosion behavior of dissimilar aluminum alloy RFSSW joint
Da Zhang, Northwestern Polytechnical University, China

12:05-13:00 Lunch

13:30-17:05 Session VI
Material Manufacturing-Part 3
Chairs: Lina Yu and Neng Li

13:30-13:55 (G01-35)
Bulk synthesis of $Ti_{28}Zr_{40}Al_{20}Nb_{12}$ high entropy alloy: a critical evaluation of processing conditions (Inv. Lect.)
Binbin Liu, University of Science and Technology Beijing, China

13:55-14:15 (G01-36)
Electropulsing treatment for healing cracks in stainless steel and additive-manufactured TiC/316L stainless steel composites
Qing Cai, Brunel University, U.K.

14:15-14:35 (G01-37)
Advanced manufacturing of strong and ductile Ti-15Zr alloys for dental application
Yuankui Cao, Central South University, China

14:35-14:55 (G01-38)
The plasticizing mechanism of Fe-6.5wt%Si alloy under high-energy electropulsing
Zhen Wang, University of Science and Technology

Beijing, China

14:55-15:15 (G01-39)

Repair of thin-wall geometry using Inconel 718 by electrospark deposition

Jihui Yan, University of Waterloo, Canada

15:15-15:35 (G01-40)

Microstructure and properties of titanium matrix composites reinforced with in situ synthesized TiC particles

Zhiyu Sun, Beijing Institute of Aeronautical Materials, China

15:35-15:45 Coffee break

Chair: Chuanbao Jia

15:45-16:05 (G01-41)

Research progress on hot deformation behavior of high entropy alloys (Inv. Lect.)

Qiuying Yu, Beijing Institute of Aeronautical Materials, China

16:05-16:25 (G01-42)

Effect of rapid heating on microstructure and mechanical properties of Fe-6Mn-3Al-0.2C medium-Mn steel

Ying Sun, Shandong University of Science and Technology, China

16:25-16:45 (G01-43)

Failure prevention of AISI TP347 thick-wall pipe by the primary plus secondary local post weld heat treatment

Qiang Jin, Institute of Materials Joining, Shandong University, China

16:45-17:05 (G01-44)

A Low-Cost Morphology Improvement Method for Wire Arc Additive Manufactured Parts Based on Tungsten Arc Remelting

Zhao Bo, Shandong Jianzhu University, China

18:00 Dinner

Poster

(G01-45) Strong Cooperation Growth Related with Interfacial Energy Anisotropy of Two Phases in the Ternary Eutectic

Xingwu Li, Northwestern Polytechnical University, Northwest Institute for Non-ferrous Metal Research, China

(G01-46) Preparation of graphite lead-free copper by casting method based on electromagnetic heat

Yabo Fu, Taizhou University, China