

International Symposium on High-temperature Oxidation and Corrosion 2022 (ISHOC-2022)

16 OCT 2022 - 21 OCT 2022, Takamatsu, Kagawa, Japan

Oral presentation: Plenary 50 min, Keynote 30 min, Oral 25 min (including discussion)

----- **16 OCT (Sunday)** -----

Registration (15:00-18:00)

Welcome Party (18:00-21:00)

----- **17 OCT (Monday)** -----

Registration (8:00-9:05)

Opening Remarks (9:05-9:20)

S. Hayashi, Chair of ISHOC 2022

Plenary Lecture (9:20-10:10)

Chairperson : S. Hayashi

(PL01) High Temperature Corrosion Research for a Net Zero Carbon Future

Bruce A. Pint (1)

(1) Materials Science & Technology Division, Oak Ridge National Laboratory

Coffee / Tea (10:10-10:30)

Session 1, Fundamental (10:30-12:20)

Chairperson : M. Galetz and S. Hayashi

(KY-1) The Effects of Yttrium Segregated at Grain Boundaries on Mass Transfer in Polycrystalline Alumina under Oxygen Potential Gradients at High Temperatures

Satoshi Kitaoka (1), Tsuneaki Matsudaira (1), Takafumi Ogawa (1), Miyuki Takeuchi (2), Naoya Shibata (2), and Yuichi Ikuhara (2)

(1) Japan Fine Ceramics Center, Japan, (2) The University of Tokyo, Japan

(O-2) Low oxygen partial pressure oxidation of a model Ni-30Cr alloy between 500 and 900°C: point defects and oxidation mechanisms in chromia

Xian Huang (1), Sophie Bosonnet (1), Laure Martinelli (1), Paul Fossati (1), Yves Wouters (2), and Laurence Latu-Romain (2)

(1) Université Paris-Saclay, CEA, France, (2) Université Grenoble Alpes, CNRS, France

(INV-3) Transient Oxidation Behavior of Additive-Manufactured Alloy 625

Grace de Leon Nope (1), Guofeng Wang (1), Juan Manuel Alvarado-Orozco (2), Brian Gleeson (1)

(1) University of Pittsburgh, USA, (2) CIDESI (Centro de Ingenieria y Desarrollo Industrial), Mexico

(O-4) Role of the building direction on the oxidation behavior of additive manufactured superalloy Rene 65

Martin Huguet (1), Germain Boissonnet (1), Patrick Villechaise (2), Jonathan Cormier (2), Gilles Bonnet (1), and Fernando Pedraza (1)

(1) Université de La Rochelle, France, (2) Institut Pprime, UPR CNRS 3346, Physics and Mechanics of Materials Department, ISAE-ENSMA, France.

Lunch (12:20-13:30)

Session 2, Oxidation (13:30-15:10)

Chairperson : B. Gleeson and K. Kawamura

(INV-5) Rapid High Temperature Oxidation Evaluation Methodology for Alloy Design

Thomas Perez (1), Daniel Monceau (1), and Clara Desgranges (2)

(1) CIRIMAT, France, (2) Safran Tech, France

(O-6) Effects of shot peening on the stress corrosion cracking resistance of single crystal nickel-based superalloys at 550°C

Fabian Duarte Martinez (1), Nicolau Morar (2), Maadhav Kothari (3), Aabid H. Hakeem (1), Jonathan Leggett (4), Grant Gibson (4), Simon Gray (1), and John Nicholls (1)

(1) Cranfield University, UK, (2) University of London, UK, (3) Zeiss Microscopy (ZEISS House Cambridge), UK, (4) Rolls Royce Plc, Derby, UK

(O-7) Improving the surface-mechanical properties of a TiZrNbHfTa high-entropy alloy through thermal oxidation

Daniel Dickes (1), Beyza Öztürk (2), Rainer Völkl (1), Mathias C. Galetz (2), and Uwe Glatzel (1)

(1) University of Bayreuth, Germany, (2) DECHEMA-Forschungsinstitut, Germany

(O-8) Effect of Co and Fe content on oxidation of Co-Cr-Fe-Mn-Ni-Si complex concentrated alloys at 800°C

Jonathan Apell (1,2), Robert Wonneberger (2), Pauline Meyé (1), Katharina Freiberg (1), Martin Seyring (1), Stephanie Lippmann (1), and Andreas Undisz (2)

(1) Friedrich Schiller University Jena, Germany, (2) Chemnitz University of Technology, Germany

Coffee / Tea (15:10-15:25)

Session 3, Oxidation (15:25-16:15)

Chairperson : B. Gleeson and K. Kawamura

(O-9) In-situ Characterisation on Co-27Cr-6Mo Alloy during High Temperature Oxidation

Patthranit Wongpromrat (1), Phacharaphon Tunthawiroon (2), Kenta Yamanaka (3), Akihiko Chiba (3), Thanasak Nilsonthi (4), Somrerak Chandra-ambhorn (4), and Walairat Chandra-ambhorn (1)

(1) King Mongkut's Institute of Technology Ladkrabang, Thailand, (2) King Mongkut's Institute of Technology Ladkrabang, Thailand, (3) Tohoku University, Japan, (4) King Mongkut's University of Technology North Bangkok, Thailand

(O-10) Study of oxidation resistance of Co-Cr-Ta ternary alloy system for ultra-high temperature applications

MOREAU Louis Etienne (1,2), GORSSE Stephane (3), LAMBARD Guillaume (1,2), and MURAKAMI Hideyuki (1,2)

(1) Waseda University, Japan, (2) National Institute for Materials Science, Japan, (3) Institut de chimie de la matière condensée de Bordeaux, France

Session 4, Water Vapor (10:30-12:10)

Chairperson : F. Pedraza and J. Zhang

(INV-11) High temperature oxidation behavior of SOEC separator steels with Cr vaporization suppressive coatings under air / H₂+H₂O dual atmosphere

Riko Inuzuka (1), Norikazu Osada (1), Kiyoshi Imai (1), and Tsuneji Kameda (1)

(1) Toshiba Energy Systems & Solutions Corporation, Japan

(O-12) Oxidation lifetime modeling of Ni-based alloy foils in low and high flowing air+10 %H₂O

Marie Romedenne (1), Rishi Pillai (1), Sebastien Dryepondt (1), and Bruce Pint (1)

(1) Oak Ridge National Laboratory, USA

(O-13) Flow Accelerated Corrosion of titanium alloys in water at 300 °C and 15 MPa

Sabrina Selva (1,2), Frédéric Datcharry (1), Frantz Martin (1), Quentin Auzoux (1), G. Renou (2), Laurence Latu-Romain (2, 3), and Yves Wouters (2)

(1) Université Paris-Saclay, CEA, France, (2) Université Grenoble Alpes, CNRS, France, (3) Ugitech, Centre de recherches, France

----- 18 OCT (Tuesday) -----

Session 5, Coating for SOFC etc. (8:30-10:10)

Chairperson : C. Desgranges and H. Murakami

(INV-14) Formation of NiWO₄ and FeWO₄ layers as Cr ion diffusion barriers

Spicha Trakludit (1), Isao Saeki (1), and Hideyuki Murakami (2)

(1) Muroran Institute of Technology, Japan, (2) National Institute for Materials Science, Japan

(O-15) Performance of a coated and uncoated ferritic stainless steel for interconnects of solid oxide electrolyser cells

A. Casadebaigt (1), S. Bosonnet (1), F. Miserque(1), T. Dejob(2), A. Michau(2), K. Couturier(3), and F. Rouillard (1,2)

(1) Université Paris-Saclay, CEA, France, (2) Université Paris-Saclay, CEA, France

(O-16) Development of Mn-Co Spinel Coated 430 Stainless Steels for SOFC Interconnect Application

Thammaporn Thublaor (1), Saravut Thanedburapasup (1), Nattapol Wetchirarat (1), Wanna Homjabok (1), Padungaut Srihathai (1), Putinan Uawongsuwan (1), Walairat Chandra-ambhorn (2), and Somrerak Chandra-ambhorn (1,)

(1) King Mongkut's University of Technology North Bangkok, (2) King Mongkut's University of Technology Ladkrabang, Thailand

(O-17) Pure Cr-oxide formation during high-temperature oxidation of austenitic stainless steel triggered by deposition of a thin SiO_x layer

Robert Wonneberger (1), Katharina Freiberg (2), Martin Seyring (2), and Andreas Undisz (1)

(1) Chemnitz University of Technology, Germany, (2) Friedrich Schiller University Jena, Germany

Coffee / Tea (10:10-10:30)

Session 6, Coatings (10:30-12:10)

Chairperson : F. Pérez and S. Yoneda

(INV-18) Aluminide coatings with dispersed Y₂O₃ nano-particles manufactured by a combination of galvanic co-deposition and pack cementation

Mathias Galetz (1), and Christoph Grimme (1)

(1) DECHEMA-Forschungsinstitut, Germany

(O-19) Burn-in diffusion aluminide coatings to protect ferritic steel against corrosion by molten salt for concentrated solar power

M. Juez Lorenzo (1), V. Kolarik (1), E. Walschburger (1), and A. Koleczko (1)

(1) Fraunhofer Institute for Chemical Technology ICT, Germany

(O-20) Analysis of a Slurry Aluminide Coated Burner Exposed to Metal Dusting in a Syngas Production Plant After 4 Years in Service

Alina Agüero (1), Marcos Gutiérrez (1), María José Landeira Oestergaard (2), and Anette N. Hansson (2)

(1) Instituto Nacional de Técnica Aeroespacial, SPAIN, (2) Topsoe A/S, DENMARK

(O-21) Electroless metal (Ni, Co, Pt) plating for high temperature applications

Virgilio Genova (1), Marco Conti (1), Giulia Pedrizzetti (1), Laura Paglia (1) Giovanni Pulci (1), and Francesco Marra (1)

(1) Sapienza University of Rome, Italy

Lunch (12:10-13:30)

Session 7, Scale Failure (13:30-14:45)

Chairperson : J. Favergeon and A. Yamauchi

(O-22) Static Fatigue Behavior of Cr₂O₃ in Atmosphere Containing Water Vapor at High Temperatures

Yen-Ling Kuo (1), Rintaro Fukuda (1), Chiharu Fukuda (1), and Makoto Nanko (1)

(1) Nagaoka University of Technology, Japan

(INV-23) Recent Progress in the Study of the Adhesion of Thermal Oxide Scale to AISI 430 Stainless Steel Oxidised in Water Vapour and in CO₂

Panya Wiman (1), Angkana Muengjai (1), Padungaut Srihathai (1), Thammaphorn Thublaor (1), Walairat Chandra-ambhorn (2), and Somrerk Chandra-ambhorn (1)

(1) King Mongkut's University of Technology North Bangkok, Thailand (2) King Mongkut's University of Technology Ladkrabang, Thailand

(O-24) Use of in situ SEM multiple cracking test to correlate crack propagation mode in thermal oxide scales with acoustic emission signals

Solene Houde (1), Julie Marteau (1), and Jerome Favergeon (1)

(1) Université de technologie de Compiègne, France

Break (14:45-15:00)

Session 8, Scale Properties (15:00-16:15)

Chairperson : J. Favergeon and A. Yamauchi

(O-25) Effect of Scale Phase Transformation on the Accumulation Behavior of Scale Stress

Yohei Yamada (1), Ryosuke Otomo (1), Amane Kitahara (2), and Kazunori Fukuda (2)

(1) KOBE STEEL, LTD., Japan, (2) KOBELCO RESEACH INSTITUTE, INC., Japan

(O-26) Thermal Diffusivity and Conductivity of Iron Oxide Scale Provided by Oxidation

Mu Li (1), Megumi Akoshima (1), Rie Endo (2), Mitsutoshi Ueda (3), and Masahiro Susa (3)

(1) National Institute of Advanced Industry Science and Technology, Japan, (2) Shibaura Institute of Technology, Japan (3) Tokyo Institute of Technology, Japan

(O-27) Thermal insulation potential of the corrosion product resulting from the exposure of T92 steel to NaCl-KCl at high temperature by laser-flash

G. Boissonnet (1), N. Abu-warda (2), A.J. López (2), M.V. Utrilla (2), and F. Pedraza (1)

(1) Université de La Rochelle, France, (2) Universidad Rey Juan Carlos, Spain

Poster Session (16:25-18:30)

----- 19 OCT (Wednesday) -----

(8:30-9:20)

Chairperson : S. Hayashi

(PL2) Steam Oxidation Behavior of Chromia-Forming Alloys: Effects of Microstructure and Alloying Elements

Mitsutoshi Ueda (1)

(1) Tokyo Institute of Technology, Japan

Session 9, Oxidation and Microstructure (9:20-10:10)

Chairperson : D. Young and M. Ueda

(O-28) Interdiffusion coefficient evaluation for considering oxidation behavior and intermetallic phase precipitation near the surface of high Cr ferritic alloys

Dosung Lee (1), Shintaro Kondo (1), Manabu Watanabe (1) , Takako Yamashita (2), Shin Ishikawa (2), and Yoshisato Kimura (1)

(1) Tokyo Institute of Technology, Japan, (2) JFE Steel Corporation, Japan

(O-29) Influence of W- and Ta-Levels on the High-Temperature Oxidation Resistance of Single Crystalline Multinary Co-Rich Superalloys with γ/γ' -Microstructure

S. P. Hagen (1), D. Kubacka (2), E. Spiecker (2), and S. Virtanen (1)

(1) Chair for Surface Science and Corrosion, Germany, (2) Institute of Micro- and Nanostructure Research (IMN) and Center for Nanoanalysis and Electron Microscopy (CENEM), Germany

Coffee / Tea (10:10-10:30)

Session 10, Corrosion by Carbon (16:15-17:30)

Chairperson : D. Young and M. Ueda

(KY30) Carburisation of Ferritic-martensitic Steels by CO₂: Effects of Non-steady State Boundary Conditions and Position-Dependent Diffusion Coefficient

Y. Gong (1), R.C. Reed (1), T. Olszewski (2), W.J. Quadackers (2), J. Zhang (3), and D.J. Young (3)

(1) University of Oxford, UK, (2) Forschungszentrum Jülich GmbH, Germany, (3) University of New South Wales, Australia

(O-31) Oxidation of Al- and Ti-containing NiCr model alloys in different oxidizing environments

Juho Lehmusto (1), James Kurley III (2), Anton levlev (3), and Bruce Pint (4)

(1) Abo Akademi University, Finland, (2) Nuclear Energy and Fuel Cycle Division, Oak Ridge National Laboratory, USA, (3) Center for Nanophase Materials Science, Oak Ridge National Laboratory, USA, (4) Materials Science and Technology Division, Oak Ridge National Laboratory, USA

(O-32) High-temperature Oxidation Behavior of Ferritic Stainless Steel Heated in Carburizing Atmosphere

Atsutaka Hayashi (1), Nobuhiko Hiraide (1), and Jun-ichi Hamada (1)

(1) Nippon Steel Stainless Steel Corporation, Japan

(O-33) Possibilities to estimate the metal dusting attack based on the gas composition

Clara Schlereth (1), Klaus Hack (2), and Mathias C. Galetz (1)

(1) DECHEMA-Forschungsinstitut, Germany, (2) GTT-Technologies, Germany

----- 20 OCT (Thursday) -----

Session 11, Deposit Induced Corrosion (8:30-10:10)

Chairperson : D. Naumenko and T. Nishimoto

(INV-34) The Impact of Heat Flux on Experimentally Exposed Samples

Joy Sumner (1), Toyin Sanusi (1), Andrew Potter (1), and Nigel Simms (1)

(1) Cranfield University, UK

(O-35) Combined Effects of Coal Ash and Chloride Deposit on Fe-based alloys in Wet CO₂ at 650°C

Yuchen Cai (1), Jianqiang Zhang (1), Brian Gleeson (2), and David J. Young (1)

(1) University of New South Wales, Australia, (2) University of Pittsburgh, USA

(O-36) Effect of Temperature Gradient in Deposited Ash on High-Temperature Corrosion Behavior

of Heat-Resistance Steels of Waste Power Generation Boiler

Takashi Furugaki (1,2) and Shigenari Hayashi (2)

(1) Takuma CO., Japan, (2) Hokkaido University

(O-37) Thermodynamic study of alloy and coatings against high temperature oxidation under fired-biomass atmosphere

Mickaël Lambrecht (1), Gustavo García-Martín (1), María Teresa de Miguel (1), María Isabel Lasanta (1), and Francisco Javier Pérez (1)

(1) Complutense University of Madrid, Spain

Coffee / Tea (10:10-10:30)

Session 12, Corrosion in Molten Salts (10:30-12:10)

Chairperson : J. Sumner and M. Fukumoto

(O-38) Corrosion in chloride molten salts: revisiting the fundamentals

Alexandre Chmakoff (1,2), Laure Martinelli (2), Céline Cannes (1), Jérôme Serp (3), Davide Rodrigues (1), Sophie Bosonnet (2), Frantz Martin (2), and Sylvie Delpech (1)

(1) Université Paris-Saclay, France, (2) Université Paris-Saclay, CEA, France, (3) CEA, DES, ISEC, DMRC, STDC, Université de Montpellier, France"

(O-39) Corrosion study of H230 alloy in molten nitrates environment for concentrated solar power application

Mickaël Lambrecht (1), Gustavo García-Martín (1), María Teresa de Miguel (1), María Isabel Lasanta (1), and Francisco Javier Pérez (1)

(1) Complutense University of Madrid, Madrid, Spain

(O-40) Lowering Costs by Improving Efficiencies in Biomass Fueled Boilers: New Materials and Coatings to Reduce Corrosion

Mickaël Lambrecht (1), Gustavo García-Martín(1), María Teresa de Miguel(1), María Isabel Lasanta (1), Francisco Javier Pérez(1), Manuel Jesús Benito González(2), Luis Alberto Bahillo Ruiz(2), Vicent Ssentenza (3), Torbjörn Jonsson(3), Peter Mayr(4), Fabian Dittrich(4), Saara Söyrintki (5), and Pakarinen Janne (5)

(1) University of Madrid, Spain, (2) Unidad de Valorización Termoquímica Sostenible, Spain, (3) Chalmers University of Technology, Sweden, (4) Technical University of Munich, Germany, (5) VTT, Finland

(O-41) Use of electrochemical impedance spectroscopy in the study of corrosion of metal materials in contact with molten salt at high temperature

Fabiola Pineda (1)

(1) Universidad Mayor, Chile

Lunch (12:10-13:30)

Session 13, Corrosion in Salts (13:30-15:10)

Chairperson : A. Agüero and Y.L. Kuo

(O-42) Corrosion Behavior of Fe- and Ni-Based Alloys in Molten Nitrate Salts and Coating Strategies for Concentrated Solar Power Applications

Ceyhun Oskay (1), Tobias M. Meissner (1), Benjamin Grégoire (1), Bastien O. Burek (1), Ali Solimani (1), and Mathias C. Galetz (1)

(1) DECHEMA-Forschungsinstitut, Germany

(O-43) Corrosion of AISI 304L steel exposed to NaNO₃-KNO₃-NaCl-KCl molten salts

Domingo Jullian (1,2), Matías Castro-Quijada (3), Fabiola Pineda (4), Magdalena Walczak (2), and Álvaro Videla (3)

(1) Universidad de O'Higgins, Chile, (2) Pontificia Universidad Católica, Chile, (3) Pontificia Universidad Católica de Chile, Chile, (4) Universidad Mayor, Chile

(O-44) Influence of microstructure on Type-I Hot Corrosion Behaviour of Ni-Based single crystal superalloy AM1 with molten film Na₂SO₄

Angéline Martin (1,2,3), Jonathan Cormier (2), Jérémy Rame (3), and Fernando Pedraza (1)

(1) La Rochelle Université, France, (2) Institut Pprime, France, (3) Safran Aircraft Engines, France

(INV-45) Comparison of Na₂SO₄, K₂SO₄ and Na₂SO₄-K₂SO₄ deposit induced hot corrosion of a β-NiAl coating

Yaping Wang (1), Rishi Pillai (1,2), Elena Yazhenskikh (1), Martin Frommherz (3), Michael Müller (1), Willem Josef Quadackers (1), Dmitry Naumenko (1)

(1) Forschungszentrum Juelich, Germany, (2) Oak Ridge National Laboratory, USA, (3) MTU Aero Engines AG, Germany

Coffee / Tea (15:10-15:25)

Session 14, Corrosion in Salts and Metal Liquid (15:25-16:40)

Chairperson : A. Agüero and Y.L. Kuo

(O-46) Corrosion Behaviors of Fe-25Cr in the Presence of Sulphates in Ar-60CO₂-20H₂O gas at 650 and 750°C

Xuteng Xi (1), Jianqiang Zhang (1), Brian Gleeson (2), and David J. Young(1)

(1) University of New South Wales, Australia, (2) University of Pittsburgh, USA

(O-47) Corrosion of pre-oxidized austenitic stainless steel 316L in stagnant lead-bismuth eutectic containing 10-8 wt.% oxygen at 803 K

Nao Watanabe (1), Eriko Irisawa (1), and Chiaki Kato (1)

(1) Nuclear Science and Engineering Center, Japan

(O-48) Comparison of Cyclic Oxidation and Hot Corrosion kinetics of Ni-base Superalloys

Tom Sanviemvongsak (1,2), Daniel Monceau (2), Elodie Hourcastagné (3), Fabrice Crabos (3), Clara Desgranges (1), and Bruno Macquaire (1)

(1) Safran Tech, France, (2) CIRIMAT, CNRS, France, (3) Safran Helicopter Engines – Safran Group, France

Banquet (18:00-20:00)

----- 21 OCT (Friday) -----

Session 15, Oxidation and Corrosion of Ultrahigh Temperature Materials, Ceramics, and Composite (8:30-9:55)

Chairperson : M. Nanko and K. Shimoda

(KY-49) Oxidation of Refractory Multiple Principal Element Alloys

Charlotte Brandenburg (1), David Beaudry (2), Michael Waters (3), James Rondinelli (3), Mitra Taheri (2), and Elizabeth J. Opila (1)

(1) University of Virginia, USA, (2) Johns Hopkins University, USA, (3) Northwestern University, USA

(O-50) Influence of Al_2O_3 scale on high-temperature oxidation of Ti_2AlC MAX phase ceramics

Naoya Yamaguchi (1), Jarosław Dąbek (2), Tomasz Brylewski (2), Yen-Ling Kuo (1), and Makoto Nanko (1)

(1) Nagaoka University of Technology, Japan, (2) AGH University of Science and Technology, Poland

(INV-51) Effect of Ni Ion Diffusion on the Growth of NiAl_2O_4 Layer of $\text{Ni}/\text{Al}_2\text{O}_3$ Self-Healing Ceramics

Daisuke Maruoka (1), Takumi Oyama (1), Taichi Murakami (1), and Eiki Kasai (1)

(1) Tohoku University, Japan

Coffee / Tea (9:55-10:15)

Session 16, Oxidation and Corrosion of Ultrahigh Temperature Materials, Ceramics, and Composite (10:15-11:55)

Chairperson : E. Opila and D. Maruoka

(INV-52) High temperature fatigue properties of SiC/SiC CMCs

Kazuya Shimoda (1) and Hideki Kakisawa (1)

(1) National Institute for Materials Science, Japan

(O-53) Synergistic Effects of Oxidation and Load on $\text{SiC}/\text{BN}/\text{SiC}$ Ceramic Matrix Composite Degradation at Intermediate Temperatures

Kaitlin N. Detwiler (1) and Elizabeth J. Opila (2)

(1) Air Force Research Laboratory, Wright-Patterson Air Force Base, USA, (2) University of Virginia, USA

(O-54) Method for quantitative measurement of CMAS infiltration in columnar Thermal Barrier Coatings

Koldo Almandoz Forcén (1), Christine Chalk (1), Luis Isern Arrom (1), John Rayment Nicholls (1)

(1) Cranfield University, UK

(O-55) Calcium-Magnesium Alumino Silicate Corrosion Behavior of Air Plasma Sprayed Nanostructured $\text{Gd}_2\text{Zr}_2\text{O}_7$ Thermal Barrier Coatings

M. Bahamirian (1) and S.M.M. Hadavi (2)

(1) Yazd University, Iran, (2) Tarbiat Modares University, Iran

Closing Remarks (11:55-12:15)

M. Nanko, Vice Chair of ISHOC-2022

Poster Presentation

(P01) Element Effect and High Temperature Oxidation of NbTi-rich Refractory High Entropy Alloy

Wei-Chih Lin (1,2), MOREAU Louis Etienne (3,4), Hideyuki Murakami (3,4), Kai-Chi Lo (1,5), An-Chou Yeh (1,5), and Stéphane Gorsse (2)

(1) National Tsing Hua University, Taiwan (2) CNRS, Univ. Bordeaux, France (3) National Institute for Materials Science, Japan. (4) Waseda University, Japan. (5) National Tsing Hua University, Taiwan

(P02) Effect of Ti on High Temperature Oxidation Behavior of Al₂O₃ Forming Austenitic Steels

Ryo Tatsushima (1), Shigenari Hayashi (1), and Suzue Yoneda (1)

(1) Hokkaido University, Japan

(P03) Cyclic oxidation and breakaway at 1150°C of thin nickel-based superalloy samples

Thomas Perez (1), Clara Desgranges (2), Tom Samvienwongsak (2) and Daniel Monceau (1)

(1) CIRIMAT, CNRS-INPT-UPS, ENSIACET, FRANCE (2) Safran Tech, France

(P04) Oxidation Behavior of Nickel based Alloys at 1273 K for Oxygen Hydrogen Combustion Chamber

Abdul Latif (1), Mitsutoshi Ueda (1), Ryota Nagashima (1), and Masao Takeyama (1)

(1) Tokyo Institute of Technology, Japan

(P05) Effect of Oxygen on the Oxidation of Ni-base Alloy in a Hydrogen Environment

Michihisa Fukumoto (1), Seiya Hara (1), Kano Nakajima (1), Hiroki Takahashi (1), and Hideyuki Murakami (2,3)

(1) Akita University, Japan (2) National Institute for Materials Science, Japan (3) Waseda University, Japan

(P06) Effect of Water Vapor on High Temperature Oxidation of Fe-10 mass% Ni Alloy

Aya Harashima (1,2) and Shigenari Hayashi (2)

(1) Nippon Steel Corporation, Japan (2) Hokkaido University, Japan

(P07) High Temperature Corrosion Behavior of Martensitic Stainless Steel in water vapor containing HCl

Takeru Sakka (1), Shigenari Hayashi (1) and Ryotaro Yamamoto (2)

(1) Hokkaido University, Japan (2) Ebara Corporation, Japan

(P08) Influence of Water Vapor and Temperature on the Oxide Scale Growth and Alpha-Case Formation in Ti-6Al-4V Alloy

B. Öztürk (1), L. Mengis (1), D. Dickes (2), U. Glatzel (2), and M. C. Galetz (1)

(1) DECHEMA Research Institute, Germany (2) University of Bayreuth, Germany

(P09) Supercritical Water Oxidation of Ti-O Alloys

Yoshiaki Toda (1), Yuhei Manita (2), Nina Kobata (1) and Motoaki Morita (2)

(1) National Institute for Materials Science, Japan (2) Tokyo University of Marine Science and Technology, Japan

(P10) High Temperature Oxidation Behaviors of Ti-40Al-2Cr and Ti-42Al-2Cr Alloys

K. Niinobe (1) and H. Kitagawa (2,3)

(1) National Institute of Technology, Matsue College, Japan, (2) Shimane University, Japan, (3) Next

generation Tatara Co-Creation Centre (NEXTA), Japan

(P11) The effect of yttrium addition on static and cyclic oxidation behavior of Hastelloy-X at 900 °C built by selective laser melting

Santhosh Banoth (1), Moreau Louis Etienne (2), Thaviti Naidu Palleda (1), Murakami Hideyuki (2, 3), and Koji Takehi (1)

(1) Tokyo Metropolitan University, Japan, (2) National Institute for Materials Science, Japan, (3) Waseda University, Japan

(P12) Preoxidation of FeCrAl particles in Fluidized Bed Reactors for additive manufacturing

Antoine Duval (1), Germain Boissonnet (1), Gilles Bonnet (1), and Fernando Pedraza (1)

(1) La Rochelle Université, France

(P13) Erosion-Corrosion Behavior of Ni-5Cr-xFe Alloy in Fluidized Bed Biomass Boiler Condition

Suzue Yoneda (1), Shigenari Hayashi (1), Takashi Kogin (2), Eiji Ishikawa (3) and So Murasue (4)

(1) Hokkaido University, Japan (2) Dai-ichi High Frequency Co., Ltd., Japan (3)EBARA Environmental Plant Co., Ltd., Japan (4)EBARA Corporation, Japan

(P14) Effect of Chloride Concentration on Breakdown of a Cr₂O₃ Scale Formed on Austenitic Heat Resistant Steels Embedding in Simulated Ash

Shingo Mizuno (1), Shigenari Hayashi (1), Takashi Furugaki (1,3), and Suzue Yoneda (1)

(1) Hokkaido University, Japan (3) TAKUMA Co., Ltd., Japan

(P15) A Comparison between Catalytically Inhibiting and Chromia Scale-forming Additively Manufactured Alloys under Metal Dusting Attack

Emma White (1), Clara Schlereth(1), Till König(1), Benedikt Nowak(2), Jan-Phillip Roth(3,4), Kathrin Jahns(3,4), Ulrich Krupp(3,4), and Mathias Galetz (1)

(1) DECHEMA Forschungsinstitut, Germany (2) VDM Metals International GmbH, Germany (3) University of Applied Sciences, Germany (4) Steel Institute (IEHK) at RWTH Aachen University, Germany

(P16) Influence of Cu Addition on the Corrosion Behavioral 510°C

Sayaka Shima (1), Akira Yamauchi (1), Asako Toda (3) and Takao Kitagawa (3)

(1) National Institute of Technology, Gunma College, Japan (2) JFE Engineering Corporation, Japan

(P17) Corrosion resistance of Ni-based and Fe-based alloys in molten carbonates salts

Takumi Nishimoto (1) and Yoshitaka Nishiyama (1)

(1) Nippon Steel Corporation, Japan

(P18) Initial Type-II hot corrosion mechanism in Ni-Al alloy

Tomohiro Asama (1), Shigenari Hayashi (1), Yuta Tanaka (2) and Yasuo Matsunaga (3)

(1) Hokkaido University, Japan (2) IHI Corporation, Japan (3) IHI Corporation, Japan

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Jun Ohigashi (1), Kenichi Kawamura (1), Mitsutoshi Ueda (1), Eriko Irisawa (2), Atsushi Komatsu (2), and Chiaki Kato (2)

(1) Tokyo Institute of Technology, Japan (2) Japan Atomic Energy Agency, Japan

(P20) Calculation of Appropriate Oxygen Concentration for Corrosion Inhibition of 9Cr-1Mo Steel in Molten Lead Bismuth Eutectic

Atsushi Komatsu (1), Chiaki Kato (1)

(1) Japan Atomic Energy Agency, Japan

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Eriko Irisawa (1), Lidiana Utami (2), Chiaki Kato (1), and Mitsutoshi Ueda (2)

(1) Japan Atomic Energy Agency, Japan (2) Tokyo Institute of Technology, Japan

(P22) The effect of oxide layer on creep deformation of heat-resistant Al alloy

Nishi Akira (1), Hayashi Shigenari (1), Minoda Tadashi (2), Nakajima Daiki (2), and Miyazaki Satoshi (2)

(1) Hokkaido University, Japan (2) UACJ Corporation, Japan

(P23s) Effect of Oxygen in Atmosphere on Adhesion of Oxide Scales on Hot-rolled Steel Strips Produced from Recycled Steel

Thanasak Nilsonthi (1), Jittra Sengsee (1), Yingyai Paengwach (1), and Somrerak Chandra-ambhorn (1)

(1) King Mongkut's University of Technology North Bangkok, Thailand

(P24) Stress measurement across the iron oxide scale formed on a pure-Fe during an isothermal transformation by in situ high-temperature X-ray diffraction combined with a constant X-ray penetration depth method

Yurika Yamanouchi (1), Shigenari Hayashi (1), Kosuke Hayashi (2), Yasuyoshi Hidaka (2) and Masugu Sato (3)

(1) Hokkaido University, Japan, (2) Nippon Steel Corporation, Japan, (3) Japan Synchrotron Radiation Research Institute, Japan

(P25) Temperature Dependence of Thermal Expansion in Fe_3O_4 and $(\text{Fe,Cr})_3\text{O}_4$

Makoto Nanko (1), and Taro Sasaki (1)

(1) Nagaoka University of Technology, Japan

(P26) Crack-healing behavior of SiC dispersed Yttrium Silicate composites by oxidation in air and water vapor

Huong Thi Nguyen (1), Yen-Ling Kuo (1), Makoto Nanko (1)

(1) Nagaoka University of Technology, Japan

(P27) Elemental Effects on the Oxidation Behaviors of Refractory Compositionally Complex Alloys

Kai-Chi Lo (1,2), Hideyuki Murakami (3,4), Uwe Glatzel (5), Jien-Wei Yeh (1,2), Stéphane Gorsse (6), and An-Chou Yeh (1,2)

(1) National Tsing Hua University, Taiwan (2) National Tsing Hua University, Taiwan (3) National Institute for Materials Science, Japan. (4) Waseda University, Japan. (5) University of Bayreuth, Germany (6) CNRS, Univ. Bordeaux, France

(P28) The mechanism of formation of vanadium carbide layers by powder pack method

Daichi Fujisaki (1), and Shigenari Hayashi (1)

(1) Hokkaido University, Japan

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L. Boccaccini (1), R. Troncy (1), G. Bonnet (1), X. Montero (2), M.C. Galetz (2), and F. Pedraza (1)

(1) LaSIE, La Rochelle Université, France (2) DECHEMA-Forschungsinstitut, Germany

(P30) Diffusion and Thermal Barrier Coating Systems on Ni-based Alloys and Thermal-Cyclic Oxidation Properties

Yasumichi Kato (1) , Takuro Narita (1) , Kazuhiko Koseki (1) , Mayumi Ara (1) , and Toshio Narita (1,2)
(1) DBC System R and D, Co. Ltd. (2) Hokkaido University, Japan

(P31) Application of Pt-based paste coating for surface modification of cast Ni-based superalloys

Hideyuki. Murakami (1)

(1) National Institute for Materials Science, Japan

(P32) Isothermal oxidation behavior of Rene N5 superalloy coated with Ni and Ni-CeO₂ electroless modified slurry aluminide coatings

Thomas Kepa (1), Gilles Bonnet (1), Virgilio Genova (2), Giovanni Pulci (2), Cecilia Bartuli (2), Francesco Marra (2), and Fernando Pedraza (1)

(1) La Rochelle Université, France (2) Sapienza University of Rome, Italy

(P33) 8000h Corrosion Resistance of Coated Materials for Biomass Power Plants

Sergio Rodríguez (1) Pauline Audigié (1) and Alina Agüero (1)

(1) Instituto Nacional de Técnica Aeroespacial, Spain

(P34) The Effect of Ru Particle s Coating on Electrical Resistance of JFE 20 5USR for Solid Oxide Cell (SOC) Application

M. Febry (1) A. Mizutani (1) T. Yano (1), T. Nakamura (1), M. Yoshino (1), and R. Sugihara (1)

(1) JFE Steel Corporation, Japan