

Symposium 16

Symposium 16: Innovation in Refractories and Traditional Ceramics

Main Organizers

- Toshiyuki Nishimura, NIMS, Japan
- Toshitaka Ota, Nagoya Institute of Technology, Japan
- Kenji Ogawa, Taiheiyo Cement Corp., Japan

Co-Organizers

- Shinobu Hashimoto, Nagoya Institute of Technology, Japan
- Marc Huger, ENSCI, France
- Emile Hideki Ishida, Tohoku University, Japan
- Norifumi Isu, INAX Corporation, Japan
- Yuichi Kobayashi, Aichi Institute of Technology, Japan
- John C. G. Lee, Research Institute of Industrial Science & Technology, Korea
- Junji Omyoji, Okayama Ceramics Research Foundation, Japan
- Victor Carlos Pandolfelli, Universidade Federal São Carlos, Brazil
- Takeshi Shiono, Kyoto Institute of Technology, Japan
- Jeffrey Smith, Missouri University of Science and Technology, USA
- Toyohiko Sugiyama, AIST, Japan
- Jinkun Yu, Northeastern University, China
- Shaowei Zhang, The University of Sheffield, UK

Oral Session

Monday, November 15

Room: 806

14:15 - 15:15 Refractories: Carbon-containing Refractories I

Chair: Jinkun Yu (Northeastern University, China)

14:15 - 14:45

S16-001 Novel Carbon-Containing Refractories with Improved Microstructure, Property and Performance (Invited)

S. Zhang; The University of Sheffield, UK

14:45 - 15:00

S16-002 Effects of Alumina Grain Size Distribution on Properties of Alumina-Graphite Bricks

R. Suzuki, M. Ogata, E. Iida; Shinagawa Refractories Co., Ltd., Japan

15:00 - 15:15

S16-003 Synthesis of MgAl₂O₄-SiC-C Refractory Composite Powder by Forsterite, Alumina and C as Raw Material

C. Deng, P. Liang, H. Zhu, Y. Wei, C. Bai; Wuhan University of Science and Technology, China

15:15 - 16:00 Refractories: Carbon-Containing Refractories II

Chair: Toshitaka Ota (Nagoya Institute of Technology, Japan)

15:15 - 15:45

S16-004 Development of the Self-Repairing Function of the Carbon-Containing Refractory (Invited)

A. Yamaguchi; Okayama Ceramics Research Foundation, Japan

15:45 - 16:00

S16-005 High Performance Trough Castables with High Level of Carbon Black

T. Iida, M. Kitamura, N. Yuki; Shinagawa Refractories Co., Ltd., Japan

16:00 - 16:15 Break

16:15 - 17:30: Refractories: Corrosion

Chair: Shaowei Zhang (The University of Sheffield, UK)

16:15 - 16:30

S16-006 Effect of Electromagnetic Field on the Slag Resistance of MgO-C Refractories

X. Li, T. Wang, B. Zhu; Wuhan University of Science and Technology, China

16:30 - 16:45

S16-007 Lab Scale Study of the Depletion of Mullite-Corundum Based Refractories Caused by Reaction with Scaffold Materials

J. Stjernberg¹, M-L. Antti¹, J. C. Ion¹, B. Lindblom²; ¹Luleå University of Technology, Sweden, ²LKAB, Sweden

16:45 - 17:15

S16-008 Improvement of Slag Corrosion Resistance of Refractories by Adding Carbothermal Reduction Reacted Non-oxides (Invited)

J. Yu, Z. Yan, B. Ma, Q. Zhu; Northeastern University, China

17:15-17:30

S16-009 Analysis of the 3D Microstructure of Zirconia-Rich Fused-Cast Refractories: Influence on Mechanical Properties and Corrosion Resistance

Y. Ding^{1,2}, M. Boussuge¹, M. Gaubil², S. Forest¹, L. Massard², S. Gailliègue¹; ¹MINES-ParisTech, France, ²Saint-Gobain CREE, France

Tuesday, November 16

Room: 806

9:15 - 10:30: Refractories: Fundamental

Chair: Marc Huger (ENSCI, France)

9:15 - 9:45

S16-010 Trend of Refractory Industry in Japan (Invited)

H. Nishio; Shinagawa Refractories Co., Ltd., Japan

9:45 - 10:00

S16-011 Matrixes for Polyhedration of Multicomponent Systems

V. Lutsyk, V. Vorobjena; RAS, Russia

10:00 - 10:15

S16-012 Refractory of Furnaces to Reduce Environmental Impact

S. Hanzawa^{1,2}; ¹NGK Insulators, LTD., Japan, ²Nagoya Institute of Technology, Japan

10:15 - 10:30

S16-013 Study of the Behaviour of Mold Powders for Continuous Casting by Using the Heating Microscope

M. Paganelli, D. Sighinolfi; Expert System Solutions S.r.l., Italy

10:30 - 10:45 Break

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10:45 - 11:45: Refractories: Evaluation

Chair: Takeshi Shiono (Kyoto Institute of Technology, Japan)

10:45 - 11:00

S16-014 Influence of Pore Structure Parameters on Thermal Properties of Matrix of Corundum Based Castables

B. Zhu¹, B. Fang^{1,2}, X. Gao², X. Li¹, X. Jiang¹, F. Zhao¹; ¹Wuhan University of Science and Technology, China, ²Shangyu Zili Industries New Material Co. Ltd., China

11:00 - 11:15

S16-015 Elaboration and Characterization of Flexible Ceramics: Case of Aluminum Titanate Samples

A. Gallet-Doncieux¹, M. Boursin¹, J.-P. Cochard¹, T. Chotard¹, M. Huger¹, P. Michaud¹, T. Ota², N. Adachi²; ¹GEMH-ENSCI, France, ²Nagoya Institute of Technology, Japan

11:15 - 11:45

S16-016 Microstructural Effects Associated to CTE Mismatch for Enhancing the Thermal Shock Resistance of Refractories (Invited)

M. Huger¹, T. Ota², N. Tessier-Doyen¹, T. Chotard¹, P. Michaud¹; ¹GEMH-ENSCI, France, ²Nagoya Institute of Technology, Japan

14:15 - 15:00: Reuse and Recycle Systems

Chair: Emile Hideki Ishida (Tohoku University, Japan)

14:15 - 14:30

S16-017 Development of Cordierite Honeycomb Ceramics Using Cordierite Waste

C. Mongkolkachit¹, P. Aungkavattana¹, W. Gosuphan², T. Wasanapiarnpong²; ¹National Metal and Materials Technology Center, Thailand, ²Chulalongkorn University, Thailand

14:30 - 14:45

S16-018 Characterization of Zeolite-Geopolymer Hybrid Bulk Materials from Coal Fly Ash

H. Takeda, S. Hashimoto, S. Honda, Y. Iwamoto; Nagoya Institute of Technology, Japan

14:45 - 15:00

S16-019 Preparation of Insulating Ceramics with Low Dielectric Constant Fabricated by Low-Temperature Firing Waste Glass Powder Compacts with Crystallization

M. Sato¹, T. Takaishi¹, H. Inada¹, T. Shiono², Y. Okamoto², K. Hayashi²; ¹Kyoto Municipal IRI, Japan, ²Kyoto Institute of Technology, Japan

15:00 - 15:45: Advances in Whiteware I

Chair: Yuichi Kobayashi (Aichi Institute of Technology, Japan)

15:00 - 15:15

S16-020 How the Surface of a Ceramic Kyusu Teapot Influences the Taste of Green Tea

J. Inagaki, T. Nishikawa; Mie Prefecture Industrial Research Institute, Japan

15:15 - 15:30

S16-021 Fabrication of Cordierite/Spodumene Composite by Slip Casting for Stove Top Ceramic Cookware

P. Junlar^{1,2}, W. T. Saengchantara², T. Wasanapiarnpong¹; ¹Chulalongkorn University, Thailand, ²Ministry of Science and Technology, Thailand

15:30 - 15:45

S16-022 Fabrication of Silica Glass Ware from Rice Husk Ash by Viscous Sintering with Spodumene Additions

B. Vorajesdarom, T. Wasanapiarnpong; Chulalongkorn University, Thailand

15:45 - 16:45: Advances in Whiteware II

Chair: Jun-ichi Inagaki (Mie Prefecture Industrial Research Institute, Japan)

15:45 - 16:00

S16-023 Characterization of Low Firing Temperature Ceramic Glaze Using Phuket MSW and Soda Lime Cullet

P. Ketboonruang, S. Jinawat, D. P. Kashima, T. Wasanapiarnpong, P. Sujaridworakun, W. Buggakupta, N. Traiphol, S. Jiemsirilers; Chulalongkorn University, Thailand

16:00 - 16:15 Break

16:15 - 16:30

S16-024 Effects of Firing Atmosphere on the Color Manifestation of Celadon

H.-S. Choj¹, J.-H. Pee¹, W.-S. Cho¹, K.-J. Kim¹, G.-I. Gang², J.-H. Ryu³; ¹KICET, Korea, ²Dankook University, Korea, ³Haegang Koryo-Celadon, Korea

16:30 - 16:45

S16-025 Effect of Porcelain Shape on Strain Behavior of Strengthened Porcelain in Impact Test

A. Hayashi^{1,2}, K. Kurachi¹, M. Mizuno¹, T. Ota²; ¹Gifu Prefectural Ceramics Research Institute, Japan, ²Nagoya Institute of Technology, Japan

Wednesday, November 17

Room: 806

9:30 - 10:30: Building Materials I

Chair: Thanakorn Wasanapiarnpong (Chulalongkorn University, Thailand)

9:30 - 9:45

S16-026 Processing of Photocatalytic, Highly Hydrophilic Porcelain Stoneware Large Slabs

M. Raimondo¹, M. Dondi¹, C. Zanelli¹, G. Guarini¹, F. Marani², L. Fossa²; ¹Institute of Science and Technology for Ceramics, Italy, ²System Group, Italy

9:45 - 10:00

S16-027 Technical Properties of Fast Firing Floor Tiles Produced by Experimental Design Method

A. Koda, G. Arslan; Anadolu University, Turkey

10:00 - 10:15

S16-028 Development of Ceramic Wall Tile Body Compositions for Energy Saving and Eco-Friendly Production

Ö. Cengiz¹, A. Kara¹; ¹Anadolu University, Turkey, ²Ceramic Research Centre, Turkey

10:15 - 10:30

S16-029 Characterisation of the Particle Generation Involved During the Laser Ablation of Heterogeneous Ceramics

R. Lahoz², J. M. Pedra¹, J. B. Carda¹, G. F. Fuente²; ¹Universidad Jaume I, Spain, ²Universidad de Zaragoza, Spain

10:30 - 10:45 Break

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10:45 - 12:00: Building Materials II

Chair: Norifumi Isu (INAX Corporation, Japan)

10:45 - 11:00

S16-030 Shading of Colours in Production of Ceramic Wares – Reasons of Formation

P. Janusz, L. Jerzy; AGH University of Science and Technology, Poland

11:00 - 11:15

S16-031 Solar Reflectance of Glazes for Exterior Wall Tiles

T. Susiygma, H. Kakiuchida, K. Kusumoto, H. Nagae, M. Ohashi; National Institute of Advanced Industrial Science and Technology, Japan

11:15 - 11:30

S16-032 Effect of the Chemical Composition on the Pyroplastic Deformation of Sanitaryware Porcelain Body

D. Y. Tunçel¹, M. K. Kara², E. Özel¹; ¹Anadolu University, Turkey, ²Organize Deri Sanayi Bölgesi, Turkey

11:30 - 11:45

S16-033 Clays Suitable for Manufacturing Sanitaryware and Ceramics: The Rheological and Mechanical Properties

F. Gridi-Bennadji, G. Lecomte-Nana, J.-P. Bonnet, S. Rossignol; GEMH, ENSCI Limoges, France

11:45 - 12:00

S16-034 Elaboration of a Clay-based “Heliothermal” Material

G. L. Lecomte-Nana, P.-H. Largillière, G. Lecomte; GEMH, ENSCI Limoges, France

13:15 - 14:00: Cements

Chair: Kenji Ogawa (Taiheiyo Cement Corporation, Japan)

13:15 - 13:45

S16-035 Technology for Quality Control of the Cement Highly Utilized Waste Materials -The Present State of Cement in Japan- (Invited)

K. Asaga; Teikyo University of Science, Japan

13:45 - 14:00

S16-036 Rheological Property of Self-Leveling Underlayments Based on Portland Cement, Aluminate Cement and Anhydrite

S. Jinawath, S. Jiemsirilers, T. Tawong; Chulalongkorn University, Thailand

14:00 - 15:00: Refractories: Sintering

Chair: Tomohiro Nishikawa (Okayama Ceramics Research Foundation, Japan)

14:00 - 14:30

S16-037 Fabrication and Characterization of Complex Carbide in the System Al-Si-C (Invited)

S. Hashimoto, T. Umeda, S. Honda, Y. Iwamoto; Nagoya Institute of Technology, Japan

14:30 - 14:45

S16-038 Sintering and Properties of Calcia/Yttria Composites

W. Dai¹, X. Wang¹, D. Zhang², D. Sun³, J. Ye⁴, J. Yu¹; ¹Northeastern University, China, ²Northern Engineering and Technology Co. Ltd., China, ³Dongfang Electric Machinery Co. Ltd., China, ⁴Jiangyin Xingcheng Special Steel Works Co. Ltd., China

14:45 - 15:00

S16-039 Sintering Mechanism of Al₈B₄C₇ Produced by Oxide Raw Material

H.-X. Zhu, C. Pan, C.-J. Deng, W.-J. Yuan; Wuhan University of Science and Technology, China

15:00 - 15:15 Break

15:15 - 16:00: Refractories: Microwave Technology

Chair: Shinobu Hashimoto (Nagoya Institute of Technology, China)

15:15 - 15:45

S16-040 Microwave Drying of Al₂O₃-MgO Pre-cast Blocks (Invited)

H. Taira; Nippon Steel Corporation, Japan

15:45 - 16:00

S16-041 Neck Growth Kinetics of Spherical Shaped WC Particles During Microwave Sintering

D. Demirsky^{1,2}, D. Agrawal¹, A. Ragulya²; ¹The Penn. State University, USA, ²Frantsevich Institute for Problems in Materials Science, NASU, Ukraine

16:00 - 17:00: Refractories: New Synthesis

Chair: Wenbin Dai (Northeastan University, China)

16:00 - 16:15

S16-042 Effect of Pore-forming Agent on Porous Reaction-bonded Silicon Nitride Ceramics

L. Yuan¹, J. Yu¹, S. Zhang²; ¹Northeastern University, China, ²University of Sheffield, U.K.

16:15 - 16:30

S16-043 Molten Salt Synthesis of a New Type of Heat Insulation Material

C.-J. Deng, L. Zhou, H.-X. Zhu, J. Ding, W.-J. Yuan; Wuhan University of Science and Technology, China

16:30 - 16:45

S16-044 Preparation of Nanocrystalline Magnesium Aluminate Spinel Powder by Thermal Explosion Mode of LCS

Z. Yan, J. Yu; Northeastern University, China

16:45 - 17:00

S16-045 Preparation of Magnesium Carbonate Whisker from Magnesite Tailings

N. Wang¹, M. Chen¹, H. Ni²; ¹Northeastern University, China, ²Wuhan University of Science and Technology, China

Poster Session

Monday, November 15

Room: Event Hall

12:00 - 14:00

S16-P001 Processing of Microporous Insulation Materials with Layered Structure

J.-H. Eom¹, Y.-W. Kim¹, D.-H. Jeong², S.-S. Lee²; ¹University of Seoul, Korea, ²Research Institute of Industrial Science & Technology, Korea

S16-P002 Contribution of Various Preparing Methods of Starting Powders and Sintering to the Development of Mullite – ZrO₂ Ceramics

G. Sedmale, I. Sperberga, A. Hmelov, I. Steins; Riga Technical University, Latvia

S16-P003 Effect of Mg Addition on Phase Composition, Microstructure and Properties of Al₂O₃-C Material

X. Liu¹, Y. Luo², J. Xie¹, Z. Wei²; ¹Zhengzhou University, China, ²Boma Refractories Group, China

S16-P004 Effect of Addition of Non-oxides on the Slag Corrosion Resistance of MgO-Al₂O₃ Refractories

K. Morita, S. Sakida, Y. Benino, T. Nanba; Okayama University, Japan

S16-P005 Corrosion Behavior of Reaction Bonded Si₃N₄-SiC Ceramics in Molten Aluminum Casting Alloy

M. Wada, K. Kashiwagi, D. Yokoe, S. Kitaoka; Japan Fine Ceramics Center, Japan

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- S16-P006 Effect of Particle Size Distribution on Alumina-based Castable Refractories**
J. M. Zhao¹, Z. X. Yang¹, K. H. Hwang¹, B. S. Jun², D. S. Bae³, S. S. Lee⁴, D. H. Jeong⁴; ¹Gyeongsang Nat'l University, Korea, ²Kyungnam Univ., Korea, ³Changwon Nat'l Univ., Korea, ⁴RIST, Pohang, Korea
- S16-P007 Manufacturing of Ceramic Tiles with Polishing Porcelain Stoneware Residues**
C.-S. Hsj, T.-H. Wu, S.-Y. Tang; National United University, Taiwan
- S16-P008 Preparation of Porcelain Tile from Iranian Raw Materials**
H. Mafi¹, N. Mousavi¹, M. Montazerian¹, V. Bertollo²; ¹Apadana Ceram Company, Iran, ²Sacmi Imola S. C., Italy
- S16-P009 Passive Cooling Effect of RC Roof Covered with the Ceramics Having High Water Retention and Evaporation Capacity**
M. Yamazaki¹, M. Kanaya¹, T. Shimazu¹, T. Ohashi¹, N. Kato², T. Horikoshi²; ¹INAX Corporation, Japan, ²Nagoya Institute of Technology, Japan
- S16-P010 Comparative Study of the Illite Clay and Illite-Based Geopolymer Products**
G. Sedmale¹, I. Sperberga¹, Ģ. Stinkulis², K. Zeila¹; ¹Riga Technical University, Latvia, ²University of Latvia, Latvia
- S16-P011 Treatment of Scumming Effects of Pottery Clay by Sodium Carbonate Addition**
T. Wasanapiampong, A. Thueploy, S. Nilpairach, D. Arayaphong; Chulalongkorn University, Thailand
- S16-P012 Lightweight of Bone China Tableware through Micro Balloon Pore Generation**
H.-S. Choi, J.-H. Pee, W.-S. Cho, K.-J. Kim; KICET, Korea
- S16-P013 Development of Low-Temperature Sintering Stoneware Bodies**
K. Kusumoto, T. Sugiyama; National Institute of Advanced Industrial Science and Technology, Japan
- S16-P014 Synthesis, and Optical and Structural Characterization of Ceria-related Powders**
M. Amimoto, M. Ozawa; Nagoya Institute of Technology, Japan
- S16-P015 Formation and Catalytic Activity of Ceria Catalyst on Ceramic Honeycomb Substrate**
H. Yuzuriha, K. Ryoji, M. Haneda, M. Ozawa; Nagoya Institute of Technology, Japan
- S16-P016 Investigation Of Refractory Lining Failure In A Caustic Incinerator**
M. K. Maity¹, E. S. Al-Zahrani¹, F. A. Habiby², R. Yin²; ¹Sabic Technology Centre - Jubail, Saudi Arabia, ²Petrokemya, Saudi Arabia