Abstract Book

International Symposium on Multifunctional Ceramic Materials Based on Nanotechnology (ISMCN2010)

Conjugated with the Workshop of
Japan - China - Korea A3 Foresight International Cooperation Key Project

6-8 March 2010

Room #101, Conference Tower,

Tokyo Big Sight, Tokyo, Japan

[Sponsors]
Japan Society for the Promotion of Science
Korea Science and Engineering Foundation
National Natural Science Foundation of China
Nagaoka University of Technology, Japan
Sunmoon University, Korea
Wuhan University of Technology, China

Scope and Topics

The scope of the International Symposium on Multi-functional Ceramic Materials Based on Nanotechnology includes all aspects of fundamental and applied researches related with engineering and functional ceramics materials. The scientific program will encompass every area of nanomaterials, nanoprocessings and their applications as follows.

1. **Nanoprocessing**: Novel processing for the nanoparticles, nanosheets, naotubes and nanocomposites
2. **Plasma and Pulsed Power Technology to Fabricate the Ceramics:** Thermal spray coating in ceramics
3. **Nanoceramics**: Characterization of nanoceramics, thin films, bulk substrates, single crystals, dots, wires and nanotubes
4. **Multifunctional Nanomaterials**: Low frictional ceramic materials, transparent ceramic materials, nano multifunctional ceramics and optical, magnetic, electronic materials

[Co-Chairs]

Kozo Ishizaki	Nagaoka University of Technology, Japan
Soo Wohn Lee	Sunmoon University, Korea
Zhengyi Fu	Wuhan University of Technology, China
Koichi Niihara	Nagaoka University of Technology, Japan

[Secretariats]

Hisayuki Suematsu	Nagaoka University of Technology, Japan
Koji Matsumaru	Nagaoka University of Technology, Japan
Makoto Nanko	Nagaoka University of Technology, Japan
Tsuneo Suzuki	Nagaoka University of Technology, Japan
Seung-Ho Kim	Sunmoon University, Korea
Wang Hao	Wuhan University of Technology, China
Kayoko Watanabe	Nagaoka University of Technology, Japan
Tadachika Nakayama	Nagaoka University of Technology, Japan

Program

6 March (Sat)

10:00-10:10 Opening Remarks

Chair; Zhengyi Fu

Welcome Address
President, Professor Koichi Niihara
Nagaoka University of Technology, Japan

10:10-11:20 Session 1

Chair; Zhengyi Fu

[Keynote Lecture 1] (10:10-10:40)
Nanoscale Plasticity of Ceramics and Semiconductors Revisited
Roman Nowak, D. Chrobak, S. Nagao, Yoshiharu Mutoh and Koichi Niihara
Nagaoka University of Technology, Japan

[Oral-1] (10:40-11:00)
Polymer-Ceramic Nanocomposite Proton Exchange Membranes (Invited)
Qiong Li, Ke Li, Gongbo Ye, Jingjing Pan, Haining Zhang and Mu Pan
Wuhan University of Technology, China

[Oral-2] (11:00-11:20)
Oxide Nano-Rod Array Structure via a Simple Metallurgical Process (Invited)
Makoto Nanko and Dung Thi Mai Do
Nagaoka University of Technology, Japan

Break (11:20-11:40)

11:40-12:30 Session 2

Chair; Kozo Ishizaki

[Oral-3] (11:40-12:00)
Nanoscale Evaluation of Plasticity and Fracture of Al_2O_3 Surfaces (Invited)
Natalia Tymiak, Roman Nowak, Ikuo Ihara, Yoshiharu Mutoh and Koichi Niihara
Nagaoka University of Technology, Japan

[Keynote Lecture 2] (12:00-12:30)
Variation of Composition, Structure and Properties of Electric Conducting Ceramic Particles in HF and H_2O_2 Liquids
Zhengyi Fu, Fei Huang, Hao Wang, Weiming Wang, Soo Wohn Lee and Koichi Niihara
Wuhan University of Technology, China

Lunch (12:30-14:00)

14:00-14:50 Session 3

Chair; Hyngsung Kim

[Oral-4] (14:00-14:20)
Synthesis and Electrical Conductivity of $La_{0.6}Sr_{0.4}Ru_{1-x}Mg_xO_{3-\delta}$ (x = 0-0.6) Perovskite Solid Solution (Invited)
S. Sameshima, D. Moriyama, Y. Hirata and N. Matsunaga
Kagoshima University, Japan

[Keynote Lecture 3] (14:20-14:50)
Diamond-Iron Hybrid Magnetic Powder on Magneto-Rheological Fluid Polishing characteristics
Jun Terauchi, Koji Matsumaru and Kozo Ishizaki
Nagaoka University of Technology, Japan

Break (14:50-15:00)

15:00-16:00 Poster Session

[Poster-1] Effect of Al_2O_3 on the Microstructure Evolution of Fluorophlogopite
Sung-Jin Kim, Hee-Gon Bang and Sang-Yeup Park
Gangneung-Wonju National University, Korea

[Poster-2] Fabrication and Properties of AlON Based Transparent Ceramics by Pressureless Sintering
Hao Wang, Qinglin Shang, Wei Wei, Xiao Liu, Weimin Wang, Zhengyi Fu, Soo Wohn Lee and Koichi Niihara
Wuhan University of Technology, China

[Poster-3] Effect of Powder Morphology on Sinterability and Microstructure of Samarium-doped Ceria Electrolyte Derived from Urea-combustion Method
Qing Xu, Duan-Ping Huang, Kai Zhao, Min Chen and Bok-Hee Kim
Wuhan University of Technology, China

[Poster-4] Microstructures Between Ag Electrode and Si Wafer With Different Si Solar Cells
Dongsun Kim, Seongjin Hwang, Seong Yong Park, Jung Woong Lee, Seung Jin Yang and Hyungsun Kim
Inha University, Korea

[Poster-5] Alignment Control of Unmodified BN Nanosheets in Polysiloxane Using Superconducting Magnet
Hong-Baek Cho, Yoshinori Tokoi, Tadachika Nakayama, Satoshi Tanaka, Weihua Jiang,
Hisayuki Suematsu, Soo Wohn Lee, Zhengyi Fu and Koichi Niihara
Nagaoka University of Technology, Japan

[Poster-6] Preparation of SiOC/Si(M)OC Thin Film via Solution Process
Yoon Joo Lee, YoungHee Kim, Soo Ryong Kim and Sol Kim
Korea Institute of Ceramic Engineering and Technolog, Korea

[Poster-7] The Influence of Microstructure on Mechanical Properties of Cr-Si-N-O Thin Films Deposited by RF Sputtering Method
Jun Shirahata, Tetsutaro Ohori, Hiroki Asami, Tsuneo Suzuki, Tadachika Nakayama, Hisayuki Suematsu,
Soo-Wohn Lee, Zhengyi Fu and Koichi Niihara
Nagaoka University of Technology, Japan

[Poster-8] Porous Ceramics with Pseudobrookite-type Structure Toward Third Generation Diesel Particulate Filter Materials
Yoshikazu Suzuki
Kyoto University, Japan

[Poster-9] Sonochemistry Methods of WO_x–TiO_2 Nanoparticles for the Degradation of Organic Pollutants in Environment
Sung Hun Cho, Gobinda Gyawali and Soo Wohn Lee
Sunmoon University, Korea

[Poster-10] Comparison of HA and TiO_2 Addition on Al_2O_3, ZrO_2, Dy_2O_3 Composite for Making an Artificial Knee Joint
Huyng Seok kim, Hyun Hwi Lee, Yuong Ju Hama, Seung-Ho Kim, Sung-Hun Cho and Soo Wohn Lee
Sunmoon University, Korea

[Poster-11] Effect of Hexagonal Boron Nitride on Mechanical Propertiesin Alumina-15wt%Zirconia Sintered by Hot Pressed Method
Hyun Hwi Lee, Seung-Ho Kim, Bhupendra Joshi, Sung-Hun Cho and Soo Wohn Lee
Sunmoon University, Korea

[Poster-12] Synthesis of Nano-size Mullite Powder by Fast Heating
Yucheng Wang, Zhengyi Fu, Yu Yang, Weimin Wang, Hao Wang and Jinyong Zhang
Wuhan University of Technology, China

[Poster-13] Residual Stress Relaxation of Cubic Boron Nitride Thin Films Deposited in Ar Gas Added with Noble Gases
Tetsutaro Ohori, Jun Shirahata, Tsuneo Suzuki, Tadachika Nakayama, Hisayuki Suematsu, Soo-Wohn Lee,
Zhengyi Fu and Koichi Niihara
Nagaoka University of Technology, Japan

[Poster-14] Crystal-oriented Tungsten-bronze Type Ceramics Prepared by A Rotating Magnetic Field and Subsequent Sintering
Satoshi Tanaka, Yutaka Doshida and Keizo Uematsu
Nagaoka University of Technology, Japan

[Poster-15] Fabrication of Low Thermal Expansion SiC-ZrW_2O_8 Porous Ceramic
Anurat Poowancum, Koji Matsumaru and Kozo Ishizaki
Nagaoka University of Technology, Japan

[Poster-16] Influence of Gas Pressure on the Surface Composition of Capsule-free HIPed Borosilicate Glass
Bo Wang, Ryoichi Hanawa, Koji Matsumaru and Kozo Ishizaki
Nagaoka University of Technology, Japan

[Poster-17] Thermoelectric and Electrical Properties of p-type YbB_6
Koji Kayamura and Masatoshi Takeda
Nagaoka University of Technology, Japan

[Poster-18] Particle Size Control of Silver Nanoparticles Prepared by Pulsed Wire Discharge in Liquid Media
Yoshinori Tokoi, Keisuke Josho, Yaya M. Izuari, Tsuneo Suzuki, Tadachika Nakayama, Hisayuki Suematsu, Soo-Wohn Lee, Zhengyi Fu and Koichi Niihara
Nagaoka University of Technology, Japan

[Poster-19] Modification of CNTs with Nanoparticles
Guobin Zheng, Ryoma Nomiyama, Hideaki Sano and Yasuo Uchiyama
Nagasaki University, Japan

[Poster-20] Nano-rods Array Structures Fabrication on Fe(Al) Solid Solution by Internal Oxidation Process
Dung Thi Mai Do and Makoto Nanko
Nagaoka University of Technology, Japan

[Poster-21] Thermoelectric Properties of Perovskite-type Rare Earth Cobalt Oxides with A-site Substitution
Hideki Hashimoto, Takafumi Kusunose, Satoshi Tsukuda, Tohru Sekino and Shun-ichiro Tanaka
Osaka University, Japan

[Poster-22] Synthesis and Characterization of $CoCrFeNiTiAl_x$ High-entropy Alloys
Kuibao Zhang, Zhengyi Fu, Weimin Wang, Hao Wang, Tadachika Nakayama, Koichi Niihara and SooWohn Lee
Wuhan University of Technology, China

[Poster-23] Synthesis and Microstructure of Fe doped SiO_2 particles by a Reverse Micelle and Sol-Gel Processes
Jeong-Ho Jin, Seung Bin Bae and Dong Sik Bae
Changwon National Universuty, Korea

[Poster-24] Synthesis and Characterization of Fe doped TiO_2 particles by combination the sol-gel and hydrothermal processes
Hyun Ju Kim, Seung Bin Bae and Dong Sik Bae
Changwon National University, Korea

[Poster-25] Brazing and Mechanical Properties of Aluminum-Silicon Alloy Foam Metals
Kwang-Ho Song, Byeong-Su Tak, Byeong-Gu Kim, Seung-Reung Jeong, Bo-Young Hur
Daelim University College, Korea

[Poster-26] Synthesis and Characterization of Ce-doped Lutetium Silicate Nanopowders
Kyung-nam Kim
Kangwon University, Korea

Break (16:00-16:10)

16:10-17:20 Session 4

Chair; Tohru Sekino

[Keynote Lecture 4] (16:10-16:40)
Morphological Control of ZnO Particles by Precipitation-Aging Process
Junichi Hojo, Z. Jiang, Miki Inada and Naoya Enomoto
Kyushu University, Japan

[Oral-5] (16:40-17:00)
Structural Stability of Boron Nitride Doped by He and Ar: Ab initio Study (Invited)
D. Chrobak, M. Andersson, H. Suematsu, T. Nakayama, R. Nowak and K. Niihara
Nagaoka University of Technology, Japan

[Oral-6] (17:00-17:20)
Oxidation of Mo/Al_2O_3 Hybrid Materials at High Temperature (Invited)
Thuy Dang Nguyen, Daisuke Maruoka and Makoto Nanko
Nagaoka University of Technology, Japan

Break (17:20-17:30)

17:30-19:30 Banquet

Chair; Tohru Sekino

RISTORANTE TREVI (Tokyo BIG SIGHT, Conference Tower 8 F.)

7 March (Sun)

8:40-10:10 Session 5

Chair; Soo Wohn Lee

[Oral-7] (8:40-9:00)
The Comparison of Manufacturing and Mechanical Properties with Al and Mg Alloy Foam (Invited)
BoYoung Hur, SeungReung Jeong, KwangHo Song
Gyeongsang National University, Korea

[Oral-8] (9:00-9:20)
Fine-structured TiO_2 Ceramic Patterns on the Ceramic Surface Fabricated by Replication (Invited)
Hong Dae Kim, Tadachika Nakayama, Byung Jin Hong, Kazuyoshi Imaki, Takeshi Fujihara, Jun Yoshimura, Hisayuki Suematsu, Tsuneo Suzuki and Koichi Niihara
Nagaoka University of Technology, Japan

[Oral-9] (9:20-9:40)
Effect of Ag Nano Recrystallines on the Electrical Properties of Si Solar Cells (Invited)
Dongsun Kim, Seongjin Hwang and Hyungsun Kim
Inha University, Korea

[Keynote Lecture 5] (9:40-10:10)
Catalytic Materials Prepared by Chemical Vapor Deposition
J R Vargas-Garcia and T. Goto
Tohoku University, Japan

Break (10:10-10:30)

10:30-11:40 Session 6

Chair; Wang Hao

[Keynote Lecture 6] (10:30-11:00)
Boron Nitride Doped Polycrystalline Silicon Nitride Ceramics
Bhupendra Joshi, Zhengyi Fu, Koichi Niihara and Soo W. Lee
Sunmoon University, Korea

[Oral-10] (11:00-11:20)
Effect of Pressure and Temperature on Sintering Cr-doped Alumina by Pulsed Electric Current Sintering Process (Invited)
Khanh Quoc Dang and Makoto Nanko
Nagaoka University of Technology, Japan

[Oral-11] (11:20-11:40)
Synthesis, Structure and Electrical Functions of Conductive-polymer/Titania Nanohybrids (Invited)
Tohru Sekino, Youn-Gyu Han, Shun-ichiro Tanaka and Koichi Niihara
Tohoku University, Japan

11:40-12:00 Closing Remarks

Chair; Kozo Ishizaki

Closing Address
Professor Zhengyi Fu
Wuhan University of Technology, China

Break (12:00-13:30)

13:30-16:00 **Visit to National Museum of Emerging Science and Innovation**

8 March (Mon)

9:30-12:00 **Laboratory Tour to National Institute of Advanced Industrial Science and Technology (AIST)**

Oral Session

Presenter's own computers can be used for the oral presentations. Additionally, another computer with Windows XP system and Microsoft Power Point will be also provided at session room (Room #101). If you use this computer, it is better to copy your files or to insert CDs or other USB data storage devices into the computer before the presentations.

Poster Session

Core Time ; 6 Feb., 15:00-16:30
Place ; Room #101

The poster board for each presenter will be 180cm in length and 120cm in width.

Poster authors are requested to follow the mounting and dismounting times.
Mounting : 6 March, 13:30~
Dismounting: 6 March, ~17:20
After the dismounting time, posters remaining on the poster boards will be removed by the staffs.

Best poster presentations will be awarded to the authors. The winners will be selected by the academic committee and will be presented at the Banquet on the 6th March.

Abstract

Keynote Lecture

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Oral Session