# Table of Contents

Preface, Committees and Sponsors

## Advanced Ceramics

<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Boundary Segregation-Induced Phase Transformation and Grain Growth in Y₂O₃-Stabilized ZrO₂ Polycrystals</td>
<td>K. Matsui, H. Yoshida and Y. Ikuhara</td>
<td>8</td>
</tr>
<tr>
<td>Fabrication of Nitride Ceramics by Electric Current Assisted Sintering</td>
<td>T. Nishimura and N. Hirosaki</td>
<td>19</td>
</tr>
<tr>
<td>Effect of Initial Alpha-SiC Content on Thermal Conductivity of Silicon Carbide Ceramics</td>
<td>K.Y. Lim, T.Y. Cho, Y.W. Kim and S.J. Lee</td>
<td>23</td>
</tr>
<tr>
<td>Fabrication of Carbon Nanotube Reinforced Boron Carbide Composite by Hot-Pressing Following Extrusion Molding</td>
<td>T. Kobayashi, K. Yoshida and T. Yano</td>
<td>27</td>
</tr>
<tr>
<td>Consolidation of SiC Powder Coated with SiO₂ Nanolayer by Spark Plasma Sintering</td>
<td>Z.H. He, H. Katsui, R. Tu and T. Goto</td>
<td>32</td>
</tr>
<tr>
<td>High-Speed Deposition of SiC Thick Film by Halide Precursor</td>
<td>M.X. Han, W. Zhou, D.H. Zheng, R. Tu, S. Zhang and T. Goto</td>
<td>37</td>
</tr>
<tr>
<td>Lamellar and Rod-Like Eutectic Growth of TiB₂-TiC-TiN Composites by Arc-Melting</td>
<td>E.J.F. Cheng, H. Katsui and T. Goto</td>
<td>43</td>
</tr>
<tr>
<td>Preparation of Zirconium Phosphate Bonded Silicon Nitride Ceramic Coatings by Cold Spray and Pressureless Sintering</td>
<td>F. Chen, F.Y. Li, Q. Shen and L.M. Zhang</td>
<td>47</td>
</tr>
<tr>
<td>Consolidation of Titanium Carbide with Zirconium Carbide by Spark Plasma Sintering</td>
<td>Y. Li, H. Katsui and T. Goto</td>
<td>52</td>
</tr>
<tr>
<td>Influence of the Process Temperature of Spark Plasma Sintering on Micorstructure and Nanoindentation Hardness/Young’s Modulus of WC-8wt%Co</td>
<td>J.F. Zhang and E. Burkel</td>
<td>56</td>
</tr>
<tr>
<td>A Wettability Tunable Surface of Nafion® with Controlling the Flip-Flop Property by DC Applied Voltage</td>
<td>X. Wei, I. Mogami, G. Kawamura, H. Muto and A. Matsuda</td>
<td>77</td>
</tr>
<tr>
<td>Interlayer Surface Modification of Layered Perovskite HLaNb₂O₇·xH₂O with Diol Compounds Possessing Ethylene Oxide Chains</td>
<td>S. Hotta, N. Idota and Y. Sugahara</td>
<td>82</td>
</tr>
<tr>
<td>Growth and Luminescence Properties of Ce and Ca Co-Doped LiGdF₄-LiF Eutectic Scintillator</td>
<td>K. Hishinuma, K. Kamada, S. Kurosawa, S. Suzuki, A. Yamaji, Y. Yokota and A. Yoshikawa</td>
<td>96</td>
</tr>
</tbody>
</table>
Effect of Annealing Temperature on Structure and Mechanical Property of Magnetron Sputtered c-BN Films
J.L. Xiao, C.B. Wang, X.S. Luo and L.M. Zhang

Electroceramics

Engineering of Lead-Free Piezoelectrics in Alkali Niobate Ceramic System: Improvement in Density by Two-Step Mixing Process
K. Kakimoto, S. Ishihara and M. Watanabe

Iron Composite Anodes for Fabricating All-Solid-State Iron-Air Rechargeable Batteries

Chemical Reactivity and Cathode Properties of LaCoO\textsubscript{3} on Lanthanum Silicate Oxyapatite Electrolyte
S. Mihara, K. Kobayashi, T. Akashi and Y. Sakka

Preparation of Layered Double Hydroxide and its Graphene Composite Films as Electrodes for Photoelectrochemical Cells
S. Azuma, G. Kawamura, H. Muto, N. Kakuta and A. Matsuda

Mesoporous Hollow Carbon Derived from Soft-Templated Hydrothermal Process for Supercapacitor Electrode
K.H. Ho, Y. Zhang, H.J. Liu, Q.Q. Ke, L. Mao, Y.T. Hu, X. Li and J. Wang

Highly (004)-Oriented Texture of γ-LiAlO\textsubscript{2} Films by Laser Chemical Vapor Deposition
C. Chi, H. Katsui, R. Tu and T. Goto

Effects of ZnO Addition and Sintering Temperature on Dielectric Properties of MgTiO\textsubscript{3} Ceramic
X.L. Ji, F. Yi, S. Zhang, C.C. Zhai and P.F. Hu

Dielectric Properties and Optical Absorption of Single-Crystalline BaTi\textsubscript{2}O\textsubscript{5} Synthesized Using High-Purity BaCO\textsubscript{3} as Source Material
K. Shiga, H. Katsui and T. Goto

Preparation and Electrical Property of Calcia Stabilized Zirconia Ceramics

Preparation and Study of (1-m)(Mg\textsubscript{0.5}Zn\textsubscript{0.5})TiO\textsubscript{3}-m[Ba\textsubscript{4}Nd\textsubscript{28/3}Ti\textsubscript{18}O\textsubscript{54}0.18Bi\textsubscript{2}O\textsubscript{3}] Microwave Dielectric Ceramics
X.L. Ji, P.F. Hu, S. Zhang, C.C. Zhai and F. Yi

Enhanced Thermoelectric Properties of Mg\textsubscript{2}Si\textsubscript{0.3}Sn\textsubscript{0.7} Compounds by Bi Doping
M.J. Yang, Q. Shen and L.M. Zhang

Effect of Oxygen Flow Rate on Electrical and Optical Properties of ATO Thin Films Prepared by RF Magnetron Sputtering
P. Yang, L.R. Jiang, J.Y. Wu, F. Chen, J.A. Galaviz-Pérez, Q. Shen, J.M. Schoenung and L.M. Zhang

Novel Processing

Synthesis of A-Type Zeolite from Flat Glass Recycle by Hydrothermal Treatments and its Evaluation
M. Kamitani, T. Tagami, T. Fukaya, M. Kondo, T. Hiki and A. Nakahira

In Situ Observation of Diamagnetic Fluid Flow in High Magnetic Fields
Y. Wang, N. Hirota, H. Okada, T. Liu, Q. Wang and Y. Sakka

Spark Plasma Sintering and Characterization of WC-Co-cBN Composites
J.F. Zhang, R. Tu and T. Goto

Fabrication of Porous Al with Controlled Pore Size by Spark Plasma Sintering
Q.Z. Li, D.M. Zhang and L.M. Zhang

Densification of Nanocrystalline Ceramics by Combustion Reaction and Quick Pressing
J.H. Liu and Z.Y. Fu

Microstructure and Properties of Aluminum-Copper Composites Prepared by Hot-Pressure Sintering

Effect of Al\textsubscript{2}O\textsubscript{3} on Microstructure and Ionic Conductivity of Li\textsubscript{1.5}La\textsubscript{1.5}Zr\textsubscript{2}O\textsubscript{12}
Y. H. Zhang, F. Chen, R. Tu, Q. Shen and L.M. Zhang

Microstructure of LiAl\textsubscript{5}O\textsubscript{8} and LiAlO\textsubscript{2} Films Prepared by Laser CVD
C. Chi, H. Katsui, R. Tu and T. Goto
Effects of C/Si Ratio on the Structure of β-SiC Film by Halide CVD

Surface Modification of Silicon Carbide Powder with Silica Coating by Rotary Chemical Vapor Deposition
Z.H. He, H. Katsui, R. Tu and T. Goto 232

Synthesis and Evaluation of Fe Nanowire and Nanorod by Electro-Chemical Process
A. Nakahira, S. Yamamoto and H. Onodera 237

Preparation and Density Control of PMMA Microcellular Foams via Supercritical Carbon Dioxide Foaming
M.J. Li, K. Xiang, Q.G. Luo, Q. Shen and L.M. Zhang 242

Perpendicular Magnetic Anisotropy in Pt/Co/A1O Trilayer Structures Depending on A1O Thickness and Fabrication Method

Materials Characterization

Synthesis and Characterization of Dense Mesoporous Alumina
A. Nakahira, H. Nishimoto, Y. Hamada and Y. Yamasaki 252

Precipitate Phases and Mechanical Properties of Heat-Treated ASTM F 90 Co-Cr-W-Ni Alloy
K. Ueki, K. Ueda and T. Narushima 258

Microstructural Analysis of Biomedical Co-Cr-Mo Alloy Subjected to High-Pressure Torsion Processing

Effect of Subsurface Deformation on Sliding Wear Behavior of Ti-29Nb-13Ta-4.6Zr Alloys for Biomedical Applications
Y.S. Lee, M. Niinomi, M. Nakai, K. Narita, J. Hieda and K. Cho 270

Effect of Al Thin Film on Microstructure and Mechanical Properties of Diffusion-Bonded LY12/TC4 Joints
Q.G. Luo, X.S. Hu, Q. Shen and L.M. Zhang 275

Effect of Holding Time on Microstructure and Mechanical Properties of Diffusion-Bonded Mg1/Pure Ag Foil/1060Al Joints

Diffusion Mechanism and Kinetics of Diffusion Bonded Mg/Ni/Al Joint
J. Zhang, Q.G. Luo, Q. Shen and L.M. Zhang 286

Dynamical Structure Factor of Magnetic Excitation in Underdoped La1.90Sr0.10CuO4 Measured by Chopper Neutron Spectrometer

Effects of Oxygen Reduction and Ce-Doping on Magnetic Order in T°-Pr1.40-4La0.60Ce0.40CuO4+δ−α Studied by μSR Measurement
K. Tsutsumi, M. Fujita, K. Sato, M. Miyazaki, R. Kadono and K. Yamada 297

Investigation of Excitation Mechanism of Cu II Lines under Different Atmospheres
Z. Lei 302

Effect of Cryomilling on Microstructure and Bonding Mechanism of Mg/B Composite Powders
L.Y. Tang, F. Chen, X. Zhang, C.M. Zhang, Q. Shen and L.M. Zhang 310

Pyrolysis Behavior of Boron-Containing Phenol-Formaldehyde Resin (BPFR) Modified by B2O3
Q. Lu, F. Chen, Q. Shen, Y. Qin, Z.X. Huang and L.M. Zhang 315