

Journal

of the American Ceramic Society

Volume 96 Number 4

April 2013



Feature

Microwave Sintering: Fundamentals and Modeling

Kirill I. Rybakov, Eugene A. Olevsky, and Ekaterina V. Krikun

1003

Rapid Communications

Enhanced Electrocaloric Effects in Spark Plasma-Sintered Ba_{0.65}Sr_{0.35}TiO₃-Based Ceramics at Room Temperature

Xiao Qiang Liu, Ting Ting Chen, Yong Jun Wu, and Xiang Ming Chen

1021

Piezoelectric Properties of Lead-free Piezoelectric Ceramics and Their Energy Harvester Characteristics

In-Tae Seo, Chang-Hoi Choi, Daniel Song, Min-Soo Jang, Bo-Yun Kim, Sahn Nahm, Young-Sik Kim, Tae-Hyun Sung, and Hyun-Cheol Song

1024

Fabrication of Highly Porous Alumina Prepared by Gelation Freezing Route with Antifreeze Protein

Manabu Fukushima, Sakae Tsuda, and Yu-ichi Yoshizawa

1029

Suppressed Reactivity of AlN Powder in Water at 5°C

Andraž Kocjan, Aleš Dakskobler, Bojan Budič, and Tomaž Kosmač

1032

Large Piezoelectric Response and Polarization in Relaxor Ferroelectric PbTiO₃-Bi(Ni_{1/2}Zr_{1/2})O₃

Yangchun Rong, Jun Chen, Huajun Kang, Laijun Liu, Liang Fang, Longlong Fan, Zhao Pan, and Xianran Xing

1035

Highly Dense, Transparent α -Al₂O₃ Ceramics From Ultrafine Nanoparticles Via a Standard SPS Sintering

Nicolas Roussel, Lucile Lallemand, Jean-Yves Chane-Ching, Sophie Guillemet-Fristch, Bernard Durand, Vincent Garnier, Guillaume Bonnefont, Gilbert Fantozzi, Lionel Bonneau, Sandrine Trombert, and Domingo Garcia-Gutierrez

1039

Preparation and Luminescence Properties of Blue-Emitting Phosphor Ba₂Ca(PO₄)₂:Eu²⁺

Yuanyuan Zhang, Zhiguo Xia, and Weiwei Wu

1043

Effect of Humidity Instability on Rehydroxylation in Fired Clay Ceramics

Jarosław Drelich, Patrick K. Bowen, and Timothy J. Scarlett

1047

ZrB₂-SiC Nano-Powder Mixture Prepared Using ZrSi₂ and Modified Spark Plasma Sintering

Seo-Hoon Lee, Si-Young Choi, and Hai-Doo Kim

1051

Spark Plasma Sintering of Superhard B₄C-ZrB₂ Ceramics by Carbide Boronizing

Ji Zou, Shui-Gen Huang, Kim Vanmeensel, Guo-Jun Zhang, Jef Vleugels, and Omer Van der Biest

1055

Growth of Highly Conformal TiC_x Films Using Atomic Layer Deposition Technique

Tae Eun Hong, Sang-Kyung Choi, Soo-Hyun Kim, and Taehoon Cheon

1060

Influence of Ln³⁺ and B³⁺ Ions Co-Substitution on Thermophysical Properties of LnMB₁₁O₁₉-type Magnetoplumbite LaMgAl₁₁O₁₉ for Advanced Thermal Barrier Coatings

Lu Haoran, Wang Chang-An, and Zhang Chenguang

1063

Transparent Y₃Al₅O₁₂: Li, Ce Ceramics for Thermal Neutron Detection

Shi Chen, Lihua Zhang, Kim Kisslinger, and Yiquan Wu

1067

Articles

Processing Science

Enhanced Hydrothermal Resistance of Y-TZP Ceramics Through Colloidal Processing

E. Rayón, R. Moreno, C. Alcázar, M. D. Salvador, F. J. Manjón, E. Jiménez-Piqué, and L. LLanes

1070

Elucidation of Viscosity Reduction Mechanism of Nano Alumina Suspensions with Fructose Addition by DSC

Simge Çınar, Laura van Steenhuyse, and Mufit Akinci

1077

Two-Dimensional Orientation in Bi₄Ti₃O₁₂ Prepared Using Platelet Particles and a Magnetic Field

Tohru S. Suzuki, Yasunari Miwa, Shinichiro Kawada, Masahiko Kimura, Tetsuo Uchikoshi, and Yoshiro Sakka

1085

Ionomigration of Pores and Gas Bubbles in Yttria-Stabilized Cubic Zirconia

Seung-Wan Kim, Suk-Joong L. Kang, and I-Wei Chen

1090

Synthesis and Evolution of Zirconium Carbide via Sol-Gel Route: Features of Nanoparticle Oxide–Carbon Reactions

Caen Ang, Tim Williams, Aaron Seeber, Huanting Wang, and Yi-Bing Cheng

1099

Effects of Epoxy Resin on Gelcasting Process and Mechanical Properties of Alumina Ceramics

Rui Xie, Kechao Zhou, Xueping Gan, and Dou Zhang

1107

Effective Laser Sealing Enabled by Glass Thick Films Containing Carbon Black/Carbon Nanotubes

Oh Hyeon Kwon, Bhaskar Chandra Mohanty, Deuk Ho Yeon, Jong-Seok Yeo, Kyoungho Lee, and Yong Soo Cho

1113

Examination of the Dye-Fixing Ability of Porous γ -Alumina Flake Powders

Pei-Ching Yu, Chih-I Chen, Fu-Su Yen, Dah-Tong Ray, and S. C. Max Yen

1118

Rheological Characterization of Aqueous 3Y-TZP Inks Optimized for Direct Thermal Ink-Jet Printing of Ceramic Components

Emre Özkol

1124

Glass Science

Properties of Ca-(Y)-Si-Al-O-N-F Glasses: Independent and Additive Effects of Fluorine and Nitrogen A. R. García-Bellés, M. Monzó, A. Barba, C. Clauzel, M. J. Pomeroy, A. R. Hanafi, and S. Hampshire	1131
Luminescence Enhancement of CdS Quantum Dots in Glass by Ag⁺ Ion Exchange Kai Xu and Jong Heo	1138
New Sintered Li₂O-Al₂O₃-SiO₂ Ultra-Low Expansion Glass-Ceramic Viviane O. Soares, Oscar Peitl, and Edgar D. Zanotto	1143
Crystallization of Rhodium Salts in a Simulated Low-Activity Waste Borosilicate Glass Brian J. Riley, John S. McCloy, Ashutosh Goel, Martin Liezers, Michael J. Schweiger, Juan Liu, Carmen P. Rodriguez, and Dong-Sang Kim	1150

Electrical, Dielectric, Optical, and Magnetic Properties

Flux Synthesis of Na₂Ca₂Nb₄O₁₃: The Influence of Particle Shapes, Surface Features, and Surface Areas on Photocatalytic Hydrogen Production David Arney, Lindsay Fuoco, Jonathan Boltersdorf, and Paul A. Maggard	1158
The Effect of Barium Substitution on the Ferroelectric Properties of Sr₂Nb₂O₇ Ceramics Zhipeng Gao, Huanpo Ning, Chen Chen, Rory Wilson, Baogui Shi, Haitao Ye, Haixue Yan, and Michael J. Reece	1163
Preparation and Electric Properties of Bi_{0.5}Na_{0.5}TiO₃-Bi(Mg_{0.5}Ti_{0.5})O₃ Lead-Free Piezoceramics Qi Wang, Jun Chen, Longlong Fan, Laijun Liu, Liang Fang, and Xianran Xing	1171
NdFeAsO_{1-x}F_x Superconductor – Impact of Fluorine Variation on Microstructure and Transport Properties Pillai Mohan Aswathy, Jayakumari Babu Anooja, and Upendran Syamaprasad	1176
Structure and Luminescence of New Red-Emitting Materials-Eu³⁺-Doped Triple Orthovanadates NaALa(VO₄)₂ (A = Ca, Sr, Ba) Chuanxiang Qin, Yanlin Huang, and Hyo Jin Seo	1181
Dielectric and Magnetic Properties of Sr(Fe_{1/2}Ta_{1/2})O₃ Complex Perovskite Ceramics Xin Lv, Xiao Qiang Liu, Hong Jian Zhao, Wen Zhi Yang, and Xiang Ming Chen	1188
Tailorable Multicolor Up-Conversion Emissions in Tm³⁺/Ho³⁺/Yb³⁺ Co-Doped LiLa(MoO₄)₂ Ting Li, Chongfeng Guo, Puju Zhao, Lin Li, and Jung Hyun Jeong	1193
Morphology Tunable Self-Assembled Sr₂P₂O₇:Ce³⁺, Mn²⁺ Phosphor and Luminescence Properties Meng Jiao Xu, Lu Xiang Wang, Dian Zeng Jia, Lang Liu, Li Zhang, Zai Ping Guo, and Rui Sheng	1198
Anomalous Correlation between Dielectric Constant and Tunability in (Ba, Sr) TiO₃-MgO-Mg₂SiO₄ Composite Ceramics Yanyan He, Jingyuan Zhao, Yebin Xu, and Changnian Li	1203
High-Energy Density Dielectrics and Capacitors for Elevated Temperatures: Ca(Zr,Ti)O₃ Haijoon Lee, Jeong Ryeol Kim, Michael J. Lanagan, Susan Trolier-McKinstry, and Clive A. Randall	1209
Color-Tunable Up-Conversion Emission and Infrared Photoluminescence and Dielectric Relaxation of Er³⁺/Yb³⁺ Co-Doped Bi₂Ti₂O₇ Pyrochlore Thin Films Jianxiong Zhao, Qinyuan Zhang, Ni Qin, Baojun Li, and Dinghua Bao	1214
Electrical Properties of Stoichiometric BiFeO₃ Prepared by Mechanosynthesis with Either Conventional or Spark Plasma Sintering Antonio Perejón, Nahum Masó, Anthony R. West, Pedro E. Sánchez-Jiménez, Rosalía Poyato, José M. Criado, and Luis A. Pérez-Maqueda	1220
Dysprosium-Doped (Ba,Sr)TiO₃ Thin Films on Nickel Foils for Capacitor Applications Iñigo Bretos, Theodor Schneller, Rainer Waser, Detlev F. Hennings, Daesung Park, and Thomas Weirich	1228
Impedance Spectroscopy Characterization in Bipolar Ta/MnO_x/Pt Resistive Switching Thin Films Chan-Rok Park, Sun-Young Choi, Yil-Hwan You, Min Kyu Yang, Seung-Muk Bae, Jeon-Kook Lee, and Jin-Ha Hwang	1234
Formation of Sol-Gel <i>In Situ</i> Derived BTO/NZFO Composite Ceramics with Considerable Dielectric and Magnetic Properties Bin Xiao, Yanling Dong, Ning Ma, and Piyi Du	1240
Electrical Properties of Amorphous BaTi₄O₇ Films Grown on Cu/Ti/SiO₂/Si Substrates Using RF Magnetron Sputtering Jin-Seong Kim, Min-Gyu Kang, Sang-Hyo Kweon, Guifang Han, Chong-Yun Kang, Jung-Rak Yun, Young-Hun Jeong, Jong-Hoo Paik, and Sahn Nahm	1248
ZnO Nanorods as Antireflective Coatings for Industrial-Scale Single-Crystalline Silicon Solar Cells Pantea Aurang, Olgu Demircioglu, Fırat Es, Rasit Turan, and Husnu Emrah Unalan	1253

Mechanical, Thermal, and Chemical Properties

Microwave-Assisted Hydrothermal Synthesis of Fe₂O₃-Sensitized SrTiO₃ and its Luminescent Photocatalytic deNO_x Activity with CaAl₂O₄:(Eu, Nd) Assistance Huihui Li, Shu Yin, Yuhua Wang, and Tsugio Sato	1258
Comparison of the Elastic–Plastic Indentation Response of MgAl₂O₄, AlON, and AlN Andrea M. Muller and David J. Green	1263
Improved Prediction of Young's Modulus of Fluorine-Containing Glasses Using MAS-NMR Structural Data Akhilesh Kumar Swarnkar, Artemis Stamboulis, Diane Holland, and Ormer Van der Biest	1271
Oxidation of Polymer-Derived HfSiCNO up to 1600°C Kalvis Terauds, David B. Marshall, and Rishi Raj	1278

Structure, Characterization, and Phase Equilibria

Thermal Properties and Phase Transition of $2\text{ZrO}_2 \cdot \text{P}_2\text{O}_5$ Studied by In Situ Synchrotron X-ray Diffraction Joachim Angelkort, Zlatomir D. Apostolov, Zachary A. Jones, Steven Letourneau, and Waltraud M. Kriven	1292
Yttrium Bearing Silicon Carbide Matrices for Robust Ceramic Composites David L. Poerschke and Carlos G. Levi	1300
Effect of FeO Concentration on the Crystallization of High-Temperature $\text{CaO}-\text{Al}_2\text{O}_3-\text{MgO}-\text{FeO}$ Melts Sung Suk Jung and Il Sohn	1309
Use of Volume Element Methods to Understand Experimental Differences in Active/Passive Transitions and Active Oxidation Rates for SiC Y. Kubota, H. Hatta, T. Yoshinaka, Y. Kogo, T. Goto, and T. Rong	1317
Nanostructured Solids from Freeze-Dried Precursors: Multigram Scale Synthesis of TiO_2 -Based Powders Regina Villanueva, Andrés Gómez, David Vie, Eduardo Martínez, Aurelio Beltrán, Fernando Sapiña, and Jaume Vila	1324
Subsolidus Phase Relations of the $\text{BaO}-\text{Y}_2\text{O}_3-\text{MnO}_2$ System in Air Changici Wang, Jing-Bo Li, Qingqing Gao, Guannan Li, Guangyao Liu, Guanghui Rao, Jun Luo, Zhenmin Du, and Jingkui Liang	1332
Erratum	1337