

Table of Contents

Dielectric, Ferroelectric and Piezoelectric Single Crystals and Ceramics

I.

Evolution of Crystallographic Grain Orientation of $(\text{K}_{0.5}\text{Na}_{0.5})\text{NbO}_3$ Piezoelectric Ceramics

H. Takao, Y. Saito, Y. Aoki and K. Horibuchi

3

Self Assemble Synthesis of Potassium Niobate at Room Temperature

K. Toda, A. Sugawara, K. Uematsu, M. Sato and M. Osada

7

Preparation of Lead-Free Multi-Layered Piezoelectric Actuator

T. Futakuchi, T. Kakuda, Y. Sakai and M. Adachi

11

Piezoelectric Properties in Textured Ceramics of $\text{SrBi}_2\text{Nb}_2\text{O}_9$

T. Sawada, H. Ogawa, M. Kimura, K. Shiratsuyu and A. Ando

15

Influence of Oxygen Vacancies on the Polarization Properties in $\text{Bi}_4\text{Ti}_3\text{O}_{12}$ Ferroelectric Single Crystals

Y. Noguchi, T. Matsumoto and M. Miyayama

19

Piezoelectric Properties and Depolarization Temperatures of $(\text{Bi}_{1/2}\text{Na}_{1/2})\text{TiO}_3$ - $(\text{Bi}_{1/2}\text{K}_{1/2})\text{TiO}_3$ - BaTiO_3 Lead-Free Piezoelectric Ceramics

Y. Hiruma, K. Yoshii, R. Aoyagi, H. Nagata and T. Takenaka

23

Influence of Annealing on Domain Structures of Bismuth-Titanate-Based Crystals

S. Katayama, Y. Noguchi and M. Miyayama

27

Electrical Properties of Grain-Oriented $\text{SrBi}_2\text{Nb}_{2-x}\text{V}_x\text{O}_9$ Ceramics

S. Inai, Y. Hiruma, R. Aoyagi, H. Nagata and T. Takenaka

31

Crystal Growth and Electric-Field-Induced Strain in $\text{Bi}_{0.5}\text{Na}_{0.5}\text{TiO}_3$ Crystals

S. Yoshimura, Y. Noguchi and M. Miyayama

35

Piezoelectric Properties of Nd and V Cosubstituted $\text{Bi}_4\text{Ti}_3\text{O}_{12}$ Ceramics

S. Matsuzawa, Y. Hiruma, R. Aoyagi, H. Nagata and T. Takenaka

39

Dielectric, Ferroelectric, and Piezoelectric Thin Films

II

Ferroelectricity of BiFeO_3 Thin Films by Pulsed Laser Deposition and Effect of Atmosphere

H.Y. Go, N. Wakiya, K. Satoh, M. Kondo, J.S. Cross, K. Maruyama, N. Mizutani and K. Shinozaki

45

Electrical Properties of Perovskite-Based Ferroelectric Thin Films Modified Using Rare-Earth Elements

H. Uchida, H. Nakaki, H. Funakubo and S. Koda

49

In Situ Simultaneous Observation of Phase Transition and Electrical Properties of $\text{Pb}(\text{Zr},\text{Ti})\text{O}_3$ Thin Film by High Temperature XRD and Electrical Measurement Apparatus

T. Onoue, N. Wakiya, K. Seo, T. Kiguchi, N. Mizutani and K. Shinozaki

53

Preparation of Epitaxial LiTaO_3 Thin Films by Metal Organic Chemical Vapor Deposition and its Electrical and Optical Properties

T. Yamamoto, N. Wakiya, N. Mizutani and K. Shinozaki

57

Photovoltaic Effect with the Structural Control and its Application to the Optical Sensor

M. Ichiki, H. Furue, T. Kobayashi, Y. Morikawa, K. Nonaka and R. Maeda

61

Effect on Crystal Orientation on Residual Stress and Electrical Properties of a PZT Thin Film Deposited on Buffered-Si Substrate

K. Fujito, N. Wakiya, T. Kiguchi, N. Mizutani and K. Shinozaki

65

Orientation Control of Perovskite Epitaxial Thin Film on Silicon Substrate with Yttria-Stabilized Zirconia Buffer Layers

M. Kondo and K. Kurihara

69

Characterization of Dielectric Properties of Alkoxy-Derived $(\text{Y},\text{Yb})\text{MnO}_3$ Ferroelectrics/ HfO_2 Stacking Layers

K. Suzuki, Y.P. Guo, K. Nishizawa, T. Miki and K. Kato

73

Chemically Deposited (100)-Oriented BaTiO_3 Films with Highly Concentrated Solution Using High Crystallinity BaTiO_3 as a Buffer Layer

Y.P. Guo, K. Suzuki, K. Nishizawa, T. Miki and K. Kato

77

Fabrication and Electrical Characterization of Epitaxially Grown (Ba,Sr)TiO₃ Thin Films Prepared by Sol-Gel Method T. Hosokura, A. Ando and Y. Sakabe	81
Crystallization Behavior of KNbO₃ Series Precursors Synthesized by CSD Process K. Tanaka, K. Kakimoto and H. Ohsato	85
Thin and Thick Films	III
Synthesis of Oxide Thin Films on Silicon Substrate Using Supercritical Carbon Dioxide Fluid F. Kano, H. Uchida, K. Sugimoto and S. Koda	91
Fabrication and Application of MoSi₂ Thin Film Electric Heaters Y. Itoh, K. Wakisaka, M. Satoh and S. Yoshikado	95
B- and P-Doped Si_{0.8}Ge_{0.2} Thin Film Deposited by Helicon Sputtering for the Micro-Thermoelectric Gas Sensor K. Tajima, W. Shin, M. Nishibori, N. Murayama, T. Itoh, N. Izu and I. Matsubara	99
Defect Structure in (Zn,Mg)O Films Prepared on YSZ Substrate H. Ryoken, I. Sakaguchi, N. Ohashi, Y. Adachi, T. Ohgaki, S. Hishita and H. Haneda	103
Zinc Oxide and Semiconductive Materials	IV
Evaluation of Planar-Type Thin Film ZnO Varistors Fabricated Using Pulsed Laser Ablation S. Sawa and S. Yoshikado	109
Near-Infrared Light Emission from of Er-Doped ZnO Thin Film in Micropits Processed on Si Substrate S. Tanaka, Y. Ishikawa, N. Ohashi, J. Niitsuma, T. Sekiguchi and N. Shibata	113
Relation Between Grain Boundary and Electrical Degradation of ZnO Varistors M. Takada and S. Yoshikado	117
Cathodoluminescence of Diffusion Layer Synthesized by Coupling of β-Ga₂O₃ and ZnO K. Suzuki, Y. Kuroki, T. Okamoto and M. Takata	121
Nanocrystals and Processing	V
Preparation and Dielectric Properties of 3D Barium Titanate Colloidal Sphere Array A. Yazawa, T. Hoshina, H. Kakemoto, T. Tsurumi and S. Wada	127
Phase Transition Behavior of Barium Titanate Nanoparticles T. Hoshina, H. Kakemoto, T. Tsurumi, M. Yashima, Y. Kuroiwa and S. Wada	131
Synthesis and Characterization of BaTiO₃ Nano-Particle by Aerosol Plasma Pyrolysis Process T. Kodera, H. Horikawa, T. Ogihara, N. Ogata, K. Nakane, S. Omura, M. Uede, K. Higeta and S. Hiyama	135
Size Dependence of Dielectric Properties for Barium Titanate Nanoparticles Prepared under Various Vacuum Atmospheres S. Wada, M. Ohishi, K. Takizawa, T. Hoshina, H. Kakemoto and T. Tsurumi	139
Powder and Dielectric Characterization of Hydrothermally Synthesized Barium Titanate Nanopowders K. Tokita and S. Sato	143
Domain Wall Engineering in Potassium Niobate Single Crystals and Their Piezoelectric Properties K. Yokoh, S.M. Nam, H. Kakemoto, T. Tsurumi, H. Kumagai and S. Wada	147
Development of Lead-Free Piezoelectric Materials Using Domain Wall Engineering S. Wada, K. Yako, T. Muraishi, H. Kakemoto and T. Tsurumi	151
Morphological Design of Zinc Oxide Films Grown in Aqueous Solutions J. Yahiro and H. Imai	155
Preparation and Characterization of Porous Alumina Film Using Sol Containing PEG T. Miki, K. Nishizawa, K. Suzuki and K. Kato	159

Synthesis of Carbon Nanotubes from Polycyclic Compounds by CVD Method K. Yamada, K. Abe, M. Mikami, M. Saito and J. Kuwano	163
Photoinduced Nanodots in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+d}$ M. Osada, M. Kakihana, H. Yasuoka, M. Käll and L. Börjesson	167
Micropattern of Colloidal Crystal by Using Electrophoretic Deposition Process with Three-Electrode System J.I. Hamagami, K. Hasegawa and K. Kanamura	171
Synthesis of a New Photochromic ZrO_2 Precursor for Preparation of Functional Thin Films K. Nishizawa, H. Fukaya, T. Miki, K. Suzuki and K. Kato	175

Microwave Dielectrics and Related Materials

VI

Low Temperature Sintering of Alumina by $\text{CuO-TiO}_2\text{-Nb}_2\text{O}_5$ Additives K. Shigeno, H. Katsumura, H. Kagata, H. Asano and O. Inoue	181
A Technique for Permittivity Measurement of Ceramic Powders at Microwave Frequencies K. Ehata, S. Che and N. Sakamoto	185
High Frequency Dielectric Mapping Using Un-Contact Probe for Dielectric Materials H. Kakemoto, S.M. Nam, S. Wada and T. Tsurumi	189
Evaluation of Characteristics of Composite Electromagnetic Wave Absorbers K. Sakai, K. Hiraki, H. Kusunoki, T. Kondo and S. Yoshikado	193
Effect of Lanthanum Oxide Addition on Dielectric Loss and Microstructure of AlN Ceramics S. Kume, M. Yasuoka and K. Watari	197
Preparation and Formation Mechanism of Micrometer-Sized Spherical Single Crystal Particles of Perovskite Oxides by Flame Fusion S. Che and N. Sakamoto	201
Effect of Powder Properties of Dielectric Filler on the Dielectric Properties of a Ceramics-Polymer Composite I. Kanada and N. Sakamoto	205
Dielectric Properties of Phosphate Glasses in the Region from 1 to 10 GHz S. Fujino and M. Kuwabara	209

Ionic Conductors and Battery Related Materials

VII

High-Rate Charge-Discharge Performance of Composite Materials of $\beta\text{-FeOOH}$ Particles and Carbon Powder Prepared in the Presence of Ti(IV) Ions H. Morimoto, K. Takeno, Y. Uozumi, K. Sugimoto and S. Tobishima	215
New Method to Adsorb Dye Molecules for Dye Sensitized Solar Cell K. Sakai, K. Fujimura and S. Yoshikado	219
High-Rate Electrode Properties of Li-Mn-oxide Synthesized by Reassembly of MnO_2 Nanosheets for Li-Ion Battery S. Suzuki, S. Takahashi, K. Sato and M. Miyayama	223
Doping Effect on Crystal Structure of Fast Oxide Ion Conductor LaGaO_3-Based Perovskite Compounds M. Kajitani, M. Matsuda, A. Hoshikawa, T. Kamiyama, F. Izumi and M. Miyake	227
Electrode Properties of Dye Sensitized Solar Cell Using Ruthenium Complex/Titania Nano Crystal H. Horikawa, T. Ogihara, N. Ogata, M. Asahara and X.Z. Wu	231
Effects of the Substitution of the B-Site Ion on Oxygen Reduction Electrode Properties of the Pyrochlore $\text{Pb}_2\text{Ru}_2\text{O}_{7-\delta}$ at Low Temperatures K. Yoshihara, T. Chuma, M. Saito, J. Kuwano and H. Shiroishi	235
Growth and Electric Properties of Al-Substituted Langasite-Type $\text{La}_3\text{Ta}_{0.5}\text{Ga}_{5.5}\text{O}_{14}$ Crystals at High Temperature H. Takeda, S. Tanaka, H. Shimizu, T. Nishida and T. Shiosaki	239
Oxygen Reduction Electrode Properties of Perovskite-Related Oxides $\text{Sr}(\text{Fe},\text{Co},\text{Ru})\text{O}_{3-\delta}$ at Low Temperatures T. Chuma, H. Toda, M. Saito, J. Kuwano and H. Shiroishi	243

Oxygen Reduction Electrode Properties of the Ba(Ce,Gd,Ru) O_{3-δ} Oxides at Low Temperatures	
H. Toda, K. Yoshihara, M. Saito, J. Kuwano and H. Shiroishi	247
Large-Scale Synthesis and Electrochemical Properties of LiAl_xMn_{2-x}O₄ Powders by Internal Combustion Type Spray Pyrolysis Apparatus Using Gas Burner	
I. Mukoyama, K. Myoujin, T. Ogihara, M. Uede, H. Ozawa and K. Ozawa	251
Synthesis and Characterization of Li(Ni_{1/3}Mn_{1/3}Co_{1/3})O₂ Nano-Particle by Aerosol Plasma Pyrolysis	
K. Myoujin, T. Ogihara, N. Ogata, K. Nakane, T. Koderu, S. Omura, M. Uede and K. Higeta	255
Preparation of LiFePO₄ as a Cathode Material for Lithium Ion Batteries by a Citric Acid Complex Method	
M. Higuchi, K. Uchida, K. Katayama and Y. Azuma	259
Preparation of Three Dimensionally Ordered Macroporous Li₄Ti₅O₁₂ Electrode	
S.W. Woo, K. Dokko and K. Kanamura	263
Proton Conducting Properties of Layered Metal Phosphate Hydrates	
Y. Kawakami and M. Miyayama	267
Electrochemical Behavior of LiFePO₄ in Aqueous Lithium Hydroxide Electrolyte	
M. Manickam, P. Singh, T.B. Issa, S. Thurgate and K. Prince	271
Computational Simulations of Li Ion Conduction in (Li,Lu)TiO₃	
T. Okumura, A. Dodomi, M. Saito and J. Kuwano	275