

Table of Contents

Preface, Organizers Committees and Sponsors

Chapter 1: Cement/Gypsum/Lime

An Innovative Low Density Synthetic Carbonate with a Composite Structure M. Lorgouilloux, R. Gaertner and T. Chopin	3
Dissolution Rate of Flat Plate Limestone in Agitated Sulfuric Acid Solution D. Tanaka, T. Ito, S. Taniguchi and T. Mizoguchi	10
Effect of Aggregate Type on the Concrete Matrix/Aggregates Interface and its Influence on the Overall Mechanical Behavior. A Numerical Study. S. Kamali-Bernard, D. KEINDE and F. Bernard	14
Elution Control of the Lead from the Fly Ash by Aluminum Hydroxide or Activated Clay H. Yoshida, Y. Tomita, M. Tsunomori, H. Asou and K. Kaikake	18
Immobilization Reaction of Chromate Ion Using $\text{Ca}_4\text{Al}_2(\text{OH})_{12}\cdot\text{Cl}_2\cdot 4\text{H}_2\text{O}$ J. Ohya, H. Sango and E. Sakai	24
Insoluble Treatment with Dolomite-Based Material for the Fluoride Ion T. Naruse, K. Tsurunaga and T. Kawashima	28
Mechanical Performances of Super Sulfated Cements C. Baux, A. Phelipot-Mardele, C. Lanos and A. Pierre	32
Mineral Foams Obtained with Super Sulfated Cement A. Phelipot-Mardele, C. Lanos, G. Samson and C. Baux	36
Removal of Toxic Oxyanion from Aqueous Solution Using Calcium Alumino-Zincate H. Sango and M. Hirano	40
Role of Siliceous Species in Geopolymer Reactant Mixture: Interaction with $(\text{NH}_4)_2\text{Mo}_2\text{O}_7$ L. Vidal, A. Autef, S. Selmani, E. Joussein and S. Rossignol	46
Role of the Japanese Cement Industry in the Establishment of a Sustainable Society Y. Izumi	50

Chapter 2: Electric Current Assisted Sintering

$\text{Co}_{80}\text{Ni}_{20}$ Nanowires-Based Tunable Sintered Materials N. Ouar, F. Schoenstein, S. Mercone, B. Villeroy, B. Leridon, S. Farhat and N. Jouini	61
Formation of M_5Si_3 Type Si-Ti-Zr System Intermetallic Compounds by Pulse Electric Current Sintering with Self-Propagating High Temperature Synthesis Y. Ikarashi, M. Nanko and K. Ishizaki	68
SPS Using SiC Die K. Kakegawa, C.M. Wen, N. Uekawa and T. Kojima	72

Chapter 3: Energy and Sustainable Materials

Mechanochemical/Solvothermal Synthesis of LiMn_2O_4 as a Cathode Material for Rechargeable Batteries O. Abe, S. Sato, S. Mitachi and T. Yamada	81
Process Study of Nanosized Powder Dispersion for DEFC K. Niwa, T. Tanaka and Y. Ikuma	85
Redox Behaviour of Potential SOFC Cathode Materials $\text{La}_{1.6}\text{Sr}_{0.4}\text{Ni}_{1-x}\text{Co}_x\text{O}_{4+\delta}$ ($x = 0.6$ and 0.8) Determined from <i>In Situ</i> Neutron Powder Diffraction under Flowing O_2 and $5\%\text{H}_2$ J.M. Hanlon, F. Tonus, T. Broux, C. Prestipino and M. Bahout	89
SEM-TES Application to Chemical State Analysis on Cation of Electrode Materials for Electrochemical Capacitors Based on the Sensitivity Correction of X-Ray Intensity Data M. Ohgaki, K. Tanaka, H. Suzuki, M. Hasuda, S. Matsumura, M. Yano and M. Miyayama	94

2-xSr_XMnO_{4±δ} (0.7 ≤ X ≤ 1.0) Solid Solutions in Oxidizing Condition	
T. Broux, M. Briand, C. Prestipino, O. Hernandez and M. Bahout	98

Chapter 4: Environment-Related Materials

Development of Novel "Sponge-Type" Sorbent for Elimination of CS: Preparation of Ammonium Molybdophosphate - Polyurethane Foam (AMP-PUF) Composite and its Sorption Behavior	
M. Murakami, S. Ohnishi, M. Hirano, K. Itoh and T. Saito	105
Effect of Multiple Parallel Grooves on the Photocatalytic Activity of Rutile TiO₂ Surfaces	
Y. Ikuma, S. Ogoe, S. Nakamura, K. Niwa, S. Anandan, H. Tajiri and O. Sakata	109
Gravimetric and Differential Thermal Analysis of Cullet-Based Glass Foams	
A. Ayadi, F. Benhaoua, L. Le Gendre, R. Benzerga and N. Stiti	113
Decontamination of Radioactive Cesium from Sea Sludge Using Microbial Activity	
H. Hirano, N. Nishimiya, Y. Kojima, T. Toyama, T. Umegaki and K. Okamoto	117
Removal of Selenium from Aqueous Sample Using Calcium Alumino-Zincate	
M. Hirano, M. Murakami, J. Ohya and H. Sango	121

Chapter 5: Functional Materials

Comparative Study of Antibacterial Efficiency of M-TiO₂ (M = Ag, Cu) Thin Films Grown by CVD	
F. Maury, J. Mungkalasiri, L. Bedel, F. Emieux, J. Dore and F.N.R. Renaud	127
Effect of RE³⁺ Codopant on Afterglow Time of SrS:Eu²⁺, RE³⁺	
A. Takahashi, T. Umegaki and Y. Kojima	131
Electric Pulse Induced Resistive Switching in the Narrow Gap Mott Insulator GaMo₄S₈	
M. Querré, B. Corraze, E. Janod, M.P. Besland, J. Tranchant, M. Potel, S. Cordier, V. Bouquet, M. Guilloux-Viry and L. Cario	135
Glass Structures and Linea/Nonlinear Optical Properties of Ag₂O-Doped TeO₂ Glasses	
Y. Kasuya, T. Suhara, T. Hayakawa, P. Thomas and M. Nogami	141
Improving Blue Phosphor BAM:Eu for Fluorescent and LED Lighting	
G. Wallez, A. Lacanilao, V. Buissette, T. Le Mercier, L. Mazerolles, B. Pavageau and L. Servant	145
Preparation of Red-Emitting Eu²⁺-Doped Barium Calcium Silicon Oxynitride by Solid-State Reaction and its Luminescence Properties	
H. Morishita, A.C.A. Delsing, H.T. Hintzen, H. Kuwahara and K. Itatani	149
Thermal Stability of MAX Phases	
I.M. Low and W.K. Pang	153

Chapter 6: Nanotechnology

Band-Gap Engineering Based on Ti@ZnO Nanocolloids: Tunable Optical Properties	
C. Neaime, F. Grasset and T. Aubert	161
Control of Shell Thickness of Hollow Silica-Alumina Composite Spheres and their Activity for Hydrolytic Dehydrogenation of Ammonia Borane	
N. Toyama, T. Umegaki, Q. Xu and Y. Kojima	166
Fabrication of Hollow Silica-Alumina Composite Spheres Using L(+)-Arginine and their Catalytic Performance for Hydrolytic Dehydrogenation of Ammonia Borane	
T. Umegaki, S. Imamura, N. Toyama, Q. Xu and Y. Kojima	170
Magnetic and Fluorescent Hybrid Silica Nanoparticles Based on the Co-Encapsulation of γ-Fe₂O₃ Nanocrystals and [Mo₆Br₁₄]²⁻ Luminescent Nanosized Clusters by Water-in-Oil Microemulsion	
C. Neaime, N. Nerambourg, T. Aubert, F. Grasset, S. Cordier, P. Gredin and M. Mortier	174
Multi-Functional Silica Nanoparticles Based on Metal Atom Clusters: From Design to Toxicological Studies	
T. Aubert, N. Nerambourg, C. Neaime, F. Cabello-Hurtado, M.A. Esnault, D. Lebrete-Chauvel, S. Jeanne, P. Pellen, N. Saito, K. Kimoto, H. Haneda, N. Ohashi, S. Cordier and F. Grasset	179

Nanohole Coat/Fill with Pt via Chemical Deposition in Supercritical Fluids E. Kondoh, T. Goto and M. Watanabe	184
Preparation of CuCrO₂ Powders with High Surface Areas T.W. Chiu and Y.W. Feng	187
Preparation of Novel TiO₂-Silica Filter Photocatalyst Derived from Titanium Alkoxy-Diolate Precursor M. Naijo, A. Hasegawa and N. Kakuta	191
Synthesis and Growth Mechanism of SiC/SiO₂ Core-Shell Nanowires by Thermal Evaporation Method N. Jirabornvornpongsa, M. Imai, K. Yoshida and T. Yano	195

Chapter 7: Science and Technology of Inorganic Materials

Evaluation of Iodine-Adsorption on Magnesium Compounds Toward Fixing of Radioactive Iodine N. Yoshida, R. Kadokura, K. Watanabe, K. Awata, A. Ishida and T. Okura	201
Fabrication and Fracture Toughness of CNTs/Alumina Composites with Fine Microstructures N. Ueda, T. Yamakami, T. Yamaguchi, M. Endo, N. Saito and S. Taruta	205
Influence of Cu₂O Addition on Crystallization Process and Microstructure of Transparent Mica Glass-Ceramics S. Taruta, K. Sakai, T. Yamakami and T. Yamaguchi	209
Interface Formation of Unidirectional SiC_f/SiC Composites by Electrophoretic Deposition Method K. Yoshida, H. Akimoto, A. Yamauchi, T. Yano, M. Kotani and T. Ogasawara	213
Low-Temperature Synthesis of MgAl₂O₄ by Capsule HIP Using Hydroxides as Starting Materials K. Yanagida, Y. Yamaguchi, K. Fujimoto and S. Ito	217
Morphological Control of Magnesium Phosphate Hydrate from a Highly Concentrated Alkaline Earth Metal Phosphate Solution by Microwave Heating T. Toyama, T. Ishigaya and N. Nishimiya	221
Reactivity of Carbonates in Superheated Steam under Atmospheric Pressure K. Asano, Y. Yamaguchi, K. Fujimoto and S. Ito	225
Synthesis of Bio-Cation-Substituted Ca-Apatites by Precipitation I. Bogdanoviciene, K. Tõnsuaadu, R. Traksmaa and A. Kareiva	229
Transition Edge Sensor (TES) X-Ray Detecting System with Sensitivity Correction to Stabilize the Spectrum Peak Center K. Tanaka, M. Ohgaki, H. Suzuki, M. Hasuda, M. Yano, M. Miyayama and S. Matsumura	233
Transmission Electron Microscopy Study of CaFe₅O₇ : Evidence of a Monoclinic Superstructure at Room Temperature C. Delacotte, F. Hüe, Y. Bréard and D. Pelloquin	237

Chapter 8: Thermoelectric Materials

Influence of Heat Treatment in Air on Thermoelectric Silicon Clathrate H. Anno and R. Shirataki	243
Light-Concentration Characteristic of Water Lens and its Application to Thermoelectric Generation K. Ito, H.T. Sui, H. Hakozaiki, H. Kinoshita and R.O. Suzuki	247
Optimization of Module Shape in Thermoelectric Power Generation R.O. Suzuki and T. Fujisaka	251
Preparation and Thermoelectric Properties of Perovskite-Type A_xCa_{1-x}B_yMn_{1-y}O_{3-δ} (A;La,Bi,Y,Sr) (B;Ni,Ti,V) Thin-Films by Electrostatic Spray Deposition Method K. Fujimoto, S. Yoshida, Y. Yamaguchi and S. Ito	256
Thermoelectric Analysis for a Three-Dimensional Power Generator in Helical X.N. Meng, T. Fujisaka and R.O. Suzuki	260