

# Contents

---



---

Preface	ix
Introduction	xi
<b>GLASSES AND CERAMICS FOR NUCLEAR AND HAZARDOUS WASTE TREATMENT</b>	
Development of Glass Compositions to Immobilize Alkali, Alkaline Earth, Lanthanide and Transition Metal Fission Products from Nuclear Fuel Reprocessing	3
J. C. Marra and A. L. Billings, J. V. Crum, J. V. Ryan, and J. D. Vienna	
Castable Glass and Glass-Ceramics from DC Plasma Treatment of Air Pollution Control Residues	11
D. Amutha Rani, J. A. Roether, D.E. Deegan, C. R. Cheeseman, and A. R. Boccaccini	
XAFS of Pu L <sub>III</sub> Edge in LaBS Glass	17
S. V. Stefanovsky, A. G. Ptashkin, A. A. Shiryayev, J. V. Zubavitchus, A. A. Veligjanin, J. C. Marra, and M. V. Chukalina	
Phase Formation Studies Using X-Ray Diffraction and Infrared Spectroscopy in the Vitrification of Savannah River Site SB4 HLW Sludge Surrogate with High Iron and Aluminum Contents at High Waste Loadings	25
O. I. Stefanovsky, S. V. Stefanovsky, D. Y. Suntsov, A. A. Akatov, and J. C. Marra	
Development of Waste Forms for Radioactive Iodine	35
Terry J. Garino, Tina M. Nenoff, James L. Krumhansl and David X. Rademacher	
CaMOO <sub>4</sub> in a Molybdenum Rich Borosilicate Glass-Ceramic: A Spectroscopic Study	43
Clément Mendoza, Gérard Panczer, Dominique de Ligny, Isabelle Bardez-Giboire, Sophie Schuller, and Sylvain Peugeot	

Glass-Ceramic Stoneware as a Promising Application for Waste Glasses	57
E. Bernardo, L. Esposito, E. Rambaldi, and A.Tucci	
<b>SOLID OXIDE FUEL CELLS AND HYDROGEN TECHNOLOGY</b>	
Low Temperature Hydrogen Release from Borontetrahydride-Sodalite and Its Reloading: Observations in In-situ and Ex-situ TIR Experiments	65
C. H. Rüscher, F. Stemme, L. Schomborg, and J.-Chr. Buhl	
Synthesis and Characterization in the New System $\text{Bi}_2(\text{Al}/\text{Ga})_4\text{O}_9$ and $^{18}\text{O}/^{16}\text{O}$ Exchange Experiments	71
T. Debnath, C. H. Rüscher, P. Fielitz, S. Ohmann, and G. Borchardt	
Microstructure of Sm-Doped Ceria Interlayer and the Impedance of $\text{LaSrCoFeO}_3/\text{SDC}/\text{LAMOX}$ Half Cell	79
Yu-Chen Chen, Hun-Chieh Chang, Dah-Shyang Tsai, Wen-Hung Chung, and Minh-Vien Le	
<b>CERAMICS FOR ELECTRIC ENERGY GENERATION, STORAGE AND DISTRIBUTION</b>	
Environmental Impact Evaluation of Ceramics Using Exergy Analysis	95
Hideki Kita, Hideki Hyuga, and Naoki Kondo	
The Dynamic Characteristics of Ultrasonic Therapeutic Transducers Using Lead-Free $\text{Na}_{0.5}\text{K}_{0.5}\text{NbO}_3$ Based Ceramics	105
Ming-Ru Yang, Sheng-Yuan Chu, Cheng-Che Tsai, Cheng-Shong Hong, and Chih-Lung Lin	
Direct In-Situ Growth of Multiwalled Carbon Nanotubes on Silicon Carbide Particles as a Precursor for Fabricating Silicon Carbide–Carbon Nanotube Composites	117
Amit Datye, Kuang-Hsi Wu, George Gomes, Latha Kumari, Wenzhi Li, and Hua-Tay Lin	
<b>PHOTOCATALYTIC MATERIALS</b>	
Effect of Functional Coatings on Topographical Properties of Glass	131
Minna Piispanen, Mikko Aromaa, Jyrki M. Mäkelä, and Leena Hupa	
Skin Damage by Different Shapes of Photocatalyst Nanoparticles	141
Eiji Watanabe, Kaoru Nishizawa, Takeshi Miki, and Hiroshi Taoda	
Characterization of Crystallized $\text{TiO}_2$ Film by Post Plasma Treatment	149
Toshiya Watanabe, Yukinobu Yokota, Naoya Yoshida, Yuko Shibayama, and Hisashi Ohsaki	

**DIRECT THERMAL TO ELECTRICAL ENERGY CONVERSION  
MATERIALS**

Thermoelectric Properties of Oxygen Deficient  $\text{La}_{2-x}\text{Sr}_x\text{CuO}_{4-\delta}$  Ceramics 163

Julio E. Rodríguez

Author Index

171