

Table of Contents

Preface

Chapter 1: Oxide Ceramics

Alpha-Alumina Synthesis	
A.H. Munhoz Jr., H.S. da Silva, M.V. Yamamoto, T.J. Masson, M.O. de Oliveira, L.F. de Miranda, R.C. Andrade and R.M. Peres	3
Synthesis of Nickel-Al₂O₃ Nanopowders and the Research of their Low Dielectric Constant Properties	
W. Hu, C. Li, S.L. Zheng, T. Xiang, P.J. Liu and S.B. Ding	9
Influence of Compaction Pressure on Density, Bending Strength, and Microstructures of Al₂O₃-SiC-ZrO₂ Ceramic Matrix Composites with Nb₂O₅ Additives	
D.L. Natalia, R. Wijanarko, I. Angela and B.T. Sofyan	15
Characterization of Al₂O₃-Al₂TiO₂ Ceramic Composites: Effects of Sintering Parameters on the Properties	
M.F.R. Pais Alves, C.M.F.A. Cossu, R.d.O. Magnago, A.S. Ramos and C. dos Santos	20
Modeling and Optimization of the Fabrication of Al₂O₃- Based Ceramocomposites Reinforced with Carbon Nanotubes	
E. Koltsova, N. Mamonova, A. Shaneva, M. Babkin, N. Popova and E. Zharikov	26
Development and Characterization of Al₂O₃-ZrO₂ Composites Using ZrO₂(Y₂O₃)-Recycled as Raw Material	
C.M.F.A. Cossu, M.F.R. Pais Alves, L.C.L. de Assis, R.d.O. Magnago, J.V.C. de Souza and C. dos Santos	33
The Effect of Polyvinyl Alcohol Addition on the Solid Carbon Infusion in Zirconia-Toughened Alumina	
N. Roshidan, H. Manshor, A.N. Rozhan and A.Z.A. Azhar	39
Preparation and Characteristics of ZrO₂/ZrW₂O₈ Composites with Low Thermal Expansion	
J.P. Li, C. Yang, Y.H. Li and S.H. Meng	54
Effect of Pressure Load on the Physical Properties of ZTA-TiO₂-Cr₂O₃	
H. Manshor, A. Ali and A.Z.A. Azhar	59
Improving the Tribological Properties of Ceramic Dies	
V. Alisin	65
Fabrication and Characterization of Low Thermal Expansion Cordierite/Spodumene/Mullite Composite Ceramic for Cookware	
P. Junlar, T. Wasanapiarnpong, L. Punsukmtana and N. Jiraborvornpong	71
Mechanical and Thermal Properties of MgAl₂O₄-Y₃Al₅O₁₂ Ceramic Composites	
J.B. Liu, Z.F. Wang, H. Liu, X.T. Wang and Y. Ma	77
Fabrication of MgO/Graphene Composites by Combustion Synthesis and Spark Plasma Sintering	
N. Lu, J.X. Liu, G. He and J.T. Li	83
Effect of Various Solid Loadings in Producing Silica-Nickel Oxide (SiO₂- NiO) Foams	
N.A. Nazaruddin, S. Ahmad, H. Taib, S. Mahzan, S.A.S. Abu Bakar and H.M. Elwalwal	89

Chapter 2: Non-Oxide Ceramics

Processing, Characteristics and Properties of Cubic Boron Nitride - An Updated Review	
L.A.F. Peçanha Jr., M.P. Oliveira, A.L.D. Skury, S.N. Monteiro, R.H.M. Reis, L.C. da Silva and F.d.C.G. Filho	99
Thermal Shock Resistance of Si₃N₄/hBN Ceramic Composites	
A. Kovalcikova, M. Húlan, R. Sedlák, M. Fides, C. Balázsi, M. Mihaliková and J. Dusza	104
SiAlON-TiN Ceramic Composites by Electric Current Assisted Sintering	
K.L. Smirnov, E.G. Grigoryev and E.V. Nefedova	110

Microstructure Formation and Performance of Reactive Sintered Titanium Oxycarbide Base Ceramic-Ceramic Composites	115
K. Juhani, J. Kübarsepp, M. Tarraste, J. Pirso and M. Viljus	
Effect of Forming Pressure on Microstructure and Mechanical Properties of B₄C-SiC-Si Ceramic Composites	120
H. Zong, C.P. Zhang, H.Q. Ru, H. Huang, J.H. Zhu, H.B. Xu and Q. Xia	
Mechanical Properties of Hot-Pressed B₄C-TiB₂ Composites Synthesized from B₄C-TiO₂ and B₄C-TiC	127
S.M. Zhao and L.R. Zhao	
Sintering of TiB₂-TiC-SiC Composite Materials by Combined SPS/SHS Method	133
L. Rurua, L. Khundadze and L. Nadaraia	
Development of Ultra-High Temperature Ceramics: From Monoliths to Composites	140
A. Julian-Jankowiak, V. Mathivet, J.F. Justin and V. Guérineau	
Processing and Properties of (Zr,Hf)B₂-SiC Ceramic Composites	146
X.T. Zhao, H.L. Wang, G. Shao, B.B. Fan, H.X. Lu, H.L. Xu, D.L. Chen and R. Zhang	

Chapter 3: Ceramic Matrix Composites

BN-Based Fiber Coatings by Wet-Chemical Coating	155
J. Maier, A. Nöth and K. Schönfeld	
Quartz Fibers Reinforced SiNB Ceramic Matrix Composites Prepared by PIP	161
L.F. Gao, S. Li, S.Q. Wang, K. Yu, X.M. Zhang, Y.Y. Xiao and K.X. Dong	
Powder Injection Molding of Oxide Ceramic CMC	168
V. Piotter, M. Tueluemen, T. Hanemann, M.J. Hoffmann and B. Ehreiser	
Injection Moulding of Oxide Ceramic Matrix Composites: Comparing Two Feedstocks	173
M. Böttcher, D. Nestler, J. Stiller and L. Kroll	
Study on the Highe-Temperature Mechanical of Al₂O₃/_fSiO₂ and SiO₂/_fSiO₂ Ceramic Matrix Composites	181
J.L. Ci, F.D. Cui, L.L. Zhang, J. Zhang, Y. Lv, Y.M. Zhao and H. Zhang	
Preparation and Performance of C/C-SiC Ceramic Matrix Composites	189
F.H. Yang, Y.Y. Wang, R.X. Liu, C.L. Zhou, L.P. Yang and K. Jiang	
Modification of the Thermoset Injection Moulding Process for Shaping to Increase the Fibre Length in C/C-SiC Ceramics Produced by the LSI Process	195
J. Stiller, D. Nestler, E. Päßler, F. Kempe, H. Wätzig, H. Ahmad, L. Kroll, M. Sommer and G. Wagner	
Processing of C/_fSiC Composites through Two-Channel Temperature-Control CVI: I, Modeling	203
P.F. Wang, S.F. Luo, H. Zhang, S. Zhang and L.L. Zheng	
The Microstructure and Shear Properties of SiC/SiC Composite Pins with Designed SiC Fiber Preform	212
S.H. Liu, H.P. Qiu, L. Wang, B.Y. Zhang, M.W. Chen, W.J. Xie and Y.Y. Liang	
Modelling of Hysteresis Behavior of Ceramic Matrix Composites	220
X.F. Teng, D.Q. Shi and X.G. Yang	
Dynamic Mechanical Properties of 2D-C/SiC and 2D-SiC/SiC	228
X.J. Gao, C. Li, H. Hasigaowa, Z.P. Li, Y.G. Bao, Y.L. Wang, S.Y. Yang and P. Man	
Modification of the Fiber-Matrix Interface in the Carbon Fiber Reinforced ZrB₂- Based Ultra-High Temperature Ceramic Composites	237
Y.F. Zu, J. Li, J.X. Dai and J.J. Sha	

Chapter 4: Glass-Ceramics

The Effect of Lithium on Crystallization and Microstructure of Glass-Ceramics in Soda-Lime Silicate System	245
E. Meechoowas, B. Petchareanmongkol, U. Pantulap and K. Tapasa	
Study of Thermal Property of Glass-Ceramics Produced from Soda Lime Glass Waste by Single-Step Sintering Process	252
N. Kulrat, D. Bootkul, S. Dangtip and S. Intarasiri	

Preparation and Characterization of Macro Porous Glass-Ceramics as Bioactive Scaffold Material	S.R. Zainudin, S.A. Syed Nuzul Fadzli, D.S. Che Halin, M.R. Yusof, B. Johar and F. Zainuddin	259
Influence of Thermal Treatment Temperature on Phase Formation and Bioactivity of Glass-Ceramics Based on the SiO₂-Na₂O-CaO-P₂O₅ System	P. Kantha, N. Barnthip, K. Pengpat, T. Tunkasiri and N. Pisitpipathsin	266
Crystallization Kinetics and Heat Treatment Temperature on Microstructure of Na₂O-CaO-P₂O₅-TiO₂ Glass System	P. Intawin, S. Eitssayeam, G. Rujijanagul, T. Tunkasiri and K. Pengpat	272
Influence of B₂O₃ on Dielectric, Mechanical, and Thermal Properties of MgO-Al₂O₃-SiO₂ Glass-Ceramics	B. Li, K. Jing and H.B. Bian	278
Mechanical Properties and Microstructure of Li₂O-SiO₂-P₂O₅-Al₂O₃-K₂O-CaO Glass-Ceramics	M. Kamnoy, U. Intatha, A. Munpakdee, S. Eitssayeam and T. Tunkasiri	283
Influence of Sm₂O₃ Additive on BaO-Al₂O₃-B₂O₃-SiO₂ Glass-Ceramics for CBGA Package	B. Li, H.B. Bian and K. Jing	289
The Bending Strength and Microwave Properties of xAl₂O₃+ (1-x) BaO-Al₂O₃-B₂O₃-SiO₂-ZnO Glass-Ceramics	T.Y. Qin, C.W. Zhong, Y. Qin and S.R. Zhang	294
Evaluation of Bonding Resistance after Surface Treatment of Two Glass-Ceramics Used in Dentistry	C.L. Melo-Silva, T.C.F. de Melo-Silva, C.F. de Carvalho, Á.B. Teixeira, E.C. Carvalho, A.S. Carvalho, F.A. Araujo, J.P. de Gouvêa and J.F.C. Lins	301
Feasibility of Producing Glass-Ceramics from a Mixture of Glass Cullet-Eggshell and Perlite	P. Nakkam and N. Chantaramee	306
Luminescence Property of Yb³⁺, Er³⁺ Co-Doped Oxy-Fluoride Transparent Glass	J.Y. Su and X.Y. Zhang	312
Dielectric Properties and Microstructural Studies of Er₂O₃ Doped Potassium Sodium Niobate Silicate Glass-Ceramics	P. Yongsiri, W. Senanon, P. Intawin and K. Pengpat	317

Chapter 5: Machining Technologies

Study on the Influence of Amplitude on Ultrasonic Assisted Grinding of Hard and Brittle Materials	X.Z. Li, B. Dai, J.K. Xu, L. Tong, M.X. Wang and S. Wang	325
Machining of TiB₂- SiC Ceramic Composites through WEDM Process	K. Jayakumar	330
Cutting Behavior of Self-Lubricating Ceramic Tool in Dry Machining of 40Cr Quenched Steel	B.Y. Wang, G.C. Xiao, Z.Q. Chen, M.D. Yi, J.J. Zhang and C.H. Xu	336
Evaluation of Ceramic Matrix Composite Edge and Surface Damage	R. Goller, A. Rösiger and Y. Azzaz	349
2D Geometrical Parameters Optimization Design Method of CMC/Metal Dovetail Joint	T.Y. Yang, D.Q. Shi and Z. Cheng	355
Calculation of the Grinding Performance of Diamond-Bearing Ceramic Tools	O.O. Novikova, V.V. Novikov and A.N. Bolotov	363
Research of Influence of Technological Factors of Formation of Plasma Coatings on their Thermal Technical Properties	F. Vashkevich, D. Laukhin, M. Spilnyk, V. Zhuravel and A. Zagorodni	369