

Table of Contents

Acknowledgements

Committees & Preface

Microstructure Characteristics of Spray-Formed and Melt-Spun Al85Nd5Ni10 and Al89La6Ni5 Bulk Hybrid Composites

M.L.T. Guo, C.Y.A. Tsao, J.C. Huang and J.S.C. Jang 1

High Energy Planetary Ball Milling of SiC Powders

Y.B. Pan, Z.R. Huang, D.L. Jiang, L. Mazerolles, D. Michel, J.L. Pastol and G. Wang 7

Thermomechanical Properties of Nanosilica Reinforced PEEK Composites

Y.H. Lai, M.C. Kuo, J.C. Huang and M. Chen 15

Design and Experimental Investigation of Laminated Ceramic Composites with High Strength

Y. Huang, S.K. Zhao, C.A. Wang and R.F. Chen 21

Microstructure and Properties of Vacuum Hot-Pressing SiC/ Ti-Cu-Ni-Sn Bulk Metallic Glass Composites

H.M. Lin, G.S. Chen and P.Y. Lee 26

Materials Characterization in Continuous Fiber-Reinforced Ceramic Composites Served in Simulating Environment

J.Z. Li, L.T. Zhang, L.F. Cheng, Y.D. Xu, S.R. Qiao, G.Q. Jiao, J. Zhang and X.G. Luan 31

Fabrication of Ceramic-Metal Composites by Melt Infiltration of Moso-Bamboo-Derived Porous SiC

Y.J. Lin and S.Y. Lin 37

Oxidation Behavior of Carbon Phase in 3D C/SiC Composites

J.Z. Li, J. Zhang, L.T. Zhang, L.F. Cheng and Y.D. Xu 43

Microstructure Evolution and Microwave Dielectric Properties of Multi-Phase Ba(Ti_{1-x}M_x)O₃ Ceramics

S.F. Wang, Y.R. Wang and T.C.K. Yang 48

Wettability and its Improvement at Al/SiC Interfaces

Q.B. Ouyang, W.M. Zhou, G.D. Zhang and D. Zhang 52

Novel Composite Anode Containing Tin Compounds and Carbonaceous Materials for Li-Ion Batteries

T. Fang, L.Y. Hsiao and J.G. Duh 58

Deformation and Fracture Behavior of 7039 Al Reinforced with B4C Particles at Elevated Temperature

C.Z. Nie, J.J. Gu, J.L. Liu and D. Zhang 65

Development and Photoluminescence of ZnO-ZnS Core-Shell Nanotube and Nanorod Arrays

P.C. Kuo, S.Y. Chen and J.S. Bow 70

Fretting Wear of SiC and Ni3Al Particles Reinforced Al Alloy Matrix Composites

R. Chen, H.H. Wang, D. Zhang and G.D. Zhang 75

Characterization on Microstructure Homogeneity of θ-Al₂O₃ Powder Systems During Phase Transformation

F.S. Yen, P.L. Chang, P.C. Yu and R.J. Yang 81

Densification Mechanism of SnO₂ Ceramics Doped with 5.0 mol% MnO₂

G.Q. Luo, J. Li, D.M. Zhang, Q. Shen and L.M. Zhang 88

Investigation of Hot-Pressed Al₂O₃-Cr₂O₃/ Cr₃C₂ Nanocomposite

H.T. Lin, J.L. Huang and S.C. Wang 93

Consolidation and Properties of Tungsten Carbide Target with Low Cobalt Content by Hot-Press Sintering

G.Q. Shao, Z. Xiong, T.G. Wang, X.L. Shi and X.L. Duan 98

Hot Workability of the Mg₆₅Cu₂₀Y₁₀Ag₅ Amorphous/ NanoZrO₂ Composite Alloy within Supercooled Temperature Region

L.J. Chang, G.R. Fang, J.S.C. Jang, I.S. Lee, J.C. Huang and C.Y.A. Tsao 103

Structures of Ceramics/Metal and Ceramics/Ceramics Core/Shell Particles by Hybridization

Z.Y. Fu, Z. Fan, W.J. Tang, J.Y. Zhang, W.M. Wang, H. Wang, Y.C. Wang and Q.J. Zhang 109

Microstructure and Mechanical Properties of Nano-ZrO₂ and Nano-SiO₂ Particulate Reinforced AZ31-Mg Based Composites Fabricated by Friction Stir Processing	114
C.I. Chang, Y.N. Wang, H.R. Pei, C.J. Lee, X.H. Du and J.C. Huang	
Preparation and Conductivity of TiO₂-Doped Y₂O₃-Stabilized ZrO₂ Ceramic	120
X.L. Lei, D.M. Zhang and L.M. Zhang	
Determining Interface Strength of Glass-Metal Bi-Layer Laminates Using Cross-Push Method	126
Y.W. Bao, S.J. Gao, Y.F. Han and M. Guan	
Effects of Particle Size on the Thermal Physical Properties of SiCp/Al Composites	131
L. Geng and Y.W. Yan	
High Temperature Mechanical Property of Al₂O₃ Coated Quartz-Fiber Reinforced Methyl Silicon Resin Composites	135
L. Wang, Y.D. Huang and L. Liu	
Preparation and Flame Ablation/Oxidation Behavior of ZrB₂/SiC Ultra-High Temperature Ceramic Composites	142
C.A. Wang, H.L. Wang, Y. Huang and D.N. Fang	
Friction and Wear Properties of Aluminum Matrix Composites and its Application	147
Q.B. Ouyang, H.L. Gu, W.L. Wang, D. Zhang and G.D. Zhang	
Fabrication and Formation Mechanism of In Situ AlN and Mg₂Si Particles-Reinforced Mg Matrix Composites	151
C.F. Zhang, W. Cao, T.X. Fan and D. Zhang	
Prediction of the Effect of Alloying Elements on In Situ Reaction in Synthesizing (AlN+Mg₂Si)/Mg Composites	156
C.F. Zhang, W. Cao, T.X. Fan and D. Zhang	
Thermodynamics of the Effect of Alloying Additions on In-Situ Reaction to Synthesize TiC/Mg Composites	161
W. Cao, C.F. Zhang, T.X. Fan and D. Zhang	
In Situ Synthesis of TiB₂/Mg Composites by Flux-Assisted Synthesis Reaction of the Al-Ti-B System in Molten Magnesium	166
W. Cao, C.F. Zhang, T.X. Fan and D. Zhang	
Experimental Investigation on the Electrical and Dynamic Mechanical Properties of PMN/Electrically Conductive Carbon Black/Butyl Composites	171
Y.B. Wang, Z.X. Huang, Y. Qin, M. Du and L.M. Zhang	
Spark Plasma Sintering of α-Si₃N₄ Ceramics with MgO-Al₂O₃ as Sintering Additives	176
F.Q. Yan, F. Chen, Q. Shen and L.M. Zhang	
Compressive Strength and Phase Transformation of Zirconia Porous Ceramics at Different Sintering Temperatures	180
C.L. Chen, Q. Shen, J.G. Li and L.M. Zhang	
Growth and Properties of Pulsed Laser Deposited K₃Li₂Nb₅O₁₅ Thin Films	184
Z.S. Zhan, Y.S. Gong, Q. Shen and L.M. Zhang	
Study on the Thermodynamics and Kinetics in the Combustion Reaction between Titanium and Boron Powders	189
K. Wang, Z.Y. Fu, W.M. Wang, Y.C. Wang, H. Wang, J.Y. Zhang and Q.J. Zhang	
The Influence of Mixing Manner on Microstructure and Mechanical Performance of B4CP/2024Al Composites	195
C.Z. Nie, J.J. Gu, J.L. Liu and D. Zhang	
Microstructure and Tensile Properties of In Situ Synthesized (TiB+TiC)/Ti-6Al-4V Composites	201
J.Q. Lu, W.J. Lu, Y. Liu, J.N. Qin and D. Zhang	
A Review on Bolt Load Retention Test of Magnesium Alloys	208
W. Cao, C.F. Zhang, T.X. Fan and D. Zhang	
Influence of Processing Parameters on the Microstructure of (AlN+Mg₂Si)/Mg Metal Matrix Composites	214
C.F. Zhang, W. Cao, T.X. Fan and D. Zhang	
Comparison of Activated Carbon from Water Bamboo Residues with Surfaces Modified by Different Methods	220
D.C. Huang, T.X. Fan and D. Zhang	
Fabrication CNTs/SiO₂ Laminated Structure from Aqueous Tape Casting	227
Y. Zhu, C.S. Xiang, H. Xu, Y.B. Pan and J.K. Guo	

The Thinking on Multiphase Materials	
J.K. Guo, H.M. Kou and Y.B. Pan	233
Preparation and Characterization of Porous Ceramic Support	
Y.M. Wang, Y.X. Xue, Q. Shen and L.M. Zhang	238
The Mechanical Properties of a New Titanium Alloys with Low Modulus	
H.H. Wang, C. Rong and D. Zhang	243
Study on the Possibility of the Application of Metal Matrix Composites on Extendible Exit Cone Nozzles	
J.F. You, D.O. Zhang, Q.B. Ouyang and J.H. Su	248
Functional Properties of BaTiO₃/Ni Composites	
Y.C. Huang and W.H. Tuan	254