

# Papers Published in Volumes 7 and 8

## Contents of Volume 7

### Number 1

Editorial . . . . .	1
Calculation of Heterogeneous Phase Equilibria in the System Si–Mg–N–O . . . . .	3
H.-J. RICHTER, M. HERRMANN & W. HERMEL (FRG)	
The Effect of Fluorine Source and Concentration on the Crystallization of Machinable Glass–Ceramics . . . . .	11
LJ. RADONJÍĆ & LJ. NIKOLIĆ (Yugoslavia)	
Fundamental Condition for the Existence of Microcrack Clouds in Monophase Ceramics . . . . .	17
BRIAN R. LAWN (USA)	
Crystallization Behaviour of Amorphous Silicon Nitride . . . . .	21
RALF RIEDEL & MARTIN SEHER (FRG)	
Interfacial Reaction in Zircon–Alumina Multilayer Composites . . . . .	27
J. S. MOYA, R. MORENO, J. REQUENA (Spain), R. TORRECILLAS & G. FANTOZZI (France)	
The Mechanism of $MgAl_2O_4$ Spinel Formation from the Thermal Decomposition of Coprecipitated Hydroxides . . . . .	31
G. GUSMANO, P. NUNZIANTE, E. TRÀVERSA & G. CHIOZZINI (Italy)	
Fracture Sources and Processing Improvements in SiC-Whisker-Reinforced Mullite–Zirconia Composites . . . . .	41
H. Y. LIU, N. CLAUSSEN, M. J. HOFFMANN & G. PETZOW (FRG)	
Acoustic Emission Characteristics and Fracture Toughness of Artificial Graphite Electrodes . . . . .	49
NAOTAKA EKINAGA, KINJI TAMAGAWA & HIDEAKI TAKAHASHI (Japan)	
Phase Studies in the Chromium–Manganese–Titanium Oxide System at Different Oxygen Partial Pressures . . . . .	55
A. NAOUMIDIS, H. A. SCHULZE, W. JUNGEN & P. LERSCH (FRG)	

### Number 2

Editorial . . . . .	65
Computer Modelling Studies of Defect Structures and Migration Mechanisms in Yttrium Aluminium Garnet . . . . .	67
L. SCHUH, R. METSELAAR (The Netherlands) & C. R. A. CATLOW (UK)	
The Interaction of Iron during the Hot-Pressing of Silicon Nitride . . . . .	75
A. D. STALIOS, J. LUYTEN (Belgium), C. D. HEMSLEY, F. L. RILEY (UK) & R. J. FORDHAM (The Netherlands)	
Possible Transformation-toughening Mechanism in Glass– $C_2S$ Particulate Composites . . . . .	83
R. DAL MASCHIO & R. DI MAGGIO (Italy)	
Deformational Behaviour of Ceramics . . . . .	87
GEORGY A. GOGOTSI (USSR)	

*Journal of the European Ceramic Society—Volumes 7 and 8*

Fabrication of Flaw-tolerant Aluminum-titanate-reinforced Alumina . . . . .	93
JULIE L. RUNYAN & STEPHEN J. BENNISON (USA)	
SiC Whiskers Reinforced $\text{Si}_3\text{N}_4$ Matrix Composites: Oxidation Behaviour and Mechanical Properties . . . . .	101
J. M. DESMARRES, P. GOURSAT, J. L. BESSON, P. LESPADE & B. CAPDEPUY (France)	
Cathodoluminescence Measurement of Strained Alumina Single Crystals . . . . .	109
CLAUDIA P. OSTERTAG, LAWRENCE H. ROBINS & LAWRENCE P. COOK (USA)	
Organic Gels in the Preparation of Silico-aluminate Powders. I. Mullite . . . . .	117
A. DOUY (France)	
Silicon Nitride Oxidation/Re-oxidation . . . . .	125
P. ANDREWS & F. L. RILEY (UK)	

*Number 3*

Editorial . . . . .	133
Unlubricated Sliding Behaviour of Various Zirconia-based Ceramics . . . . .	135
M. WOYDT, J. KADOORI, K.-H. HABIG & H. HAUSNER (FRG)	
Phase Transformations in Polymer Al-Si Gels of Mullite Composition . . . . .	147
A. V. GALAKHOV & V. YA. SHEVCHENKO (USSR)	
Mechanical Properties of Injection Moulding Suspensions as a Function of Ceramic Volume Fraction and Temperature . . . . .	155
T. ZHANG & J. R. G. EVANS (UK)	
Joining Ceramics before Firing by Solvent Welding . . . . .	165
H. RASHID, K. A. LINDSEY & J. R. G. EVANS (UK)	
The Chemistry of the Carbothermal Synthesis of $\beta$ -SiC: Reaction Mechanism, Reaction Rate and Grain Growth . . . . .	177
F. K. VAN DIJEN & R. METSELAAR (The Netherlands)	
The System $\text{Y}_2\text{O}_3$ – $\text{Sc}_2\text{O}_3$ – $\text{ZrO}_2$ : Phase Characterisation by XRD, TEM and Optical Microscopy . . . . .	185
F. T. CIACCHI, S. P. S. BADWAL & J. DRENNAN (Australia)	
The System $\text{Y}_2\text{O}_3$ – $\text{Sc}_2\text{O}_3$ – $\text{ZrO}_2$ : Phase Stability and Ionic Conductivity Studies . . . . .	197
F. T. CIACCHI & S. P. S. BADWAL (Australia)	

*Number 4*

Editorial . . . . .	207
Duplex Ceramics: I. Stress Calculations, Fabrication and Microstructure . . . . .	209
H. E. LUTZ & N. CLAUSSEN (Germany)	
Duplex Ceramics: II. Strength and Toughness . . . . .	219
H. E. LUTZ & N. CLAUSSEN (Germany)	
Uniaxial Tension and Cyclic Tension–Compression Testing of Ceramics . . . . .	227
J. N. ADAMI, D. BOLSCH, J. BRESSERS, E. FENSKE & M. STEEN (The Netherlands)	
Effect of Water Suspension pH on Thermomechanical Properties of $\text{Al}_2\text{O}_3$ –10 wt% $\text{ZrO}_2$ Ceramics . . . . .	237
HENRYK TOMASZEWSKI (Poland)	

*Journal of the European Ceramic Society—Volumes 7 and 8*

Hot Isostatic Pressing of Presintered Silicon Carbide Ceramics SHE JIHONG, JIANG DONGLIANG (People's Republic of China) & PETER GREIL (Germany)	243
Effect of Flaw–Flaw Interaction on the Strength of a Soda-Lime Glass M. SAKAI & T. MIYAJIMA (Japan)	249
Fracture Toughness and Crack Bridging of a Silicon Nitride Ceramic Y. MANIETTE, M. INAGAKI & M. SAKAI (Japan)	255
Properties of Sintered SiC Whisker-Reinforced $\text{Si}_3\text{N}_4$ Composites C. OLAGNON, E. BULLOCK (The Netherlands) & G. FANTOZZI (France)	265

*Number 5*

Editorial . . . . .	275
Fabrication and Properties of Al-infiltrated RBAO-based Composites SUXING WU, ADAM J. GESING, NAHUM A. TRAVITZKY & NILS CLAUSSEN (Germany)	277
Thermo-mechanical Properties and Oxidation Resistance of Zirconia CVI Matrix Composites: 2—Thermal Properties and Oxidation Resistance J. MINET, F. LANGLAIS & R. NASLAIN (France)	283
Sol-Gel-Derived $\text{CaO}$ - and $\text{CeO}_2$ -stabilized $\text{ZrO}_2$ Fibers—Conversion Process of Gel to Oxide and Tensile Strength KANICHI KAMIYA, KYOICHI TAKAHASHI, TAKUYA MAEDA, HIROYUKI NASU & TOSHINOBU YOKO (Japan)	295
Pressure Casting of Silicon Nitride J. F. A. K. KOTTE, J. A. M. DENISSEN & R. METSELAAR (The Netherlands)	307
High Temperature Properties of $\text{Si}_3\text{N}_4$ Materials H. KLEMM, M. HERRMANN, T. REICH & W. HERMEL (Germany)	315
The Rate-controlling Processes in the Oxidation of HIPped $\text{Si}_3\text{N}_4$ with and without Sintering Additives J. CHEN, J. SJÖBERG, O. LINDQVIST, C. O'MEARA & L. PEJRYD (Sweden)	319
$\text{Si}_3\text{N}_4$ -AlN Polytypoid Composites by GPS H. R. ZHUANG, W. L. LI, J. W. FENG, Z. K. HUANG & D. S. YAN (People's Republic of China)	329
A Description of Microstructure Applied to the Thermal Conductivity of AlN Substrate Materials S. RUCKMICH, A. KRANZMANN, E. BISCHOFF & R. J. BROOK (Germany)	335

*Number 6*

Editorial . . . . .	343
Particulate Composites from Coated Powders. DAVID KAPOLNEK & LUTGARD C. DE JONGHE (USA)	345
Evaluation of Oxygen Content on Silicon Nitride Powder Surface from the Measurement of the Isoelectric Point PETER GREIL, RALF NITZSCHE, HANNELORE FRIEDRICH & WALDEMAR HERMEL (FRG)	353
Surface Modification and Dispersion of Silicon Nitride and Silicon Carbide Powders E. LIDÉN, L. BERGSTRÖM, M. PERSSON & R. CARLSSON (Sweden)	361

*Journal of the European Ceramic Society—Volumes 7 and 8*

Oxidation of Pressureless Sintered $\text{Si}_2\text{N}_2\text{O}$ Materials . . . . .	369
C. O'MEARA, J. SJÖBERG, G. DUNLOP & R. POMPE (Sweden)	
Effect of Oxygen Chemisorption on the Electrical Conductivity of Zinc Oxide Films Prepared by a Spray Pyrolysis Method . . . . .	379
FRÉDÉRIC CAILLAUD, AGNÈS SMITH & JEAN-FRANÇOIS BAUMARD (France)	
Microstructural Characterization of Aluminum Titanate-based Composite Materials . . . . .	385
HANS WOHLFROMM, THIERRY EPICIER, JOSÉ S. MOYA, PILAR PENA & GARETH THOMAS (Spain/USA/France)	
Organic Gels in the Preparation of Silico-aluminate Powders. II. Cordierite . . . . .	397
A. DOUY (France)	
The Properties of a Ceramic Injection Moulding Suspension Based on a Preceramic Polymer . . . . .	405
T. ZHANG & J. R. G. EVANS (UK)	
Contributor Index . . . . .	417

**Contents of Volume 8**

*Number 1*

Editorial . . . . .	1
Formation of an Y/Ce-Doped $\alpha$ -Sialon Phase . . . . .	3
THOMMY EKSTRÖM, KJELL JANSSON, PER-OLOF OLSSON & JONAS PERSSON (Sweden)	
Determination of the Concentration of Oxygen Dissolved in the AlN Lattice by Hot Gas Extraction from AlN Ceramics . . . . .	11
ANDREAS THOMAS & GERD MÜLLER (FRG)	
$\alpha/\beta$ -Phase Transformation of $\text{Si}_3\text{N}_4$ without Sintering Additives . . . . .	21
P. ŠAJGALÍK (CSFR)	
Synthesis and Characterization of Si-Zr-C-O Ceramics from Polymer Precursors . . . . .	29
FLORENCE BABONNEAU & GIAN DOMENICO SORARU (France/Italy)	
$\text{BaTiO}_3$ Preparation by Reaction of $\text{TiO}_2$ with $\text{Ba}(\text{OH})_2$ . . . . .	35
G. PFAFF (FRG)	
Highly Textured Thick Layers of YBCO Superconductor . . . . .	41
F. GUERIN, F. LAINEE & J. MASSOL (France)	
Description and Role in High-temperature Deformation of Grain Boundaries in $\alpha$ -Alumina Ceramics . . . . .	47
L. PRIESTER & S. LARTIGUE (France)	
Modified CVD of Nanoscale Structures in and EVD of Thin Layers on Porous Ceramic Membranes . . . . .	59
L. G. J. de HAART, Y. S. LIN, K. J. de VRIES & A. J. BURGGRAAF (The Netherlands)	

*Number 2*

Microstructure and Mechanical Properties of $\beta'$ - $\text{Si}_3\text{Al}_3\text{O}_3\text{N}_5$ Ceramics . . . . .	71
E. KOKMEIJER, G. DE WITH & R. METSELAAR (The Netherlands)	

*Journal of the European Ceramic Society—Volumes 7 and 8*

Kinetics of Capillary Extraction of Organic Vehicle from Ceramic Bodies. Part I: Flow in Porous Media Y. BAO & J. R. G. EVANS (UK)	81
Kinetics of Capillary Extraction of Organic Vehicle from Ceramic Bodies. Part II: Partitioning between Porous Media Y. BAO & J. R. G. EVANS (UK)	95
Hydrothermal Preparation of Barium Titanate from Barium–Titanium Acetate Gel Precursors DETLEV HENNINGS, GÖTZ ROSENSTEIN & HERBERT SCHREINEMACHER (Germany)	107
Effect of Dopants on the Crystallite Growth of Superfine Zirconia Powder J. L. SHI, Z. X. LIN & T. S. YEN (People's Republic of China)	117
Wear and Strength of Mg-PSZ, Worn on Hardened Steel P. H. J. VAN DEN BERG & G. DE WITH (The Netherlands)	123
<i>Number 3</i>	
Phase Relations in the Ti–Si–C System W. J. J. WAKELKAMP, F. J. J. VAN LOO & R. METSELAAR (The Netherlands)	135
The Si–Al–O–N System at Temperatures of 1700–1775 °C BILL BERGMAN, THOMMY EKSTRÖM & ANDERS MICKSKI (Sweden)	141
Synthesis of Silicon Nitride Powder by Gas-phase Reaction JÁN JANIGA, KIM PAK SIN & VILIAM FIGUSCH (CSFR)	153
Formation, Crystallisation and Oxidation of Selected Glasses in the Y–Si–Al–O–N System C. O'MEARA, G. L. DUNLOP & R. POMPE (Sweden)	161
Thermal Decomposition of Freeze-dried Complex Acetates of Iron, Nickel and Zinc, and Structural Characterization of Products H. LANGBEIN, C. MICHALK, K. KNESE & P. EICHHORN (FRG)	171
Phase Transformation in Al–Si–Mg Gels: Effect of Additions of Ti, Ce and Zr A. V. GALAKHOV & V. YA. SHEVCHENKO (USSR)	177
The Effect of Manganese Doping on the Mechanical Behavior of Cordierite Glass-Ceramics. YU. V. BASCHENKO, S. M. BARINOV, V. YA. SHEVCHENKO & R. YA. HODAKOVSKAYA (USSR)	181
Determination of Preferred Orientation Textures in $\text{Al}_2\text{O}_3$ Ceramics A. BÖCKER, H. G. BROKMEIER & H. J. BUNGE (FRG)	187
<i>Number 4</i>	
Editorial F. THEVENOT	195
Nitrides and Oxynitrides: Preparation, Crystal Chemistry and Properties ROGER MARCHAND, YVES LAURENT, JEAN GUYADER, PAUL L'HARIDON & PATRICK VERDIER (France)	197
Nanometric Si/C/N Composite Powders: Laser Synthesis and IR Characterization M. CAUCHETIER, O. CROIX, M. LUCE, M. I. BARATON, T. MERLE & P. QUINTARD (France)	215

Pyrolysis of Polyvinylsilazane Precursors to Silicon Carbonitride . . . . .	221
A. LAVEDRINE, D. BAHLOUL, P. GOURSAT, N. CHOONG KWET YIVE, R. CORRIU, D. LECLERQ, H. MUTIN & A. VIOUX (France)	
Colloidal Dispersion of Alumina–Carbon Homogeneous Mixtures for Carbothermal Synthesis of AlN. . . . .	229
M. P. CORRAL, R. MORENO, J. REQUENA, J. S. MOYA & R. MARTÍNEZ (Spain)	
Proposal of a Composition Model for Commercial AlN Powders . . . . .	233
E. PONTHIEU, P. GRANGE, B. DELMON, L. LONNOY, L. LECLERCQ, R. BECHARA & J. GRIMBLOT (Belgium/France)	
Growth of Aluminium Nitride Crystal Under a Nitrogen Transferred Arc Plasma. . . . .	243
H. AGEORGES, CHANG KUN, S. MEGY, E. MEILLOT, A. SANON & J. M. BARONNET (France)	
Organometallic Chemical Vapour Deposition in the Al–O–N System . . . . .	251
B. ASPAR, B. ARMAS, C. COMBESCURE & D. THENEGAL (France)	
Alumina- $\gamma$ -Aluminum Oxynitride Composites from Alumina Nitrided by Ammonia . . . . .	257
J. SAPPEI, D. GOEURIOT, F. THEVENOT, Y. LAURENT, J. GUYADER & P. L'HARIDON (France)	
<i>Number 5</i>	
Titanium Carbonitride–Zirconia Composites: Formation and Characterization . . . . .	263
E. BARBIER & F. THEVENOT (France)	
Thermal Conductivity of SiC–AlN Ceramic Materials . . . . .	271
MARTINE LANDON & FRANÇOIS THEVENOT (France)	
Oxidation Behavior of SiC–AlN Ceramic Materials . . . . .	279
M. LANDON, P. GOEURIOT & F. THEVENOT (France)	
Reactivity in Oxygen of a HIPed Zirconium Nitride Material. . . . .	285
N. ALEXANDRE & M. DESMAISON-BRUT (France)	
Oxidation Stages of Aluminium Nitride Thin Films Obtained by Plasma-enhanced Chemical Vapour Deposition (PECVD) . . . . .	291
N. AZEMA, J. DURAND, R. BERJOAN, C. DUPUY & L. COT (France)	
Nitrogen Self-Diffusion in Titanium Nitride Single Crystals and Polycrystals. . . . .	299
F. ANGLEZIO-ABAUTRET, B. PELLISSIER, M. MILOCHE & P. EVENO (France)	
Mechanical Properties of Silicon Nitride–SiC Platelet Composites . . . . .	305
M. POORTEMAN, P. DESCAMPS, S. SAKAGUCHI, F. CAMBIER (Belgium), E. GILBART, F. L. RILEY & R. J. BROOK (UK)	
Creep and Microstructure of TiC Particulate $\text{Si}_3\text{N}_4$ -based Composites . . . . .	311
F. PENI, J. CRAMPON, R. DUCLOS & B. CALES (France)	
The Direct Bonding Between AlN Ceramics and CaO-doped Tungsten . . . . .	319
ROLAND QUERIAUD, PIERRE LEFORT & MICHEL BILLY (France)	
<i>Number 6</i>	
Editorial . . . . .	327
Joining Ceramics before Firing by Ultrasonic Welding . . . . .	329
H. RASHID, K. N. HUNT & J. R. G. EVANS (UK)	

*Journal of the European Ceramic Society—Volumes 7 and 8*

Ultrasonic Monitoring of Slip Casting Kinetics of Silicon Nitride Ceramic . . . . .	339
S. APPLETON, D. A. HUTCHINS & M. H. LEWIS (UK)	
The Production of Titanium Nitride by the Carbothermal Nitridation of Titanium Dioxide Powder . . . . .	345
WEN-YU LI & F. L. RILEY (UK)	
Interrelation among Flaw Resistance, $K^R$ -Curve Behavior and Thermal Shock Strength Degradation in Ceramics. I. Theoretical Considerations . . . . .	355
H. E. LUTZ & M. V. SWAIN (Australia)	
Interrelation among Flaw Resistance, $K^R$ -Curve Behavior and Thermal Shock Strength Degradation in Ceramics. II. Experiment . . . . .	365
H. E. LUTZ & M. V. SWAIN (Australia)	
The Formation of Phases in the AlN-rich Corner of the Si-Al-O-N System . . . . .	375
P. J. CANNARD, THOMMY EKSTRÖM & R. J. D. TILLEY (UK/Sweden)	
Thermal Evolution of $\text{Fe}_2\text{O}_3$ – $\text{TiO}_2$ Sol–Gel Thin Films . . . . .	383
P. COLOMBO, M. GUGLIELMI & S. ENZO (Italy)	
Contributor Index . . . . .	389