

# Table of Contents

## Foreword

### New Ternary Nitrides

F.J. DiSalvo 3

### Synthesis and Ionic Conductivity Properties of Oxynitride Perovskites $A_xLa_{2/3}Ta_2O_6$ - $xN_x$ (A=Na,Li) with $La_{2/3}Ta_2O_6$ Type Structure

S. Esmaeilzadeh, J. Grins and T. Hörlin 11

### Synthesis and X-Ray Diffraction Study of Substituted $La_{10}(Si_6O_{22}N_2)O_2$ Silicon Apatites

S. Titeux, M. Gervais, P. Verdier and Y. Laurent 17

### Na Flux Growth and Characterization of GaN Single Crystals

H. Yamane, M. Shimada and F.J. DiSalvo 21

### The Crystalline Structure of Germanium Oxynitrides within the CdZnGeON Family

M.J. Capitán, C.L.d. Picard, Y. Laurent and J.A. Odriozola 25

### Solvothermal Synthesis of the Graphitic Form of $C_3N_4$ as Macroscopic Sample

H. Montigaud, B. Tanguy, G. Demazeau, I. Alves, M. Birot and J. Dunogues 31

### The Nucleation and Growth Mechanisms of Si-N-O Fibres

H. Ewing, A. Vital, U. Vogt and A. Hendry 37

### Synthesis and Catalytic Evaluation of New Metallophosphate Oxynitrides MPON (M = Al, Ga, Ti)

V. Peltier-Baron, R. Marchand, A. O'Malley and B.K. Hodnett 45

### Activity and Stability of a <>Pt/AIGaPON>> Oxynitride in the Dehydrogenation of Isobutane

S. Delsarte, Y. Laurent and P. Grange 51

### Surface Property and HDN Activity of $NH_3$ Treated Molybdena-Alumina Catalysts

M. Nagai, Y. Goto, O. Uchino and S. Omi 57

### DRIFTS Study of Pt-AIPON Catalysts

M.A. Centeno, M. Debois and P. Grange 65

### Surface Stability of Amorphous Aluminophosphate Oxynitrides (AIPON)

J.J. Benítez, A. Díaz, M. Montes, Y. Laurent and J.A. Odriozola 71

### Phosphorus Oxynitride PON: A New Silica

A. Le Sauze, J. Haines, C. Chateac, J.M. Léger and R. Marchand 77

### Synthesis of MIBK from Acetone in a Single Step over Ni/AIPON Catalysts

M. Montes, M. Martin, A. Díaz, J.J. Benítez and J.A. Odriozola 83

### $\alpha''Fe_{16}N_2$ : A Giant Magnetic Moment Material?

K.H. Jack 91

### Mechanosynthesis of $Fe_{16}N_2$ , from this Special Case to General Principles

J. Foct 99

### Why is Nitrogen so Different? Structure, Bonding and Magnetic Properties of some Model Nitrides, Carbides and Phosphides

G.A. Landrum, B. Eck and R. Dronskowski 105

### Giant Magnetism in Fe Metal/AlN Multilayered Thin Film Prepared by RF-Sputter Deposition

S. Kikkawa, M. Fujiki, S. Enomoto, K. Hirota and O. Yamaguchi 111

### Order-Disorder-Phenomena in the $\varepsilon$ -Phase of the System Fe/N

H. Jacobs, A. Leineweber and W.A. Kockelmann 117

### Aluminium Nitride Coatings Preparation Using a Chemical Vapour Deposition Process

B. Armas, C. Combescure, M. De Icaza Herrera and F. Sibieude 125

### A Multi-Technique Study of Titanium Nitride Films Deposited via Reactive Sputter Deposition

C.G.H. Walker, S.A. Morton, J.M. Charnock, E.J. MacLean and N.M.D. Brown 131

### A Comparison between the Tribological and Mechanical Properties of TiN and TiCN

N. Donnelly, M. McConnell, D.P. Dowling and J.D. O'Mahony 141

### Plastic Forming of Silicon Nitride Powders via Colloidal Processing

F.F. Lange, M. Colic, G. Franks and M. Fisher 149

<b>The Influence of Continuous Sintering on the Properties of Si<sub>3</sub>N<sub>4</sub></b> D.E. Wittmer, S.P. Etherton, P.M. Holgesson, M. McGown and J. Kellogg	155
<b>Influence of CaZrO<sub>3</sub> on the Sintering Behaviour and Microstructural Development of Si<sub>3</sub>N<sub>4</sub> Based Ceramics</b> M. Casey, B. Djurciel, L. Looney, J.B. Veyretland and E. Bullock	161
<b>Elastic and Anelastic Properties of Silicon Nitride at High Temperatures by Non-Destructive Impulse Excitation</b> G. Roebben and O. Van der Biest	167
<b>Anisotropic Properties in Hot Pressed Silicon Nitride - Silicon Carbide Platelet Reinforced Composites</b> M. Poorteman, P. Descamps, F. Cambier, A. Poulet and J. Descamps	173
<b>Characterisation of Hot Pressed Commercial Si<sub>3</sub>N<sub>4</sub> Powders</b> D. Libert, P. Descamps and F. Cambier	179
<b><math>\alpha</math> <math>\beta</math> Transformation in Lithium <math>\alpha</math>-Sialon Ceramics</b> Z. Yu, D.P. Thompson and A.R. Bhatti	185
<b>Nd-Doped <math>\alpha</math>-Sialon and Related Phases: Stability and Compatibility</b> Z. Shen and M. Nygren	191
<b>Pressureless Sintering of Calcium Alpha Sialons</b> W. Ta, Y.B. Cheng, B.C. Muddle, C. Hewett and M. Trigg	199
<b><math>\alpha</math>-SiAlON Ceramics Densified with Mixed Oxide Sintering Additives</b> H. Mandal, R. Oberacker, M.J. Hoffmann and D.P. Thompson	207
<b>The Effect of Processing Conditions on the Microstructures of <math>\alpha</math>-SiAlON Ceramics</b> H. Zhao, C. Wood and Y.B. Cheng	213
<b>Hard and Tough <math>\alpha</math>-SiAlON Ceramics</b> H. Mandal and M.J. Hoffmann	219
<b>Microstructural Development of Nd, Gd and Yb-Doped <math>\alpha'</math>/<math>\beta'</math> Sialons</b> A. Nordmann, M.H.H. Jumali, M.H. Lewis, R.J. Lumby and N.R. Gajum	225
<b>Imaging and Analysis of Sialon Interfaces</b> L.K.L. Falk	231
<b>Liquid Formation in the Y-Si-Al-O-N System</b> W. Redington, M. Redington and S. Hampshire	237
<b>An Examination of the Stability of Crystalline and Amorphous Silicon (Oxy) Nitride Fibres in an Oxide Matrix</b> Z. Laczik, H.J. Edrees and A. Hendry	243
<b>Effect of Y<sub>2</sub>O<sub>3</sub> Content on Sintering of Aluminum Nitride</b> R.A.L. Drew, Y. Baik and M. Entezarian	249
<b>Nitrogen Ceramics for Engine Applications</b> K.H. Jack	255
<b>Characterisation and Crystallisation of La-Oxynitride Glass</b> N.K. Schneider, H. Lemercier and S. Hampshire	265
<b>Preparation and Characterisation of I<sub>w</sub>-Phase in the Y-Si-Al-O-N System</b> J. Parmentier and D.P. Thompson	271
<b>Influence of the Atmosphere on the Oxidation State of the Eu-Ion in a SiAlO(N) Glass and Glass-Ceramic</b> Y. Menke, V. Baron, H. Lemercier and S. Hampshire	277
<b>XPS and DRIFTS Study of Cerium in Ce-Si-Al-O-N Glasses</b> A. Díaz, S. Guillópé, P. Verdier, Y. Laurent, A. López, J. Sambeth, A. Paúl and J.A. Odriozola	283
<b>A TEM Study of Crystal Growth in a Y-Si-Al-O-N Glass Ceramic System</b> W.T. Young, L.K.L. Falk, H. Lemercier and S. Hampshire	289
<b>Fracture of Oxynitride Glasses and SiC Particulate Composites</b> B. Baron, H. Lemercier, C. Veyrac, A. Pomianowski and S. Hampshire	295
<b>Applications of Magic-Angle Spinning NMR to Nitrogen-Containing Ceramics</b> R.K. Harris and P.R. Bodart	305
<b>Ab Initio and Experimental Studies on the Structure of Amorphous Aluminophosphate Oxynitrides (AIPON)</b> J.J. Benítez, J. Oviedo, A. Marquez, J. Fernandez-Sanz and J.A. Odriozola	313
<b>High Resolution NMR of BN and BN Precursors: a Combined <sup>11</sup>B and <sup>14</sup>N Approach</b> P.M. Geffroy, F. Mabilat, C. Bessada, J.P. Coutures and D. Massiot	319

**Crystal Structure Determination of  $\text{Y}_2\text{SiAlO}_5\text{N}$  'B-Phase' by Rietveld Analysis**

M.F. Gonon, J. Descamps, F. Cambier and D.P. Thompson

325

**A Core Level Study of  $\text{ZrN}$  (100) and  $\text{NbN}$  (100)**

L.I. Johansson and H.I.P. Johansson

335