

Table of Contents

Preface

Advances in Electrochromic Materials and Devices	
C.G. Granqvist, E. Avendaño and A. Azens	1
Physical Properties of Sputtered ITO and WO₃ Thin Films	
H.N. Cui, V. Teixeira, A.C. Monteiro, E. Fortunato, R. Martins and E. Bertran	7
ZnO:Ga Thin Films Produced by RF Sputtering at Room Temperature: Effect of the Power Density	
E. Fortunato, V. Assunção, A. Marques, A. Gonçalves, H. Águas, L. Pereira, I. Ferreira, F.M. Braz Fernandes, R.J.C. Silva and R. Martins	12
Effect of Thermal Treatment on the Properties of Sol-Gel Derived Al-Doped ZnO Thin Films	
V. Muşat, B. Teixeira, E. Fortunato, R.d.C.C. Monteiro and P.M. Vilarinho	16
KrF Laser CVD of Chromium Oxide by Photodissociation of Cr(CO)₆	
P.M. Sousa, A.J. Silvestre, N. Popovici, M.L. Paramês and O. Conde	20
Deposition of SiO₂ and SiO₂:Ge Films for Optical Applications in a Matrix Distributed Electron Cyclotron Resonance Reactor	
D. Daineka, P. Bulkin, G. Girard and J.- Bourée	25
Structural and Dielectric Characteristics of Ba₂MeWO₆ (Me=Mg, Ni, Zn) Double Perovskites	
D.D. Khalyavin, J.P. Han, A.M.R. Senos and P.Q. Mantas	30
Microstructure and Electrical Properties of SrBi₂Ta₂O₉ Ceramics Processed by Tempered Grain Growth	
H. Amorín, M.E.V. Costa and A.L. Kholkin	35
Structural and Dielectric Properties of Mg-Doped Strontium Titanate Ceramics: Dependence on the Materials Processing	
A. Tkach, P.M. Vilarinho, A.L. Kholkin, I.M. Reaney and J. Petzelt	40
La(Mg_{1/2}Ti_{1/2})O₃ – Based Materials for Microwave Applications	
M.P. Seabra, A.N. Salak, M. Avdeev and V.M. Ferreira	45
Lead Zirconate Titanate Thin Films Prepared with Different Types of Seeds: A Comparison Study	
A.Y. Wu, P.M. Vilarinho and I.M. Miranda Salvado	50
The Use of Thin Silicon Films in Flat Panel Displays	
D. Pribat	56
Improvement of Field-Effect Mobilities in TFTs: Surface Plasma Treatments Vs Stack Dielectric Structures	
G. Lavareda, C. Nunes de Carvalho, A. Amaral and E. Fortunato	64
Sputtering Preparation of Silicon Nitride Thin Films for Gate Dielectric Applications	
L. Pereira, H. Águas, R. Igreja, R.M.S. Martins, N. Nedev, L. Raniero, E. Fortunato and R. Martins	69
MIS Photodiodes of Polymorphous Silicon Deposited at Higher Growth Rates by 27.12 MHz PECVD Discharge	
H. Águas, L. Pereira, L. Raniero, E. Fortunato and R. Martins	73
Characterization of Polymorphous Silicon Thin Film and Solar Cells	
S. Zhang, Y. Xu, X. Liao, R. Martins, E. Fortunato, X. Zeng, Z. Hu and G. Kong	77
Stacked a-SiC:H Optical Transducers: the Influence of the Sensing Material	
P. Louro, M. Fernandes, I. Rodrigues, A. Fantoni, A. Maçarico and M. Vieira	81
Dynamic Characterization of Large Area Image Sensing Structures Based on a-SiC:H	
M. Fernandes, M. Vieira and R. Martins	86
High Sensitive Image Sensors Based on a Tandem Laser Scanned Photodiode	
M. Vieira, M. Fernandes, P. Louro, A. Fantoni and I. Rodrigues	91
Effect of Annealing on Gold Rectifying Contacts in Amorphous Silicon	
H. Águas, L. Pereira, I. Ferreira, A.R. Ramos, A.S. Viana, J. Andreu, P.M. Vilarinho, E. Fortunato and R. Martins	96

Composition, Structure and Optical Characteristics of Polymorphous Silicon Films Deposited by PECVD at 27.12 MHz	R. Martins, H. Águas, I. Ferreira, E. Fortunato, L. Raniero and P. Roca i Cabarrocas	100
Batch Processing Method to Deposit a-Si:H Films by PECVD	L. Raniero, H. Águas, L. Pereira, E. Fortunato, I. Ferreira and R. Martins	104
Influence of the Rapid Thermal Annealing on the Properties of Thin a-Si Films	N. Nedev, G. Beshkov, E. Fortunato, S.S. Georgiev, T. Ivanov, L. Raniero, S. Zhang and R. Martins	108
Role of Substrate on the Growth Process of Polycrystalline Silicon Thin Films by Low-Pressure Chemical Vapour Deposition	L. Pereira, H. Águas, L. Raniero, R.M.S. Martins, E. Fortunato and R. Martins	112
Spiral Inductors on Silicon for Wireless Communications	P.M. Trabulo, D.A. Durães, P.M. Mendes, P.J. Garrido and J.H. Correia	116
Silicon Etching in CF₄/O₂ and SF₆ Atmospheres	A. Silva, L. Raniero, E. Ferreira, H. Águas, L. Pereira, E. Fortunato and R. Martins	120
Optimisation of a Home-Made RIE System - Effect of SF₆ Plasma on the Properties of Partially Etched a-Si:H Films	P. Pereira, G. Lavareda, A.M. Botelho do Rego, A. Amaral and C. Nunes de Carvalho	124
Optical and Morphological Properties of Annealed PbS Thin Films Obtained from a Chemical Solution.	L. Raniero and C.L. Ferreira	128
Absolute Scale Reciprocal Space Mapping on X-Ray Diffractometers Incorporating a Position Sensitive Detector: Application to III-Nitride Semiconductors	N. Franco, S. Pereira and A.D. Sequeira	132
Recent Advances in Spintronics. Half-Metal Ferromagnets: Their Role in Spintronics	S. Gardelis, J. Androulakis, P. Migiakos and J. Giapintzakis	137
An Approach to the Magnetic Disaccommodation in Nd Doped Yttrium Iron Garnets	P. Hernández-Gómez, C. de Francisco, C. Torres, J.M. Muñoz, O. Alejos, J.I. Iñiguez, V. Raposo, J.M. Perdigão, A.R. Ferreira and C.S. Furtado	143
Magnetocaloric Effect in Manganites: Ferromagnetism and Charge-Ordering Effects	M.S. Reis, A.M. Gomes, J.P. Araújo, P.B. Tavares, J.S. Amaral, I.S. Oliveira and V.S. Amaral	148
Study of Giant Magnetoimpedance in Amorphous Wires by Means of the Complex Impedance Phase Analysis	J. Iñiguez, V. Raposo, D. García, A.G. Flores, M. Zazo, P. Hernández-Gómez and C. de Francisco	153
Donor/Acceptor Substituted Oligothiophenes: Synthesis, Spectroscopic and Electrochemical Properties	M.M.M. Raposo, A.M.C. Fonseca and G. Kirsch	157
Structure of Cellular Cordierite Foams	M.J. Matos, M. Fátima Vaz, J.C. Fernandes and F.A.C. Oliveira	163
Aqueous Tape Casting of Low-k Cordierite Substrate: The Influence of Glass Content	S. Mei, J. Yang, J.M.F. Ferreira and R. Martins	168
Crushing Behaviour of Cellular Cordierite Foams	F.A.C. Oliveira, S. Dias, M. Fátima Vaz and J.C. Fernandes	172
Fabrication of Cellular Cordierite Foams	F.A.C. Oliveira, S. Dias, J.M.G. Mascarenhas, J.M.F. Ferreira, S. Olhero and D.P. Dias	177
Thermal Expansion Behaviour of P₂O₅-Doped Sol-Gel-Derived Cordierite	S. Mei, J. Yang and J.M.F. Ferreira	182
Synthesis and Characterization of SrBi₂Nb₂O₉ Powders Prepared by a New Chemical Method	G.G. Aguilar and M.E.V. Costa	186
Combustion Synthesis Ternary Carbide Ti₂AlC_{1-x} Powders	K.X. Chen, J.M. Guo, R.L. Fu and J.M.F. Ferreira	191
Characterization of Glassy Phase at the Surface of Alumina Ceramics Substrate and its Effect on Laser Cutting	R.L. Fu, Y.B. Li, X. Xu and J.M.F. Ferreira	196
Thermal Cycling Life of Plasma Sprayed Alumina Coating on Cast Irons	T. Irisawa, H. Matsumoto, K. Kishitake, T. Tanaka and O. Yamada	200

Effect of Nitrogen Pressure and Additives on Combustion Synthesis of Rod-Like Yttrium α-SiAlON Crystals	204
R.L. Fu, K.X. Chen, X. Xu and J.M.F. Ferreira	
Effect of Magnetic Field on the Crystallization Behaviour of Fe Containing Pb and Ba Borate Glasses	208
N.M. Ferreira, S.K. Mendiratta and M.A. Valente	
Crystallization of a Borosilicate Glass during Sintering Studied by Dilatometry and XRD Analysis	212
M.M.R.A. Lima and R.d.C.C. Monteiro	
Effect of Different Oxide Additives on Colloidal Processing and Sintering of Alumina	216
S.M.H. Olhero and J.M.F. Ferreira	
The Use of Electrophoretic Deposition for the Fabrication of Ceramic Matrix Composites	221
A.R. Boccaccini	
Complete Densification of Si_3N_4 – SiC Ceramic Matrix Composites (CMC's) by a Pressureless Sintering Route	225
J.M. Carrapichano, A. Tailaire, F.J. Oliveira and R.F. Silva	
Porosity Assessment of β-Spodumene/Glass Matrix Composites by Small Angle Neutron Scattering	230
F.M.A. Margaça, M. Moreira, J.M. Teixeira, R.F. Silva and I.M. Miranda Salvado	
Torsion of Cork under Compression	235
M.E. Rosa, J. Osório, V. Green and M.A. Fortes	
Mechanical Properties and Microstructure of Fe40Al/TiC Composites with Low Content of Intermetallic	239
M.X. Gao, F.J. Oliveira, Y. Pan, J.L. Baptista and J.M. Vieira	
Strengthening in a Copper Based Nanocomposite	244
M.T. Marques, J.B. Correia and P. Matteazzi	
Bentonite Clays from Paraíba State, Brazil: Effects of Na and Mg Compounds in the Rheology of the Dispersions	249
L.V. Amorim, J.D. Viana, K.V. Farias, H.L. Lira and H.C. Ferreira	
Recent Developments in the Powder Metallurgy Processing of Steels	253
A.S. Wronski and J.M.G. Mascarenhas	
Processing Effects on the Characteristics of the In-Situ Formed Al_3Ni Reinforcement in a PM Al Matrix	258
T. Marcelo and M.H. Carvalho	
Study of Transformations in a Cu-9Ni-6Sn Alloy by Differential Scanning Calorimetry (DSC)	262
N. Lourenço and H. Santos	
Tungsten Carbide Powder Inserts in Ductile Iron	267
L.I. Duarte, N. Lourenço, H. Santos, J. Santos and C. Sá	
Evolution of the Recrystallization Texture in an IF Steel	271
A. Machado Lopes, A. dos Santos Paula and C. Sérgio da Costa Viana	
Contact Fatigue Behaviour of Artificially Indented Austempered Ductile Iron Discs	275
L. Magalhães, A. Duarte, J. Seabra, H. Santos and C. Sá	
Microstructural Plastic Behaviour of AISI 304 Austenitic Stainless Steel	280
M.M. Vieira, B.M. Chaparro, M.F. Vieira and J.V. Fernandes	
Thermal Behaviour of Nanostructured Intermetallics Synthesized by Mechanical Alloying and Coated with Metallic Elements	285
F. Simões, B. Trindade and J.A. Santos	
Soft Annealing of High Chromium White Cast Iron	290
P. Amorim, H. Santos, J. Santos, S. Coimbra and C. Sá	
Study of Sintering Variables of Tungsten Carbide Particles Sputter-Deposited with Stainless Steel	295
C.M. Fernandes, A.M.R. Senos and M.T. Vieira	
Defects Formation in Friction Stir Welding of Aluminium Alloys	299
R.M. Leal and A. Loureiro	
In-Phase Multiaxial Fatigue Analysis of Tubular AlMgSi Welded Specimens	303
L.M.P. Abreu, J.D.M. Costa, J.A.M. Ferreira and F. Antunes	
Effect of the Bi Content on the Mechanical Properties of a Sn-Zn-Al-Bi Solder Alloy	307
D. Soares, C. Vilarinho, J. Barbosa, R. Silva, M. Pinho and F. Castro	

Effect of Cooling Rate on the Microstructure and Hardness of Austenitic Stainless Steel Welds	312
A. Rodrigues and A. Loureiro	
Corrosion Resistance of Two Ternary Mg₈₈Ti₅Si₇ and Mg₆₀Ti₁₀Si₃₀ Alloys Synthesised by Mechanical Alloying	317
L. Dias, B. Trindade, R. Fischer, S. Mies and C.M.A. Brett	
Characterization of Glassy Phase at the Surface of Alumina Ceramics Substrate and its Effect on Laser Cutting	322
R.L. Fu, Y.B. Li, X. Xu and J.M.F. Ferreira	
In Situ XRD Study of the Graphite Surface Layer Formation during Thermal Cycling of Cast Iron	326
F.M. Braz Fernandes, R.J.C. Silva and Â. Gomes	
Cyclic Deformation Behaviour of Copper Polycrystals Pre-Strained in Tension	330
W.P. Jia and J.V. Fernandes	
Microstructure and Thermo-Mechanical Properties of NiTi Shape Memory Alloys	335
E. Hornbogen	
In-Situ GIXRD Characterization of the Crystallization of Ni-Ti Sputtered Thin Films	342
R.M.S. Martins, R.J.C. Silva, F.M. Braz Fernandes, L. Pereira, P.R. Gordo, M.J.P. Maneira and N. Schell	
Effect of Thermal Cycling on the Transformation Temperatures of a Ni-Ti Shape Memory Alloy	346
A. dos Santos Paula, J.P.H.G. Canejo, R.J.C. Silva and F.M. Braz Fernandes	
Preparation of Porous Hydroxyapatite Particles to Be Used as Drug Delivery Systems	353
M.A. Martins, C. dos Santos, M.E.V. Costa and M.M. Almeida	
Production of Porous Hydroxyapatite with Potential for Controlled Drug Delivery	358
A.C. Queiroz, S. Teixeira, J.D. Santos and F.J. Monteiro	
Influence of Characteristics of the Starting Hydroxyapatite Powders and of Deagglomeration Procedure, on Rheological Behaviour of HA Suspensions	361
A.F. Lemos, J.D. Santos and J.M.F. Ferreira	
Effect of the Enzyme Concentration on the DIRECT Coagulation Casting of Hydroxyapatite-Alumina Bodies	366
A. Rolo, A.P. Tavares, A.M.R. Senos and M.M. Almeida	
Medical Applications of Bonelike® in Maxillofacial Surgery	370
F. Duarte, J.D. Santos and A. Afonso	
Bonelike®/PLGA Hybrid Materials for Bone Regeneration: In Vivo Evaluation	374
J.M. Oliveira, T. Kawai, M.A. Lopes, C. Ohtsuki, J.D. Santos and A. Afonso	
Effect of Human Serum Proteins on Pure Hydroxyapatite and Silicon Substituted Hydroxyapatatite: AFM and SEM Studies	378
C.M. Botelho, D.J. Stokes, R.A. Brooks, S. Best, M.A. Lopes, J.D. Santos, N. Rushton and W. Bonfield	
Network Connectivity and Bio-Mineralization of 0.45SiO₂-(0.45-x)MgO-xK₂O-0.1(3CaO:P₂O₅) Glasses	383
C.M. Queiroz, S. Agathopoulos, J.R. Fraude and M.H.F.V. Fernandes	
Synthesis and Characterization of Amorphous Silica Modified with Organic Ligands	388
G. Marino, É.T.G. Cavalheiro and A.G. Ferreira	
Mechanical Characterization of Dental Restorative Composite Materials	393
P.V. Antunes and A. Ramalho	
Protein Adsorption Effect on In Vitro Acellular Biodegradation of CaO-P₂O₅ Glass Ceramics	398
A.G. Dias, M.A. Lopes and J.D. Santos	
Early Steps of Orthophosphate Crystallisation in a Ca-Mg-K Phosphosilicate Glass Frit	402
C.M. Queiroz, M.H.F.V. Fernandes and J.R. Fraude	
Bioinspired Macromolecular Actuators	406
D. De Rossi, A. Mazzoldi and F. Carpi	
A Piezoelectric Pseudo-Composite Polymer Film for the Detection of Proteins	411
P. Inácio, J.N. Marat-Mendes and C.J. Dias	
Novel Bioresorbable Poly(lactide-co-glycolide) (PLGA) and PLGA/Bioglass® Composite Tubular Foam Scaffolds for Tissue Engineering Applications	415
J.J. Blaker, R.M. Day, V. Maquet and A.R. Boccaccini	

Capacitance Response of Polysiloxane Films with Interdigital Electrodes to Volatile Organic Compounds	420
R. Igreja and C.J. Dias	
Hydrophilic – Hydrophobic Polymers Based on Poly(L-lactide) and Poly(2-Hydroxyethyl Methacrylate)	425
A. Cretu, D. Kuckling and H. Adler	
Enzymatic Degradation of Starch Based Thermoplastic Compounds Used in Protheses	429
M.A. Araújo, A.M. Cunha and M. Mota	
Swelling and Tribological Properties of Poly (HEMA) Hydrogels	433
V.P. Bavaresco, C.A.C. Zavaglia, M.C. Reis and J.R. Gomes	
Misanthus x Giganteus: Contribution to a Sustainable Agriculture of a Future/Present - Oriented Biomaterial	437
A.L. Fernando, V. Godovikova and J.F.S. Oliveira	
Electrical Charge Injection/Ejection and Transport at Moderate Fields in Low-Density Polyethylene	442
E.R. Neagu, R.M. Neagu and J.N. Marat-Mendes	
The Influence of Water on Direct Current Conductivity of Cork	446
J.N. Marat-Mendes and E.R. Neagu	
Isothermal and Non-Isothermal DC Measurements to Analyze Space Charge Behavior in Polyamide 11	450
R.M. Neagu, E.R. Neagu, C.J. Dias and J.N. Marat-Mendes	
Spectrophotometric and Electrokinetic Characterization of Dye Sorption on PA 6	455
L. Tušek, K. Stana-Kleinschek, V. Ribitsch and S. Strnad	
Correlation between High Power Proton T₂ NMR Relaxation and Macroscopic Viscoelastic Properties	459
J. Alexandre, G. Feio, M.R. Marvão and J. Figueiredo	
TGA as a Tool for Studying the Thermal Stability of Polymeric Materials	463
C. Leer, G. Botelho and P. Gijsman	
Comparative Study, by Optical Techniques of the Interface Polymer/Steel in Replication Conditions	467
E.C. Ferreira, M.F. Costa, C.R. Laranjeira, M.J. Oliveira and A.S. Pouzada	
Residual Strength in Adhesive Joints with a Natural Fibber Reinforcement Interface Layer	472
H. Silva, J.D.M. Costa, J.M.F. Ferreira and M. Richardson	
PP/LCP Blends: Influence of the LCP Content on the Mechanical, Rheological and Morphological Properties	476
S. Filipe, J.M. Maia and M.T. Cidade	
Effect of Experimental Conditions on the Grafting of Maleic Anhydride onto Polyethylene in Extruders	480
A.V. Machado and J.A. Covas	
Electrochemical Synthesis of Polythiophene Coatings on Zinc and a Zinc Alloy in Organic Media	484
M. Bazaaroui, E.A. Bazaaroui, J.I. Martins and L. Martins	
Polypyrrole Coated Galvanized Steel by Electrochemical Polymerization in Aqueous Electrolytic Medium	489
M. Bazaaroui, J.I. Martins, L. Martins, E.A. Bazaaroui, T.C. Reis and M.C. Nunes	
Performances of Paint Systems Proposed for Atmospheres with very High Corrosivity Category	494
D. Santos, C. Brites, C. Coelho, M.R. Costa and E.M. Almeida	
Production of a Copper- Iron Carbide Nanocomposite Via Mechanical Alloying	501
J.B. Correia and M.T. Marques	
Process Development of γ-TiAl Based Alloys and their Consolidation	505
F. Neves, M.H. Carvalho and B. Trindade	
Fretting Wear of Sputtered W-Si-N Coatings against Steel	510
M.C. Gaspar, A. Ramalho and A. Cavaleiro	
Behaviour of Nanocomposite Coatings of W-S-N/C System under Pin-on-Disk Testing	515
A. Nossa and A. Cavaleiro	

Nucleation and Crystallization of Titania Nanoparticles in Silica Titania Planar Waveguides: a Study by Low Frequency Raman Scattering	
M. Montagna, A. Chiasera, E. Moser, F. Visintainer, M. Ferrari, L. Zampedri, R.R. Gonçalves, S.J.L. Ribeiro, A. Martucci, M. Guglielmi, M. Ivanda and R.M. Almeida	520
Novel Microporous and Layered Luminescent Lanthanide Silicates	
J. Rocha, L.D. Carlos, A. Ferreira, J.P. Rainho, D. Ananias and Z. Lin	527
Growth of Polymorphous/Nanocrystalline Silicon Films Deposited by PECVD at 13.56 MHz	
L. Raniero, R. Martins, H. Águas, S. Zang, I. Ferreira, L. Pereira, E. Fortunato and L. Boufendi	532
Effect of Dopants on the Dynamic of Powder Formation and the Properties of Polymorphous Silicon Thin Films	
A.V. Kharchenko, V. Suendo, D. Daineka and P. Roca i Cabarrocas	536
Structural Characterization and Luminescence of Ge/Si Quantum Dots	
A. Fonseca, N.A. Sobolev, J.P. Leitão, M.C. Carmo, N. Franco, H. Presting and A.D. Sequeira	540
Active Nanocrystals in Erbium-Doped Silica-Titania Sol-Gel Films	
L.F. Santos, H.C. Vasconcelos, M.I. Barros Marques and R.M. Almeida	545
Mechanical Properties of Nanostructured Ceramic Materials	
I. Amato	550
Hydrothermal Fabrication of Rod-Like Rutile Nano-Particles	
J. Yang, S. Mei and J.M.F. Ferreira	556
Activated Sintering of TiC–TiB₂ SHS–Powders	
D. Vallauri, I.M. Martins, F.A. Deorsola, I. Amato, F. Delmas and M. Oliveira	560
Nanosized Photonics and Magnetism in Organic-Inorganic Hybrids	
L.D. Carlos, R.A.S. Ferreira, N.J.O. Silva, V.S. Amaral, M.C. Gonçalves and V. de Zea Bermudez	564
Preparation of New Materials Containing Diazoalcene Molybdenum Complexes in Pillared Clays	
F. Costa, C.J.R. Silva, A.M.C. Fonseca, I. Neves, A.P. Carvalho, J. Pires and M.B. Carvalho	569
Preparation and Characterization of Polymer Nanoparticles for Hybrid Silica-Latex Aerogel Foams	
T. Fonseca, J.M.G. Martinho and J.P.S. Farinha	573
Thermal Conductivity and Thermal Stability of Zirconia and Hafnia Based Thermal Barrier Coatings by EB-PVD for High Temperature Applications	
J. Singh, D.E. Wolfe, R.D. Miller, J. Eldridge and D.M. Zhu	579
Zirconium Oxide Modified Sulfonated Poly (Ether Ether Ketone) Membranes for Direct Methanol Fuel Cell Applications	
V. Silva, B. Ruffmann, H. Silva, A. Mendes, M. Madeira and S. Nunes	587
The Influence of Reducing Agents in the Performance of the Proton Exchange Membrane Fuel Cell	
L. Martins, M.C. Nunes, J.I. Martins, M. Pinto and M. Bazzaoui	592
Preparation and Characterization of a Novel Polymer Electrolyte Based on Lithium Hexafluoroarsenate	
S. Cerqueira Barros, M.A. Silva, M.J. Smith and J.R. MacCallum	596
Dielectric Breakdown Statistics of Polyethylene for Progressively-Censored Data	
M. Carmo Lança and J.N. Marat-Mendes	602
Turning of CFRC Composites Using Si₃N₄ and Thin CVD Diamond Coated Si₃N₄ Tools	
M. Belmonte, F.J. Oliveira, M.A. Lanna, C.R.M. Silva, E.J. Corat and R.F. Silva	609
Cutting of Free Standing CVD Diamond Films by Optical Fibre Guided Nd:YAG Laser	
M. Boutinguiza, F. Quintero, M. Belmonte, A.J.S. Fernandes, F.M. Costa, R.F. Silva, J. Pou and M. Pérez Amor	614
New Multilayer Coatings for Secondary Wood Products Cutting	
J.M. Castanho, D. Pinheiro and M.T. Vieira	619
Near-Surface Studies on Low-Energy Ion Irradiated Ni Using a Positron Beam	
M. Duarte Naia, P.M. Gordo, A.P. de Lima, A.M.C. Moutinho and R.S. Brusa	623
Deposition of Titania Washcoat Membranes on Stainless Steel Plates through Sol-Gel Method	
S. Mei, J. Yang and J.M.F. Ferreira	627
Effect of Quaternary Ammonium Hydroxides on the Stabilisation of Al₂O₃ Aqueous Suspensions	
M. Guedes, A.C. Ferro and J.M.F. Ferreira	631

Contribution of the Phase-Matrix Interface to the Behaviour of Aluminium Filled Epoxyes P.V. Vasconcelos, F.J. Lino, R.J.L. Neto and P. Henrique	635
Interfacial Reactions, Thermodynamics and Kinetics in Doped Aluminosilicate Ceramics/Liquid Al-Alloy Contacting Systems M.I.L.L. Oliveira, S. Agathopoulos, J. Lino and J.M.F. Ferreira	639
Tensile Testing and Dislocation Glide in Liquid Foams M.A. Fortes, M.E. Rosa and L. Afonso	644
Effects of Triple Grain Junctions on Equilibrium Boundary Angles and Grain Growth Kinetics M.A. Fortes and A.M. Deus	648
Characterization of TiAl Alloys by Secondary Ion Mass Spectrometry J. Barbosa, O.M.N.D. Teodoro, A.M.C. Moutinho, S.J.L. Ribeiro and C. Monteiro	653
Ellipsometry to Access Structural Information of Electroactive Polymer Films J.P. Correia and L.M. Abrantes	657
Effect of Substrate Preparation Conditions on the Morphology of Polypyrrole Coatings on Copper - an AFM Study A.C. Cascalheira, A.S. Viana and L.M. Abrantes	661
Spectral Imaging for Visualization of Distribution of Nd³⁺ Ions in CaTaO₆ Fibre S.K. Mendiratta, J. Cascalheira, C.R. Ferrari and A.C. Hernandes	665
Minimum Surface Energy of Self-Assembled Two-Dimensional Cells of Equal Area M. Fátima Vaz and M.A. Fortes	671
Statistical Evaluation of the Adequacy of a Mixture of Two Weibull Distributions to Model Strength and Fracture-Strain of Carbon Fibres L.G. Rosa, I. Figueiredo and C.A. Anjinho	676
Examples of Model Validation for Foundry Processes Virtual Prototyping Z. Ignaszak	681
An Investigation of the Influence of Strength Mis-Matching and HAZ Width on the Fracture Behaviour of Welds with Cracks in the WM/HAZ Interface D.M. Rodrigues, L.F. Menezes and A. Loureiro	685
Confrontation of Two Solidification Simulation Software to a Particular Use into Foundry Industry J. Moreira and C.A. Silva Ribeiro	690
Numerical Simulation of Ultramicrohardness Tests in Thin Films J.M. Antunes, L.F. Menezes, J.V. Fernandes and M. Simões	694
The Use of Thermal Analysis Techniques into the Prediction of Shape Factor of Graphite C.A. Silva Ribeiro, D. Santos and W. Baumgart	699
Observations Concerning Relaxation Parameters for Polarisation Decay and their Distributions in the Range of Glass Transition R. Neagu, E.R. Neagu and J.N. Marat-Mendes	703
Reference Experimental Tests to be Used to Validate Numerical Results in Sheet Metal Forming A. dos Santos, J.F. Duarte, A. Reis, P. Teixeira, A.B. Rocha, A. Ajmar, M. Bertero and S. Saporita	707
Influence of the Mechanical Microtwinning on the Plastic Behaviour of the AISI 304 Stainless Steel B.M. Chaparro, M.M. Vieira and J.V. Fernandes	711
Work Hardening Models and the Numerical Simulation of the Deep Drawing Process B.M. Chaparro, M.C. Oliveira, J.L. Alves and L.F. Menezes	717
Large Deformation Processes on AA1050-O Aluminium at Elevated Temperatures A. Andrade Campos, L.F. Menezes and F. Teixeira Dias	723
Influence of Metal/Mold Heat Transfer Coefficient on the Inverse Macrosegregation Profile of an Al - 6.2wt% Cu Alloy Unidirectionally Solidified I.L. Ferreira, C.A. Siqueira, C.A. Santos and Á. Garcia	728
Springback Evaluation with Several Phenomenological Yield Criteria J.L. Alves, M.C. Oliveira and L.F. Menezes	732
Numerical Analysis on the Effects of the Friction Coefficient on the Deep Drawing of a Rail M.C. Oliveira, J.L. Alves and L.F. Menezes	737
Mathematical Models for Particulate Filled and Milled Fibre Reinforced Composites P.V. Vasconcelos, F.J. Lino, F.W.J. van Hattum and R.J.L. Neto	742

Modelling Interface-Controlled Strength of Short-Fibre and Particulate Reinforced Composites	746
J.D. Botas	
Computing Structural and Transport Properties of C/C Composites from 3D Tomographic Images.	751
O. Coindreau and G. Vignoles	
Effect of Melt Viscosity on the Ejection Force in Injection Moulds	755
A.J. Pontes, A.M. Brito and A.S. Pouzada	
Creep Behaviour of Viscoelastic Polymer Materials	759
J. Reinas Dos Santos André and J.J.C. Cruz Pinto	
Modelling of the Grafting of Maleic Anhydride onto Polyethylene in an Extruder	763
A.V. Machado, A. Gaspar-Cunha and J.A. Covas	
Optimising Comfort during Wool and Blended Fabrics Design	767
J.M. Lucas, R.A.L. Miguel and A.M. Manich	
Study of Pilling Formation in Wool and Blended Fabrics Using the Optical Profile Analysis	771
M.L.A.G. Carvalho, R.A.L. Miguel, J.M. Lucas and P.T. Fiadeiro	
The Knitting Thread's Stretch at the Float Stitch with Elasticity of Elongation Only	775
G. Priniotakis, A. Charalambus and P. Hadjidobrev	
The Paper and its Unsuspected Dimensions	781
J. Silvy	
Fibrous Reinforcements for Composite Materials: Producing and Modelling	787
M. de Araújo, R.M.E. Sousa Fangueiro and H. Hong	
Microscopical Examination: The Impact of Different Ionising Radiation Doses over Protective Clothing Used in the Operating Theatre	792
M.J. Abreu, M.E. Cabeço Silva, L. Schacher and D. Adolphe	
Tensile Properties and Fracture of Viscose Yarn under High Speed Impact	797
F. Marques, E. Cabeço Silva, M.J. Abreu and J. Drean	
Free Formaldehyde Determination Using HPLC	801
B. Voncina, N. Majcen, A. Majcen Le Marechal, D. Brodnjak Vončina and D. Bezek	
Mechanical Behaviour of Cork-Modified Polymer Concrete	805
P.J.R.O. Nóvoa, M.C.S. Ribeiro and A.J.M. Ferreira	
Fracture Energy of Polymer Concrete Reinforced with Short Carbon and Glass Fibers	810
J.M. Reis and A.J.M. Ferreira	
The Effect of Holding Pressure on the Shrinkage and Birefringence of Injection Moulded Polypropylene Plates	814
A.J. Pontes, M.J. Oliveira and A.S. Pouzada	
Preparation of Mullite Whiskers from Kaolinite Using CuSO₄ as Fluxing Agent	818
S. Agathopoulos, H.R. Fernandes, D.U. Tulyaganov and J.M.F. Ferreira	
Manufacture of Ceramic Products Using Inertized Aluminum Sludges	822
I.M. Martins, S. Vieira, V. Livramento, J.B. Sousa, F. Delmas, M. Oliveira and M.T. Vieira	
Microstructural Characterization and Properties of a Glass and a Glass-Ceramic Made from Municipal Incinerator Bottom Ash	827
M.S.J.G. Alendouro, R.d.C.C. Monteiro, C.F.M.L. Figueiredo, R.M.S. Martins, R.J.C. Silva, M.C. Ferro and M.H.F.V. Fernandes	
Effect of TiO₂ on the Crystallization of Fly-Ash Based Glass-Ceramics	831
M.C. Ferro, M.H.F.V. Fernandes, C.F.M.L. Figueiredo, M.S.J.G. Alendouro and R.d.C.C. Monteiro	
Rapid Prototyping and Rapid Tooling Applied in Product Development of Ceramic Components	835
F.J. Lino, R.J.L. Neto, R. Paiva and A. Moreira	
Leaching of Brasses in Long-Term Direct Contact with Water	839
C. Vilarinho, D. Soares, J. Barbosa and F. Castro	
Morphology of Copper Coatings Electroplated in an Ultrasonic Field	844
L. Martins, J.I. Martins, A.S. Romeira, M.E.V. Costa, J.D.M. Costa and M. Bazzaoui	
The Influence of Flame Retardant Agents in the Fire Performance of SMC	849
J. Alcino Rodríguez and A.T. Marques	
Use of Composite Materials to Renovate a Steel Water Pipe	853
M. Sousa, C. Novo, A.N. Costa, A.T. Marques and J.F. Justo	

Powder Metallurgy: A Major Partner of the Sustainable Development	857
J.M.G. Mascarenhas	
The Role of Low Temperature on Mechanical and Fatigue Properties of Different Alloys	861
F.S. Silva	
Mathematical Description of the Composition Distribution of Comminuted Polyphase Materials	
M.H. Marto, J.H. Gonçalves and M.J. Matos	866
Tribocorrosion Studies in Centrifugally Cast Al-Matrix SiCp-reinforced Functionally Graded Composites	
A. Velhinho, J.D. Botas, E.A. Avila, J.R. Gomes and L.A. Rocha	871
Corrosion / Protection in Interface Equipment of Telecommunication Systems	
T.C. Diamantino, M.J.F. Marques, J.M. Gomes and E.M. Almeida	876
Joining Ti-47Al-2Cr-2Nb with a Ti-Ni Braze Alloy	
A. Guedes, A.M.P. Pinto, M.F. Vieira and F. Viana	880
Effect of Oxygen Doping on the Structure and Photoluminescence of PVD AlN(Er) Thin Films	
J.C. Oliveira, A. Cavaleiro, M.T. Vieira, L. Bigot, C. Garapon, J. Mugnier and B. Jacquier	885
Manufacture of a Fin-Box Made by RTM	
P. Vieira, S.T. Pinho, A.T. Marques, A. Vieira, A. Nicolau and P. Oliveira	890