

# Table of Contents

## Preface

### Towards SiGe Terahertz VCSELs

R.W. Kelsall, Z. Ikonić, P. Harrison, D.J. Paul, S.A. Lynch, R. Bates, D.J. Norris, S.L. Liew, A.G. Cullis, D.D. Arnone, C.R. Pidgeon, P. Murzyn, D.J. Robbins and R.A. Soref

1

### Comparison of Direct Numerical Procedure and Monte Carlo Technique to Determine the Charging Effects in Submicron Structures

Z.L. Petrović, S. Sakadžić, N. Spasojević, J. Matsui and T. Makabe

9

### Data Bases for Modeling Plasma Devices for Processing of Integrated Circuits

Ž. Nikitović, O. Šašić, Z.L. Petrović, G.N. Malović, A. Strinić, S. Dujko, Z. Raspopović and M. Radmilović-Radjenović

15

### Optimization of Intersubband Optical Nonlinearities in Continually Graded AlGaN Quantum Well Structures

J. Radovanović, V. Milanović, Z. Ikonić and D. Indjin

21

### Surface Density Analytical Model of Two-Dimensional Electron Gas in HEMT Structures

R.M. Ramović and P.M. Lukić

27

### Thermodynamics of Mechanical Oscillations in Superlattices

S.K. Jaćimovski, J.P. Šetrajić, B.S. Tošić and V.D. Sajfert

33

### Study of the Increased Temperature Influence on the Degradation of the Photodetectors through Ideality Factor

A. Vasić, P. Osmokrović, S. Stanković and B. Lončar

37

### Metal-Induced Crystallization of Polycrystalline Silicon by In-Situ Excimer Laser Annealing During Low-Pressure CVD Growth

S. Loreti, A. Santoni, R. Fryček, I. Menicucci, C. Minarini and D. Della Sala

43

### Applications of $\text{ZrO}_2$ - $\text{CeO}_2$ - $\text{La}_2\text{O}_3$ Films in Multilayered Oxide Heterostructures

A.N. Khodan, J.-. Contour and D. Michel

47

### The Effect of Various Parameters on the Structure of W-Ti Thin Films

S. Petrović, B. Gaković, Z. Rakočević and T. Nenadović

55

### Plasma Oxidation of Salt Bath Nitrided C 15 Steel Samples

M. Zlatanović, N. Popović, Ž. Bogdanov and A. Kunosić

61

### Vortex Phases in $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$ Single Crystals in Tilted Magnetic Fields

J. Mirković, S. Hayama, A. Nakano, K. Ivanović, J.P. Šetrajić and K. Kadouwaki

67

### Structure Prediction of Solids: Heuristic Algorithms for Local Optimization on Hartree-Fock Level

Ž.P. Čančarević, J.C. Schön and M. Jansen

71

### Dispersion of Refractive Index of Non-Crystalline Chalcogenides in Cu-As-Se System

S.R. Lukić, D.M. Petrović, V.B. Petrović and D.D. Petrović

77

### Oxidation State of Copper Ions in ZSM-5 Zeolite

V. Rakić, V. Dondur, S. Gajinov and A. Auroux

83

### Influence of Annealing on Structure and Magnetic Properties of Laves Phase $\text{HfFe}_2$

J. Belošević-Čavor, B. Čekić, N. Novaković, N. Ivanović and M. Manasijević

89

### Site Occupation Preferences in Multicomponent Semiconductors: The $\text{Cd}_{1-x}\text{Zn}_x\text{Te}$ Case

N. Ivanović, V. Koteski and H.E. Mahnke

93

### Structural Properties of $\text{Pb}_{1-x}\text{Mn}_x\text{Te}$ Alloys

A. Golubović, S. Nikolić, J. Trajić, S. Djurić, N.Ž. Romčević, M.J. Romčević, A.J. Nadolny, B. Taliashvili, V. Domukhovski and V.N. Nikiforov

99

### Body Ni-Doped Glassy Carbon: Physical and Electrochemical Characterization

B. Šljukić, N. Vukelić and S. Mentus

103

### Apparent Enthalpies of Activation for Oxygen Reduction at $\text{Pt}_3\text{Co}$ Electrode in Alkaline Solution

M.D. Obradović, B.N. Grgur and L.M. Vračar

109

### Underpotential Temperature Dependence Deposition of Hydrogen on MoPt<sub>3</sub> Alloy in Acid Solution

J. Jakšić, N. Krstajić and L.M. Vračar

115

### Study of Supported Pt and PtRu Catalysts in Methanol and Formic Acid Oxidation

A.V. Tripković, K.D. Popović and J.D. Lović

121

|   |     |
|---|-----|
| <b>Corrosion of Ti<sub>3</sub>SiC<sub>2</sub> and Ti<sub>4</sub>AlN<sub>3</sub> in Concentrated HCl Solutions</b>                         | 127 |
| V.D. Jović  |     |
| <b>The Influence of Oxide Sol Properties on the Capacitive Behaviour of Carbon Supported Hydrous Ruthenium Oxide</b>                      |     |
| V. Panić, A. Dekanski, S.L. Gojković, V.B. Mišković-Stanković and B. Nikolić  | 133 |
| <b>Electrochemical Polymerization of 2- Methyl-1- Naphthylamine in an Acidic Perchlorate Aqueous Medium</b>                               |     |
| G. Ćirić-Marjanović, I. Krakovsky and J. Budinski-Simendić  | 139 |
| <b>Electrolytic Hydrogenation of Glucose on Amalgamated Zinc in Sulphate Solutions</b>  |     |
| T.L. Trišović, L.M. Gajić-Krstajić and N. Krstajić  | 145 |
| <b>Thermal and Conductivity Analyses of Alkaline Earth Salts of 12-Tungstophosphoric Acid</b>   |     |
| Z. Nedić, U.B. Mioč, M.R. Todorović, D. Arandjelović and M. Odović  | 151 |
| <b>Physicochemical Properties of Al-Pillared Montmorillonite Doped with 12-Tungstophosphoric Acid</b>                                     |     |
| S. Sredić, T. Čajkovski, M. Davidović, D. Čajkovski, V. Likar-Smiljanić, M. Marinović-Cincović, U.B. Mioč, Z. Nedić and R. Biljić         | 157 |
| <b>Surface Composition and Adsorption Properties of Activated Carbon Cloth</b>  |     |
| T. Vasiljević, M. Baćić, M. Laušević and A. Onjia   | 163 |
| <b>TiAl – A New High Temperature Material for Turbocharger Rotors</b>   |     |
| B. Dimčić, M.T. Jovanović, I. Bobić, S. Zec and S. Tadić  | 169 |
| <b>The Influence of Microstructure on Ductile Fracture Initiation in Low-Alloyed Steel</b>  |     |
| M. Rakin, Z. Cvijović, V. Grabulov, N. Gubeljak and A. Sedmak   | 175 |
| <b>Fracture Toughness Modeling in High-Strength Al-Based Alloys</b>   |     |
| M. Vratnica, Z. Cvijović and M. Rakin   | 181 |
| <b>Aging Effects in Cu-Zn-Al Shape Memory Alloy</b>   |     |
| V. Asanović, K. Delijić and Z. Leka   | 187 |
| <b>DSC Investigation of High-Copper AlCuMg Alloys</b>   |     |
| B. Zlatičanin, B. Radonjić and M. Filipović   | 193 |
| <b>Dimethyldichlorosilane Hydrolysate as a Substitute for Cyclic Monomers in the Preparation of Functional Poly(siloxane)s</b>            |     |
| M.P. Antić, M.V. Vučković, V.V. Antić and M.N. Govedarica   | 199 |
| <b>Microstructure and Hydrogen Desorption in Nanostructured MgH<sub>2</sub>-Fe</b>  |     |
| A. Bassetti, E. Bonetti, A.L. Fiorini, J. Grbović Novaković, A. Montone, L. Pasquini and M. Vittori Antisari                              | 205 |
| <b>Synthesis of Carbon Nanostructures with Mechanical Alloying</b>  |     |
| M. Drofenik, D. Makovec, A. Košak and M. Kristl   | 213 |
| <b>Microemulsion Synthesis of MnZn-Ferrite Nanoparticles</b>  |     |
| A. Košak, D. Makovec and M. Drofenik  | 219 |
| <b>Synthesis of Nanocrystalline Nickel-Zinc Ferrites via a Microemulsion Route</b>  |     |
| V. Uskoković and M. Drofenik  | 225 |
| <b>Crucial Role of Alkyl-Substituted Benzenes in the Formation of Intercalate Derivatives of C<sub>60</sub></b>                           |     |
| A. Djordjević, M. Vojinović-Miloradov, A. Kapor, D. Lazar, D.D. Petrović, V. Djordjević-Milić and M. Hegediš                              | 231 |
| <b>Laser Induced Synthesis of Ultrafine Anatase TiO<sub>2</sub> Powders</b>   |     |
| Z. Dohčević-Mitrović, M. Šćepanović, I. Hinić and G. Stanišić   | 237 |
| <b>n-Alkane Nanoparticles in Cryogenic Trichlorofluoromethane/n-Alkane Systems: Their Use in the Study of the σ-Basicity of n-Alkanes</b> |     |
| J. Ceulemans  | 243 |
| <b>Characterization of Nanoporous Lanthanide-Doped YAG Powders Obtained by Propellant Synthesis</b>                                       |     |
| R. Krsmanović, P. Canton, A. Speghini, M. Bettinelli and S. Polizzi   | 251 |
| <b>Introduction of Pt and Pd Nanoclusters in Zeolite Cavities by Thermal Degradation of Acetylacetones</b>                                |     |
| Z. Mojović, S. Mentus and Ž. Tešić  | 257 |
| <b>EPR Study of Manganese in Cd<sub>1-x</sub>Mn<sub>x</sub>S Quantum Dots</b>   |     |
| B. Babić-Stojić, D. Milivojević, V.V. Vodnik and M.I. Čomor   | 263 |
| <b>Raman/ Rayleigh Study of Nanophases</b>  |     |
| P. Colomban   | 269 |

|  |     |
|--|-----|
| <b>Optical Diagnostics of Carbon Arc and Induction Plasmas</b>   | 277 |
| B. Todorović-Marković, Z. Marković, I. Mohai and J. Szépvölgyi   |     |
| <b>Thermal Diffusivity of Cold Sintered Co</b>   | 283 |
| M.D. Dramićanin  |     |
| <b>Photoacoustic Properties of Single Crystal NiO</b>  | 287 |
| S.M. Savić, M.D. Luković, S. Vujatović, D. Vasiljević-Radović, K.T. Radulović and S. Djurić  |     |
| <b>Far-Infrared Phonon Spectroscopy of Cd<sub>1-x</sub>Mn<sub>x</sub>S Quantum Dots</b>  | 293 |
| R. Kostić, N.Ž. Romčević, M.I. Čomor, M.J. Romčević, M. Grujić-Brojčin, V.V. Vodnik and J.M. Nedeljković   |     |
| <b>Raman Spectroscopy of Polycrystalline <math>\alpha</math> - MnSe</b>  | 299 |
| A. Milutinović, Z.V. Popović, N. Tomić and S.D. Dević  |     |
| <b>Sorption Mechanisms and Sorption Models</b>   | 305 |
| M. Fedoroff, G. Lefevre, M. Duc, S.K. Milonjić and C. Nešković   |     |
| <b>New Method of Porous Oxide Synthesis: Alumina and Alumina Based Compounds</b>   | 315 |
| T. di Costanzo, A.A. Fomkin, C. Frappart, A.N. Khodan, D.G. Kuznetsov, L. Mazerolles, D. Michel, A.A. Minaev, V.A. Sinitzin and J.L. Vignes            |     |
| <b>Aging of a Commercial Al-Cu-Si Based Alloy Modified with Germanium</b>  | 323 |
| V. Maksimović, A. Tolley, M.T. Jovanović and V. Radmilović   |     |
| <b>Modeling of Electrophoretic Deposition of Oxides on C/C-SiC-Composites</b>  | 329 |
| B. Jokanović, T. Damjanović, R. Weiss and G. Borchardt   |     |
| <b>Electrophoretic Deposition of Thin SOFC-Electrolyte Films on Porous La<sub>0,75</sub>Sr<sub>0,2</sub>MnO<sub>3-δ</sub> Cathodes</b>                 | 335 |
| C. Argirusis, T. Damjanović and G. Borchardt   |     |
| <b>Sol-Gel Route for Electrophoretic Deposition of Mullite Diffusion Barriers on C/C-SiC Composites</b>  | 343 |
| T. Damjanović, H.S. Leipner, C. Argirusis, R. Herbig, R. Weiss, G. Tomandl and G. Borchardt  |     |
| <b>Electrophoretic Deposition of Boehmite Coatings on Titanium from Aqueous Sols</b>   | 349 |
| M. Lazić, V.B. Mišković-Stanković, D. Janaćković, R. Petrović and L.M. Pavlović  |     |
| <b>Modification of Carbon Cloth by Interaction with Pulsed TEA CO<sub>2</sub> Laser</b>  | 355 |
| B. Kaludjerović, M. Trtica, M. Srećković, B. Babić, S. Zec and Ž. Bogdanov   |     |
| <b>The Influence of the Solid/Liquid Ratio on the Point of Zero Charge of Alumina</b>  | 361 |
| Ž.N. Todorović, S.K. Milonjić and V. Dondur  |     |
| <b>Synthesis, Preparation and Properties of New Fe-Based Soft Magnetic Amorphous Alloys with a Large Supercooled Liquid Region</b>                     | 367 |
| N. Mitrović, R. Simeunović, A. Marićić and B. Jordović   |     |
| <b>Crystallization Kinetics of Fe-B Based Amorphous Alloys Studied In Situ by X-Ray Diffraction and Differential Scanning Calorimetry</b>              | 375 |
| P. Tomić, M. Davidović and S. Batinić  |     |
| <b>Investigation of Magnetic Susceptibility in an Amorphous Fe<sub>43,2</sub>Ni<sub>23,2</sub>Co<sub>13,6</sub>B<sub>20</sub> System</b>               | 381 |
| S. Bikić, I. Gazdić, M. Tais, S. Sulejmanović, N. Bajrović and T. Mihač  |     |
| <b>Properties of LiMn<sub>2</sub>O<sub>4</sub> Powders Obtained by Ultrasonic Spray Pyrolysis</b>  | 387 |
| D. Jugović, M. Mitrić, N. Cvjetićanin, M. Miljković, V. Jokanović and D.P. Uskokovic   |     |
| <b>The Effect of Reversing Current on the Properties of Copper and Electrolytic Copper Powder. I. The Morphology of Powder Particles</b>               | 393 |
| M.G. Pavlović, K.I. Popov, L.J. Pavlović, E.R. Ivanović and V.D. Jović   |     |
| <b>The Effect of Reversing Current on the Properties of Copper and Electrolytic Copper Powder. II. The Apparent Density and Flowability of Powders</b> | 399 |
| K.I. Popov, M.G. Pavlović, L.J. Pavlović, V. Maksimović and E.R. Ivanović  |     |
| <b>Nicolson-Ross Analysis of Absorption Coefficients of Nickel and Nickel-Zinc Ferrite Powders Prepared Using a Novel Method</b>                       | 405 |
| A.S. Nikolić, V. Likar-Smiljanić, Č. Jovalekić, T. Čajkovski, R. Biljić, Z.Ž. Lazarević and M.B. Pavlović  |     |
| <b>Hydrogen Absorption and Desorption Kinetics in Nickel and Cobalt Alloy Powder</b>   | 411 |
| A. Marićić, M. Spasojević, L. Rafailović, V. Milovanović and L. Ribić-Zelenović  |     |
| <b>Mechanochemical Activation in Synthesis of LaTi<sub>0,5</sub>Mg<sub>0,5</sub>O<sub>3</sub> Perovskite-Type Oxides</b>                               | 417 |
| S. Petrović, P. Kirilov-Stefanov, L. Karanović, M. Zdujić and A. Terlecki-Baričević  |     |
| <b>The Influence of Mechanical Activation on the Stoichiometry and Defect Structure of a Sintered ZnO-Cr<sub>2</sub>O<sub>3</sub> System</b>           | 423 |
| Z. Marinković, L. Mančić, P. Vulić and O. Milošević  |     |

|   |     |
|---|-----|
| <b>Mechanochemical Synthesis of CaTiO<sub>3</sub> from CaCO<sub>3</sub> - TiO<sub>2</sub> Mixture</b>   | 429 |
| V.M. Vukotić, T. Srećković, Z. Marinković, G. Brankovic, M. Cilense and D. Arandjelović   |     |
| <b>Enhancing Synthesis and Sintering of Zinc Titanate Using Mechanical Activation</b>   | 435 |
| T. Srećković, N. Labus, N. Obradović and L. Živković  |     |
| <b>A Phenomenological Analysis of Sintering Kinetics of Alumina</b>   | 441 |
| M.V. Nikolić and N. Labus   |     |
| <b>Phase Evolution of Si<sub>3</sub>N<sub>4</sub> Ceramic with Additives from Li<sub>2</sub>O-Y<sub>2</sub>O<sub>3</sub></b>  | 447 |
| B. Matović and S. Bošković  |     |
| <b>DPR Analysis of Microstructural Evolution of ZnO Ceramics</b>  | 453 |
| Z.M. Nikolić and V.B. Pavlović  |     |
| <b>Screen Printed BaTi<sub>1-x</sub>Sn<sub>x</sub>O<sub>3</sub> Multilayer Materials</b>  | 459 |
| S. Marković, V.Z. Pejović, M. Mitrić, N. Cvjetićanin, D. Makovec and D.P. Uskokovic   |     |
| <b>Effects of Stacking Sequence on the Strength of Cross-Ply and Quasi-Isotropic Carbon/Epoxy Laminates</b>   | 465 |
| M.M. Stevanović, D.S. Marković and D.R. Pešikan-Sekulić   |     |
| <b>Scratch and Abrasion Resistant Polymeric Nanocomposites – Preparation, Characterization and Applications</b>   | 473 |
| S. Stojanović, F. Bauer, H.J. Glaesel and R. Mehnert  |     |
| <b>Characterization of Cold-Rolled Cu-Nb Composite</b>  | 479 |
| A. Ishmaku and K.P. Han   |     |
| <b>Chain Conformational Statistics and Mechanical Properties of Elastomer Composites</b>  | 485 |
| M.B. Plavšić, I. Pajić-Lijaković, B. Čubrić, R.S. Popović, B. Bugarski, M. Cvetković and N.L. Lazić   |     |
| <b>Increased Stability of C/C-Composite towards Catalytic Oxidation</b>   | 491 |
| A. Devečerski, J. Grbović Novaković, Z. Laušević and N. Petranović  |     |
| <b>Fatigue Damage Detection in Composite Rods Using Fiber Optic Intensity Based Sensors</b>   | 497 |
| L. Brajović, Z. Mišković, P.S. Uskoković, I. Živković and R. Aleksić  |     |
| <b>The Effect of Polar Aluminium Trihydrate Molecules on the Dielectric Relaxations of Low-Density Polyethylene</b>   | 505 |
| D. Miličević, E. Suljorrujić, D. Kostoski, S. Spasović and L. Novaković   |     |
| <b>The Effect of Nucleants on the Crystallization Behavior of Isotactic Polypropylene</b>   | 509 |
| J. Budinski-Simendić, Z.L. Petrović, V. Lazić, R. Radičević and V. Divjaković   |     |
| <b>Effects of Structure Characteristics on Mechanical Properties of Aluminum Alloy Matrix Composites</b>  | 515 |
| D. Božić, A. Devečerski, O. Erić, V. Rajković and Ž. Gnjidić  |     |
| <b>Polymer Conformational Transitions: A Quantum Decoherence Theory Approach</b>  | 521 |
| D. Raković, M. Dugić and M.B. Plavšić   |     |
| <b>Gibson: Peptide Plane as a Unique Biological Nanostructure</b>   | 529 |
| D. Koruga, A. Tomić, Ž. Ratkaj and L. Matija  |     |
| <b>Preparation and Properties of Polymeric and Composite Bioresorbable Barrier Membranes</b>  | 537 |
| N. Ignjatović, A. Nastasović, V. Laninović, A. Onjia, M. Miljković and V. Konstantinović  |     |
| <b>An Investigation of the Dehydration of Superabsorbing Polyacrylic Hydrogels</b>  | 543 |
| J. Jovanović, B. Adnadjević, S. Ostojić and M. Kićanović  |     |
| <b>Cell Support Studies Aimed for Cartilage Tissue Engineering in Perfused Bioreactors</b>  | 549 |
| B. Obradović, D. Bugarski, M. Petakov, G. Jovčić, N. Stojanović, B. Bugarski and G. Vunjak-Novaković  |     |
| <b>Hydroxyapatite as a Root Canal System Filling Material: Cytotoxicity Testing</b>   | 555 |
| D. Marković, V. Živojinović, V. Koković and V. Jokanović  |     |
| <b>In Vitro and In Vivo Investigation of Collagen - C<sub>60</sub>(OH)<sub>24</sub> Interaction</b>   | 561 |
| L. Matija, D. Koruga, J. Jovanović, D. Dobrosavljević and N. Ignjatović   |     |
| <b>Investigation of Thermal Stability and Kinetic Studies of Transition Metal Complexes with the Condensation Product of 2,6-Diacetylpyridine and Semioxamazide</b> | 567 |
| D. Minić, G. Jakovljević, D.M. Sladić and K.K. Andjelković  |     |