

Table of Contents

Preface, Conference Committee

Chapter 1: Engineering Materials and Applications

Synthesis and Photocatalytic Activity of Modified TiO₂ Thin Films Prepared by Spray Pyrolysis L. Rozenberga-Voska and J. Grabis	3
Analysis of Pigment Process and Production Techniques for Use in Nail Polish Systems Z. Grigale-Soročina, I. Birks and M. Kalniš	7
Nanoparticle Gels Obtained from Hardwood and Softwood Bark for Reinforcing of Paper M. Laka, M. Skute, S. Janceva, V. Fridrihsone, I. Sable, L. Vecbiskena, U. Grinfelds, L. Andze and J. Zoldners	12
Crude Tall Oil as Raw Material for Rigid Polyurethane Foams with Low Water Absorption V. Zeltins, V. Yakushin, U. Cabulis and M. Kirpluks	17
Morphology Analysis and Mechanical Properties of MWCNT Reinforced Nylon-6,6 Nanofiber Mats by Electrospun Method F. Durmuş and M. Ekrem	23
Two Component Silyl-Terminated Polyether/Epoxy Resin Systems Mechanical and Rheological Properties R. Berzins, R. Merijs Meri and J. Zicans	28
Variational Approximate and Mixed-Finite Element Solution for Static Analysis of Laminated Composite Plates E. Madenci and A. Özütok	35
Application of Smart Materials in Structural Elements of Pneumatic Vibroexciters D. Pauliukaitis and E. Kibirkštis	40
Studying Temperature Variations that Occurred during Cold and Hot Rolling of AA5454-O Alloy S. Sezek and B. Aksakal	45
New Tanning Agent with Montmorillonite for Leather Manufacturing M. Marukhlenko, O. Mokrousova and O. Okhmat	52
The Effect of Firing Temperature on the Composition and Microstructure of a Geocement-Based Binder of Sodium Water-Glass K. Sotiriadis, S. Gužii, I. Kumpová, P. Mácová and A. Viani	58
The Properties of Mesh Reinforced Nonwoven Composites A. Bernava, S. Reihmane, J. Bitenieks and R. Merijs Meri	63
Surface Energetic Characteristics of Wood-Polymer Composites, Containing a Valorised Hardwood By-Product J. Jaunslavietis, G. Shulga, J. Ozolins, B. Neiberte, A. Verovkins, S. Vitolina and V. Shakels	68
Some Exploitation Properties of Wood Plastic Composites Based on Recycled High Density Polyethylene and Plywood Production Residues J. Kajaks, K. Kalnins, A. Zagorska and J. Matvejs	76
Technological Peculiarities of Chromium Carbide-Based Iron Alloy Bonded Cermet M. Kolnes, J. Kübarsepp, M. Viljus and R. Traksmaa	82
Comparative Study of a Neat Epoxy and Unidirectional Carbon/Epoxy Composites under Tensile and Impact Loading K. Naresh, S. Krishnapillai and V. Ramachandran	87
Influence of Silver on Photocatalytic Activity of Nanosized ZnO Doped with Iron Group Metals J. Grabis, A. Letlena and A. Krūmiņa	93
Investigation on Polymer-Mineral Tanned Leather Properties O. Andreyeva, A. Nikonova and L. Maistrenko	98
Effect of Fiber Orientation on Carbon/Epoxy and Glass/Epoxy Composites Subjected to Shear and Bending K. Naresh, S. Krishnapillai and R. Velmurugan	103

Processing Technology Development for Organic Clay Suspension System Z. Grigale-Soročina, I. Birks and M. Kalniņš	109
Matrix Bondable Antistatic Additives for Fiber Reinforced Thermosets M. Gedan-Smolka, K. Schubert, A. Täger and H. Marks	114
Synthesis of Amorphous Calcium Phosphate as a Starting Material for α-Tricalcium Phosphate Z. Irbe, A. Buss, D. Loca and L. Malniece	119
Local and Systemic Morphofunctional Response of Osteoporotic Rabbits Bone Defect Following Implantation of Strontium Doped Biphasic Ceramic Granules J. Zarinis, M. Pilmane, E. Sidhoma, I. Salma and J. Locs	124
Characterization and Recycling of a Low-Coast Derivative Iron Hydroxide Adsorbent H. Ait Mahamed, H. Aguedal, H. Hentit, A. Iddou, K. Mekhissi, A. Aziz, J.C. Jumas and A. Shishkin	132
Bio-Waste Recovery for the Removal of Cr (VI) in Aqueous Solution: Case of the Green Alga <i>Ulva lactuca</i> B. Bouacherine, A. Iddou, H. Hentit, J.C. Jumas, A. Aziz and A. Shishkin	139
Radiological Evaluation of Maxillary Sinus Augmentation with Calcium Phosphate Materials and Influence of Titanium Dental Implant Artifacts L. Neimane and A. Skagers	145

Chapter 2: Advanced Technologies in Materials Science

Buckling of Eccentrically Loaded Carbon Nanotubes M. Arda and M. Aydogdu	151
Fatigue Crack Growth and Threshold Behavior of DMLS Ti6Al4V R. Konečná, L. Kunz, P. Pokorný and G. Nicoletto	157
The Influence of Processing Parameters on Mechanical Properties of Spark Plasma Sintered Chromium Carbide Based Cermets K. Juhani, J. Pirso, M. Tarraste, M. Viljus and S. Letunovitš	162
Peculiarities of Photovoltage Formation across p-n Junction under Illumination of Laser Radiation S. Ašmontas, J. Gradauskas, A. Sužiedėlis, A. Šilėnas, E. Širmulis, V. Švedas, V. Vaičikauskas, V. Vaičiūnas, D. Valiulis, O. Žalys and V. Kostylyov	167
Extraction and Characterization of Collagen Obtained from Collagen-Containing Wastes of the Leather Industry O. Savchuk, N. Raksha, L. Ostapchenko, O. Mokrousova and O. Andreyeva	172
Overall Heat Transfer Coefficient of Functionally Graded Hollow Cylinder A. Ozturk	177

Chapter 3: Surface Engineering and Tribology

Evaluation of Wear Rate of Nanocrystalline Diamond Films Using Abbott Curve A. Bogatov and V. Podgursky	185
Morphology and Tribological Behaviour of Amorphous and Crystalline Aluminum Oxide Layers F. Ausserer, I. Velkavrh, J. Voyer, S. Klien, A. Diem, J. Schmidt, R. Tessadri and V. Kahlenberg	190
Sliding Wear of Composite Stainless Steel Hardfacing under Room and Elevated Temperature A. Surzhenkov, J. Baroninš, M. Viljus, R. Traksmaa and P. Kulu	195
Prediction of Abrasive Erosion Impact Wear of Composite Hardfacings P. Kulu, F. Casesnovas, T. Simson and R. Tarbe	201
Influence of Air Plasma Spraying Process Parameters on Ceramic Layer in Thermal Barrier Coatings T. Kubaszek and M. Góral	207
Evaluation of Residual Stresses in PVD Coatings by Means of Strip Substrate Length Variation and Curvature Method of Plate Substrate H. Lille, A. Ryabchikov, J. Kõo, E. Adoberg, L. Lind, L. Kurissoo and P. Peetsalu	212

Wear Rate of Nanocrystalline Diamond Coating under High Temperature Sliding Conditions	
M. Yashin, J. Baroninš, P.L. Menezes, M. Viljus, T. Raadik, A. Bogatov, M. Antonov and V. Podgursky	219
Comparative Study of Adhesive Wear for CoCr, TiC-NiMo, WC-Co as Potential FSW Tool Materials	
M. Kolnes, J. Kübarsepp, F. Sergejev and M. Kolnes	224
Dependance of Wear of Cu-Cr-S Alloy on Hardness and Electrical Conductivity in Sliding Electrical Contact	
L. Kommel and J. Baroninš	229
Development of Impact Energy Distribution of Various Abrasives during Cyclic Impact/Abrasion Testing	
L. Widder, M. Varga, K. Adam and A. Kuttnar	234
The Influence of Process Parameters on Structure of Ceramic Coatings Deposited by PS-PVD Method	
M. Góral and T. Kubaszek	243
Non-Destructive Testing of Joints of Antifriction Parts Crimped by Pulsed Magnetic Deformation	
A. Tatarinov, V. Mironov, D. Rybak and P. Stankevics	248
Anti-Irradiation and Wear Resistance of Polyimide Composites	
J.F. Song, G. Zhao, Q.J. Ding and J.H. Qiu	253