

Table of Contents

Preface

Chapter 1: Materials and Technologies for Chemical Production and Environmental Engineering

Changes in Composition of Birch Outer Bark Extractives After Recrystallization with C2-C5 Alkanols	
R. Makars, A. Paze, J. Rizikovs, R. Berzins, D. Godiņa, M. Puke, K. Stankus and I. Virsis	3
Development of Peat Processing Methods for Production of Innovative Products	
K. Irtiseva, J. Baronins, J. Krūmiņš, J. Ozolins, M. Kļaviņš and O. Medne	9
Using Activated Diatomite as Adsorbent for Treatment of Arsenic Contaminated Water	
H.T. Nguyen and P.T. Dang	16
Liquid Membrane System for Extraction and Electrodeposition of Copper(II)	
T. Sadyrbaeva	22
Clay-Humic Substance Composites for Removal of Pharmaceuticals from Water	
L. Ansonē-Bērtiņa, M. Jemeljanova, M. Kļaviņš, R. Ozola-Davidāne and J. Kvisies	28
ZnO Photocatalysts Modified with Eu₂O₃ and Sm₂O₃	
P. Rodionovs and J. Grabis	35
Oxidation of 1,2-Propanediol to Lactic Acid under Novel Supported Au Catalysts and Reaction Kinetics	
S. Zhizhkuna, S. Chornaja, J. Vladiko, R. Drunka, D. Jankoviča, K. Dubencovs and E. Sile	41
Oxidation Kinetics of 1,2-Propanediol in the Presence of Pd and Pt Catalysts	
S. Chornaja, S. Zhizhkuna, J. Vladiko, R. Drunka and A. Krūmiņa	48
Prediction of Solid Solution Formation among Chemically Similar Molecules Using Calculation of Lattice and Intermolecular Interaction Energy	
K. Saršūns and A. Bērziņš	54

Chapter 2: Polymers and Composites

Characteristics of a Fly Ash-Based Geopolymer Cured in Microwave Oven	
Q.M. Do, P.M. Ngo and H.T. Nguyen	63
Analysis of Curing Kinetic Models for Polyester Resin C-L ISO 112 G	
E. Namsone, A. Arshanica and A. Morozovs	70
Adhesion Investigations of Systems Based on Birch Plywood and Wood Plastic Composites	
J. Kajaks, K. Kalnins and J. Matvejs	76
Recycled Paper Additive for Wood-Polymer Composite: Preparation and Characterization	
J. Jaunslavietis, J. Ozolins, M. Kalniņš, G. Shulga, B. Neiberte and A. Verovkins	81
Characteristics of HPMC/Beeswax Edible Composite Film and its Application for Preservation of Seedless Lime Fruit	
T.L. Nguyen, H.T. Nguyen, V.K. Nguyen, T.T.H. Pham, T.H.T. Le and T.T. Nguyen	87
Correlation of Mechanical Properties of Polymer Composite Coatings with Viscosity of Unpolymerized System	
Z. Grigale-Soročina, E. Vindedze and I. Birks	94
Evaluation of Adhesion of Polymer Composite Coatings	
Z. Grigale-Soročina, E. Vindedze and I. Birks	100
Influence of Rubber Particle Size on Functional Properties of a Composite Material Based on Scrap Tires and a Polymer Binder	
L. Mālers and A. Cirvele	107
FTIR Spectroscopy Analysis of PLA Biocomposites Reinforced with Hemp Fibers	
A. Smoca	112
On the Development and Characterization of Rheological and Mechanical Properties of Polylactide Blends with Polybutylene Adipate Terephthalate	
A.Ē. Nesaule, E. Didrihsone, R. Merijs Meri, O. Grigs and J. Zicans	118

Chapter 3: Renewable Fuel Technologies

Catalytic Intermediate Pyrolysis of Cellulose for Hydrocarbons Production in the Presence of Zeolites by Using TGA-FTIR Method K. Lazdovica and V. Kampars	127
The Effect of Biodiesel Composition on Characteristics of Blended Summer Diesel Fuel V. Kampars, R. Kampare and A. Naumova	133
Modelling IR Spectra of Sulfonated Polyether Ether Ketone (SPEEK) Membranes for Fuel Cells G. Vaivars, K. Krūkle-Bērziņa and M. Markus	138
Preparation and Characterization of Fe₂O₃/ SBA-15 for Fischer-Tropsch Process A. Stanke, V. Kampars, O.A. Lazar and M. Enachescu	144

Chapter 4: Biotechnologies

Review of <i>Spirulina/Arthrospira</i> Growth Medium Modifications A. Stunda-Zujeva	153
Evaluation of Suitability of Treated Sewage Sludge for Maize Cultivation L. Dubova, N. Cielava, V. Vibornijs, A. Rimkus, I. Alsina, O. Mutere, N. Strunnikova and O. Kassien	159
Evaluation of Sewage Sludge for Further Nutrient Conservation V. Vibornijs, A. Rimkus, L. Dubova, D. Bekkers, N. Strunnikova, O. Kassien, I. Alsina and O. Mutere	166
Changes in the Biochemical Composition of Tomato Fruit under the Influence of Illumination Quality I. Erdberga, I. Alsina, L. Dubova, M. Dūma, D. Sergejeva, I. Augšpole and A. Avotiņš	172
Use of Wood Ash in the Forest and its Effect on the Concentration of Essential and Heavy Metallic Elements in Soil and Blueberries (<i>Vaccinium myrtillus L.</i>) V. Lazarenko, V. Rudovica, A. Viksna, Z.A. Zvaigzne and M. Okmanis	179
Phytochemical Profile of Chokeberry (<i>Aronia melanocarpa</i>) A. Bataraga and V. Valkovska	184
Microwave Based Pretreatment for Efficient Extraction of Biologically Active Compounds from <i>Fucus vesiculosus</i> S. Janceva, A. Arshanica, L. Lauberte, A. Andersone, L. Jashina, Y. Akishins and G. Telysheva	190

Chapter 5: Biomaterials and Pharmacology

Synthesis of Amorphous Calcium Phosphate: A Review M. Mosina and J. Locs	199
Computational Study of Association of Dihydroxybenzoic Acids in Solution: Testing the Molecular Self-Association Computational Methodology for Formation of Binary Systems A. Trimdale and A. Bērziņš	207
Hyaluronic Acid/Polylysine Composites for Local Drug Delivery: A Review E. Tračuma and D. Loca	213
Effect of Isothiocyanates on the Activity of <i>Lactobacillus plantarum</i> Exposed to Irradiation K. Kalneniece, T. Kusiņš, I. Balode, L. Mazkalniņa, K. Švirks, M. Grūbe, G. Kizane, V. Bankovskis, A. Grīnbergs and O. Mutere	219
Simple Solution for Single Final Vial Filling of Ga-68 Radiopharmaceuticals in One Hot Cell Isolator at Small-Scale Radiopharmacy Laboratories under Aseptic Conditions H. Rozenšteins, J. Zicans, O. Mutere, R. Bērziņa, R. Merijs Meri, T. Kusiņš, I. Reinholds, L. Mazkalniņa, K. Švirks, R. Kovaldins, G. Kizane and A. Grīnbergs	225
Synthesis and Antiradical Activity of 2-Arylidenemalonamic Acid Dianilides I. Mieriņa, D. Kostjuņina, D.Z. Skrastiņa and M. Jure	230
Development of Bioadhesive Biomaterials Based on Silk and Hyaluronic Acid K. Egle and A. Dubnika	236

Novel Hydrogels and Composite Hydrogels Based on -Polylysine, Hyaluronic Acid and Hydroxyapatite	
A. Ščeglovs and K. Salma-Ancane	242
The Histomorphometry of Rabbit Bone Tissue with Experimental Osteoporosis after Implantation of Biphasic Calcium Phosphate Materials	
V. Ananjevs, A. Abolins, J. Locs, I. Salma, A. Skagers, J. Vetra and V. Kasyanov	249
Investigation of Carbohydrate C-Silylation with Chlorosilanes	
V. Kroskins, K. Nikitina, J. Lugiņina and V. Rjabovs	254
Core-Shell PVA/PVP-FeOOH Nanofibers as a Potential Visible Light Responsive Drug Delivery System	
A. Šutka	259

Chapter 6: Functional and Special Materials

Preparation and Characterization of Nanocrystalline Gadolinium Oxide Powders and Films	
R. Burve, V. Serga, A. Krūmiņa and R. Poplausks	267
Porous Ceramics from Al₂O₃ Nanopowders	
I. Zālīte, L. Grase, S. Lagzdina and D. Rašmane	273
Synthesis and Spark Plasma Sintering of Nanosized Refractory Carbide/Nitride Powders	
I. Zālīte, A. Letlena, I. Šteins, A. Krūmiņa, M. Lubāne and J. Grabis	279
Relaxation Polarization Dependence of Circular Vector Gratings in Azobenzene Glassy Molecular Films	
A. Ozols, P. Augustovs, K. Traskovskis, V. Kokars, L. Laipniece, A. Ruduss and K. Balodis	285
Understanding and Control of Stress at Si-SiO₂ Interface	
D. Kropman, V. Seeman, A. Medvids, P. Onufrijevs, S. Vitusevich and V. Mikli	291
Woven Textile Pressure Switch	
I. Balgale and I. Baltina	297

Chapter 7: Building Materials

Magnesium-Based Binders and its Materials	
E. Namsone, I. Shvetsova, G. Sahmenko and A. Korjakins	305
Production of Foamed Concrete in a Planetary Ball Mill	
E. Namsone, G. Sahmenko, E. Namsone and A. Korjakins	311
Changes in Ecological Linseed Oil Paints During Outdoor Weathering of Wood Panels	
E. Sansonetti, D. Čirule, B. Andersons, I. Andersone and E. Kuka	316