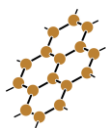




**RIGA TECHNICAL UNIVERSITY**

**61<sup>st</sup> International Scientific Conference**

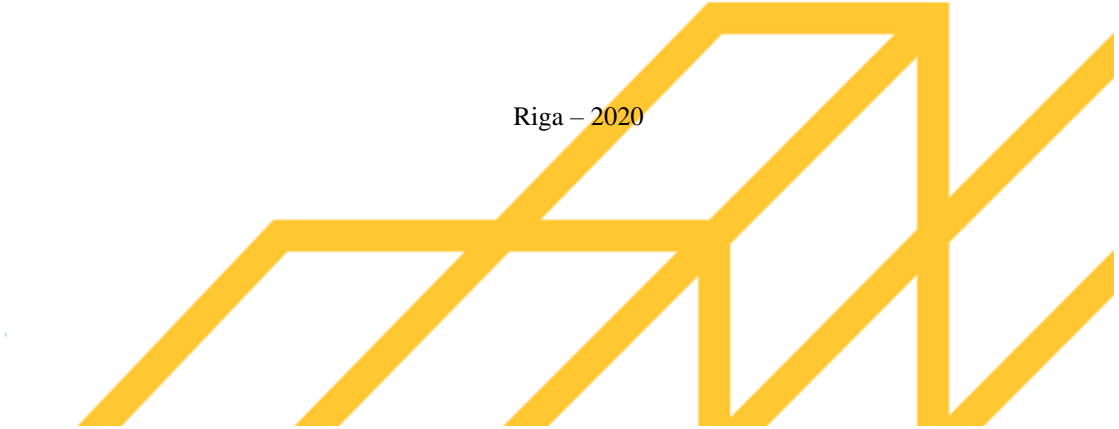
**"MATERIALS SCIENCE AND APPLIED CHEMISTRY  
2020"**



**MSAC** 2020

**Book of abstracts**

Riga – 2020



RIGA TECHNICAL UNIVERSITY

61<sup>st</sup> International Scientific Conference

"MATERIALS SCIENCE AND APPLIED CHEMISTRY 2020"

Riga, 2020, 84 pp.

ISBN: 978-9934-22-530-7

# Table of contents

## Invited lecture

<b>How to quantify 200 metabolite with one LC-MS/MS method?</b>	9
<i>Kristaps Kļaviņš</i>	

## Oral communications

<b>Sol-gel coating processing optimization for knitwear and yarns</b>	11
<i>Ieva Baķe</i>	
<b>Integration of electrically conductive yarns into fabric by weaving</b>	12
<i>Ilze Balgale</i>	
<b>Use of propargylsilanes in tandem transformation for the synthesis of silyl sulfolenes</b>	13
<i>Rūdolfs Beļāunieks, Māris Turks</i>	
<b>Lignocellulose based aerogel preparation from wood and hemp waste materials</b>	14
<i>Sergejs Beluns, Sergejs Gaidukovs</i>	
<b>Development of fibrin matrices for controlled drug delivery</b>	15
<i>Karina Egle, Arita Dubnika</i>	
<b>The effect of crosslinking on the electro-thermal properties of carbon black and ethylene-vinyl acetate composites</b>	16
<i>Sintija Eglīte, Astrida Berzina, Maris Knite</i>	
<b>An adaptive smart window device based on the photochromic effect and capable of electricity generation</b>	17
<i>Raivis Eglītis, Andris Šutka</i>	
<b>The mechanism of contact-electrification on polydimethylsiloxane surface</b>	18
<i>Paula Kaufelde, Andris Šutka, Kaspars Mālnieks</i>	
<b>Development and biomimetic characterization of bilayer scaffolds based on gellan gum and bioactive glass for osteochondral tissue engineering</b>	19
<i>Ilijana Kovrlija, Jovana Zvicer, Ana Medič, Saša Novak, Bojana Obradović</i>	
<b>Effect of the reinforced plastic clamp fitting on the bending strength of the spruce T-type loose tenon joints</b>	20
<i>Artūrs Ņisis, Edgars Kirilovs, Ilze Gūtmane</i>	
<b>Polymer based triboelectric nanogenerators: how to choose the right materials?</b>	21
<i>Linars Lapčinskis, Kaspars Mālnieks, Māris Knite, Andris Šutka</i>	
<b>Method for evaluation anthropometric fit and ergonomics of clothing</b>	22
<i>Eva Lapkovska, Inga Dāboliņa, Liene Siliņa</i>	
<b>Synthesis and characterization of amorphous calcium phosphate</b>	23
<i>Marika Mosina, Janis Locs</i>	
<b>Laser technology for controlling the spectral sensitivity of the GeSn IR photodiode</b>	24
<i>P. Onufrijevs, P. Ščājevs, A. Mekys, T. Malinauskas, L. Subačius, A. Medvids, Kuo-Chih Lee, H. H. Cheng</i>	

<b>Synthesis of A-D-A type chromophores containing 5,11-dihydroindolo[3,2-b]carbazole donor core</b>	25
<i>Armands Ruduss</i>	
<b>Individualization of tight-fitting sportswear</b>	26
<i>Liene Siliņa, Inga Dāboliņa, Eva Lapkovska</i>	
<b>Optimal use of industrial hemp for PLA biocomposite and LLDPE composite reinforcement</b>	27
<i>Anete Smoca, Zane Zelca</i>	
<b>Biological nitrogen removal from pharmaceutical wastewater</b>	28
<i>Elina Strade</i>	
<b>Liposomes as vancomycin hydrochloride delivery system</b>	29
<i>Marite Skrinda, Arita Dubnika, Janis Locs</i>	
<b>Hyaluronic acid based composites for local drug delivery</b>	30
<i>Elīza Tracuma, Dagnija Loca</i>	
<b>Injectable, porous, osteoinductive calcium phosphate cements</b>	31
<i>Agneta Veženkova, Jānis Ločs</i>	
<b>Synthesis of 1,4-dihydropyridine derivatives with spontaneous and stimulated emission properties</b>	32
<i>Elmars Zarins, Julija Pervenecka, Elina Misina, Kristine Lazdovica, Karlis Balodis, Aivars Vembris, Valdis Kokars</i>	

## Posters

<b>Effects of clays on CO<sub>2</sub> hydrogenation at low pressure over CuO/SBA-15 catalysts</b>	34
<i>Zane Abelniece, Valdis Kampars</i>	
<b>Chemical engineering for improvement efficiency of microwave energy usage in processing of plant biomass</b>	35
<i>Yegor Akishin, Alexandr Semenischev, Alexandr Arshanitsa, Galina Telysheva</i>	
<b>Impact of hyaluronic acid content on hyaluronic acid/<math>\epsilon</math>-polylysine hydrogels properties</b>	36
<i>Kristine Belune, Dagnija Loca</i>	
<b>Heat treatment effect on a hypereutectic Al alloy obtained by selective laser melting</b>	37
<i>Jairo Alberto Muñoz Bolaños, Alexander Komissarov, Alexander Gromov</i>	
<b>Use of disperse dyes for dyeing of recycled polyethylene terephthalate fibers</b>	38
<i>Aina Bernava</i>	
<b>The influence of the solvents on the antioxidant properties of the birch outer bark extract in cosmetic emulsions</b>	39
<i>Rudolfs Berzins, Aigars Paze, Janis Rizhikovs, Raimonds Makars, Daniela Godina, Maris Lauberts, Kristaps Stankus</i>	
<b>A novel approach for the synthesis of nanocrystalline TiO<sub>2</sub> and its phase transformation in the presence of gadolinium</b>	40
<i>Regina Burve, Vera Serga, Aija Krumina</i>	
<b>Kinetic model of the 1,2-propanediol oxidation reaction in the presence of</b>	41

**3wt%Pd/Al<sub>2</sub>O<sub>3</sub> catalyst**

*Svetlana Chornaja, Svetlana Zhizhkuna, Jevgenija Vladiko*

**Optimization of main synthetic medium component concentration relations for *Kluyveromyces marxianus* biomass production** 42

*Konstantins Dubencovs, Anastasija Šuleiko, Jānis Liepiņš, Arturs Šuleiko, Oskars Grīgs*

**Method development for leachable furfural determination in wood-based panels by HPLC-UV system** 43

*Daniela Godina, Raimonds Makars, Rudolfs Berzins, Aigars Paze, Janis Rizhikovs*

**Synthesis and structure investigation of benzimidazole-based 1,2- and 1,4-quinone derivatives** 44

*Anastasija Gaile, Sergey Belyakov, Nelli Batenko*

**Formation of anisotropic tribological properties on the steel surface by laser radiation** 45

*Līga Grāse, Pavels Onufrijevs, Juozas Padgurskas, Audrius Zunda, Mindaugas Rukanskis, Gundars Mežinskis*

**HBsAg production in methanol controlled *P. pastoris* GS115 MutS bioreactor process** 46

*Oskars Grīgs, Emīls Bolmanis, Andris Kazaks*

**Peat processing processes to highly added products** 47

*Kristīne Irtiseva, Janis Baronins, Vjaceslavs Lapkovskis, Jurijs Ozolins*

**Influence of extracts from bark of deciduous trees on the activity of the amylolytic enzyme – alpha-amylase** 48

*Sarmīte Janceva, Jelena Krasilnikova, Anna Andersone, Natalija Zaharova, Galina Telysheva, Ināra Nokaļna, Julija Janceva*

**Wood and wood bark extracts as natural sunscreen ingredients for cosmetic products** 49

*Lilija Jashina, Sarmīte Janceva, Līga Lauberte, Anna Andersone, Natalja Zaharova, Galina Telysheva*

**Application of arylsulfanyl group dance in the synthesis of novel tetrazoloquinazolines** 50

*Andris Jeminejs, Irina Novosjolova, Ērika Bizdēna*

**Optimization of exposed concrete pigmented with FexOy..** 51

*Inna Juhnevica, Arturs Curakovs*

**Rheological properties of wood plastic composites based on polypropylene and plywood sanding dust** 52

*Janis Kajaks, Karlis Kalnins, Juris Matvejs*

**Formate esters containing biodiesel – diesel mixed fuels** 53

*Valdis Kampars, Anastasija Naumova*

**Photopolymerization of epoxidized soybean oil acrylate / lignocellulose biocomposites** 54

*Edgars Kampe, Anda Barkane, Sergejs Gaidukovs, Y. Habibi*

**Synthesis of 2-triazolyl purine C6 phosphonates in SNAr-Arbuzov reaction** 55

*Kārlis Ēriks Kriķis, Irina Novosjolova*

<b>Lichens (<i>Xanthoria parietina</i>) – bio-indicators for sulphur and metallic elements for pollution investigation in Riga city</b>	56
<i>Viktorija Krjukoviča, Zenta Balcerbule, Vitālijs Lazarenko, Māris Bērtiņš, Arturs Vīksna</i>	
<b>Variations of some metallic elements in different parts of lingonberry (<i>Vaccinium vitis-idaea</i> L.) and soil</b>	57
<i>Vitālijs Lazarenko, Karina Babiča, Zenta Balcerbule, Māris Bērtiņš, Arturs Vīksna</i>	
<b>Influence of crystallite size of nickel and cobalt ferrite on the catalytic intermediate pyrolysis of buckwheat straw by using TGA-FTIR method</b>	58
<i>Kristine Lazdovica, Valdis Kampars</i>	
<b>Micromechanical and tribological properties of nanostructured carbonitride coatings deposited by PVD technique</b>	59
<i>Armands Leitans, Janis Lungevics, Uldis Kandars, Irina Boiko</i>	
<b>Synthesis of silicon-containing unsaturated carbohydrates</b>	60
<i>Jevgenija Lugiņina, Vitālijs Rjabovs</i>	
<b>The synthesis of renewable hydrocarbons from different vegetable oils and soapstock by hydrotreatment over high metal loading supported Ni catalyst</b>	61
<i>Kristaps Malins, Ilze Malina, Mara Legzdina</i>	
<b>Investigation of furfural formation and mechanical properties of suberinic-acids bonded particleboards depending on their preparation parameters</b>	62
<i>Raimonds Makars, Daniela Godina, Janis Rižikovs, Aigars Paze</i>	
<b>Effect of ground vulcanizate modification methods on properties of oil-petroleum-resistant rubber</b>	63
<i>Vadim Myadelets, Vjaceslavs Lapkovskis, Andrey Kasperovich</i>	
<b>Properties of magnesium oxychloride and magnesium oxysulphate cement composites</b>	64
<i>Elviņa Namsone, Genadijs Sahmenko, Aleksandrs Korjajkins</i>	
<b>Characterization of woven composite material properties by using an inverse technique based on vibration tests</b>	65
<i>Endija Namsone, Denis Ermakov</i>	
<b>Development of plywood binder by partial replacement of phenol-formaldehyde resins with birch outer bark's components</b>	66
<i>Aigars Pāže, Jānis Rižikovs, Daniela Godiņa, Raimonds Makars, Rūdolfs Bērziņš</i>	
<b>Study of chromatographic properties of catecholamines and their acidic metabolites using novel molecularly imprinted polymers as stationary phases</b>	67
<i>Antons Podjava, Artūrs Šilaks</i>	
<b>Analytical pyrolysis for valorization of herbal pharmaceutical industry wastes excluding necessity of preparative isolation of their components</b>	68
<i>Jevgenija Ponomarenko, Botir Abduazimov, Vilhelmine Jurkjane, Sarmite Janceva, Galina Telysheva</i>	
<b>Densification of amorphous calcium phosphate: A comparison of cold sintering processes</b>	69
<i>Aīga Anna Pudule, Kārlis Agris Gross, Dārta Ūbele, Ilze Jerāne, Ints Šteins</i>	

<b>Influence of MeV gamma rays on thermostimulated exoelectron emission from MgO films</b>	70
<i>Marina Romanova, Vera Serga, Regina Burve, Kristaps Palskis, Yuri Dekhtyar</i>	
<b>Effect of the cold sintering process parameters on densification and structure of amorphous calcium phosphate</b>	71
<i>Kristaps Rubenis, Signe Zemjane, Janis Locs</i>	
<b>Comparison of efficiency of three primary driers during auto-oxidation of alkyd and boiled linseed oil</b>	72
<i>Errj Sansonetti, Dace Cīrule, Bruno Andersons, Ingeborga Andersone, Edgars Kuka</i>	
<b>Computational prediction and experimental confirmation of solid solution formation from different nitrobenzoic acid derivatives and their isomers</b>	73
<i>Kristaps Saršūns, Agris Bērziņš</i>	
<b>Evaluation of antibacterial properties of chemically cross-linked hydrogels based on <math>\epsilon</math>-polylysine and hyaluronic acid</b>	74
<i>Artemijs Sceglavs, Aigars Reinis, Kristine Salma-Ancane</i>	
<b>Purine-phenoxazine and purine-phenothiazine conjugates</b>	75
<i>Armands Sebris, Kaspars Traskovskis, Irina Novosjolova, Māris Turks</i>	
<b>Influence of crystallization additives on morphology of selected benzoic acids – a molecular dynamics (MD) simulation study</b>	76
<i>Aina Semjonova, Agris Bērziņš</i>	
<b>Biodegradation studies of poly(butylene succinate)/nanofibrillated cellulose nanocomposites</b>	77
<i>Aleksandrs Sereda, Oskars Platnieks, Sergejs Gaidukovs</i>	
<b>Influence of leaning materials on the quality of building ceramics</b>	78
<i>Ruta Svinka, Visvaldis Svinka, Maris Rundans, Inta Timma, Laila Petersone</i>	
<b>Use of molecular dynamics simulations to investigate the molecular association of dihydroxybenzoic acids in solution</b>	79
<i>Aija Trimdale, Agris Bērziņš</i>	
<b>Features of the structure formation of diffusion boride layers upon preliminary activation</b>	80
<i>Yulia Usherenko, Viktors Mironovs, Vladimir Dashkevich</i>	
<b>Characterization of pigments from <i>Malus domestica</i> leaves for wool dyeing</b>	81
<i>Valda Valkovska, Liāna Orola</i>	
<b>Amorphous calcium phosphate with fluoride for dental application</b>	82
<i>Vita Zalite, Janis Locs</i>	
<b>Synthesis and spectroscopic characteristics of new ligands based on quinolin-8-ol for preparation of Alq3 type complexes</b>	83
<i>Elmars Zarins, Deins Alksnis, Patricija Paulsone, Karlis Balodis, Aivars Vembris, Valdis Kokars</i>	
<b>Influence of the cellulose and soft wood fibres on the impact and tensile properties in polypropylene bio composites</b>	84
<i>Janis Zicans, Remo Merijs Meri Tatjana Ivanova, Andrejs Kovalovs, Piotr Franciszczak, Andrzej K. Bledzki</i>	

