Materials Science and Applied Chemistry 2019

PROGRAMME AND ABSTRACT BOOK

Riga, Latvia

24 October, 2019

http://msac.rtu.lv/

List of posters

P-1 **Structurally perfect glassy azobenzene core 1st generation dendrimer and its non-linear optical properties**
Lauma Laipniece, Valdis Kampars, Andrejs Tokmakovs, Artūrs Bundulis, Martins Rutkis

P-2 **Catalytic intermediate pyrolysis of cellulose for hydrocarbons production in the presence of zeolites by using TGA-FTIR method**
Kristine Lazdovica, Valdis Kampars

P-3 **Investigation of carbohydrate C-sylilation with chlorosilanes**
Vladislavs Kroskins, Karina Nikitina, Jevgenija Luginina, Vitalijs Rjabovs

P-4 **Sulfonylpurine synthesis using sulfonyl group dance**
Jānis Miķelis Zaķis, Kristers Ozols, Irina Novosjolova, Māris Turks

P-5 **Synthesis and antiradical activity of 2-arylidenemalonic acid dianilides**
Inese Mieriņa, Darja Kostjuņina, Māra Jure

P-6 **2,6-Diazidopurine Derivatives as Substrates in Reactions with Arylthiols**
Andris Jeminejs, Ērika Bizdēna, Irina Novosjolova

P-7 **Preparation and characterization of Fe_2O_3/SBA15 for Fischer-Tropsch process**
Agija Stanke, Valdis Kampars

P-8 **The effect of biodiesel composition on characteristics of blended summer diesel fuel**
Valdis Kampars, Rūta Kampare, A.Naumova

P-9 **Solvent and pH Effects on the UV-Vis Spectra of 6,7-dichloropyrido[1,2-*a*]-benzimidazol-8,9-dione derivatives**
Nelli Batenko, Anastasija Gaile

P-10 **An approach for prediction of solid solution formation possibility of chemically similar molecules using calculation of lattice and intermolecular interaction energy**
Kristaps Saršūns, Agris Bērziņš

P-11 **Computational study of association of dihydroxybenzoic acids in solution: testing the molecular self-association computational methodology for formation of binary systems**
Aija Trimdale, Agris Bērziņš

P-12 **Internal stresses diminishing in the Si-SiO_2 system**
D. Kropman, V. Seeman, T. Laas, A. Medvids, P. Onufrijevs, S. Vitusevich

P-13 **Oxidation kinetics of 1,2-propanediol in the presence of Pd and Pt catalysts**
Svetlana Chornaja, Svetlana Zhizhkuna, Jevgenija Vladiko, Reinis Drunka, Aija Krumina

P-14 **Oxidation of 1,2-propanediol to lactic acid under novel supported Au catalysts and reaction kinetics**
Svetlana Zhizhkuna, Svetlana Chornaja, Jevgenija Vladiko, Reinis Drunka, Dzidra Jankovica, Konstantins Dubencovs, Elina Sile

P-15 **Characteristics of Fly Ash-Based Geopolymer Cured in Microwave Oven**
Nguyen Hoc Thang, Ho Chi Minh

P-16 **Modelling IR Spectra of Sulfonated Polyether Ether Ketone Membranes for Fuel Cells**
Guntars Vaivars, Kristīne Krūkle-Bērziņa, Madara Markus

P-17 **Porous ceramics from Al_2O_3 nanopowders**
Ilmārs Zālīte, Līga Grase, Santa Lagzdiņa, Dzintra Rašmane

P-18 **Synthesis and Spark Plasma Sintering of Nanosized Refractory Carbide / Nitride Powders**
Ilmārs Zālīte, Anita Letlena, Ints Šteins, Aija Krūmiņa, Māra Lubāne, Jānis Grabis

P-19 **Liquid membrane system for extraction and electrodeposition of copper(II)**
Tatiana Sadyrbaeva

P-20 **Preparation and characterisation of gadolinium oxide nanocrystalline powders and films**
Regīna Burve, Vera Serga, Aija Krūmiņa, Raimonds Poplausks

P-21 **Nickel(II) Ion Adsorption by Nitric Acid Modification of Activated Carbon from Olive Stones**
Termoul Mourad, Benderdouche Nourddine, Bestani Benaouda, Attouti Salima

P-22 **Study of the Photocatalytic degradation of organic pollutants in the presence of titanium dioxide supported on a microporous silico-aluminophosphate**
Salima Larbaoui, Hafida Hentit, Halima Boukabous, Jean-Claude Jumas, Abdelhadi Bentouami

P-23 **Study of humic acid sorption on clay minerals**
Linda Ansone-Bertina, Marta Jemeljanova, Maris Klavins, Ruta Ozola-Davidane

P-24 **Microwave based pretreatment for the efficient extraction of biological active compounds from *Fucus Visculosius***
Sarmite Janceva, Alexandr Arshanica, Liga Lauberte, Anna Andersone, Yegor Akishin, Galina Telysheva

P-25 **Changes of birch outer bark extractives' composition after recrystallization with C_2–C_5 alkanols**
Raimonds Makars, Aigars Pāže, Jānis Rižikovs, Rūdolfs Bērziņš

P-26 **Development of peat processing methods for obtaining innovative products**
Kristine Irtiseva, Janis Baronins, J.Krumins, Jurijs Ozolins, Maris Klavins, Olita Medne

P-27 **Changes of ecological linseed oil paints during outdoor weathering of wood panels**
Errj Sansonetti, Dace Cīrule, Bruno Andersons, Ingeborga Andersone, Edgars Kuka

P-28 **Recycled paper additive for wood-polymer composite: preparation and characterization**
Jevgenijs Jaunslavietis, Galia Shulga, Jurijs Ozolins, Anrijs Verovkins, Brigita Neiberte

P-29 **Using Activated Diatomite as Absorbent for Treatment of Arsenic Contaminated Water**
Nguyen Hoc Thang, Ho Chi Minh

P-30 **A short review of processing methods for reuse of secondary materials**
Lapkovskis Vjaceslavs, Mironovs Viktors, Irtiseva Kristine, Dmitri Goljandin

P-31 **Educated society - phosphorous responsible society**
Daina Kalniņa, Marija Gadzimuradova

P-32 **Phytochemical profile of chokeberry (*Aronia melanocarpa*)**
Anda Batarāga, Valda Valkovska

P-33 **Light source as a heat source for photobioreactor**
Matīss Zuteris, Kristīne Veģere, Agnese Stunda-Zujeva

P-34 **Spirulina/Arthrospira growth medium recycling**
Agnese Stunda-Zujeva, Sabīne Irbe

P-35 **Evaluation of suitability of treated sewage sludge for maize cultivation**
Laila Dubova, Nauris Cielava, Viktors Vibornijs, Alīna Rimkus, Ina Alsiņa, Olga Muter, Natalya Strunnikova, Oleg Kassien

P-36 **Evaluation of sewage sludge for further nutrient conservation**
Viktors Vibornijs, Alīna Rimkus, Laila Dubova, Dmitrijs Bekkers, Natalya Strunnikova, Oleg Kassien, Ina Alsiņa, Olga Muter

P-37 **Distribution and activity of airborne microorganisms in the experimental green wall system**
Mārtiņš Kalniņš, Alise Sieriņa, Alvis Epners, Olga Muter

P-38 **Effect of isothiocyanates on the activity of Lactobacillus plantarum exposed to irradiation and hydrogen peroxide**
Kristine Kalneniece, Toms Kusins, Inga Balode, Liva Mazkalnina, Karlis Shvirksts, Mara Grube, Gunta Kizane, Vasilijs Bankovskis, Andrejs Grinbergs, Olga Muter

P-39 **Use of wood ash in the forest and its effect on the concentration of metallic elements in soil and blueberries (*Vaccinium myrtillus L.*)**
Vitālijs Lazarenko, Vita Rudoviča, Arturs Vīksna, Zaiga Anna Zvaigzne, Modris Okmanis

P-40 **Influence of Ag/Ti co-substitution on the hydroxyapatite physicochemical properties**
Līga Stīpniece

P-41 **Application of Taguchi design method for textile dye removal onto biomaterials: Optimization of adsorption parameters**
Farhate Bensalah, Hakim Aguedal, Abdelkader Iddou, Abdallah Aziz Taguchi

P-42 **Novel hydrogels and composite hydrogels based on ε-polylysine, hyaluronic acid and hydroxyapatite**
Artemijs Ščeglovs, Kristīne Šalma-Ancāne

P-43 **Strontium Ranelate Release Evaluation from Composites Based on Hydroxy-apatite and Poly(vinyl)alcohol**
Sofja Batalova, Kristīne Šalma- Ancāne

P-44 **Core-shell PVA/PVP-FeOOH nanofibers as potential visible light responsive drug delivery system**
Anna Šutka, Andris Šutka

P-45 **Development of bioadhesive biomaterials based on silk and hyaluronic acid**
Karina Egle, Arita Dubņika

P-46 **Synthesis of amorphous calcium phosphate: a review**
Marika Mosina, Janis Locs

P-47 **Hyaluronic acid/polylysine composites for local drug delivery: a review**
Elīza Tračuma, Dagnija Loča

P-48 **Alveolar bone quality around dental implants with peri-implantitis 5-10 years after implantation of biphasic calcium phosphate (HAp/βTCP) granules**
Vadims Klimecs, Alexandrs Grishulonoks, Ilze Salma, Laura Neimane, Janis Locs, Eva Saurina, Andrejs Skagers

P-49 **Clothing fit in terms of sustainability**
Liene Siliņa, Inga Dāboliņa, Eva Lapkovska, Jolanta Graudone, Pēteris Apse-Apsītis

P-50 **Woven Textile Pressure Switch**
Ilze Balgale, Ilze Baltiņa

P-51 **Modeling and optimization of the adsorption process of textile dye onto diatomite by Artificial Neural Network**
Hakim Aguedal, Brahim Mohammedi, Djillali Redha Merouani, Abdelkader Idoou

P-52 **Evaluation of adhesion for polymer composite coatings**
Zane Grigale-Soročina, Elīna Vīndedze, Ingmārs Birks

P-53 **Correlation of mechanical properties of polymer composite coatings with viscosity of unpolymerized system**
Zane Grigale-Soročina, Elīna Vīndedze, Ingmārs Birks

P-54 **On the development and characterization of rheological and mechanical properties of polylactic acid blends with polybutylene adipate terephthalate**
A. Nesaule, E. Didrihsone, R. Merijs-Meri, O. Grīgs, J. Zicāns

P-55 **Adhesion investigations of systems based on birch plywood and wood plastic composites**
Janis Kajaks, Karlis Kalnins, Juris Matvejs

P-56 **FTIR spectroscopy analysis of hemp fibres reinforced PLA bio-composites**
Anete Smoča

P-57 **Possible Mechanism of Permittivity Change of Natural Rubber/Carbon Black Composite During Tensile and Compressive Deformation**
Kaspars Ozols, Māris Knite, Juris Blūms

P-58 **Characteristics of HPMC/Beeswax Edible Composite Film and Application for Preservation of Seedless Lime Fruit**
Nguyen Thi Luong, Nguyen Thanh Tung, Nguyen Van Khoi, Pham Thi Thu Ha, Le Thi Hong Thuy, Nguyen Hoc Thang

P-59 **Influence of rubber particles size on functional properies of composite material based on scrap tires and polymer binder**
Agnija Cirvele, Laimonis Mālers

P-60 **Composition-Driven Magnetic Transformation in $BiFeO_3$-Based Multiferroics**
U. Khomchanka, D.V. Karpinsky, S.V. Dubkov, M.V. Silibin, J.A. Paixão

P-61 **Spacing Effect between Electrodes for Delamination Detection in Composite Material using Electric Resistance Change Method**
Andrejs Kovalovs, Andris Chate

P-62 **Vibration correlation technique for predicting the buckling load of cylindrical shells: a comparison of various methods**
Eduards Skukis, Kaspars Kalniņš, Gints Jēkabsons, Olgerts Ozoliņš

P-63 **Development of Sealing System for Vial Filling of Radiopharmaceuticals in One Hot Cell Isolator at Small-Scale Radiopharmacy Laboratories under Aseptic Conditions**
Harijs Rozensteins, Janis Zicans, Olga Mutere, Rita Berzina, Remo Merijs Meri, Toms Kusins, Ingars Reinholds, Liva Mazkalnina, Karlis Svirksts, Ricards Kovaldins, Gunta Kizane, Andrejs Grinbergs

P-64 **Production of foamed concrete in a planetary ball mill**
Eva Namsone, Genadijs Sahmenko, Elvija Namsone, Aleksandrs Korjakins

P-65 **Magnesium-based binders and materials based on it**
Elvija Namsone, Irina Shvetsova, Genadijs Sahmenko, Aleksandrs Korjakins

P-66 **Adsorption of anionic surfactant on an aluminum-based waste**
Abdelkader Iddou, Samia Benhammadi

P-6

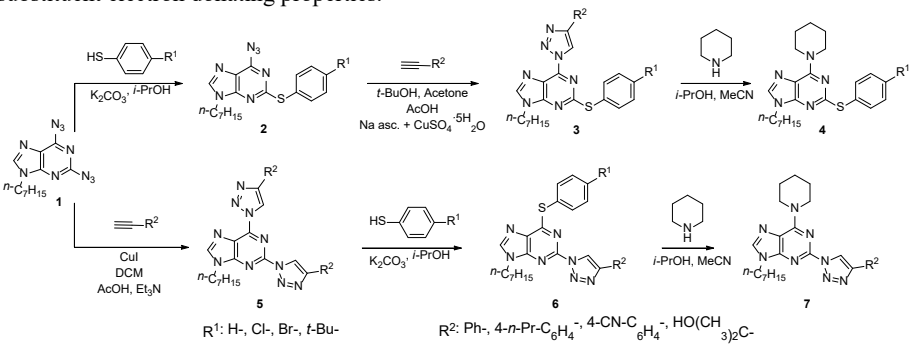
2,6-Diazidopurine Derivatives as Substrates in Reactions with Arylthiols

Andris Jeminejs, Ērika Bizdēna, Irina Novosjolova

Faculty of Materials Science and Applied Chemistry, Riga Technical University, Latvia
e-mail: Andris.Jeminejs@rtu.lv

Purine and thiopurine derivatives are widely studied due to their broad spectrum of biological activity. Some of them have already been used as an effective tool in the treatment of cancer and autoimmune disorders.[1]

2,6-Diazidopurine substrate **1** has been proven to be a valuable starting material in the synthesis of new arylthiopurine derivatives. Nucleophilic substitution with thiophenols can be mainly observed at C2 position of purine, providing 2-arylthio-6-azidopurine derivatives **2** with yields up to 74% (Scheme 1).[2] In solution these compounds exist in azide-tetrazole equilibrium which is dependent on several factors, such as temperature, solvent polarity and substituent electron donating properties.



Scheme 1. Synthesis of arylthiopurine derivatives and their further modification.

Further CuAAC reaction and different sequence of the reactions leaded to 2-arylthio-6-triazolyl- and 6-arylthio-2-triazolylpurine derivatives **3** and **6**. Regioselectivity of obtained products was confirmed by NMR and UV absorbance data. Despite the location of triazolyl- and thiogroups following nucleophilic substitution with piperidine was observed regioselectively at C6 position of purine (products **4** and **7**).

Acknowledgements
This work was supported by the Latvian Council of Science grant No LZP-2018/2-0037.

References

1. Sahasranaman, S., Howard D., Roy S. *Eur. J. Clin. Pharmacol.* **2008**, *64*, 753–767.
2. Zaķis, J., Jeminejs, A., Ozols, K., Bizdēna, Ē., Novosjolova, I., Turks, M. Novel Method for the Synthesis of 6-Azido 2-Sulfonylpurine Derivatives. In: *Balticum Organicum Syntheticum (BOS 2018): Program and Abstracts*, Estonia, Tallinn, 1-4 July, **2018**, pp.144.