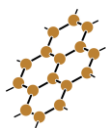




RIGA TECHNICAL UNIVERSITY

61st International Scientific Conference

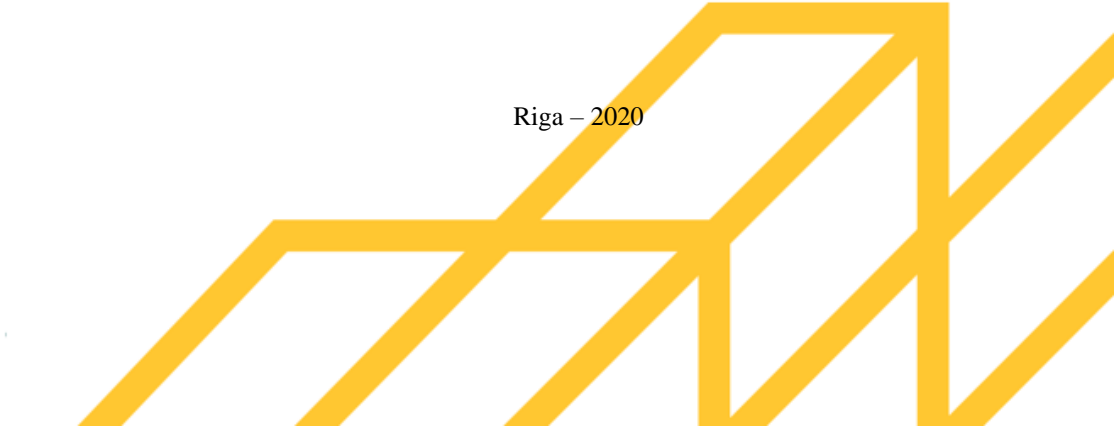
**"MATERIALS SCIENCE AND APPLIED CHEMISTRY
2020"**



MSAC 2020

Book of abstracts

Riga – 2020



RIGA TECHNICAL UNIVERSITY

61st International Scientific Conference

"MATERIALS SCIENCE AND APPLIED CHEMISTRY 2020"

Riga, 2020, 84 pp.

ISBN: 978-9934-22-530-7

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

Purine-phenoxazine and purine-phenothiazine conjugates

Armands Sebris, Kaspars Traskovskis, Irina Novosjolova, Māris Turks

Faculty of Materials Science and Applied Chemistry, Riga Technical University

e-mail: armands.sebris_1@rtu.lv

Several reports about fluorescent properties of purine derivatives have been published till now.¹⁻⁴ Such compounds are often used for fluorescent cell labeling, however research into purine photophysical properties for application in materials science is rare. Currently there is only investigation of purine derivatives as fluorescent emitters in OLEDs by Castellano's group^{5,6} and a single publication about development of fluorescent purine derivatives as emitters exhibiting thermally activated delayed fluorescence (TADF).⁷

In this research, phenoxazine and phenothiazine groups were introduced as electron donors in an electron deficient purine system through a meta-connected benzene ring bridge to facilitate thermally activated delayed fluorescence. Mitsunobu reaction and Suzuki-Miyaura coupling afforded the target compounds **1-4** (Figure 1). Photophysical properties of the synthesized purine derivatives were explored and quantum yields in the thin layer film reached up to 8 % and in the PMMA doped thin layer film up to 15 %.

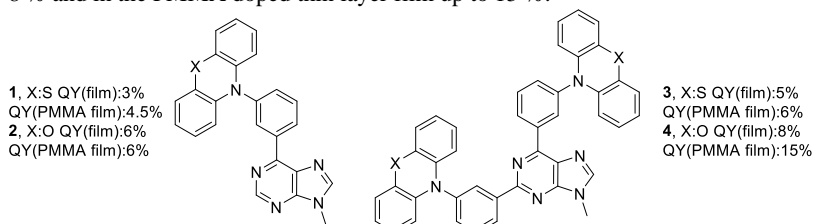


Figure 1. Purine derivatives with phenoxazine and phenothiazine electron donating groups

Acknowledgements

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

References

1. Matarazzo, A.; Hudson, R. H. E. *Tetrahedron* **2015**, *71* (11), 1627.
2. Saito, Y.; Hudson, R. H. E. *J. Photochem. Photobiol. C Photochem. Rev.* **2018**, *36*, 48.
3. Šišulins, A.; Bucevičius, J.; Tseng, Y.; Novosjolova, I.; Traskovskis, K.; Bizdēna, Ē.; Chang, H.; Tumkevičius, S.; Turks, M. *Beilstein J. Org. Chem.* **2019**, *15* (9), 474.
4. Novosjolova, I.; Bizdēna, Ē.; Turks, M. *Eur. J. Org. Chem.* **2015**, *2015* (17), 3629.
5. Yang, Y.; Cohn, P.; Dyer, A. L.; Eom, S. H.; Reynolds, J. R.; Castellano, R. K.; Xue, J. *Chem. Mater.* **2010**, *22* (12), 3580.
6. Yang, Y.; Cohn, P.; Eom, S.-H.; Abboud, K. A.; Castellano, R. K.; Xue, J. *J. Mater. Chem. C* **2013**, *1* (16), 2867.
7. Wang, Z.; Yao, J.; Zhan, L.; Gong, S.; Ma, D.; Yang, C. *Dye. Pigment.* **2020**, *180*, 108437.