

79.



KĪMIJAS SEKCIJA

Tēžu krājums

Latvijas
Universitātes
starptautiskā
zinātniskā
konference

2021. gada februāris



LATVIJAS
UNIVERSITĀTE

**Latvijas Universitātes
79. starptautiskā
zinātniskā konference**

ĶĪMIJAS SEKCIJA
Tēžu krājums

Book of Abstracts

**The 79th International
Scientific Conference
of the University of Latvia**

CHEMISTRY SECTION

2021

FIZIKĀLĀS ĶĪMIJAS SEKCIJA 33

A. Ansonē, A. Zariņš, L. Avotiņa, G. Ķizāne. ANALYSIS OF SORBED GASES ON SURFACE OF LITHIUM ORTHOSILICATE BASED CERAMICS WITH THERMOGRAVIMETRY AND IR SPECTROMETRY	34
A. Auce, I. Auce, I. Horns, A. Jeremuss, S. Ivanovs, M. Drozdovs, Ā. Ruciņš. REDUCTION OF CO ₂ EMISSIONS IN GREENHOUSE HEATING BY USING AIR TO AIR HEAT PUMP	35
L. Avotiņa, E. Pajuste, I. Reinholds, E. Sprūģis, G. Vaivars. ANALYSIS OF ELECTRON IRRADIATED PROTON EXCHANGE MEMBRANES WITH INFRARED SPECTROMETRY	36
R. Bobrovs, I. Kaņepe-Lapsa, K. Jaudzems. IDENTIFICATION OF POTENTIAL PLASMEPSIN IX INHIBITORS USING HIGH-THROUGHPUT VIRTUAL SCREENING	37
L. Bugovecka, K. Buks, K. Niherush, J. Andžāne, D. Erts. SYNTHESIS AND PROPERTIES OF FLEXIBLE CARBON NANOTUBE-METAL CHALCOGENIDE STRUCTURES	38
Z. Čerpakovska, K. Saršūns, A. Bērziņš. INVESTIGATION OF POSSIBILITIES TO CONTROL THE POLYMORPH OBTAINED IN CRYSTALLIZATION OF 3-HYDROXYBENZOIC ACID	39
S. Homiča, E. Sprūģis, G. Vaivars. PREPARATION OF ZIRCONIUM DIOXIDE NANODISPERSIONS FROM ZIRCONIUM OXYCHLORIDE OKTAHYDRATE AND ELECTRICAL PROPERTIES OF PREPARED DISPERSIONS	40
L. Jasulaneca, R. Meija, E. Kauranens, R. Sondors, J. Andzane, J. Prikulis, G. Kunakova, D. Erts. FABRICATION AND CHARACTERIZATION OF ON-CHIP SEMICONDUCTOR NANOWIRE NANO-ELECTROMECHANICAL SWITCHES	41
P. Kalnina, E. Pajuste, G. Kizane. OPTIMIZATION OF THE EFFICIENCY OF THE DISTILLATION METHOD FOR THE SEPARATION OF TRITIUM FROM BERYLLIUM-CONTAINING ACID SOLUTIONS	42
K. Kokina, V. Valkovska. CHEMICAL COMPOSITION OF <i>MALUS DOMESTICA</i> LEAVES	43
A. Kons, A. Mishnev, T. A. Mukhametzyanov, A. V. Buzyurov, S. E. Lapuk, A. Bērziņš. HEXAMORPHISM OF DANTROLENE: INSIGHT INTO THE CRYSTAL STRUCTURES, STABILITY, AND PHASE TRANSFORMATIONS	44
E. Lagzdina, E. Pajuste, G. Kizane, A. Lescinskis. INCONEL-718 ALLOY ELECTROCHEMICAL POLISHING	45
K. Saršūns, A. Karziņins, K. Leduskrasts, A. Bērziņš, T. Rekis. FORMATION OF SOLID SOLUTION IN XANTHONE DERIVATIVE SYSTEMS EXHIBITING LUMINESCENCE PROPERTIES ..	46
A. Semjonova, A. Bērziņš. SCREENING OF CRYSTALLIZATION ADDITIVES FOR POLYMORPH CONTROL OF 2,6-DIMETHOXYBENZOIC ACID	47
T. E. Šusts, E. Pajuste, G. Ķizāne. EFFECTS OF RADIATION ON CMS MTD BTL COMPONENTS AND BINDING MATERIALS	48
A. Trimdale, A. Bērziņš. BEHAVIOR OF DIHYDROXYBENZOIC ACID MOLECULES IN SOLUTIONS DETERMINED USING SPECTROSCOPIC METHODS AND MOLECULAR DYNAMICS SIMULATIONS, AND THE POSSIBLE EFFECT OF DISPARITIES ON THEIR PROPENSITY TO FORM SOLID PHASES	49
A. Trubača-Boginska, R. Ādiņa, A. Prikšāne, G. Vaivars, J. Švirksts. MODIFICATION OF BENTONITE CLAY WITH ZWITTERIONS FOR APPLICATION IN SPEEK COMPOSITE MEMBRANES	50
V. Valkovska, L. Orola. CHARACTERIZATION OF PIGMENTS FROM <i>RUMEX CONFERTUS</i> ROOT FOR WOOL DYEING	51

ORGANISKĀS ĶĪMIJAS SEKCIJA 52

L. L. Barbare. TOWARDS DYNAMIC KINETIC RESOLUTION OF AMINES	53
A. Burcevs, A. Sebris, A. Jeminejs. SYNTHESIS AND PHOTOPHYSICAL PROPERTIES OF TRIAZOLYL PURINES	54
A. Čižikovs. COBALT-CATALYZED C(sp ²)-H BOND CARBONYLATION	55
A. R. Feldmanis, O. Filipsons. A MECHANISTICAL STUDY OF LEWIS BASE CATALYZED CYANOHYDRIN SYNTHESIS	56
A. Jeminejs. SYNTHESIS OF TETRAZOLO[1,5-c]QUINAZOLINE DERIVATIVES	57
G. Jersovs. SYNTHETIC APPROACH TO SULPHUR BASED ENANTIOPURE L-LACTAM BIOISOMERS	58
S. Kaštaljana. SYNTHESIS OF LINKERS FOR BIOCONJUGATION OF SARS-COV-2 RECEPTOR-BINDING DOMAIN SPIKE PROTEIN WITH Qβ VLPs	59
V. Kovada. SYNTHESIS OF NOVEL ASPARTIC-PROTEASE INHIBITORS FOR TREATMENT OF MALARIA	60
A. Sebris. SYNTHESIS AND PHOTOPHYSICAL PROPERTIES OF STERICALLY HINDERED PURINE DERIVATIVES	61
D. Sloboda, D. Hazens, I. Kļimenkovs. SYNTHESIS AND PROPERTIES OF ISOELECTRONIC BRANCHED IONIC LIQUIDS	62
A. Spērga. SYNTHESIS OF FLUORINATED ISOXAZOLINE N-OXIDES THROUGH FLOUROMETHYLENE TRANSFER	63

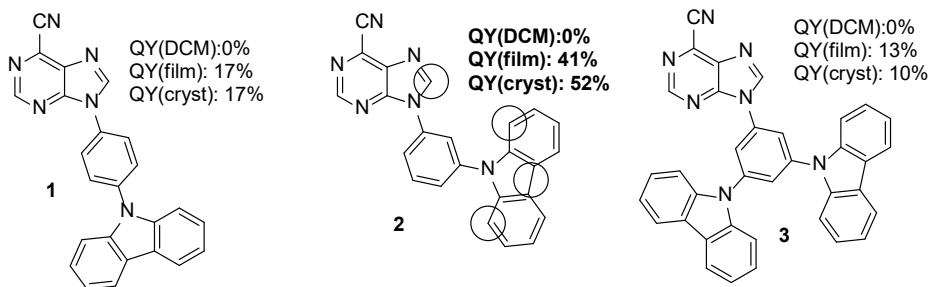
SYNTHESIS AND PHOTOPHYSICAL PROPERTIES OF STERICALLY HINDERED PURINE DERIVATIVES

Armands Sebris*

¹ Faculty of Materials Science and Applied Chemistry, Riga Technical University,
P. Valdena str. 3, Riga, Latvia
e-mail: armands.sebris_1@rtu.lv

Fluorescence of purine derivatives has widely been studied for purposes of cell imaging [1], while application in materials science has only a few examples [2]. Earlier our group reported synthesis and photophysical properties of fluorescent purine push-pull systems with potential uses in cell imaging [3]. We have followed up this work with research in purine based thermally activated delayed fluorescence (TADF) emitters, which only recently has had a first published example [4].

In our initial attempts we synthesized compounds **1,2**, which, according to DFT calculations, had separated HOMO and LUMO, and thus potential for TADF. These compounds had no emission in a solution, but moderate to good emission in a thin layer film and a crystalline phase. In our attempts to optimize the results achieved for compound **2** we introduced another electron donating group for compound **3** and also modified purine and carbazole moieties with different functional groups at circled positions of compound **2** to restrict intramolecular rotation that causes emission quenching.



This work was supported by ERDF project Nr. 1.1.1.1/16/A/131. Dr. K. Traskovskis and Dr. A. Vembris are acknowledged for the photophysical measurements and calculations.

Supervisors: Dr. chem. M. Turks, Dr. chem. I. Novosjolova

References:

- [1] Saito, Y.; Hudson, R. H. E. *J. Photochem. Photobiol. C* **2018**, 36, 48.
- [2] Yang, Y.; Cohn, P.; Eom, S.-H.; Abboud, K. A.; Castellano, R. K.; Xue, J. J. *Mater. Chem. C* **2013**, 1, 2867.
- [3] Šišulīns, A.; Bucevičius, J.; Tseng, Y.; Novosjolova, I.; Traskovskis, K.; Bizdēna, Ē.; Chang, H.; Tumkevičius, S.; Turks, M. *Beilstein J. Org. Chem.* **2019**, 15, 474.
- [4] Wang, Z.; Yao, J.; Zhan, L.; Gong, S.; Ma, D.; Yang, C. *Dyes Pigm.* **2020**, 180, 108437.