24th Congress of Chemists and Technologists of Macedonia

BOOK of ABSTRACTS

11-14 September 2016
Ohrid, Republic of Macedonia

Сојуз на хемичарите и технолозите на Македонија
Society of Chemists and Technologists of Macedonia

XXIV Congress
with international participation

BOOK OF ABSTRACTS

11-14 September 2016

Ohrid, R. Macedonia

Metropol Lake Resort

Society of Chemists and Technologists:

Svetomir Hadzi Jordanov

Zoran Zdravkovski

Jon Magdeski

Scientific Committee:

Elena Tomovska

Elena Velickova

Ljupco Pejov

Organizing Committee:

Zagorka Koncska

Jane Bogdanovski

Karmina Mitevska

Bozidar Ristovski

Jana Simonovska

Sponsors:

University "Ss Cyril and Methodius", Skopje

Faculty of Technology and Metallurgy, Skopje

Република Македонија
Министерство за образование и наука

Ministry of Education and Science

Faculty of Natural Sciences and Mathematics, Skopje

TITAN
CEMENTARNICA USJE

Cementarnica Usje AD-Skopje

Pivara Skopje

TIKVEŠ

Tikveš Winery, Kavadarci

Kvatro, Kumanovo

University Gocc Delcev, Stip

VIEMI

Viemi, Ohrid

Special thanks to OPCW, Hague

Preface

The 24th Congress of SCTM is a biannual presentation of the newest achievements in several disciplines of chemistry, technology, engineering and education of fundamental and applicative research. The large number of abstracts, presented in 15 conference sections (organic chemistry and technology, analytical chemistry, physical chemistry, biochemistry, electrochemistry, spectroscopy and structural chemistry, materials science and technology, polymers, environmental, bio- and food technology, medical and pharmaceutical chemistry and engineering, fuel and energy, textile, metallurgy, education) clearly demonstrate the broad scope of problems addressed by the Congress. Over the past years our aim has always been to bring to one place scientists and engineers from different scientific fields, encourage the exchange of ideas and know-how, as well as to promote new contact and cooperation.

The Book of Abstracts of the 24th Congress of SCTM contains 265 publications, from over 150 authors from 15 countries, presented in oral and poster sections. On behalf of the Scientific and Organizing Committees we would like to thank all of the sponsors who contribute to the success of the Congress and the publishing of this book, as well as to the support of the Ministry of Education and Science and the Organization for the Prohibition of Chemical Weapons.

Last but not least, we would like to thank all participants for enriching the Congress.

Elena Tomovska, Scientific Committee

Zagorka Koneska, Organizing Committee

CONTENTS

PLENARY LECTURES

PL 001 **PANČE NAUMOV**
New York University Abu Dhabi, POB 129188, Abu Dhabi, UAE
THE MYSTERY OF FIREFLY BIOLUMINESCENCE– SOLVED?

PL 002 **EVELINA SLAVCHEVA**
Institute of Electrochemistry and Energy Systems - Bulgarian Academy of Sciences "Acad. G. Bonchev" 10, Sofia 1113, Bulgaria
ANION EXCHANGE MEMBRANE ELECTROLYSIS CELLS- CLEAN COST EFFICIENT TECHNOLOGY FOR HYDROGEN PRODUCTION

PL 003 **THOMAS G. MAYERHÖFER**
Leibniz Institute of Photonic Technology, Albert-Einstein-Straße 9, D-07745 Jena, Germany
ULTRA-SENSING WITH SLIT-ENHANCED INFRARED SPECTROSCOPY

PL 004 **VLADIMIR D. JOVIĆ**
Institute for Multidisciplinary Research, University of Belgrade, P.O. Box 33, 11030 Belgrade, Serbia
ELECTRODEPOSITED COATINGS AS CATHODES FOR HYDROGEN EVOLUTION IN INDUSTRIAL CHLOR-ALKALI ELECTROLYSIS

PL 005 **AYHAN ORAL**
Çanakkale Onsekiz Mart University, Faculty of Art &Science, Department of Chemistry Terzioglu Campus, Canakkale, Turkey
PREPARATION AND CHARACTERIZATION OF GELATIN/ GERANIOL ELECTROSPUN NANOFIBERS

PL 006 **CANER ZANBAK**
Turkish Chemical Manufacturers Association, Istanbul, Turkey
SAFETY AND SECURITY CONCEPTS IN CHEMICALS MANAGEMENT AND PRIVATE/PUBLIC PARTNERSHIP IN CHEMICAL SUPPLY CHAIN SECURITY

PL 007 **KRSTE DIMITROVSKI**
University of Ljubljana, Faculty for Natural Sciences and Engineering, Department of Textiles, Graphic Arts and Design
VORTEX YARNS–SIGNIFICANT INCREASE IN MARKET COMPETITION

PL 008 **ILDA KAZANI**
Polytechnic University of Tirana, Department of Textile & Fashion, Albania
MAINTENANCE OF ELECTROCONDUCTIVE FLEXIBLE SUBSTRATES

PL 009 **JANE BOGDANOV**
Institute of Chemistry, Faculty of Natural Sciences and Mathematics, Ss. Cyril and Methodius University, Skopje, Macedonia
HEXACHLOROCYCLOHEXANES – ENVIRONMENTAL FATE, CHEMISTRY AND DEHALOGENATION APPROACHES REVISITED

PL 010 **DARKO DIMITROVSKI**
Faculty of Technology and Metallurgy, University of Ss Cyril and Methodius. Rudjer Boskovic 16, 1000 Skopje, Macedonia
APPLICATION OF PROBIOTICS IN FOOD

PL 011 **VIOLETA IVANOVA-PETROPULOS**
Faculty of Agriculture, University "Goce Delčev" – Štip, Krste Misirkov, bb, 2000 Štip, Republic of Macedonia
APPLICATION OF ADVANCED SEPARATION TECHNIQUES IN WINE QUALITY CONTROL

SECTION PRESENTATIONS

ANALYTICAL CHEMISTRY

AC 001 Jelena Đorđević, Zsigmond Papp, Ana Kalijadis, Tatjana Trtić-Petrović
Adsorptive stripping voltammetric determination of carbendazim fungicide

AC 002 Zoran Simić, Biljana Šmit, Jelena Milivojević
1,2,4- trihydroxybenzene/ hydroxyl-1,4- benzoquinone ISE carbon paste electrode as pH sensors

AC 003 Zoran Simić, Zorka Stanić
Enargite-carbon paste electrode as a sensor for acid-base determination in methanol and dimethylformamide

AC 004 Milena Nikolić, Aleksandra Pavlović, Snežana Mitić, Snežana Tošić, Ivana Rašić Mišić
Evaluation of an inductively coupled plasma atomic emission spectrometry method for macro and trace element determination in blackberry samples

AC 005 Jovana N. Krstić, Jelena M. Mrmošanin, Aleksandra N. Pavlović, Snežana S. Mitić, Snežana B. Tošić
Multi-element analysis of bagged *Aronia melanocarpa* teas using ICP-AES

AC 006 Branka B. Petković, Dalibor Stanković, Teodora Dimitrijević, Darko Kuzmanović, Milena P. Krstić
Selective voltammetric determination of an antipsychotic drug thioridazine at boron-doped diamond electrode

AC 007 Nimet Orqusha, Avni Berisha, Azem Lajçi, Nardi Sheqerxhiu, Jeton Halili, Valbonë Mehmeti, Elvir Azizi, Osman Hasku
Comparison of the solvent effect on the ultrasonic-assisted extraction of the essential oil from silver fir (*Abies Alba Mill*) by GC-FID

AC 008 Nimet Orqusha, Blerina Baxhaku, Nardi Sheqerxhiu, Valbonë Mehmeti, Ahmet Hoxha, Jeton Halili, Avni Berisha
Assessing the short-term UV-photostability of the alprazolam drug

AC 009 Irina Fierascu, Alina Ortan, Florin Constantin, Mihai Statescu, Radu Claudiu Fierascu
Nuclear analytical techniques for the characterisation of numismatic artefacts

AC 010 Radu Claudiu Fierascu, Alina Ortan, Gabriel Vasilievici, Sorin Marius Avramescu, Mira Oana Turtoi, Irina Fierascu
Analytical and bioanalytical evaluation of paper artefacts from the beginning of the XX century

AC 011 Ana S. Miletic, Emilija T. Pecev-Marinkovic, Aleksandra N. Pavlovic, Snezana B. Tosic, Ivana D. Rasic Misic
Kinetic-spectrophotometric method for herbicide dicamba determination

AC 012 Ana S. Miletic, Emilija T. Pecev-Marinkovic, Zora M. Grahovac, Aleksandra N. Pavlovic, Ivana D. Rasic-Misic
Development and validation of kinetic and HPLC method for herbicide atrazine determination

AC 013 Vera Lukic, Anja Jokic, Dragana Sejmanovic, Ruzica Micic
Identification and quantitative analysis of synthetic cannabinoid JWH-018 in plant materials

AC 014 Vera Lukic, Anja Jokic, Dragana Sejmanovic, Ruzica Micic
2,5-dimetoxy-4-bromophenethylamine identification and quantitative determination by GC-EI/MS

AC 015 Lenche Velkoska-Markovska, Biljana Petanovska-Ilievska
Rapid resolution liquid chromatography method development and validation for determination of some pesticide residues in apple juice

AC 016 Lenche Velkoska-Markovska, Biljana Petanovska-Ilievska
Development and validation of rapid resolution liquid chromatography method for determination of 2,4-d in pesticide formulations

AC 017 Marjan Piponski, Tanja Bakovska, Magdalena Piponska, Stefan Stefov, Marija Globochki, Marjan Velkovski, Gordana Trendovska Serafimovska
Fast simple RP-HPLC stability indicating method for analysis of Montelukast sodium pharmaceutical dosage forms

AC 018 Marjan Piponski, Tanja Bakovska, Magdalena Piponska, Stefan Stefov, Marjan Velkovski, Emilija Janeva Pockova, Gordana Trendovska Serafimovska
Development of fast simple RP-HPLC method for simultaneous determination of ciprofloxacin and ornidazole in pharmaceutical dosage forms

AC 019 Elena Cvetkovska, Elizabeta Dimitrieska-Stojković, Emil Popovski, Kristina Mladenovska, Goran Stojković
Optimization and validation of UV-Vis spectrophotometric method for determination of enrofloxacin in veterinary drugs by complex formation with Fe(III) ions

AC 020 Bujar Qazimi, Jasmina Petreska Stanoeva, Gjoshe Stefkov, Marina Stefova, Svetlana Kulevanova
The content of phenolic compounds in flowering stems and rosette leaves of *Sideritis Raeseri* Boiss. & Heldr., wildly growing in R. Macedonia

AC 021 Krste Tašev, Violeta Ivanova-Petropulos, Marina Stefova
Comparative determination of biogenic amines by HPLC-DAD and UPLC-TQ/MS techniques: advantages and disadvantages

AC 022 Slavica Mitrevska, Elena Kazandzievska, Liljana Krsteska, Irena Brasnarska, Biljana Sapkareva, Sonja Ugarkovic
Method development of water determination in semisolid pharmaceutical formulations using Karl-Fisher titration

AC 023 Natasha Karalija, Zoran Zivic, Biljana Sapkareva, Irena Brasnarska, Liljana Krsteska, Sonja Ugarkovic
pH dependent equilibrium of paracetamol impurity K and unknown entity, during HPLC method development for related substances

AC 024 Marius Ghiurea, Ştefan-Ovidiu Dima, Irina Fierăscu, Sanda Maria Doncea, Florin Oancea
Structural changes in Poaceae plants due to the action of solvents by different extraction methods

AC 025 Mălina Deşliu-Avram, Marius Ghiurea, Stefan-Ovidiu Dima, Radu-Claudiu Fierăscu, Fănica Bacalum, Adrian Radu, Florin Oancea
Analytical investigation of bioactive compounds present in extracts from grass biomass

AC 026 Goran Stojković, Kristina Mladenovska, Lulzime Ballazhi, Ahmed Jashari, Elizabeta Dimitrieska-Stojković, Emil Popovski
UV-VIS spectrophotometric and pH-metric determination of dissociation constants of thiazole derivates of 4-hydroxycoumarin

AC 027 Ştefan-Ovidiu Dima, Radu-Claudiu Fierăscu, Irina Genţiana Băjenaru (Ciobanu), Adrian Radu, Florin Oancea
Analytical characterization of maize biomass before and after mild solvent extraction

AC 028 Ştefan-Ovidiu Dima, Irina Fierăscu, Sanda-Maria Doncea, Ana-Maria Popescu (Gălan), Florin Oancea
Analytical evaluation of wheat residues in order to determine the capitalization potential

AC 029 Ana Petkovska, Katerina Runcevska, Marina Chachorovska, Blagica Manchevska, Packa Antovska, Gjorgi Petruševski, Sonja Ugarkovic
Development and optimization of HPLC/DAD/MS method for Indapamide 1.5mg prolonged release tablets

AC 030 M. Karadjov, T. Stafilov, O. Veleva, N. Velitchkova
Degree of pollution assessed by analysis of vegetables and soils from the region of Pb-Zn metallurgical plant – Plovdiv, Bulgaria

AC 031 G. Gentscheva, I. Uzunov, M. Karadjov, T. Stafilov, I. Karadjova
Inorganic components, IR, XRD and TG/DTA characterisation of *Triticum monococcum L.* and modern cultivated cereals

AC 032 Vesna Vukašinović-Pešić, Nada Blagojević, Snežana Vukanović
Total phenols and antioxidant activity of honey from Montenegro

AC 033 Snežana Vukanović, Jelena Mutić, Vanja Tadić, Nada Blagojević, Vesna Vukašinović-Pešić, Sladana Đurdić, Vesna Vukojević
Content of major and trace elements in Vaccinium myrtillus and their extracts

AC 034 Nada Blagojević, Vesna Vukašinović-Pešić, Snežana Vukanović, Vladimir Pešić
Determination of heavy metals and trace element levels in honey from Montenegro

AC 035 A. Dimkovski, A. Petrovska, M. Velickovska, V. Popovska Jakimovska, I. Brasnarska, B. Sapkareva, S. Ugarkovic
Peak purity assessment during forced degradation study on novel solid dosage form

BIOCHEMISTRY

BC 001 Violeta Jakovljević, Jasmina Nikolić, Miroslav Vrvić
High biodegradation rate of anionic surfactants of synthetic detergent by *Trichoderma harzianum*

BC 002 Jasmina M. Jovanović-Mirković, Ružica S. Nikolić, Danijela J. Dejković
The protective role of α-lipoic acid trough the activity of endonucleases in chronic intoxication with copper

BC 003 Jelena Katanić, Tatjana Boroja, Vladimir Mihailović, Stefanie Nikles, San-Po Pan, Gvozden Rosić, Dragica Selaković, Jovana Joksimović, Rudolf Bauer
Anti-inflammatory potential of meadowsweet (*Filipendula ulmaria*): *in vitro* and *in vivo* analysis

BC 004 Jelena Katanić, Tatjana Boroja, San-Po Pan, Stefanie Nikles, Rudolf Bauer, Vladimir Mihailović, Milan Mladenović, Nevena Stanković, Nezrina Mihović
Lunaria annua L. (anual honesty) as new antioxidant and anti-inflammatory agent

BC 005 Tatjana Boroja, Jelena Katanić, Vladimir Mihailović, Stefanie Nikles, San-Po Pan, Rudolf Bauer, Milan S. Stanković
In vintro anti-inflammatory activity assessement of lady's mantle

BC 006 Tatjana Boroja, Vladimir Mihailović, Jelena Katanić, Gvozden Rosić, Dragica Selaković, Jovana Joksimović, Milan Mladenović, Nevena Stanković, Nezrina Mihović
Hepatoprotective efficacy of summer savory against cisplatin-induced oxidative damage in rats

BC 007 Jasmina Nikolić, Violeta Jakovljević, Miroslav Vrvić
In vitro antioxidant activity of ethanolic extracts of *Penicillium* species

PLENARY LECTURES (PL)

BF 011

EVALUATION OF BIOACTIVE PHENOLIC COMPOUNDS AND ANTIOXIDANT ACTIVITY OF CABERNET SAUVIGNON WINES DURING WINEMAKING

Violeta Ivanova-Petropulos[1], Sanja Durakova[1], Arianna Ricci[2], Giuseppina P. Parpinello[2], Andrea Versari[2]

e-mail: violeta.ivanova@ugd.edu.mk

1-Faculty of Agriculture, University "Goce Delčev", Krste Misirkov, bb, 2000 Štip, Republic of Macedonia

2-Department of Agricultural and Food Sciences, University of Bologna, Piazza Goidanich 60, Cesena (FC) 47521, Italy

Bioactive phenolic compounds of red wines from Cabernet Sauvignon, *V. vinifera* red variety, were determined using high-performance liquid chromatography coupled to diode array detector (HPLC-DAD) [1]. Spectrophotometric analyses were performed at the following wavelength: 280 nm (total phenols), 420 nm (browning degree), 520 nm and 620 nm (anthocyanins) nm with a UV-VIS spectrophotometer. Antioxidant activity of wines was determined as a radical scavenging ability following the procedure described by Brand-Williams et al. (1995) [2]. Wines were produced by different maceration time (3, 6 and 9 days) in order to study its influence on the phenolics extraction during winemaking. A total of 19 bioactive phenolic compounds were identified and quantified in wines. Malvidin-3-glucoside was the main anthocyanin in wines, ranging from 251 to 466 mg/L, while caftaric acid was the predominant cinnamic acid derivative, ranged from 94.1 to 166 mg/L. Anthocyanins were observed to be present in the highest content after 6 days of maceration (858 mg/L), while phenolic acids and (+)-catechin content was highest 9 days after the skin maceration (523 and 375 mg/L, respectively). Cabernet Sauvignon wines showed relatively high antioxidant activity (on average: 115 mg/L, Trolox equivalents).

Key words: phenolic compounds; HPLC; skin contact; Cabernet Sauvignon, antioxidant acitivity

References:

[1]Ivanova-Petropulos V., Durakova S., Ricci A., Parpinnelo G.P., Versari A. Extraction of natural occurring bioactive compounds and change in antioxidant capacity of Macedonian red wines during vinification. *Journal of Food Science and Technology*, in press, doi: 10.1007/s13197-016-2235-7.

[2]Brand-Williams W., Cuvelier M.E., Berset C. (1995). Use of free radical method to evaluate antioxidant activity. *LWT-Food Science and Technology*, 28, 25–30. doi:10.1016/S0023-6438(95)80008-5.

Acknoledgement: This work was financially supported by JoinEU-SEE IV, Erasmus Mundus Action 2 Partherships, which is gratefully acknowledged, covering the study stay of Violeta Ivanova-Petropulos at the University of Bologna, whereas the HPLC analyses of wines were performed.