



Society of Chemists and Technologists of Macedonia

Сојуз на хемичарите и технолозите на Македонија

**26th Congress of
SCTM
with international participation**

BOOK of ABSTRACTS

**20–23 September 2023
Metropol Lake Resort
Ohrid, R. Macedonia**



Сојуз на хемичарите и технолозите на Македонија

Society of Chemists and Technologists of Macedonia

20–23 September 2023, Metropol Lake Resort, Ohrid

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Dear Esteemed Colleagues and Participants,

It is with great pleasure that we present the Book of Abstracts for the 26th Congress of the Society Chemists and Technologists of Macedonia, which was originally scheduled for 2020 but, due to the global pandemic caused by Covid-19, has been rescheduled to this momentous occasion. As we gather here in the breathtaking backdrop of the historic city of Ohrid, Macedonia, we reflect not only on the innovative strides made in the field of chemistry and chemical engineering, but also on the unwavering spirit of resilience that has brought us together despite the challenges that have beset us. The world has experienced an unprecedented disruption, testing the limits of our adaptability and resolve. Yet, as chemists and chemical engineers, we have shown that the pursuit of knowledge and advancement knows no bounds. Our ability to transcend obstacles, adapt methodologies, and harness innovation in the face of adversity is a testament to the invincible human spirit.

Within the pages of this Book of Abstracts with 15 invited lecturers and almost 200 presentations from 174 authors and 570 coauthors from the region and much wider making it a really international meeting, you will find a diverse array of topics that reflect the vigor and dedication of the scientific community. From breakthroughs in green chemistry to pioneering developments in materials science, from the forefront of pharmaceutical research to cutting-edge advancements in nanotechnology, each abstract showcases the remarkable flexibility and ingenuity of our colleagues.

We extend our deepest gratitude to Prof. Jadranka Blaževska Gilev and Prof. Biljana Angjuševa, the organizers of this meeting who have dedicated all their efforts and time to make this meeting possible. Our gratitude goes to all members of the scientific and organizational committees who have been in the background making sure things flow seamlessly. Also, our appreciation goes to the reviewers and all participants who have come together to give the substance to this Congress. Your commitment to the scientific endeavor underscores the importance of collaborative efforts in times of uncertainty. It is through the exchange of ideas, the sharing of knowledge, and the fostering of connections that we fortify ourselves and drive the progress of our disciplines. Furthermore, our deepest gratitude goes to the sponsors given in the back cover of this book and most of all to the Organization for the Prohibition of Chemical Weapons who have always given their support to our meetings.

As we come together in Ohrid, we do so with renewed appreciation for the importance of shared experiences and face-to-face interactions. We eagerly anticipate the discussions, debates, and collaborations that will shape the future of our disciplines. Let us seize this opportunity to learn, inspire, and foster connections that will resonate long after the congress concludes.

We hope that this Book of Abstracts serves as a source of inspiration and a record of the remarkable work presented at the 26th Congress of SCTM. Let us seize this opportunity to celebrate not only our achievements, but also our resilience, determination, and enduring commitment to the pursuit of knowledge. Let us navigate the challenges together, and through our collective efforts, continue to inspire innovation that transforms the world in a positive way.

With warm regards,

Prof. Zoran Zdravkovski, president

Society of Chemists and Technologists of Macedonia

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pollution in aquatic ecosystems. Due to the diverse environmental conditions and sources of HMs, different pollution indices are used to assess the anthropogenic impact of PTEs in sediment samples^{2,3}. In this study, ecological risk assessment of the urban shallow lake sediments in Central Serbia by HMs was analyzed by calculating single and multi-pollution indices and using multivariate techniques to reveal the associated adverse effects of the investigated contaminants.

Keywords: risk indices; anthropogenic pollution; sediment quality; multivariate analysis; positive matrix factorization.

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AEC P-14

Polycyclic Aromatic Hydrocarbons in Dry Herbs: Source Identification, Quantification, and Health Risk Assessment

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Polycyclic aromatic hydrocarbons (PAHs) are amongst the most toxic compounds known to man. Several PAHs are proven to be carcinogenic, mutagenic, and teratogenic. Due to their wide distribution in the environment and their toxicity, it is considered important to monitor the levels of these compounds in foodstuffs.

PAHs have been detected in many food products including plant-based such as vegetable oils, cereal grains, herbs, spices, teas, and supplements^{1,2}. As the awareness of the healthy lifestyle has increased globally, the intake of medicinal herbs such as teas and spices has also grown immensely. Therefore, an even bigger emphasis must be made to monitor the toxic levels of PAHs in herbs. The maximum concentrations of certain contaminants in food in the Republic of Serbia included PAHs values in dry herbs only by the end of 2019 ("Official Gazette / RS", No. 81/2019)³. Herein, were investigated the sources of PAHs contamination in dry herbs collected from the different parts of Serbia, its quantification and the potential health risk posed by their toxicity.

Keywords: analytical chemistry, PAH, processing, pollution

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AEC P-15

Kinetic and equilibrium studies about sorption removal of textile dye from water

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Dyes are comprehensively used in food, textile, plastic, metal, pharmaceutical and many other industries. Currently, more than 700 000 tons of dyes are required each year, of which at least 10–15% are discarded into the wastewater and responsible for water pollution. These dyes alter the color of water, and inhibit light penetration, reducing the rate of photosynthesis and the oxygen level, causing damage to aquatic ecosystem. Often, these dyes are carcinogenic and initiate various diseases in humans.¹ Therefore, it is essential to remove dyes from wastewater.