BOOK of ABSTRACTS

26th Congress of Chemists and Technologists of Macedonia

20-23 9 2023 OHRID, RN MACEDONIA

CXTM

Сојуз на хемичарите и технолозите на Македонија

Society of Chemists and Technologists of Macedonia

26th Congress of SCTM

with International Participation

BOOK of ABSTRACTS

20–23 September 2023
Metropol Lake Resort
Ohrid, N. 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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РЕПУБЛИКА СЕВЕРНА МАКЕДОНИЈА
МИНИСТЕРСТВО ЗА ОБРАЗОВАНИЕ И НАУКА

Ss. Cyril and Methodius University in Skopje

The 26th Congress of SCTM is a EuChemS European Chemical Society **recognized event.**

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, especially to Assoc. Prof. Vojo Jovanov, Iva Dimitrievska and Marija Prosheva for managing the web page, Book of Abstracts etc. 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 at the end of the 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 26thCongress 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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PSSE P-14
Copper Electrodeposition onto Palladium from a Deep Eutectic System Based on Choline Chloride

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Recently, there has been an increasing interest in developing non-aqueous electrolytes which have been widely employed as an alternative media for a range of metals and metal alloys electrodepositions. A promising and new class of electrolytes among ionic liquids (Ils) are deep eutectic solvents (DESs)[1]. The purpose of the copper deposition study from DESs is the application of copper coating and copper alloys in both, industry and fundamental research. In this work, the electrochemical deposition of copper onto palladium working substrate from ChCl/EG (1:2 ratio) DES electrolyte at 50°C was investigated. Additionally, the Cu(II) electroreduction process was studied by potentiodynamic measurements, cyclic voltammetry, chronoamperometry, in the electrolytes with different concentrations of Cu(II) ions ranging from 0.1 M to 0.5 M.

The cyclic voltammetry results indicated that the bulk deposition of Cu(II) begins to occur at around –0.080 V vs. Cu. It was found that copper deposition onto the Pd cathode from ChCl:EG electrolyte under potentiostatic conditions is achievable.

Data collected from X-ray diffraction (XRD) analysis proved that the cathodic deposits are composed of Cu and CuPd intermetallic. CuPd alloys with different Pd-Cu ratios were prepared by constant potential of –0.100 V vs. Cu from ChCl/EG containing 0.1 M and 0.5 M Cu(II). It is worth noting that the X-ray data indicated that the composition of the produced Pd-Cu films could be varied by changing the concentration of Cu(II) ions in the electrolyte or changing the deposition mode.

Keywords: deep eutectic solvents(DESs), Cu-Pd alloys, electrodeposition

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