

BOOK of ABSTRACTS

26th Congress of Chemists and Technologists of Macedonia

26th Конгрес на
Хемичари и
Технолози
на Македонија

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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



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 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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ICTM P-1

Microstructural Analysis of Thermally Treated Geopolymer Incorporated with Neodymium

S. Knežević^{a*}, M. Ivanović^a, D. Kisić^b, S. Nenadović^a, J. Potočnik^b and M. Nenadović^b

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The following investigation presents the thermal treatment of geopolymer based on metakaolin, with the addition of 1% and 5% of neodymium in the form Nd_2O_3 , at 300°C, 600°C and 900°C. Six samples were synthesized in total. Samples GT1 and GT2 containing 1% and 5% of Nd_2O_3 , and they were treated at 300°C, while the samples GT3 and GT4 also had the same percentage composition of Nd_2O_3 and were treated at 600°C, and the samples GT5 and GT6 were treated at 900°C with the same percentage of Nd_2O_3 . Physical and chemical changes in the aluminosilicate geopolymer matrix were monitored. The incorporation of rare earths into the polymer network of aluminosilicates has been proven to disrupt the basic structure of geopolymers, however, with increased temperature, these materials show even more unusual properties. DRIFT was employed to investigate the structural properties of thermally treated geopolymers. Additionally, TEM provided further insight into the structural changes induced by thermal treatment and Nd_2O_3 doping. SEM was used to observe the effect of thermal treatment temperature (300°C and 600°C) on geopolymer porosity, which resulted in the appearance of large pores and cracks in the material. The UV/Vis spectra of the synthesized Nd_3^+ doped geopolymers exhibited attractive optical properties. The photoexcitation of electrons from the valence band to the conduction band in the geopolymer structure is responsible for the absorbance observed at 260 nm, while the minor peaks at slightly longer wavelengths can be linked to Nd^{3+} .

Keywords: Geopolymers, Rare earth, Neodymium, Metakaolin, DRIFT, UV/Vis