BOOK of ABSTRACTS

25th Congress of Chemists and Technologists of Macedonia

19-22 9 2018

OHRID, R MACEDONIA

CXTM

Сојуз на хемичарите и технолозите на Македонија

Society of Chemists and Technologists of Macedonia

25th Congress of SCTM
with international participation

BOOK of ABSTRACTS

19–22 September 2018
Metropol Lake Resort
Ohrid, R. Macedonia

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

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The 25th Congress of SCTM is a EuChemS European Chemical Society **recognized event.**

Dear Colleagues,

Welcome to the 25th Congress of the Society of Chemists and Technologists of Macedonia. Although this is our silver jubilee, our society is celebrating more than 50 years of scientific meetings. The first conference, one of the first activities of our society, was organized in the 1960-ties and was a meeting between the faculties of the Institute of Chemistry at Faculty of Sciences and Mathematics and the Faculty of Technologists, both at the Ss. Cyril and Methodius University in Skopje. They gradually grew into biennial meetings and attracted participants outside of Macedonia. Beginning from the 18th Congress in 2004 all our meetings are held in the exceptional setting of Lake Ohrid. In 1994 our society started to organize students' scientific meetings and now the two alternate, so there is a congress organized by our society every year.

Since 2012 we have been using the Open Journal System to manage the editorial process of the *Macedonian Journal of Chemistry and Chemical Engineering* published by our society. In order to streamline the technical management of this congress and future such meetings, we have undertaken for the first time to implement the Open Conference System. You are all now familiar with the whole process of registering, submitting the abstracts etc. – at times you/we did encounter problems but overall we are satisfied with this platform and plan to use it in the future. For all of you who have smart phones, you will find the abstracts and schedule online which can be searched by various criteria. Furthermore, in line with the digital age we live in, for the first time we will not have a printed Book of Abstracts but only an electronic one. A draft version with all submitted abstracts along with the conference program was uploaded to the platform three weeks ago. The final version will be available after the conference and only the presented contributions will be included. Another first at this conference will be a Skype presentation on Saturday. We hope in the future to further improve the technical capabilities by streaming at least some of the lectures online.

Next year the world will be celebrating 150 years of Mendeleev's Periodic table of the chemical elements. Our society was involved from the very beginning two years ago – we immediately contacted our representative to UNESCO to give our full support for this important event marking one of the few discoveries in science that has withstood such a long test of time. It is nice to see the world united in a scientific achievement despite the extreme polarization in other areas. I believe you share my opinion that we are so fortunate to have chosen to pursue chemistry, the ever evolving science. Whenever I hear divisive undignified debates that take place so often now, the words of Sir Humphrey Davy in his discourse delivered at the Royal Society, in November 1825 echo in my ears: *Fortunately science, like that nature to which it belongs, is neither limited by time nor by space. It belongs to the world, and is of no country and of no age. The more we know, the more we feel our ignorance; the more we feel how much remains unknown; and in philosophy, the sentiment of the Macedonian hero can never apply, – there are always new worlds to conquer.*

From the more than 250 contributions given in this book we have a truly diverse body of researchers in many fields of chemistry. But more important than the number is the quality of the scientists presenting their new results: we have two exceptional keynote speakers, 10 invited speakers, 49 oral presentations and 195 poster presentations. Due to the traditional environment of tolerance in Macedonia, it is a truly unique regional conference bringing together the scientists from a very wide area.

I would like to thank sincerely the presidents of the Organizing and Scientific Committees, Prof. Viktor Stefov and Prof. Trajče Stafilov. Also, I must mention Assistant Prof. Jasmina Petreska-Stanoeva and Prof. Marina Stefova. I think this is the best team we could put together to make a really flawless organization. Furthermore, I would like to thank the Ministry of Education and Science of Macedonia, the Ss. Cyril and Methodius University in Skopje and the Goce Delčev University in Štip for their financial support, as well as the commercial sponsors that are given at the end of this book for their financial support and/or support in their products.

I do hope you will enjoy the scientific program of this congress, the interactions with colleagues from other institutions and countries and will build new relationships and collaborations. Most of all I would like to ask you to spend some time with the young researchers and students present here – for one of our main goals is also to build on the nexus between education and research and inspire and energize the young in the intricacies of the science of chemistry. I know I do not need to tell you to enjoy this magnificent lake, for us the most beautiful lake in the world, the inspirational crammed with extraordinary churches city of Ohrid and its unique heritage to world civilization.

Prof. Zoran Zdravkovski, president
Society of Chemists and Technologists of Macedonia

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ELECTROPHYSICAL PROPERTIES OF NONWOVEN VISCOSE/POLYPROPYLENE FABRICS

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Textile materials like woven, knitted and nonwoven fabrics are good insulators with very high electrical resistance. It is known that dielectric properties (effective dielectric permeability, electrical conductivity, and dielectric loss tangent) and electrical resistivity (volume resistivity and surface resistivity) of fabric are depending on several factors such as fiber type, fabric structure, moisture content of the material, air humidity, temperature, etc. The purpose of this investigation is to study the influence of the different content of viscose and polypropylene as well as the type of web bonding on the dielectric loss tangent and volume electrical resistivity. Also, the dielectric loss tangent was analyzed over a range of frequencies from 30 Hz to 140 kHz. Three investigated nonwoven fabrics were mechanically and thermally bonded, and one of the samples was additionally chemically bonded. The investigations were realized at 40 % relative air humidity.

Conducted analyses show that at frequencies below 100 Hz all investigated samples have higher, while at higher frequencies, the investigated samples show lower values of loss tangent. Namely, gradually decrease of the loss tangent value with the increase in the frequency from 30 Hz to 140 kHz was registered. The highest loss tangent value shows the sample with the highest viscose fiber content and thus the highest number of polar hydroxyl groups. The smallest loss tangent value was registered for a sample which was additionally chemically bonded.

Results obtained for the volume electrical resistivity was in accordance with the loss tangent values. The lowest resistivity value was recorded for sample with the highest viscose fiber content both in the machine direction as well as in the cross direction (5.27 GΩ·cm and 5.03 GΩ·cm, respectively), while the highest resistivity value was registered for additionally chemically bonded sample also in both investigated direction (11.84 GΩ·cm and 12.51 GΩ·cm, respectively). Some little differences in volume electrical resistivity in the machine and in cross direction are probably due to the fiber orientation in the samples and the number of contacts established between the fibers, because better contact between fibers causes an easier flow of charge.

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Keywords: viscose/polypropylene, dielectric loss tangent, volume electrical resistivity, nonwoven fabrics.

n.b.: Manuscripts submitted to this Congress were not subjected to language or other corrections, except in some extreme cases. Authors are fully responsible for the content of their Abstracts.

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