



University of Zagreb Faculty of Textile Technology & AMCA TTF

invite you to a

SCIENTIFIC LECTURE

entitled

Tuning the jute fabric properties and extending its lifecycle using different oxidation agents

of

Aleksandra Ivanovska, PhD

on Thursday, April 10th, 2025 at 10:00 AM

in lecture hall **B-323**, Prilaz baruna Filipovića 28a, Zagreb

Abstract:

At the outset of this lecture, the Innovation Center of the Faculty of Technology and Metallurgy in Belgrade (ICTMF) will be introduced with its scientific achievements, publications, patents, and ongoing research projects. This overview will highlight the institution's commitment to cutting-edge research and technological advancements. Afterwards, the developing oxidation protocols to tune the properties of jute, the world's most widely used lignocellulosic fiber, will be given. By leveraging oxidation with sodium chlorite or sodium periodate, as well as functionalizing oxidized fabrics with polysaccharide-based coatings like sodium alginate, new possibilities for jute fabrics are unlocked. A comprehensive analysis of oxidized jute fabric properties and its application will be presented. Sodium chlorite oxidized jute emerges as a key material for textile capacitive sensors, energy storage devices, protective clothing for electro-sensitive environments, flexible electronics, electromagnetic shielding fabrics, and even as efficient filters for water purification and heavy metal and organic dye adsorption. Sodium periodate-oxidized fabrics show promise in carpet backing, packaging, outdoor gear, agricultural covers, and organic dye adsorption. Additionally jute fabric oxidation with sodium periodate and further coating with alginate paves the way for groundbreaking applications, such as supporting cyanobacterial growth for land rehabilitation and terrain restoration, offering a novel approach to biocarpet engineering. Notably, waste from sodium periodate-oxidized and alginate-coated oxidized jute fabrics exhibits strong adsorption capacity for the antibiotic ciprofloxacin, further extending their environmental benefits. The lecture will conclude with a focus on sustainability, emphasizing a "zero waste" approach. By converting oxidized jute waste into activated carbon, we open avenues for high-value applications such as charge storage devices, particularly supercapacitors. This transformation not only meets the growing demand for sustainable energy solutions but also reinforces the vision of maximizing jute's utility while minimizing environmental impact. Join us to discover how oxidation-driven modifications can revolutionize jute fabrics and propel them into a new era of multifunctional, eco-friendly applications.

Biography:



Aleksandra Ivanovska was born in 1988 in Ohrid, Republic of North Macedonia. She is employed as a Senior Research Associate at the Innovation Center of the Faculty of Technology and Metallurgy in Belgrade, Republic of Serbia. Aleksandra Ivanovska has been involved in three national projects and two international projects. She is the Principal Investigator of one national project and one international project. According to the indicators of the Ministry of Science, Technological Development, and Innovation of the Republic of Serbia, and based on the quantitative parameters of scientific excellence, Aleksandra Ivanovska belongs to the top 10% of researchers in the Republic of Serbia, while in the field of technical-technological and biotechnical sciences, she was ranked as the best Research Associate in the Republic of Serbia. In April 2024, she was awarded the prize for the best scientific work among young scientists at the University of Belgrade. She is the author and co-author of 41 SCI papers, 3 book chapters, 1 accepted patent, and more than 45 conference papers. She has 440 citations and an h-index of 12. Research interests: functionalization and characterization of cellulose and lignocellulosic fibers, utilization of natural dyes for simultaneous fabric functionalization and dyeing, revalorization of agro-industrial waste.