

INSTITUTE OF TECHNICAL SCIENCES OF SASA
MATERIALS RESEARCH SOCIETY OF SERBIA

Programme and the Book of Abstracts

**TWENTY-FIRST YOUNG RESEARCHERS' CONFERENCE
MATERIALS SCIENCE AND ENGINEERING**

Belgrade, November 29 – December 1, 2023



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**Materials Research Society of Serbia
&
Institute of Technical Sciences of SASA**

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Program and the Book of Abstracts

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Aim of the Conference

Main aim of the conference is to enable young researchers (post-graduate, master or doctoral student, or a PhD holder younger than 35) working in the field of materials science and engineering, to meet their colleagues and exchange experiences about their research.

Topics

Biomaterials
Environmental science
Materials for high-technology applications
Materials for new generation solar cells
Nanostructured materials
New synthesis and processing methods
Theoretical modelling of materials

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Results of the Conference

Beside printed «Program and the Book of Abstracts», which is disseminated to all conference participants, selected and awarded peer-reviewed papers will be published in journal “Tehnika – Novi Materijali”. The best presented papers, suggested by Session Chairpersons and selected by Awards Committee, will be proclaimed at the Closing Ceremony. Part of the award is free-of-charge conference fee at YUCOMAT 2024.

Sponsors



ANALYSIS
LABORATORY EQUIPMENT

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Utilization of carbon fiber in the context of microbial fuel cell systems

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The paramount challenge of the 21st century lies in the profound energy demands imposed by contemporary society. The utilization of energy derived from non-renewable sources, notably coal, oil, and their byproducts, is intrinsically associated with grave environmental repercussions, primarily manifested in the form of pollution. The notion of fuel cells stands as a prospective resolution to this problem, offering a sustainable avenue for energy production devoid of environmentally adverse emissions. The aim of this research was to explore the potential of carbon cloth electrodes in the Microbial Fuel Cell (MFC) system. To create a microbial fuel cell, river sediment was utilized as the medium, sandwiched between two carbon cloth electrodes (R&G, Great Britain) with an electrode surface area of 82.5 cm². The system is designed to measure the open circuit voltage of the MFC, as well as the voltage across a series of external resistors that are progressively connected to the MFC. To achieve this, resistors that cover the 1 kΩ - 10 MΩ range are mounted on a breadboard (Velleman SD35N), while voltages are measured using a multimeter (PeakTech 2025). Using Ohm's law, the generated current is later calculated. The experimental investigation extended over ten days, during which voltage measurements were conducted daily. Analysis of the experimental findings revealed that the MFC employing a carbon cloth electrode exhibited noteworthy power generation capabilities. Notably, on the eighth day of the experiment, a peak current density of 0.27 mA/cm² was attained, surpassing previous outcomes achieved with MFC configurations utilizing inox electrodes³. These empirical observations lead to the inference that carbon cloth represents a superior material for electrode construction, particularly in performance in the context of power generation.