

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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## **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.

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**ANALYSIS**  
LABORATORY EQUIPMENT

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### **Microbial degradation of terephthalic acid as a PET-derived compound**

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Polyethylene terephthalate (PET) is a plastic material that poses a significant global concern due to its durability and resistance to degradation. One effective method for minimizing PET waste is through microbial degradation, resulting in the production of ethylene glycol and terephthalic acid (TA). Terephthalic acid, as a PET monomer, holds promise as a model compound for further exploration into PET plastic degradation and valorisation. In this study, degradation of TA is monitored by Micro-Oxymax Respirometer (Columbus Instruments, USA). It's used in a 'Closed Loop Measurement Method' mode and during the 12 days experiment it measured changes in oxygen and carbon dioxide concentration. The gas flow was 500 mL/min and concentration of gases were measured every 10 h. Microorganisms (single and in consortium) were inoculated in MSM medium that contains 0.025% (w/v) TA as carbon source. The microorganisms used were previously isolated from contaminated environment. Results showed higher oxygen consumption and carbon dioxide production by *Rhodococcus sp.* and consortia which contained *Enterobacter sp.*, *Bacillus sp.* and *Pseudomonas sp.* The present study indicate that studied microorganisms with higher metabolic activity in the presence of TA are promising candidates for further valorization of PET-derived monomers.