

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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Bentonite modified with cationic surfactant as promising adsorbent for carbamazepine

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Numerous chemical compounds present in natural waters and wastewater are resistant to conventional water treatments and persist in treated effluents. Among these substances, pharmaceuticals, due to their widespread use, raise special concern due to their potentially harmful effects on human health especially when they reach drinking water. One of the most efficient technique for removal of pharmaceuticals from polluted water is their adsorption on various adsorbents, such as activated carbons, clays (kaolin, bentonite, etc.) and zeolites. In this study, the potential of modified bentonite for removal of carbamazepine, a pharmaceutical with anticonvulsant and mood-stabilizing properties, was investigated. The natural bentonite from Šipovo deposit, Bosnia and Herzegovina, was modified with the cationic surfactant Arquad®2HT-75 in amounts equivalent to 50% and 100% of the bentonite's cationic exchange capacity. Characterization of prepared samples by Fourier-transform infrared spectroscopy and Simultaneous Thermal Analysis, confirmed presence of surfactant in modified bentonites. Results on carbamazepine removal by modified bentonites showed that its adsorption increased with increasing of the amount of surfactant as well as with increasing of the initial pharmaceutical concentration. The highest adsorption of carbamazepine was achieved with bentonite containing the highest amount of surfactant. Since the natural bentonite has no affinity to remove carbamazepine, these findings suggest that modified bentonite is a promising adsorbent for its removal from contaminated water.