

MATERIALS RESEARCH SOCIETY OF SERBIA
INSTITUTE OF TECHNICAL SCIENCES OF SASA



Programme and the Book of Abstracts

**EIGHTEENTH YOUNG RESEARCHERS' CONFERENCE
MATERIALS SCIENCE AND ENGINEERING**

Belgrade, December 4–6, 2019

<http://www.mrs-serbia.org.rs/index.php/young-researchers-conference>

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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 2020.

Sponsors



ANALYSIS
LABORATORY EQUIPMENT

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12-1

Mechanochemically synthesized cobalt-ferrite and starch-coated cobalt-ferrite nanoparticles as efficient adsorbents for hexavalent chromium removal

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Cobalt-ferrite (CoFe₂O₄) and starch-coated CoFe₂O₄ nanoparticles were prepared by the mechanochemical method and carefully chosen as adsorbents for Cr(VI) removal from wastewater. The kinetic study, adsorption isotherms and influence of pH, contact time and interfering ions were investigated to have deeper insight into adsorbent quality. UV/Vis spectroscopy confirmed that the dominant adsorption mechanism is the electrostatic attraction at lower pH values. The study showed there was no significant change in adsorption efficiency for starch-coated nanoparticles. However, starch as a natural and biocompatible compound can enhance nanoparticles water dispersibility. The advantage of such materials is that saturation time does not exceed 20 minutes. Therefore, the as-prepared and starch-coated CoFe₂O₄ presents very efficient material for application in the field of water remediation.

12-2

Photocatalytic degradation of methylene blue and oxytetracycline via sol-gel synthesized pseudobrookite

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Fe₂TiO₅ nanoparticles were synthesized by modified sol-gel method using Fe(NO₃)₃·9H₂O and Ti(OC₃H₇)₄ as starting reagents, oxalic acid as chelate agent and cetyltrimethylammonium bromide as surfactant. The aim of this study was to assess the photocatalytic degradation of water pollutants, methylene blue and the antibiotic Oxytetracycline (OTC) using natural sunlight irradiation. As prepared nanoparticles were characterized by XRD, BET, FESEM and UV-vis DRS. The optimal operating conditions of photocatalytic degradation of water pollutants were achieved by changing the pH of the solution and changing the concentration of photocatalyst.