

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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Finding optimal conditions and investigating the structure & morphology of cobalt/magnesium ferrite based cubic spinels ($\text{Co}_x\text{Mg}_{1-x}\text{Fe}_2\text{O}_4$) as photocatalysts

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Cobalt/magnesium ferrites with various mole percentage ratio of the metals (obtained structures are $\text{Co}_x\text{Mg}_{1-x}\text{Fe}_2\text{O}_4$ with x being 0, 0.1, 0.3, 0.5, 0.7, 0.9, 1.0) were synthesized by sol-gel combustion synthesis using glycine as fuel, following the rules of propellant chemistry. The powders were then sintered at 700 °C for 3 hours. Obtained powders were characterized by X-Ray diffraction (XRD), scanning electron microscopy (SEM), Raman spectroscopy, UV/*vis* diffuse reflectance spectroscopy (DRS). Investigation of the magnetic properties was also conducted by vibrating sample magnetometry (VSM). The obtained powders were proved to be phase-pure cubic spinels which formed agglomerated micrograins. Series of photocatalytic experiments of methylene blue degradation were done. The influence of different experimental conditions was investigated including variations of: pH values, concentrations of the pollutant, masses of the photocatalyst, different light sources and therefore different light irradiation. Interesting results, including enhancement of the degradation rate with the introduction of cobalt into MgFe_2O_4 and decrease of the degradation rate with further increase of cobalt content and formation of hard agglomerates, open new possibilities for further investigation of the utilisation of Co/Mg ferrites as photocatalysts.