

MATERIALS RESEARCH SOCIETY OF SERBIA
INSTITUTE OF TECHNICAL SCIENCES OF SASA

Programme and the Book of Abstracts

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

Belgrade, December 1-3, 2021



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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 2022.

Sponsors



ANALYSIS
LABORATORY EQUIPMENT

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Dental inserts based on calcium hydroxyapatite: The influence of cation doping

Tamara Matic¹, Maja Ležaja Zebić², Vesna Miletić³,
Rada Petrović⁴, Đorđe Janačković⁴, Đorđe Veljović⁴

¹*University of Belgrade, Innovation Center of the Faculty of Technology and Metallurgy, Belgrade, Serbia,* ²*University of Belgrade, School of Dental Medicine, Belgrade, Serbia,* ³*The University of Sydney, Faculty of Medicine and Health, Sydney Dental School, Surry Hills NSW, Australia,* ⁴*University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia*

Large teeth restorations have a relatively short life span due to the polymerization shrinkage (PS) of the resin-based composites (RBCs) commonly used in restorative dentistry. In order to overcome this problem bioceramic inserts based on calcium hydroxyapatite (HAP), the main inorganic component of tooth structure, have been proposed as dentin substitutes. Biological apatite present in dentin has a variety of dopants in the structure such as Mg, Sr, Cu, which play an important role in the dentin formation and remineralization.

The application of cation doped HAP inserts could improve the biological response of the tissue, prolong its lifespan by reducing PS and simplify the clinical procedure. However, the presence of dopants leads to the lattice distortion, which influences solubility and mechanical properties of the hydroxyapatite based materials.

This study aimed to investigate the effects of single and bi- dopant calcium substitutions in hydroxyapatite structure on the phase composition and bonding ability of dental inserts with a commercially available restorative material. Hydroxyapatite nanopowders doped with Mg, Sr and Mg+Sr were obtained hydrothermally and pressed into compacts which were further sintered at 1200 °C. The restorative material used was Filtek Z_250 composite applied with Single Bond Universal adhesive (SBU_Z250). The bonding ability of inserts with SBU_250 was tested using the Shear Bond Strength (SBS) test. The dopants were shown to have a great impact on the phase composition of thermally treated hydroxyapatite, thus on the bonding ability with SBU_250.

