



# YOURS 2020

## ABSTRACT PROCEEDINGS

**YOUng ResearcherS Conference 2020**


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**Ministry of Education, Science and Technological Development**

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**UKAS - Association for Quality, Accreditation and Standardization**

**Faculty of Mechanical Engineering, University of Belgrade**



# YOURS 2020

## YOUng ResearcherS Conference 2020

YOURS 2020 supports young researchers and their results in its broadest sense by highlighting the presentation of new trends and research and promoting innovative practices that advance academic achievements.

This year's conference topics are dedicated to

***Methods, policies and technologies in technical sciences, materials, energy, energy efficiency, environment, industrial engineering, traffic and transportation, civil engineering, quality management and other related sciences***

**YOURS 2020** promotes the presentation of new trends, advances and research in all mentioned areas bringing together prosperous researchers with leading professionals, academicians, universities, industry experts from around the region.

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## BONDING ABILITY OF MAGNESIUM DOPED HYDROXYAPATITE BASED INSERT WITH CLEARFIL DENTAL ADHESIVE

Tamara Matic<sup>1</sup>, Maja Ležaja Zebić<sup>2</sup>, Vesna Miletic<sup>2</sup>, Rada Petrović<sup>3</sup>, Đorđe Janačković<sup>3</sup>, Đorđe Veljović<sup>3</sup>

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**Summary:** Decayed or damaged tooth structure is widely being repaired with the resin based dental composites (RBCs) in the clinical practice. However, relatively high failure rate and short lifespan are common in the case of the larger posterior teeth restorations, caused by the polymerization shrinkage of RBCs. In order to reduce the polymerization shrinkage inorganic dental inserts were introduced. The aim of this study was to fabricate dental inserts based on hydroxyapatite doped with 5 mol. % of magnesium ions (MgHAP) and determine their bonding ability with a restorative material widely used in the clinical practice – Clearfil Universal adhesive. The MgHAP powder and insert were characterized using energy dispersive X-ray (EDX) analysis, X-ray diffraction (XRD) analysis and scanning electron microscopy (FE-SEM). Bonding ability of the inserts with restorative material was measured by shear bond strength (SBS) test, and the type of fracture was determined by the optical microscope. The obtained mean SBS value of the MgHAP inserts was 12.7 MPa, with mostly cohesive type of the fracture present. These inserts present promising dentin substitutes for application in the restorative dentistry.

**Keywords:** hydroxyapatite, magnesium, dental insert, shear bond strength, restorative dentistry

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