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I INTERNATIONAL CONFERENCE ON ADVANCES  
IN SCIENCE AND TECHNOLOGY

# BOOK OF ABSTRACTS

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FACULTY OF MANAGEMENT HERCEG NOVI

HERCEG NOVI, MONTENEGRO

26-29 MAY 2022



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FAKULTET ZA MENADŽMENT HERCEG NOVI

I INTERNATIONAL CONFERENCE ON  
ADVANCES IN SCIENCE AND TECHNOLOGY

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HERCEG NOVI, 26-29 MAY 2022

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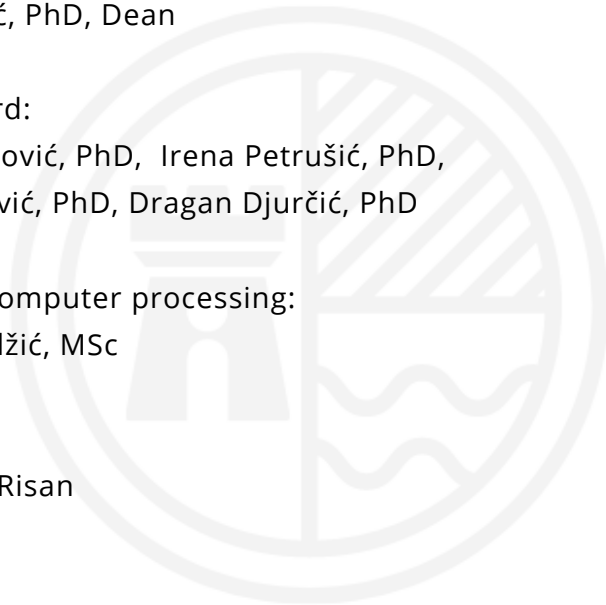
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## **CORRELATION BETWEEN METHODS OF ACTIVATION OF MONTMORILLONITE K10 AND FORMALDEHYDE CONTENT IN UREA-FORMALDEHYDE COMPOSITES**

Mirjana Ristić<sup>1</sup>, Suzana Samaržija-Jovanović<sup>1</sup>, Vojislav Jovanović<sup>1</sup>, Branka Petković<sup>1</sup>,  
Marija Kostić<sup>2</sup>, Tijana Jovanović<sup>3</sup>, Milena Marinović-Cincović<sup>4</sup>

<sup>1</sup>Faculty of Science, University of Priština-Kosovska Mitrovica, Kosovska Mitrovica, Serbia

<sup>2</sup>Faculty of Technology Novi Sad, University of Novi Sad, Serbia

<sup>3</sup>Faculty of Science and Mathematics, University of Niš, Serbia

<sup>4</sup>Vinča Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, University of Belgrade, Serbia

Corresponding author e-mail address: [suzana.samarzija@pr.ac.rs](mailto:suzana.samarzija@pr.ac.rs) (S.Samaržija-Jovanović)

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### **ABSTRACT:**

*In this paper, the methods of activation of montmorillonite (MMT) K10 with the content of formaldehyde (FA) in urea-formaldehyde (UF) composites are compared. MMT K10 samples were activated in two ways: thermally(physical activation) and with sulfuric acid (chemical activation). In situ synthesis of UF composites with unmodified and activated K10 under the same conditions was performed. A total of three UF composites were synthesized: reference UF composite containing unmodified MMT UF/K10, UF composite containing thermally activated MMT (UF/□K10), and UF composite containing activated MMT with sulfuric acid (UF/ SKK10). Characterization of inactivated and differently activated MMTs as well as synthesized UF/MMT composites was performed using scanning electron microscopy (SEM), X-ray analysis (XRD), thermogravimetric analysis-TG, and infrared spectroscopy (FTIR), and the degree of success of MMT activation was monitored by determining the specific surface area (SP) of MMT using the Sears method. Based on the obtained values for SP, it can be concluded that successful activation of K10 was performed in both ways, because the value increased in both samples compared to unmodified K10 from 74.2 m<sup>2</sup>/g to 317.4 m<sup>2</sup>/g for □TK10 and 183 m<sup>2</sup>/g for SKK10. The content of free FA was determined by the bisulfite method. The obtained results show that there is a correlation between the way of activating MMT K10 and the FA content in the tested UF/MMT composites. The lowest FA content was determined for UF/SKK10 composites and is 0.06% compared to the UF/K10 sample containing 0.5% FA and UF/□TK10 has 0.9% free FA.*

**Keywords:** Activation, Specific surface area, Montmorillonite, free formaldehyde, urea-formaldehyde composite

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