УНИВЕРЗИТЕТ У БАЊОЈ ЛУЦИ
UNIVERSITY OF BANJA LUKA
ТЕХНОЛОШКИ ФАКУЛТЕТ
FACULTY OF TECHNOLOGY

BOOK OF ABSTRACTS

OCTOBER 21-22, 2022

ACADEMY OF SCIENCES AND ARTS
OF THE REPUBLIC OF SRPSKA,
BANJA LUKA, REPUBLIC OF SRPSKA, B&H

INTERNATIONAL SCIENTIFIC CONFERENCE

XIV CONFERENCE OF CHEMISTS, TECHNOLOGISTS AND ENVIRONMENTALISTS OF REPUBLIC OF SRPSKA

XIV CONFERENCE OF CHEMISTS, TECHNOLOGISTS AND ENVIRONMENTALISTS OF REPUBLIC OF SRPSKA

BOOK OF ABSTRACTS

Publisher:
University in Banjaluka, Faculty of Technology

Editorial board:
Borislav Malinovic, PhD, dean

Design and computer processing
Pero Sailovic, PhD
Msc Branka Ruzicic

CIP - Каталогизација у публикацији
Народна и универзитетска библиотека
Републике Српске, Бања Лука

66(048.3)(0.034.2)
661:663/664(048.3)(0.034.2)
677(048.3)(0.034.2)
655(048.3)(0.034.2)
502(048.3)(0.034.2)

CONFERENCE of Chemists, Technologists and Environmentalists of Republic of Srpska (14 ; Banja Luka ; 2022)
Book of Abstracts [Електронски извор] / XIV Conference of Chemists, Technologists and Environmentalists of Republic of Srpska, Banja Luka, October 21-22, 2022 ; [editorial board Borislav Malinović]. - Onlajn izd. - El. zbornik. - Banja Luka : University in Banjaluka, Faculty of Technology = Tehnološki fakultet, 2022

Sistemski zahtjevi: Nisu navedeni. - Način pristupa (URL): https://savjetovanje.tf.unibl.org/. - El. publikacija u PDF formatu opsega 207 str. - Nasl. sa naslovnog ekrana. - Opis izvora dana 20.10.2022.

ISBN 978-99938-54-96-8

COBISS.RS-ID 137004033

Organizing Committee:

PhD Pero Sailovic, president, PhD Darko Bodroza, general secretary, M.Sc Maja Milijaš secretary, M.Sc Dajana Dragić, M.Sc Branka Ružičić, M.Sc Marina Rakanovic, M.Sc Maja Katic, Sanda Pilipović, M.Sc Nebojsa Gorgi, Biljana Vasić, Sanja Novakovic, M.Sc Jovanka Kotur

***Students*:** Vladimir Ivković, Jovan Savić, Nevena Janjić, Bojana Milinković, Danijela Lazić

Scientific Committee:

Dr Božana Odžaković, president, University of Banja Luka, **B&H**, Dr Nada Štrbac, co-president, Univesity of Belgrade, **Serbia**, Dr Borislav Malinović, University of Banja Luka, **B&H**, Dr Vlada Veljković, University of Nis, **Serbia**, Dr Todor Vasiljević, Victoria University Melbourne, **Australia,** Dr Sanja Mahović-Poljačak, University of Zagreb, **Croatia**, Dr Csaba Horvath, University Obuda, Budapest, **Hungary**, Dr Mihail Kochubovski, University of Skopje, **Macedonia**, Dr Massimiliano Fenice, Universityt Della Tuscia, **Italy**, Dr Georgij Petriaszwili, Warshav University of Technology, **Poland**, Dr Mira Vukcevic, University of Monte Negro, **Monte Negro**, Dr Ondrej Panák, University of Pardubice, **Czech Republic**, , Dr Pospiech Matej, University of Veterinary and Pharmaceutical Sciences, Brno, **Czech Republic**, , Dr Dani Dordevic, University of Veterinary and Pharmaceutical Sciences, Brno, **Czech Republic,** Dr Iskren Spiridonov, University of Chemical Technology and Metallurgy, **Bulgaria**, Dr Laura Benea, West University of Timisoara, **Romania**, Dr Savvas G. Vassiliadis, University of Piraeus, **Greece**, Dr Helena Prosen, University of Ljubljana, **Slovenia**, Dr Srecko Stopic, RWTH University Aachen, **Germany**, Dr Maria Iosune Cantalejo, UPNA, **Spain**, Dr Jurislav Babić, University of Osijek, **Croatia**, Dr Svetozar Milosavić, University of Kosovska Mitrovica, **Serbia**, Dr Petar Uskoković, University of Belgrade, **Serbia**, Dr Mitja Kolar, University of Ljubljana, **Slovenia**, Dr Dragiša Savić, , University of Nis, **Serbia**, Dr Dragan Vujadinović, University of East Sarajevo, **B&H**, Dr Biljana Pajin, University of Novi Sad, **Serbia**, Dr Sead Ćatić, University of Tuzla, **B&H**, Dr Husein Vilić, University of Bihac, **B&H**, Dr Sanjin Gutić, University of Sarajevo, **B&H**, Dr Goran Trbić, University of Banja Luka, **B&H**, Dr Milica Balaban, University of Banja Luka, **B&H**, Dr Ljiljana Vukić, University of Banja Luka, **B&H**, Dr Ljiljana Topalić-Trivunović, University of Banja Luka, **B&H**, Dr Slavica Sladojević, University of Banja Luka, **B&H**, Dr Pero Dugić, University of Banja Luka, **B&H**, Dr Zoran Kukrić, University of Banja Luka, **B&H**, Dr Slavica Grujić, University of Banja Luka, **B&H**, Dr Milorad Maksimović, University of Banja Luka, **B&H**, Dr Branka Rodić-Grabovac, University of Banja Luka, **B&H**, Dr Rada Petrović, University of Banja Luka, **B&H**, Dr Dragana Grujić, University of Banja Luka, **B&H**, Dr Svjetlana Janjić, University of Banja Luka, **B&H**, Dr Zora Levi, University of Banja Luka, **B&H**, Dr Ladislav Vasilišin, University of Banja Luka, **B&H**

NOTE:

The authors have full responsibility for the originality and content of thier own papers

УНИВЕРЗИТЕТ У БАЊОЈ ЛУЦИ
UNIVERSITY OF BANJA LUKA
ТЕХНОЛОШКИ ФАКУЛТЕТ
FACULTY OF TECHNOLOGY

International scientific conference

"XIV CONFERENCE OF CHEMISTS, TECHNOLOGISTS AND ENVIRONMENTALISTS OF REPUBLIC OF SRPSKA"

under the auspices of

MINISTRY OF SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT, HIGHER EDUCATION AND INFORMATION SOCIETY

MINISTRY OF AGRICULTURE, FORESTRY AND WATER MANAGEMENT

ACADEMY OF SCIENCES AND ARTS OF THE REPUBLICA OF SRPSKA

CARBOHYDRATE-COATED CERIUM OXIDE NANOPARTICLES AFFECT THE GERMINATION OF *Sinapis alba* AND *Chenopodium rubrum* SEEDS THROUGH THE GENERATIONS

Ivana Milenković[1], Slađana Z. Spasić[1,2], Ksenija Radotić[1]

[1]Institute for Multidisciplinary Research, University of Belgrade, Kneza Višeslava 1, 11030 Belgrade, Serbia
[2]Singidunum University, Danijelova 32, 11010 Belgrade, Serbia
Corresponding author e-mail: ivana.milenkovic@imsi.rs

Abstract

The various applications of cerium oxide nanoparticles ($nCeO_2$), one of the most produced metal oxide nanoparticles, could affect environmental health due to accumulation of uncoated and coated $nCeO_2$ with increased suspension stability. The trans-generational effects on seed characteristics are important components of the life histories of plants representing the pathway from adult to offspring that completes the life cycle. The effects of carbohydrate-coated $nCeO_2$ on the plant seeds through the generations are still unknown. The main aim of this study was to investigate the effect of the treatment of maternal *Sinapis alba* and *Chenopodium rubrum* plants with 200 mg/L of uncoated (CeO_2) and glucose-, levan-, or pullulan coated $nCeO_2$ (G-, L-, or P-CeO_2) on germination of three generations of seeds. *Sinapis alba* was selected as a hyperaccumulator of heavy metals, while *Chenopodium rubrum* was selected as a short-day plant and weed. In *Sinapis alba*, the results of germination on the 4^{th} day revealed increased germination after the treatment with CeO_2 and L-CeO_2 nanoparticles in zero generation and after all $nCeO_2$ treatments in the 1^{st} and 2^{nd} generation of seeds. In *Chenopodium rubrum*, there were no changes after the treatments. It can be concluded that trans-generational effects of the different $nCeO_2$ treatments persist to at least the second generation in seeds. Compared to the same generation control, the 2^{nd} generation of seeds showed the highest sensitivity. The coated $nCeO_2$ were more effective than the uncoated ones. Enhanced germination in three generations of *S. alba* seeds recommends $nCeO_2$ for application in seed-priming.

Keywords: CeO_2, germination, nanoparticles, seed generation, *Sinapis alba*.