

# BOOK of ABSTRACTS



International Conference  
on Advanced Production and Processing

**2<sup>nd</sup> International Conference  
on Advanced Production and Processing  
20<sup>th</sup>-22<sup>nd</sup> October 2022  
Novi Sad, Serbia**

**Title:**

Book of Abstracts of the 2<sup>nd</sup> International Conference on Advanced Production and Processing publishes abstracts from the following fields: Innovative Food Science and Bioprocesses, Nutraceuticals and Pharmaceuticals, Sustainable Development, Chemical and Environmental Engineering, Materials Design and Applications, Petroleum Refining and Production.

**Publisher:**

University of Novi Sad, Faculty of Technology Novi Sad,  
Bulevar cara Lazara 1, 21000 Novi Sad, Serbia

**For publisher:**

prof. Biljana Pajin, PhD, Dean

**Editorial board:**

Jovana Petrović, Ivana Nikolić, Milica Hadnađev Kostić, Snežana Škaljac, Milana Pribić, Bojan Miljević, Branimir Pavlić, Olga Govedarica

**Editor-in-Chief:**

Prof. Zita Šereš, PhD

**Design and Printing Layout:**

Saša Vulić

CIP - Каталогizacija u publikaciji  
Biblioteke Matice srpske, Novi Sad

658.5(048.3)

INTERNATIONAL Conference on Advanced Production and Processing (2 ; 2022 ; Novi Sad)  
Book of abstracts [Elektronski izvor] / 2nd International Conference on Advanced Production and Processing, 20th-22nd October 2022, Novi Sad ; [editor-in-chief Zita Šereš]. - Novi Sad : Faculty of Technology, 2022

Način pristupa (URL): <https://www.tf.uns.ac.rs/download/icap-2022/book-of-abstracts.pdf>. - Opis zasnovan na stanju na dan 14. 10. 2022. - Nasl. s naslovnog ekrana.

ISBN 978-86-6253-160-5

a) Tehnologija - Proizvodnja - Apstrakti

COBISS.SR-ID 77341961



**2<sup>nd</sup> International Conference  
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## GREEN BIOSYNTHESIS OF ZnO NANOPARTICLES USING AGRO-WASTE AND THEIR ANTIBACTERIAL AND ANTIOXIDANT ACTIVITY

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Metal oxide nanomaterials have gained a lot of attention during last decades due to their potential applications in wastewater treatment, energy storage, sensors, food packaging, etc. To date, these materials have been synthesized by different chemical and physical techniques. However many of them employ environmentally unfriendly solvents and toxic chemical compounds. To tackle this problem, use of renewable biomass such as plants and fungi as reducing or stabilizing agents in green synthesis has been considered as more sustainable option compared to toxic chemical compounds. These biological substances also behave as capping agent, which control the size and the shape of the nanoparticles. In this work, ZnO nanoparticles (NPs) have been prepared *via* simple, low cost and ecofriendly method using citrus fruit peel and extracts, *Agaricus bisporus* powder and extract as biological reducing agents. Zinc nitrate and zinc acetate were used as source of zinc ions. Structural and optical properties were investigated by X-ray diffraction analysis (XRD), Zeta potential, Fourier Transform Infrared (FTIR) spectroscopy, UV-visible (UV-vis) spectroscopy and Photoluminescence spectroscopy (PL). Morphological features were characterized by Field Emission Scanning Electron microscopy (FESEM) and High Resolution Transmission Electron Microscopy (HRTEM). Antibacterial and antioxidant activity was tested and evaluated.

*Keywords: ZnO, Green synthesis, Citrus extract, Agaricus bisporus, Antibacterial*

*Acknowledgements: The authors would like to express their gratitude to the Ministry for Education, Science and Technology Development under the contract 451-03-68/2022-14/200053.*