

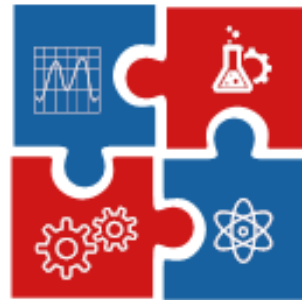
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**CNN TECH**

**„International Conference of Experimental and  
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# **Programme and The Book of Abstracts**

**04 – 07 July 2023**

**Zlatibor, Serbia**

**„International Conference of Experimental and Numerical  
Investigations and New Technologies“**

# **CNN TECH 2023**

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**Hotel Mona, Miladina Pecinara 26, Zlatibor, Serbia**

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Faculty of Mechanical Engineering, University of Belgrade  
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<b>Title:</b>	International Conference of Experimental and Numerical Investigations and New Technologies – <b>CNN TECH 2023</b>  <b>PROGRAMME AND THE BOOK OF ABSTRACTS</b>
<b>Publisher:</b>	University of Belgrade - Faculty of Mechanical Engineering Kraljice Marije 16, 11120 Belgrade 35 tel: (+381 11) 3302-346, fax 3370364 e-mail: <a href="mailto:cnntechno@gmail.com">cnntechno@gmail.com</a> web site: <a href="http://cnntechno.com">http://cnntechno.com</a> , <a href="http://www.inovacionicentar.rs">http://www.inovacionicentar.rs</a>
<b>Editors:</b>	Dr Goran Mladenovic, Associate Professor Dr Martina Balac, Senior Scientific Researcher Dr Aleksandra Dragicevic, Scientific Researcher
<b>Technical editor</b>	Dr Goran Mladenovic, Associate Professor
<b>Cover page:</b>	Ivana Jevtic, Junior Researcher
<b>Printed in:</b>	Innovation Center of Faculty of Mechanical Engineering Kraljice Marije 16 11120 Belgrade 35 tel: (+381 11) 3302-346
<b>Circulation:</b>	150 copies. The end of printing: June 2023.

**ISBN: 978-86-6060-155-3**

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# CHARACTERIZATION OF MECHANICALLY ACTIVATED ZrO<sub>2</sub>-C POWDER MIXTURES

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## Abstract

*Mechanical activation represents a very useful technique for powder processing prior to sintering process. First of all, it makes powders homogenized, leads to attrition of powder particles, and makes powder mixtures more reactive. Secondly, it can lead to mechano-chemical reaction, and finally, lowering of sintering time and temperature. Mixtures of ZrO<sub>2</sub> and C were mechanically activated by high-energy ball milling. Powders were milled for times from 0 to 120 minutes in air atmosphere. Mechanically activated powder mixtures were characterized by various techniques, such as particle size analysis (PSA), X-ray powder diffraction (XRPD), scanning electron microscopy (SEM), Fourier-transform infrared (FTIR) spectroscopy, Raman spectroscopy, and diffraction scanning calorimetry along with thermo gravimetry (DSC-TGA). As milling time increased, surface area of powders increased, indicating significant particle size reduction. Mechanical activation for 15 minutes provides the best balance between particle size reduction and reactivity for the powders.*

## Keywords

ZrO<sub>2</sub>-C, mechanical activation, SEM, XRD.

CIP - Каталогизација у публикацији Народна библиотека Србије, Београд

621(048)(0.034.2)

62:519.6(048)(0.034.2)

**INTERNATIONAL conference of experimental and numerical investigations  
and new technologies (2023 ; Zlatibor)**

Programme [Elektronski izvor] ; and The Book of Abstracts / International Conference of Experimental and Numerical Investigations and New Technologies - CNN TECH 2023, 04 – 07 July 2023, Zlatibor, Serbia ; organized by Innovation Center of Faculty of Mechanical Engineering [and] University of Belgrade, Faculty of Mechanical Engineering, Center for Business Trainings ; [editors Goran Mladenovic, Martina Balac, Aleksandra Dragicevic]. - Belgrade : University, Faculty of Mechanical Engineering, 2022 (Belgrade : Innovation Center of Faculty of Mechanical Engineering). - 1 USB fleš memorija ; 1 x 2 x 5 cm

Sistemski zahtevi: Nisu navedeni. - Nasl. sa naslovne strane dokumenta. - Tiraž 150.

ISBN 978-86-6060-155-3

а) Машинство -- Апстракти б) Техника -- Нумерички методи -- Апстракти

COBISS.SR-ID 119652617