Innovation Center of Faculty of Mechanical Engineering

Faculty of Mechanical Engineering, University of Belgrade

Center for Business Trainings

CNN TECH

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

Sponsored by:

MINISTRY OF EDUCATION, SCIENCE AND TECHNICAL DEVELOPMENT

OF THE REPUBLIC OF SERBIA

Programme

and

The Book of Abstracts

05 – 08 July 2022

Zlatibor, Serbia

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

CNN TECH 2022

05 – 08 July 2022

Hotel Mona, Miladina Pecinara 26, Zlatibor, Serbia

http://cnntechno.com

Programme

and

The Book of Abstracts

Organised by:

Innovation Center of Faculty of Mechanical Engineering

Faculty of Mechanical Engineering, University of Belgrade

Center for Business Trainings

Sponsored by:

Ministry of Education, Science and Technical development of the Republic of Serbia

Title:	International Conference of Experimental and Numerical Investigations and New Technologies – **CNN TECH 2022** **PROGRAMME AND THE BOOK OF ABSTRACTS**
Publisher:	Innovation Center of Faculty of Mechanical Engineering Kraljice Marije 16, 11120 Belgrade 35 tel: (+381 11) 3302-346, fax 3370364 e-mail: cnntechno@gmail.com web site: http://cnntechno.com, http://www.inovacionicentar.rs
Editors:	Dr Martina Balac, Senior Scientific Researcher Dr Aleksandra Dragicevic, Scientific Researcher Dr Goran Mladenovic, Associate Professor
Technical editor	Dr Goran Mladenovic, Associate Professor
Cover page:	Dr Goran Mladenovic, Associate Professor
Printed in:	Innovation Center of Faculty of Mechanical Engineering Kraljice Marije 16 11120 Belgrade 35 tel: (+381 11) 3302-346
Circulation:	150 copies. The end of printing: June 2022.

ISBN: 978-86-6060-120-1

“International Conference of Experimental and Numerical Investigations and New Technologies”

CNN TECH 2022

SCIENTIFIC COMMITTEE:

Nenad Mitrovic, Serbia (chairman)
Milos Milosevic, Serbia (co-chairman)
Aleksandar Sedmak, Serbia
Hloch Sergej, Slovakia
Drazan Kozak, Croatia
Nenad Gubeljak Slovenia
Monka Peter, Slovakia
Snezana Kirin, Serbia
Samardzic Ivan, Croatia
Martina Balac, Serbia
Mládková Ludmila, Czech Republic
Johanyák Zsolt Csaba, Hungary
Igor Svetel, Serbia
Aleksandra Mitrovic, Serbia
Valentin Birdeanu, Romania
Danilo Nikolic, Montenegro
Goran Mladenovic, Serbia
Bajic Darko, Montenegro
Tasko Maneski, Srbija
Luis Reis, Portugal
Zarko Miskovic, Serbia
Tozan Hakan, Turkey
Nikola Momcilovic, Serbia
Traussnigg Udo, Austria
Gordana Bakic, Serbia
Katarina Colic, Serbia
Peter Horňak, Slovakia
Róbert Huňady, Slovakia
Martin Hagara, Slovakia
Jovan Tanaskovic, Serbia
Marija Durkovic, Serbia
Tsanka Dikova, Bulgaria
Ján Danko, Slovakia
Ognjen Pekovic, Serbia
Jelena Svorcan, Serbia
Suzana Filipovic, Serbia
Darko Kosanovic, Serbia
Nebojsa Manic, Serbia
Zorana Golubovic, Serbia
Vera Pavlovic, Serbia
Nikola Grozdanic, Serbia
Aleksandra Dragicevic, Serbia
Dragan Milkovic, Serbia
Vesna Miletic, Australia
Katarina Colic, Serbia

ORGANIZING COMMITTEE:

Milos Milosevic (chairman)
Nenad Mitrovic (co-chairman)
Aleksandar Sedmak
Martina Balac
Igor Svetel
Goran Mladenovic
Aleksandra Mitrovic
Aleksandra Dragicevic
Zarko Miskovic
Milan Travica
Aleksandra Joksimovic
Isaak Trajkovic
Toni Ivanov
Snezana Kirin
Igor Stankovic
Ivana Vasovic Maksimovic
Nina Obradovic
Andreja Stojic
Ivana Jevtic
Jovana Zvicer

enterprise europe network
Business Support on Your Doorstep

INFLUENCE OF MN DOPING ON THE EVOLUTION OF MICROSTRUCTURE AND OPTICAL PROPERTIES OF MECHANICALLY ACTIVATED SRTIO$_3$ POWDERS

Jelena Zivojinovic[1,*], Darko Kosanovic[1], Vladimir Blagojevic[1], Vera Pavlovic[2], Jovana Cirkovic[3], Vladimir Pavlovic[4]

[1]Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Knez Mihailova 35/IV, 11000 Belgrade, Serbia

[2] University of Belgrade, Faculty of Mechanical Engineering, Kraljice Marije 16, 11120 Belgrade 35, Serbia

[3] Institute for Multidisciplinary Research, University of Belgrade, Serbia

[4] University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080 Belgrade, Serbia

*Corresponding author e-mail: jelena.zivojinovic@itn.sanu.ac.rs

Abstract

Manganese doped $SrTiO_3$ powders with various manganese dioxide weight percentages in the range of 1.5, 3 and 6 wp% were prepared by a solid-state method in the presence of mechanical activation (10, 30 and 120 minutes). A systematic investigation by X-ray diffraction (XRD), scanning electron microscopy (SEM), particle size analisys (PSA), Brunauer-Emmett-Teller (BET) methods and Raman spectroscopy has been undertaken to evaluate the role of dopants on the microstructural and morphological study of the perovskite oxide obtained. The optical properties of the different manganese doped and activated $SrTiO_3$ powders have been also evaluated. Mn insertion in $SrTiO_3$ is discussed considering the possibility for Mn ions to occupy both Ti^{4+} and Sr^{2+} sites as well as manganese segregation and Mn incorporation-related non-homogeneities. The results demonstrated that Mn has substituted into the lattice and surface layers of the particles of $SrTiO_3$ powders and the absorption onset shifted to higher values of wavelengths with increasing time of activation and dopant concentration. The lowest value of the band gap (E_g=3.10 eV) was registered with the longest activation for 120 minutes and the highest concentration of dopant (6 wp%). Combining doping with mechanical activation lower values of band gap can be achieved and that fact could be used in subsequent studies to make Mn-$SrTiO_3$ more suitable visible-light photocatalysts.

Keywords

Mn-doped $SrTiO_3$ powders, mechanical activation, structural and optical properties.

Acknowledgment

Funds for the realization of this work are provided by the Ministry of Education, Science and Technological Development of the Republic of Serbia, Agreement on realization and financing of scientific research work of the Institute of Technical Sciences of SASA in 2022 (Record number: 451-03-68/2022-14/200175).

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 (2022 ; Zlatibor)
Programme [Elektronski izvor] ; and The Book of Abstracts / International Conference of Experimental and Numerical Investigations and New Technologies - CNN TECH 2022, 05-08 July 2022, Zlatibor, Serbia ; organized by Innovation Center of Faculty of Mechanical Engineering [and] University of Belgrade, Faculty of Mechanical Engineering, Center for Business Trainings ; [editors Martina Balac, Aleksandra Dragicevic, Goran Mladenovic]. - Belgrade : Innovation Center of Faculty of Mechanical Engineering, 2022 (Belgrade : Innovation Center of Faculty of Mechanical Engineering). - 1 elektronski optički disk (CD-ROM) ; 12 cm

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

ISBN 978-86-6060-120-1

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

COBISS.SR-ID 70009609