

MATERIALS RESEARCH SOCIETY OF SERBIA
INSTITUTE OF TECHNICAL SCIENCES OF SASA

Programme and the Book of Abstracts

**NINETEENTH YOUNG RESEARCHERS' CONFERENCE
MATERIALS SCIENCE AND ENGINEERING**

Belgrade, December 1-3, 2021



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**Materials Research Society of Serbia
&
Institute of Technical Sciences of SASA**

2021

Book title:

Nineteenth Young Researchers' Conference - Materials Science and Engineering:
Program and the Book of Abstracts

Publisher:

Institute of Technical Sciences of SASA
Knez Mihailova 35/IV, 11000 Belgrade, Serbia
Tel: +381-11-2636994, 2185263, <http://www.itn.sanu.ac.rs>

Conference organizers:

Materials Research Society of Serbia, Belgrade, Serbia
Institute of Technical Sciences of SASA, Belgrade, Serbia

Editor:

Dr. Smilja Marković

Technical Editor:

Aleksandra Stojičić

Cover page: Aleksandra Stojičić and Milica Ševkušić

Cover: Milica Ševkušić

Printing:

Gama digital centar
Autoput No. 6, 11070 Belgrade, Serbia
Tel: +381-11-6306992, 6306962
<http://www.gdc.rs>

Publication year: 2021

Print-run:

120 copies

CIP - Каталогизacija у публикацији
Народна библиотека Србије, Београд
66.017/.018(048)

YOUNG Researchers Conference Materials Sciences and Engineering (19 ; 2021 ; Beograd)

Program ; and the Book of abstracts / Nineteenth Young Researchers' Conference Materials
Science and Engineering, December 1-3, 2021, Belgrade, Serbia ; [organized by] Materials Research
Society of Serbia & Institute of Technical Sciences of SASA ; [editor Smilja Marković]. - Belgrade :
Institute of Technical Sciences of SASA, 2021 (Belgrade : Gama digital centar). - XVIII, 86 str. : ilustr.
; 23 cm

Tiraž 120. - Registar.

ISBN 978-86-80321-36-3

а) Наука о материјалима -- Апстракти б) Технички материјали – Апстракти

COBISS.SR-ID 51231241

Aim of the Conference

Main aim of the conference is to enable young researchers (post-graduate, master or doctoral student, or a PhD holder younger than 35) working in the field of materials science and engineering, to meet their colleagues and exchange experiences about their research.

Topics

Biomaterials
Environmental science
Materials for high-technology applications
Materials for new generation solar cells
Nanostructured materials
New synthesis and processing methods
Theoretical modelling of materials

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Results of the Conference

Beside printed «Program and the Book of Abstracts», which is disseminated to all conference participants, selected and awarded peer-reviewed papers will be published in journal “Tehnika – Novi Materijali”. The best presented papers, suggested by Session Chairpersons and selected by Awards Committee, will be proclaimed at the Closing Ceremony. Part of the award is free-of-charge conference fee at YUCOMAT 2022.

Sponsors



ANALYSIS
LABORATORY EQUIPMENT

Acknowledgement

The editor and the publisher of the Book of abstracts are grateful to the Ministry of Education, Sciences and Technological Development of the Republic of Serbia for its financial support of this book and The Nineteenth Young Researchers' Conference - Materials Sciences and Engineering, held in Belgrade, Serbia.

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**Effective sorption of toxic brilliant green
using lignocellulosic waste biomasses and derived biochar samples**

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Lignocellulosic waste biomass (LCW) certainly represents a part of the solutions to the low-carbon future. LCW could serve as a base for a variety of sustainable fuels and bio based materials, whose proper implementation could help in economic and environmental growing world demands. Fruit stones, wastes from food processing industries, are contributing toward negative effects on the environment systems through the impacts associated with both waste production and its disposal. This waste type can be converted into value-added products using thermochemical methods, such as pyrolysis, where the biomass is efficiently converted into biofuels, biochars and different value added products. In this paper, two LCW materials, peach (PS) and cherry stones (CS) and their derived biochars (PS-B and CS-B), have been successfully applied for the removal of the hazardous water-soluble cationic dye, brilliant green (BG). Functional groups present in LCWs and related biochars were analysed using Fourier transform infra-red (FTIR) technique. Bio based sorbents were also characterized by determination of pH_{sus} and pH_{pzc}. The pristine LCWs, PS and CS, were first milled to desired dimensions, washed and dried at 60 °C. Pyrolysed samples, PS-B and PS-C, were obtained by heating in oxygen limited conditions from 25 to 500 °C (10 °C/min heat flow), and kept at 500 °C for 2 h. The contact pH (pH_{sus}) as well as pHP_{zc} were higher in both cases for the biochar samples, indicating higher –OH content (confirmed also by FTIR analysis) and favourable surface for cationic sorbate types. The experimental sorption results indicated that biochars have almost two times higher sorption capacities than the native materials, under the same operational conditions, while the highest binding was achieved by cherry stone biochar, 135.3 mg/g (experimental data modelled by Sips isotherm). Conclusively, the LCWs derived biochars can be efficiently used as an alternative to conventional sorbents in contaminated water treatment.