

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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**Novel PAN-based Air Filters for Potential Applications
in Industrial Air Filtering and Facemask Production**

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Air pollution is often related to increased concentration of particulate matter 2.5 (PM_{2.5}) pollutant particles in the air. One of the methods of their removal is air filtration. Hereby, a novel and simple method of producing nanofiber-based air filters with multiple active components for highly efficient PM_{2.5} capture is proposed. Micro-porous carbon nanofibers (MCNFs) were produced by carbonizing electrospun polyacrylonitrile (PAN) polymer and was later incorporated into the nanofibrous structure of the filters, which itself was made from electrospun PAN, achieving the production of two active components of the filter from one starting material, simplifying the production process. When compared to the base PAN filter, PAN/MCNFs filter exhibits greater filtering properties with almost absolute pollutant particle removal. Their improved thermal and mechanical properties make this kind of filters suitable for harsh-condition environments, such as those in industrial plants. The possibility of using studied filters in facemask production was studied and reduced temperature variation was recorded when using a facemask with an inserted PAN/MCNFs filter, thus increasing wearing comfort for the user. All mentioned properties open a potential possibility for these filters to be used in different environments, but also leave room for further improvement.

