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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&
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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

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Studentski trg 12-16, 11158 Beograd, Serbia, [3]Institute of Chemistry, Technology and Metallurgy, Department of Electrochemistry, University of Belgrade, Njegoševa 12, 11000 Belgrade, Serbia

10.30 – 10.45 Break

10.45 – 12.15 11th Session – Materials for High-technology Application II
Chairpersons: Dr. Zoran Jovanović and Vladimir Terek

10.45 – 11.00 Electrochemical deposition for advanced engineering of novel electrocatalytic interfaces
Aleksandar Z. Jovanović[1], Sanjin J. Gutić[2], Lidija Rafailović[3], Igor A. Pašti[1]
[1]University of Belgrade – Faculty of Physical Chemistry, Belgrade, Serbia, [2]University of Sarajevo, Faculty of Science, Department of Chemistry, Sarajevo, Bosnia and Herzegovina, [3]CEST, Centre of Electrochemical Surface Technology, Wr. Neustadt, Austria

11.00 – 11.15 Effect of different cobalt loadings on the electrochemical performance of aluminum pillared clay-supported cobalt towards glucose oxidation
Biljana Milovanović, Tihana Mudrinić, Sanja Marinović, Marija Ajduković, Aleksandra Milutinović-Nikolić, Predrag Banković
University of Belgrade - Institute of Chemistry, Technology and Metallurgy, National Institute of the Republic of Serbia, Department of Catalysis and Chemical Engineering, Njegoševa 12, Belgrade, Serbia

11.15 – 11.30 Synthesis and characterization of new dysprosium doped phosphate-tungsten bronze
Tijana Maksimović[1], Jelena Maksimović[2], Pavle Tančić[3], Ljubinka Joksović[1], Maja Pagnacco[4], Zoran Nedić[2]
[1]Faculty of Science, Department of Chemistry, University of Kragujevac, Radoja Domanovića 12, 34000 Kragujevac, Serbia, [2]Faculty of Physical Chemistry, University of Belgrade, Studentski trg 12-16, 11001 Belgrade, Serbia, [3]Geological Survey of Serbia, Rovinjska 12, 11000 Belgrade, Serbia, [4]Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Njegoševa 12, 11000 Belgrade, Serbia

11.30 – 11.45 Novel PAN-based Air Filters for Potential Applications in Industrial Air Filtering and Facemask Production
Mihailo Mirković[1], Dušica Stojanović[1], Daniel Mijailović[2], Nemanja Barać[2], Đorđe Janaćković[1], Petar Uskoković[1]
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11-3

Synthesis and characterization of new dysprosium doped phosphate-tungsten bronze

Tijana Maksimović[1], Jelena Maksimović[2], Pavle Tančić[3],
Ljubinka Joksović[1], Maja Pagnacco[4], Zoran Nedić[2]
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Dysprosium phosphate tungsten bronze has been successfully synthesized and characterized (TGA, DSC, FTIR). For the preparation of dysprosium phosphate tungsten bronze (Dy-PWB), as a starting material is used 12-tungstophosporic heteropoly acid $H_3PW_{12}O_{40}\times 29H_2O$ (PWA), which was first transformed into $H_3PW_{12}O_{40}\times 6H_2O$ (6-PWA) by heating of PWA at 80 °C in a kiln. Aqueous solution $H_3PW_{12}O_{40}\times 6H_2O$ is then commingled with aqueous solution of $DyCl_3\times 6H_2O$, slightly heated in order to start the crystallization process and left during the night to finish the crystallization. The obtained salt $DyPW_{12}O_{40}\times nH_2O$ is then heated in furnace, from room temperature to 600 °C, whereby the yellow crystals of dysprosium phosphate tungsten bronze are formed. The structure and its phase transformations were characterized by thermal analysis (TGA and DSC) and Fourier-transform infrared spectra (FTIR).

In this paper, the dysprosium phosphate tungsten bronze has been synthesized and characterized for the first time in order to obtain more information about its structure, chemical features and potential practical application. The potential practical application of Dy-PWB is in its installation in batteries and fuel cells, as catalyst for the reduction of oxygen in acidic electrolytes. Due to the specific yellow color and its thermal stability, Dy-PWB could also be used as a pigment.

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