

INSTITUTE OF TECHNICAL SCIENCES OF SASA  
MATERIALS RESEARCH SOCIETY OF SERBIA

*Programme and the Book of Abstracts*

**TWENTY-FIRST YOUNG RESEARCHERS' CONFERENCE  
MATERIALS SCIENCE AND ENGINEERING**

Belgrade, November 29 – December 1, 2023



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MATERIALS SCIENCE AND ENGINEERING**

**November 29 – December 1, 2023, Belgrade, Serbia**

**Program and the Book of Abstracts**

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

2023

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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 2024.

### Sponsors



**ANALYSIS**  
LABORATORY EQUIPMENT

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**Programme**  
**Twenty-First Young Researchers Conference**  
**Materials Science and Engineering**

**Wednesday, November 29, 2023**

**09.00 – 09.30 Opening Ceremony**

**09.30 – 11.15 1<sup>st</sup> Session – Biomaterials I**

**Chairpersons: Prof. Dr. Bojana Obradović and Katarzyna Pastuszek**

**09.30 – 09.45 Dental cements based on  $\alpha$ -tricalcium phosphate and boron nitride: Synthesis, mechanical and antibacterial properties and bioactivity**

Ivana Šarić<sup>1</sup>, Tamara Vlajić-Tovilović<sup>2</sup>, Đorđe Veljović<sup>1</sup>

<sup>1</sup>Faculty of Technology and Metallurgy, University of Belgrade, Serbia, <sup>2</sup>School of Dental Medicine, University of Belgrade, Serbia

**09.45 – 10.00 Development of macroporous bioceramic materials based on multi-ion doped calcium-hydroxyapatite coated with chitosan**

Teodora Jakovljević<sup>1</sup>, Jelena Stanisavljević<sup>1</sup>, Tamara Matić<sup>1</sup>, Julijana Tadić<sup>2</sup>, Đorđe Veljović<sup>1</sup>

<sup>1</sup>University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia, <sup>2</sup>Vinča Institute of Nuclear Science, University of Belgrade, Serbia

**10.00 – 10.15 Synthesis of nanoparticles based on RuBisCO protein derived from pumpkin leaves for the controlled release of vitamin B12**

Dora B. Mikašinović, Jelena R. Mijalković, Zorica D. Knežević-Jugović

University of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4, 11020 Belgrade, Serbia

**10.15 – 10.30 Starch aerogels impregnated using supercritical CO<sub>2</sub>: Application in controlled release of biologically active compounds**

Filip Koldžić, Stoja Milovanović, Ivana Lukić, Melina Kalagasidis Krušić

University of Belgrade – Faculty of Technology and Metallurgy

**10.30 – 10.45 Evaluation of the anti-inflammatory potential of *Paeonia tenuifolia* L. petal extract**

Natalija Čutović<sup>1</sup>, Tatjana Marković<sup>1</sup>, Tamara Carević<sup>2</sup>, Dejan Stojković<sup>2</sup>, Branko Bugarski<sup>3</sup>, Aleksandra A. Jovanović<sup>4</sup>

<sup>1</sup>*Institute for Medicinal Plants Research “Dr Josif Pančić”, Tadeuša Košćuška 1, 11000 Belgrade, Serbia,* <sup>2</sup>*Department of Plant Physiology, Institute for Biological Research “Siniša Stanković”—National Institute of Republic of Serbia, University of Belgrade, Bulevar Despota Stefana 142, 11000 Belgrade, Serbia,* <sup>3</sup>*Faculty of Technology and Metallurgy, University of Belgrade, Karnegijeva 4, 11000 Belgrade, Serbia,* <sup>4</sup>*Institute for the Application of Nuclear Energy INEP, University of Belgrade, Banatska 31b, Zemun, 11080 Belgrade, Serbia*

#### **10.45 – 11.00 Comparison of model bacterial membranes of selected *Legionella* species**

Małgorzata Jurak<sup>1</sup>, Katarzyna Pastuszak<sup>1</sup>, Agnieszka Ewa Wiącek<sup>1</sup>, Bożena Kowalczyk<sup>2</sup>, Jacek Tarasiuk<sup>2</sup>, Marta Palusińska-Szyszt<sup>2</sup>

<sup>1</sup>*Department of Interfacial Phenomena, Institute of Chemical Sciences, Faculty of Chemistry, Maria Curie-Skłodowska University, Maria Curie-Skłodowska Sq. 3, 20-031 Lublin, Poland,*

<sup>2</sup>*Department of Genetics and Microbiology, Institute of Biological Sciences, Faculty of Biology and Biotechnology, Maria Curie-Skłodowska University, Akademicka 19, 20-033 Lublin, Poland*

#### **11.00 – 11.15 Study on interactions between the LL-37 peptide and model bacterial membranes**

Katarzyna Pastuszak<sup>1</sup>, Małgorzata Jurak<sup>1</sup>, Agnieszka Ewa Wiącek<sup>1</sup>, Bożena Kowalczyk<sup>2</sup>, Jacek Tarasiuk<sup>2</sup>, Marta Palusińska-Szyszt<sup>2</sup>

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#### **11.15 – 11.30 Break**

#### **11.30 – 13.00 2<sup>nd</sup> Session – Biomaterials II**

**Chairpersons: Dr. Ivana Drvenica and Nina Tomić**

#### **11.30 – 11.45 Activity of resveratrol nanobelt-like particles against *Pseudomonas aeruginosa* biofilms**

Nina Tomić<sup>1</sup>, Nenad Filipović<sup>1</sup>, Dragana Mitić Čulafić<sup>2</sup>, Tea Ganić<sup>2</sup>, Sergey Klyagin<sup>3</sup>, Alexander Osmolovskiy<sup>3</sup>, Magdalena M. Stevanović<sup>1</sup>

<sup>1</sup>*Group for Biomedical Engineering and Nanobiotechnology, Institute of Technical Sciences of SAsA, Belgrade, Serbia, Knez Mihailova 35/IV 11000 Belgrade, Serbia,* <sup>2</sup>*University of Belgrade – Faculty of Biology; Studentski trg 16, Belgrade, Serbia,* <sup>3</sup>*Department of Microbiology, Faculty of Biology, Lomonosov Moscow State University; Russia 119234, Moscow, Leninskie gory, 1, building 12*

#### **11.45 – 12.00 Cultivation of bone cells from different sources in a biomimetic 3D *in vitro* bone model based on alginate scaffolds and a perfusion bioreactor**



Ivana Banicevic<sup>1</sup>, Mia Milosevic<sup>1,2</sup>, Jelena Petrovic<sup>1,2</sup>, Ksenia Menshikh<sup>3</sup>, Milena Milivojevic<sup>4</sup>, Milena Stevanovic<sup>4</sup>, Radmila Jankovic<sup>5</sup>, Andrea Cochis<sup>3</sup>, Elena Della Bella<sup>6</sup>, Jasmina Stojkovska<sup>1</sup>, Martin Stoddart<sup>6</sup>, Lia Rimondini<sup>3</sup>, Bojana Obradovic<sup>1</sup>

<sup>1</sup>University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia, <sup>2</sup>Innovation Center of the Faculty of Technology and Metallurgy, Belgrade, Serbia, <sup>3</sup>Center for Translational Research on Autoimmune and Allergic Diseases–CAAD, Università del Piemonte Orientale, Italy, <sup>4</sup>University of Belgrade, Institute of Molecular Genetics and Genetic Engineering, Belgrade, Serbia, <sup>5</sup>University of Belgrade, School of Medicine, Belgrade, Serbia, <sup>6</sup>AO Research Institute Davos, Davos, Switzerland

### **12.00 – 12.15 Tuneable alginate hydrogel microfibers to support 3D cultures of cancer cells requiring different culture media**

Jelena Petrović<sup>1,2</sup>, Jasmina Stojkovska<sup>1</sup>, Miodrag Dragoj<sup>3</sup>, Milica Pešić<sup>3</sup>, Milena Milivojević<sup>4</sup>, Luka Bojić<sup>4</sup>, Milena Stevanović<sup>4,5</sup>, Radmila Janković<sup>6</sup>, Bojana Obradović<sup>1</sup>

<sup>1</sup>University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia, <sup>2</sup>Innovation Center of the Faculty of Technology and Metallurgy, Belgrade, Serbia, <sup>3</sup>University of Belgrade, Institute for Biological Research “Sinisa Stankovic” - National Institute of the Republic of Serbia, Belgrade, Serbia, <sup>4</sup>University of Belgrade, Institute of Molecular Genetics and Genetic Engineering, Belgrade, Serbia, <sup>5</sup>Serbian Academy of Sciences and Arts, Belgrade, Serbia, <sup>6</sup>University of Belgrade, School of Medicine, Belgrade, Serbia

### **12.15 – 12.30 Influence of synthesized calcium phosphate-based nanomaterial on proliferation of dental pulp stem cells in various *in vitro* conditions**

Milica Tomić<sup>1</sup>, Sanja Stojanović<sup>1,2</sup>, Nenad Ignjatović<sup>3</sup>, Stevo Najman<sup>1,2</sup>

<sup>1</sup>University of Niš, Faculty of Medicine, Scientific Research Center for Biomedicine, Department for Cell and Tissue Engineering, 18000 Niš, Serbia, <sup>2</sup>University of Niš, Faculty of Medicine, Department of Biology and Human Genetics, 18000 Niš, Serbia, <sup>3</sup>Institute of Technical Sciences of the Serbian Academy of Science and Arts, 11000 Belgrade, Serbia

### **12.30 – 12.45 Comparative analysis of subcutaneous tissue reaction to different collagen membranes with or without addition of blood**

Milena Radenković Stošić<sup>1</sup>, Sanja Stojanović<sup>1,2</sup>, Mike Barbeck<sup>3</sup>, Stevo Najman<sup>1,2</sup>

<sup>1</sup>University of Niš, Faculty of Medicine, Scientific Research Center for Biomedicine, Department for Cell and Tissue Engineering, 18000 Niš, Serbia, <sup>2</sup>University of Niš, Faculty of Medicine, Department of Biology and Human Genetics, 18000 Niš, Serbia, <sup>3</sup>Clinic and Policlinic for Dermatology and Venereology, University Medical Center Rostock, 18057 Rostock, Germany

### **12.45 – 13.00 Study of the properties of oxidized cellulose plus bioglass as a new bioink for application in regenerative medicine**

Rauany Cristina Lopes<sup>1</sup>, Mônica Rosas Costa Iemma<sup>1</sup>, Luiz Henrique Montezor<sup>1</sup>, André Capaldo Amaral<sup>1</sup>, Lidija Mančić<sup>2</sup>, Eliane Trovatti<sup>1</sup>



<sup>1</sup>University of Araraquara - UNIARA, Rua Carlos Gomes, 1217, CEP: 14801-340, Araraquara, SP, Brazil, <sup>2</sup>Institute of Technical Sciences of SASA, P.O. Box 377, 11000 Belgrade, Serbia

### **13.00 – 14.00 Lunch break**

### **14.00 – 15.30 3<sup>rd</sup> Session – Biomaterials III**

**Chairpersons: Prof. Dr. Đorđe Veljović and Milica Marković**

#### **14.00 – 14.15 Nanofabrication and characterisation of magnetic Fe<sub>3</sub>O<sub>4</sub> nanostructures for potential environmental and biomedical applications**

Dušan Milojkov<sup>1</sup>, Ana Mraković<sup>2</sup>, Gvozden Jovanović<sup>1</sup>, Nikola Vuković<sup>1</sup>, Mladen Bugarčić<sup>1</sup>, Anja Antanasković<sup>1</sup>, Vukosava Živković-Radovanović<sup>3</sup>

<sup>1</sup>Institute for Technology of Nuclear and other Mineral Raw Materials, 11000 Belgrade, Serbia, <sup>2</sup>Vinca Institute for Nuclear Science, University of Belgrade, 11351 Belgrade, Serbia, <sup>3</sup>Faculty of Chemistry, University of Belgrade, 11158 Belgrade, Serbia

#### **14.15 – 14.30 Peroxidase-like activity of chitosan modified magnetic nanoparticles**

Iryna Khmara, Iryna Antal, Alena Jurikova, Martina Kubovcikova, Vlasta Zavisova, Martina Koneracka

*Institute of Experimental Physics, SAS, Watsonova 47, Kosice, Slovakia*

#### **14.30 – 14.45 Towards new approaches for Ultraviolet sterilization of MXenes**

Yuliia Varava<sup>1,2</sup>, Volodymyr Deineka<sup>1,3</sup>, Valeriia Korniienko<sup>1</sup>, Kateryna Diedkova<sup>1,3</sup>, Viktoriia Korniienko<sup>1,3</sup>, Veronika Zahorodna<sup>4</sup>, Oleksiy Gogotsi<sup>4</sup>, Maksym Pogorielov<sup>1,3</sup>

<sup>1</sup>Sumy State University, Sumy, Ukraine, <sup>2</sup>Silesian University of Technology, Gliwice, Poland, <sup>3</sup>University of Latvia, Riga, Latvia; <sup>4</sup>Materials Research Center LTD, Kyiv, Ukraine

#### **14.45 – 15.00 Atomic and molecular spectroscopic analysis of chemically treated pig shoulder bone: possible application in forensics**

Milica Marković, Miroslav Kuzmanović, Dušan Dimić

*University of Belgrade, Faculty of Physical Chemistry, Studentski trg 12-16, 11000 Belgrade, Serbia*

#### **15.00 – 15.15 Application of polylactide (PLA) biomaterial in various fields of medicine**

Zorana Z. Stojsavljević<sup>1,2</sup>, Slobodanka P. Galović<sup>2</sup>, Katarina Lj. Đorđević<sup>2</sup>

*University of Belgrade, <sup>1</sup>Faculty of Biomedical Engineering and Technologies, Belgrade, Serbia, <sup>2</sup>Institute for Nuclear Sciences Vinča, Laboratory for radiation physics and chemistry, Belgrade, Serbia*

#### **15.15 – 15.30 The material for the treatment of periapical granulomas**

Kuzenko Yevhen, Roman Moskalenko, Kuzenko Olena

*Department of Pathology, Sumy State University, Sumy, Ukraine*

## 15.30 – 15.45 Break

### 15.45 – 17.15 4<sup>th</sup> Session – Environmental Materials I

Chairpersons: Prof. Dr. Ljiljana Damjanović-Vasilčić and Danijela Smiljanić

#### 15.45 – 16.00 Bentonite modified with cationic surfactant as promising adsorbent for carbamazepine

Danijela Smiljanić, Aleksandra Daković, Milena Obradović, Milica Ožegović, Marija Marković

*Institute for Technology of Nuclear and Other Mineral Raw Materials, Franše d' Epere 86*

#### 16.00 – 16.15 Assisted phytostabilization of Pb-contaminated soil using brushite-metakaolin geopolymer materials and *Festuca rubra*

Dunja Djukić<sup>1</sup>, Tomica Mišljenović<sup>1</sup>, Gordana Andrejić<sup>2</sup>, Uroš Aleksić<sup>2</sup>, Ksenija Jakovljević<sup>1</sup>, Miljana Mirković<sup>3</sup>

<sup>1</sup>University of Belgrade, Faculty of Biology, Belgrade, Serbia, <sup>2</sup>Department of Agrochemistry and Radioecology, Institute for the Application of Nuclear Energy, University of Belgrade, Zemun, Serbia, <sup>3</sup>Department of Materials, "Vinča" Institute of Nuclear Sciences-National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia

#### 16.15 – 16.30 Improvement of sorption properties of natural clay pyrophyllite by ultrasonic treatment

Katarina Tošić, Anđela Mitrović Rajić, Sanja Milošević Govedarović, Sara Mijaković, Ana Vujačić Nikezić, Jasmina Grbović Novaković, Bojana Paskaš Mamula

*Centre of Excellence for Hydrogen and Renewable Energy, Vinča Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, POB 522, Belgrade, Serbia*

#### 16.30 – 16.45 The impact of thermal treatment on spent coffee grounds for chlorpyrifos removal from water

Vedran Milanković<sup>1</sup>, Tamara Tasić<sup>1</sup>, Snežana Brković<sup>1</sup>, Igor Pašti<sup>2</sup>, Tamara Lazarević-Pašti<sup>1</sup>

<sup>1</sup>Laboratory of Physical Chemistry, Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, <sup>2</sup>Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia

#### 16.45 – 17.00 Applying carbon materials derived from cellulose for the removal of malathion and chlorpyrifos in food processing

Tamara Tasić<sup>1</sup>, Vedran Milanković<sup>1</sup>, Igor Pašti<sup>2</sup>, Tamara Lazarević-Pašti<sup>1</sup>

<sup>1</sup>Laboratory of Physical Chemistry, Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, <sup>2</sup>Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia

**17.00 – 17.15 Quality control of gas flow proportional counter for beta spectrometric determination of <sup>90</sup>Sr**

Nataša Sarap<sup>1</sup>, Stefana Dejković<sup>2</sup>, Marija Janković<sup>1</sup>, Jelena Krneta Nikolić<sup>1</sup>, Vojislav Stanić<sup>1</sup>, Milica Rajačić<sup>1</sup>

<sup>1</sup>University of Belgrade, Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, Radiation and Environmental Protection Department, Mike Petrovića Alasa 12-14, 11001 Belgrade, <sup>2</sup>University of Belgrade, Faculty of Physical Chemistry, Studentski trg 12-16, 11000 Belgrade, Serbia

**17.15 – 17.30 Break**

**17.30 – 18.45 5<sup>th</sup> Session – Environmental Materials II**

**Chairpersons: Dr. Smilja Marković and Miomir Krsmanović**

**17.30 – 17.45 Application of thin-layer chromatography in the assessment of lipophilicity of chloroacetamide derivatives'**

Dragana Mekić, Đendi Vaštag, Suzana Apostolov

University of Novi Sad, Faculty of Sciences, Department of Chemistry, Biochemistry and Environmental Protection, Novi Sad, Serbia

**17.45 – 18.00 Microplastics in urban soils of Belgrade: Abundance and potential sources**

Ivana Mikavica<sup>1</sup>, Dragana Ranđelović<sup>1</sup>, Miloš Ilić<sup>2</sup>, Milena Obradović<sup>1</sup>, Jovica Stojanović<sup>1</sup>, Jelena Mutić<sup>2</sup>

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**18.00 – 18.15 Microbial degradation of terephthalic acid as a PET-derived compound**

Natalija Petronijević<sup>1</sup>, Marija Lješević<sup>2</sup>, Branka Lončarević<sup>2</sup>, Kristina Joksimović<sup>2</sup>, Gordana Gojgić-Cvijović<sup>2</sup>, Vladimir Bešković<sup>1</sup>, Jasmina Nikodinović-Runić<sup>3</sup>

<sup>1</sup>University of Belgrade, Faculty of Chemistry, <sup>2</sup>University of Belgrade, Institute of Chemistry, Technology and Metallurgy, <sup>3</sup>University of Belgrade, Institute of Molecular Genetics and Genetic Engineering

**18.15 – 18.30 Immobilization of nickel ions into stable crystal structures as a promising way for their removal from wastewater**

Miomir Krsmanović<sup>1</sup>, Aleksandar Popović<sup>2</sup>, Željko Radovanović<sup>3</sup>, Smilja Marković<sup>4</sup>, Mia Omerašević<sup>1</sup>

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<sup>2</sup>Faculty of Chemistry, University of Belgrade, Studentski Trg 12-16,

Belgrade, Serbia, <sup>3</sup>Innovation Centre of Faculty of Technology and Metallurgy, University of

*Belgrade, Karnegijeva 4, Belgrade, Serbia, <sup>4</sup>Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Knez Mihailova 35/IV, Belgrade, Serbia*

**18.30 – 18.45 Particularities of the isolation of rare earth elements from mechanochemically modified brown coals**

Lidiya I. Yudina<sup>1,2</sup>, Tatiana S. Skripkina<sup>2</sup>, Svetlana S. Shatskaya<sup>2</sup>, Uliana E. Nikiforova<sup>2</sup>  
<sup>1</sup>*Novosibirsk state university, Faculty of natural sciences, Novosibirsk, Russia,* <sup>2</sup>*Institute of solid state chemistry an mechanochemistry, Novosibirsk, Russia*

**Thursday, November 30, 2023**

**09.00 – 11.00 6<sup>th</sup> Session – Theoretical Modeling of Materials**

**Chairpersons: Dr. Marko Opačić and Kristina Stevanović**

**09.00 – 09.15 Quinuclidine thiosemicarbazone crystal structure determination: Quantum insights via Hirshfeld atom refinement and intermolecular interaction energies**

Milica G. Bogdanović<sup>1</sup>, Vidak N. Raičević<sup>2</sup>, Marko V. Rodić<sup>1</sup>  
<sup>1</sup>*University of Novi Sad, Faculty of Sciences, Novi Sad, Serbia,* <sup>2</sup>*University of Novi Sad, Faculty of Medicine, Novi Sad, Serbia*

**09.15 – 09.30 Computational modeling vs. experimental analyses of the energetic performance of pyrotechnic mixtures and explosives**

Jelena Mojsilović<sup>1</sup>, Mladen Timotijević<sup>1</sup>, Mirjana Krstović<sup>1,2</sup>, Jelena Petković-Cvetković<sup>1</sup>, Bojana Fidanovski<sup>1,2</sup>, Danica Bajić<sup>1,2</sup>  
<sup>1</sup>*Military Technical Institute, Belgrade, Serbia,* <sup>2</sup>*Military Academy, Belgrade, Serbia*

**09.30 – 09.45 Composite PBX explosives with different polymer binders**

Mirjana Krstović<sup>1,2</sup>, Danica Bajić<sup>1,2</sup>, Mladen Timotijević<sup>1</sup>, Jelena Mojsilović<sup>1</sup>, Slavica Terzić<sup>1</sup>  
<sup>1</sup>*Military Technical Institute, Belgrade, Serbia,* <sup>2</sup>*Military Academy, University of Defense, Belgrade, Serbia*

**09.45 – 10.00 Modelling the detonation pressure of phlegmatized explosives in EXPLO5**

Mladen Timotijević, Danica M. Bajić, Slavica Terzić  
*Military Technical Institute, Belgrade, Serbia*

**10.00 – 10.15 QSAR and machine learning models of redox potentials of some organic pigments**

Kristina Stevanović<sup>1</sup>, Jelena Maksimović<sup>2</sup>, Jelena Senčanski<sup>3</sup>, Maja Pagnacco<sup>4</sup>, Milan Senčanski<sup>5</sup>

<sup>1</sup>Vinča Institute of Nuclear Sciences, Belgrade, Serbia, <sup>2</sup>Faculty of Physical Chemistry, Belgrade, Serbia, <sup>3</sup>Institute for General and Physical Chemistry, Belgrade, Serbia, <sup>4</sup>Institute of Chemistry, Technology and Metallurgy, Belgrade, Serbia, <sup>5</sup>Institute of Molecular Genetics and Genetic Engineering, Belgrade, Serbia

### **10.15 – 10.30 The photogenerated excess carriers influence on the photoacoustic signal of a narrow bandgap semiconductor**

Milica A. Dragaš<sup>1,2</sup>, Slobodanka P. Galović<sup>3</sup>, Katarina Lj. Đorđević<sup>3</sup>

<sup>1</sup>Faculty of Physics, University of Belgrade, 12 Studentski trg, 11001 Belgrade, Serbia,

<sup>2</sup>Faculty of Philosophy, University of East Sarajevo, 1 Alekse Santica, 71420 Pale, Bosnia and Herzegovina, <sup>3</sup>Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, University of Belgrade, 12-14 Mike Petrovica Alasa, 11351 Vinča, Belgrade, Serbia

### **10.30 – 10.45 Density functional theory calculation of the optical properties of graphene quantum dots**

Tatjana Agatonović Jovin, Biljana Todorović Marković, Zoran Marković

Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, P.O. Box 522, 11001 Belgrade, Serbia

### **10.45 – 11.00 Oxygen-terminated Ti<sub>3</sub>C<sub>2</sub> MXene as an excitonic insulator**

Nilesh Kumar, František Karlický

Department of Physics, Faculty of Science, University of Ostrava, 30. dubna 22, 701 03 Ostrava, Czech Republic

### **11.00 – 11.15 Break**

### **11.15 – 12.45 7<sup>th</sup> Session – Nanostructured Materials I**

**Chairpersons: Dr. Dragana Jugović and Katarina Aleksić**

### **11.15 – 11.30 Hydrogen storage properties of MgH<sub>2</sub>-Ni system**

Milica Prvulović<sup>1</sup>, Bojana Babić<sup>1</sup>, Nenad Filipović<sup>2</sup>, Željko Mravik<sup>1</sup>, Sanja Milošević Govedarović<sup>1</sup>, Zorana Sekulić<sup>3</sup>, Igor Milanović<sup>1</sup>

<sup>1</sup>Vinča Institute of Nuclear Sciences, National Institute of Republic of Serbia, Centre of Excellence for Renewable and Hydrogen Energy, The University of Belgrade, POB 522, 11000 Belgrade, Republic of Serbia, <sup>2</sup>Institute of Technical Sciences of SASA, Knez Mihajlova 35/IV, 11000 Belgrade, Republic of Serbia, <sup>3</sup>Ministry of Capital Investments, The Government of Montenegro, Directorate for Energy and Energy Efficiency, Podgorica, Montenegro

### **11.30 – 11.45 Temperature dependence of electric properties of GO and GO/WPA films on interdigital electrodes**

Željko Mravik<sup>1</sup>, Milica Pejčić<sup>2</sup>, Marija Grujičić<sup>2</sup>, Jelena Rmuš Mravik<sup>1</sup>, Miša Stević<sup>3</sup>, Zoran Stević<sup>4,5</sup>, Zoran Jovanović<sup>1</sup>

<sup>1</sup>*Center of Excellence for Hydrogen and Renewable Energy (CONVINCE), Laboratory of Physics, Vinča Institute of Nuclear Sciences, University of Belgrade, P.O. Box 522, 11001 Belgrade, Serbia,* <sup>2</sup>*Laboratory of Physics, Vinča Institute of Nuclear Sciences, University of Belgrade, P.O. Box 522, 11001 Belgrade, Serbia,* <sup>3</sup>*Elsys Eastern Europe, Omladinskih Brigada 90e, 11070 Belgrade, Serbia,* <sup>4</sup>*Technical faculty in Bor, University of Belgrade, 19210 Bor, Serbia,* <sup>5</sup>*School of Electrical Engineering, University of Belgrade, Bulevar kralja Aleksandra 73, 11120 Belgrade, Serbia*

**11.45 – 12.00 Electrochemically exfoliated graphene as support of platinum nanoparticles for methanol oxidation reaction and hydrogen evolution reaction**

Jelena P. Georgijević, Irina Srejić, Mirjana Novaković, Lazar Rakočević, Jelena Potočnik, Aleksandar Maksić

*Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, P.O. Box 522, Belgrade, 11001, Serbia*

**12.00 – 12.15 ZnO@RuO<sub>2</sub> composites: Cost-effective trifunctional electrocatalysts for enhanced OER, HER, and ORR activities in water electrolysis**

Katarina Aleksić<sup>1</sup>, Ivana Stojković Simatović<sup>2</sup>, Smilja Marković<sup>1</sup>

*<sup>1</sup>Institute of Technical Sciences of SASA, Belgrade, Serbia, <sup>2</sup>Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia*

**12.15 – 12.30 Investigating the influence of hydrothermal treatment on oxygen functional groups in graphene oxide-based nanocomposites**

Milica Pejčić<sup>1</sup>, Željko Mravik<sup>1</sup>, Danica Bajuk-Bogdanović<sup>2</sup>, Marija Grujičić<sup>1</sup>, Jelena Rmuš Mravik<sup>1</sup>, Sonja Jovanović<sup>1</sup>, Zoran Jovanović<sup>1</sup>

*<sup>1</sup>Laboratory of Physics, Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, <sup>2</sup>Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia*

**12.30 – 12.45 Enhanced electrochemical detection of gallic acid using modified glassy carbon electrodes with Zn/Ga-doped cobalt ferrite**

Marija Grujičić<sup>1</sup>, Marko Jelić<sup>1</sup>, Ivana Stojković Simatović<sup>2</sup>, Danica Bajuk Bogdanović<sup>2</sup>, Darija Petković<sup>1</sup>, Zoran Jovanović<sup>1</sup>, Sonja Jovanović<sup>1</sup>

*<sup>1</sup>Laboratory of Physics, Vinča Institute of Nuclear Sciences – National institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, <sup>2</sup>Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia*

**12.45 – 13.45 Lunch break**

**13.45 – 15.15 8<sup>th</sup> Session – Nanostructured Materials II**  
**Chairpersons: Dr. Ana Stanković and Tijana Stamenković**

**13.45 – 14.00 Yb<sup>3+</sup>/Tm<sup>3+</sup> doped SrGd<sub>2</sub>O<sub>4</sub> as photoluminescent and photocatalytic material**

Tijana Stamenković<sup>1</sup>, Marjan Randelović<sup>2</sup>, Ivana Dinić<sup>3</sup>, Lidija Mančić<sup>3</sup>, Vesna Lojpur<sup>1</sup>  
<sup>1</sup>*Department of Atomic Physics, Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, P.O. Box 522, 11001 Belgrade, University of Belgrade, Serbia,* <sup>2</sup>*Faculty of Science and Mathematics, University of Niš, Niš, Serbia,* <sup>3</sup>*Institute of Technical Science of SASA, Knez-Mihailova 35/4, Belgrade, Serbia*

#### **14.00 – 14.15 Physicochemical characterization of mechanochemically activated pyrophyllite/Ag composites**

Sara Mijaković, Jasmina Grbović Novaković, Katarina Tošić, Andela Mitrović Rajić, Bojana Paskaš Mamula, Ana Vujačić Nikezić

*Centre of Excellence for Renewable and Hydrogen Energy, “Vinča” Institute of Nuclear Sciences, National Institute of Republic of Serbia, University of Belgrade, POB 522, 11000 Belgrade*

#### **14.15 – 14.30 Measurement of EMI shielding performance of graphene oxide – silver nanoparticles composites**

Anđela Stefanović<sup>1,2</sup>, Dejan Kepić<sup>1</sup>, Svetlana Jovanović Vučetić<sup>1</sup>, Kamel Haddadi<sup>3</sup>, Biljana Todorović Marković<sup>1</sup>

<sup>1</sup>*Vinča Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade P.O. Box 522, 11000 Belgrade, Serbia,* <sup>2</sup>*Faculty of Chemistry, University of Belgrade, Studentski trg 12-16, 11158, Belgrade, Serbia,* <sup>3</sup>*University of Lille, CNRS, Centrale Lille, University Polytechnique Hauts-de-France, UMR 8520-IEMN, F-59000 Lille, France*

#### **14.30 – 14.45 Plasmon induced enhancement of photoinduced antibacterial activity of graphene quantum dots**

Slađana Dorontić, Svetlana Jovanović, Biljana Todorović Marković

*„Vinča”-Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade P.O. Box 522, 11000 Belgrade, Serbia*

#### **14.45 – 15.00 Innovative modifications of graphene quantum dots for improved photodynamic therapy in antibacterial treatment**

Mila Milenković, Slađana Dorontić, Biljana Todorović Marković, Svetlana Jovanović

*Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, P.O. Box 522, 11000 Belgrade, Serbia*

#### **15.00 – 15.15 Enhanced photocatalytic performance of BaTiO<sub>3</sub>/MoO<sub>3</sub>/Ag ternary heterostructure**

Kevin V. Alex<sup>1,2</sup>, Jose P. B. Silva<sup>3</sup>, K. Kamakshi<sup>4</sup>, K. C. Sekhar<sup>1</sup>

<sup>1</sup>*Department of Physics, School of Basic and Applied Sciences, Central University of Tamil Nadu, Thiruvavur, 610-005, India,* <sup>2</sup>*International & Inter University Centre for Nanoscience & Nanotechnology, Mahatma Gandhi University, Kottayam, 686-560, India,* <sup>3</sup>*Physics Center of Minho and Porto Universities (CF-UM-UP), University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal,* <sup>4</sup>*Department of Science and Humanities, Indian Institute of Information Technology, Thiruchirapalli, 620-012, India*



## 15.15 – 15.30 Break

### 15.30– 17.15 9<sup>th</sup> Session – Nanostructured Materials III

Chairpersons: Dr. Ivana Dinić and Marko Jelić

#### 15.30 – 15.45 Thin film deposition of multilayers on silicon substrate laser pre-patterned

Nevena Božinović, Suzana Petrović, Mirjana Novaković, Vladimir Rajić

*Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, P.O. Box 522, Belgrade, 11001, Serbia*

#### 15.45 – 16.00 UV protection with novel porous organosilica nanoparticles

Aleksandra Pavlović<sup>1</sup>, Nikola Knežević<sup>1</sup>, Irena Miler<sup>1</sup>, Mihailo Rabasović<sup>2</sup>

*<sup>1</sup>Institute BioSense, University of Novi Sad, Serbia, <sup>2</sup>Institute of Physics, Belgrade*

#### 16.00 – 16.15 Photoelectrochemical water oxidation properties of bismuth vanadate photoanode irradiated by swift heavy ions

Marko Jelić<sup>1</sup>, Ekaterina Korneeva<sup>2</sup>, Nikita Kirilkin<sup>2</sup>, Tatiana Vershinina<sup>2</sup>, Oleg Orelovich<sup>2</sup>, Vladimir Skuratov<sup>2</sup>, Zoran Jovanović<sup>1</sup>, Sonja Jovanović<sup>1</sup>

*<sup>1</sup>Laboratory of Physics, Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, <sup>2</sup>Joint Institute for Nuclear Research, Dubna, Russia*

#### 16.15 – 16.30 Improvement of Au-poly(N-isopropylacrylamide) hydrogel nanocomposites: Single-layer vs. bi-layered systems

Nikolina Nikolić, Jelena Spasojević, Una Stamenović, Vesna Vodnik, Ivana Vukoje, Zorica Kačarević-Popović, Aleksandra Radosavljević

*Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia*

#### 16.30 – 16.45 Radiological and structural analysis of aluminosilicate materials incorporated with samarium (III)-oxide

Sanja Knežević<sup>1</sup>, Miloš Nenadović<sup>2</sup>, Jelena Potočnik<sup>2</sup>, Danilo Kisić<sup>2</sup>, Milica Rajačić<sup>3</sup>, Snežana Nenadović<sup>1</sup>, Marija Ivanović<sup>1</sup>

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#### 16.45 – 17.00 Comparison of the conventional and green microemulsion synthesis of the manganese oxide nanoparticles

Tatjana Baljak<sup>1</sup>, Stéphane Pronier<sup>2</sup>, Celine Fontaine<sup>2</sup>, Ranka Šatara<sup>1</sup>, Radojka Jandrić<sup>1</sup>, Slađana Četojević<sup>1</sup>, Smiljana Paraš<sup>1</sup>, Suzana Gotovac Atlagić<sup>1</sup>

<sup>1</sup>University of Banja Luka, Faculty of Natural Sciences, Chemistry Department, Mladena Stojanovića 2, 78000, Banja Luka, Republic of Srpska, Bosnia and Herzegovina, <sup>2</sup>Université de Poitiers, Institut de Chimie des Milieux et Matériaux de Poitiers (IC2MP), 86073 Poitiers Cedex 9, France

**17.00 – 17.15 Preparation of dispersion strengthened nanocomposite with Al<sub>2</sub>O<sub>3</sub> and MgO particles by spark plasma sintering**

František Kromka<sup>1</sup>, Juraj Szabó<sup>1</sup>, Ondrej Milkovič<sup>1</sup>, Katarína Ďurišínová<sup>1</sup>, Nebojša Labus<sup>2</sup>

<sup>1</sup>Slovak Academy of Sciences, Institute of Materials Research, Košice, Slovak Republic, <sup>2</sup>Institute of Technical Sciences of SASA, Belgrade, Serbia

**Friday, December 1, 2023**

**09.00 – 10.30 10<sup>th</sup> Session – New Synthesis and Processing Methods I**

**Chairpersons: Dr. Sonja Jovanović and Dr. Konrad Terpilowski**

**09.00 – 09.15 Properties of polymer/MXene nanocomposite films**

Ivan Pešić<sup>1</sup>, Sanja Ostojić<sup>2</sup>, Miloš Petrović<sup>3</sup>, Dana Vasiljević Radović<sup>1</sup>, Milena Rašljić Rafajilović<sup>1</sup>, Vesna Radojević<sup>3</sup>, Marija V. Pergal<sup>1</sup>

<sup>1</sup>University of Belgrade, Institute of Chemistry, Technology and Metallurgy, Njegoseva 12, 11000, Belgrade, Serbia, <sup>2</sup>Institute of General and Physical Chemistry, University of Belgrade, Studentski trg 12-16, 11000, Belgrade, Serbia, <sup>3</sup>Faculty of Technology and Metallurgy, University of Belgrade, Karnegijeva 4, 11000 Belgrade, Serbia

**09.15 – 09.30 “Green” synthesis of silver nanoparticles and their biosafety**

Konrad Terpilowski<sup>1</sup>, K. Dybkova<sup>2</sup>, O. Goncharuk<sup>2,3</sup>, L. Rieznichenko<sup>2</sup>, T. Gruzina<sup>2</sup>, S. Dybkova<sup>2,3</sup>

<sup>1</sup>Maria Curie-Skłodowska University, Poland, <sup>2</sup>F.D. Ovcharenko Institute of biocolloidal chemistry of NAS of Ukraine, 42 Vernadskogo Ave., Kyiv 03142, Ukraine, <sup>3</sup>Institute of Agrophysics, Polish Academy of Sciences, Doświadczalna 4, 20-290 Lublin, Poland

**09.30 – 09.45 PLD growth of strontium titanate thin films on SrO-deoxidized and rGO-buffered Si(001) substrate**

Darija Petković<sup>1</sup>, Hsin Chia-Ho<sup>2</sup>, Urška Trstenjak<sup>2</sup>, Janez Kovač<sup>3</sup>, Damjan Vengust<sup>2</sup>, Matjaž Spreitzer<sup>2</sup>, Zoran Jovanović<sup>1</sup>

<sup>1</sup>Laboratory of Physics, Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, Belgrade, Serbia, <sup>2</sup>Advanced Materials Department, Jožef Stefan Institute, Ljubljana, Slovenia, <sup>3</sup>Department of Surface Engineering, Jožef Stefan Institute, Ljubljana, Slovenia

**09.45 – 10.00 Study of abnormal grain growth in cold-rolled AA5182 Al-Mg alloy**

M. Ghulam Isaq Khan<sup>1</sup>, Filip Rajković<sup>2</sup>, Miljana Popović<sup>1</sup>, Dejan Prelević<sup>2</sup>, Aleksandar Čitić<sup>3</sup>, Tamara Radetić<sup>1</sup>

<sup>1</sup>Faculty of Technology & Metallurgy, University of Belgrade, Serbia, <sup>2</sup>Faculty of Mining & Geology, University of Belgrade, Serbia, <sup>3</sup>Military-Technical Institute, Belgrade, Serbia

**10.00 – 10.15 Analysis of the change in structural parameters of mechanically alloyed Cu composite materials using different milling methods**

Marko Simić<sup>1</sup>, Emilija Nidžović<sup>1</sup>, Željko Radovanović<sup>2</sup>, Jovana Ružić<sup>1</sup>

<sup>1</sup>Department of Materials, “Vinča” Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, <sup>2</sup>Faculty of Technology and Metallurgy, University of Belgrade

**10.15 – 10.30 Synthesis and high-temperature / high-pressure exposure of compositionally complex rock-salt-type transitional metal (carbo)nitrides**

Dharma Teja Teppala<sup>1</sup>, Shrikant Bhat<sup>2</sup>, Leonard Keil<sup>1</sup>, Jan Bernauer<sup>1</sup>, Johannes Peter<sup>3</sup>, Hans-Joachim Kleebe<sup>3</sup>, Emanuel Ionescu<sup>1,4</sup>

<sup>1</sup>Institute for Material Science, Technical University of Darmstadt, 64287 Darmstadt, Germany, <sup>2</sup>Photon Science, DESY, 22607 Hamburg, Germany, <sup>3</sup>Institute for Applied Geosciences, Technical University of Darmstadt, 64287 Darmstadt, Germany, <sup>4</sup>Fraunhofer IWKS, Brentanostrasse 2a, 63755 Alzenau, Germany

**10.30 – 10.45 Break**

**10.45 – 12.15 11<sup>th</sup> Session – New Synthesis and Processing Methods II**  
**Chairpersons: Dr. Miloš Milović and Katarina Rondović**

**10.45 – 11.00 Metabolic insights through nondestructive monitoring: A case study on *Vriesea carinata***

Sara V. Ristić, Anđelija N. Mladenović, Gorana D. Madžarević, Marija M. Petković Benazzouz, Katarina M. Miletić

*Faculty of Physics, University of Belgrade, Belgrade, Serbia*

**11.00 – 11.15 Continuous monitoring of leaf optical properties for the early pathogen detection in sweet chestnut**

Anđelija N. Mladenović, Gorana D. Madžarević, Sara V. Ristić, Marija M. Petković Benazzouz, Katarina M. Miletić

*Faculty of Physics, University of Belgrade, Belgrade, Serbia*

**11.15 – 11.30 Real-time detection of early signs of Mg and N deficiency in hydroponically grown *Ocimum basilicum*: An innovative optical approach with nutrient recovery insights**

Gorana D. Madžarević, Anđelija N. Mladenović, Sara V. Ristić, Marija M. Petković Benazzouz, Katarina M. Miletić

*Faculty of Physics, University of Belgrade, Belgrade, Serbia*

**11.30 – 11.45 Generating mesoporosity in zeolite 13X by applying mild alkaline treatment with urea solution**

Katarina Rondović<sup>1</sup>, Vladislav Rac<sup>2</sup>, Vesna Rakić<sup>2</sup>, Igor Pašti<sup>1</sup>, Ljiljana Damjanović-Vasilčić<sup>1</sup>  
<sup>1</sup>University of Belgrade, Faculty of Physical Chemistry, Belgrade, Serbia, <sup>2</sup>University of Belgrade, Faculty of Agriculture, Belgrade, Serbia

**11.45 – 12.00 A fast and efficient synthesis of gamma rays dosimeters based on metalophthalocyanines**

Daliborka Odošić<sup>1</sup>, Bojana Vasiljević<sup>2</sup>, Dragana Marinković<sup>2</sup>  
<sup>1</sup>Faculty of Physical Chemistry, University of Belgrade, Studentski trg 12-16, 11000 Belgrade, Serbia, <sup>2</sup>Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, University of Belgrade, P. O. Box 522, 11000 Belgrade, Serbia

**12.00 – 12.15 The influence of the pre-deformation and post-deformation process on hardness and microstructure of the the EN AW-7075 aluminum alloy**

Avram S. Kovačević  
*University of Belgrade, Technical faculty in Bor, Bor, Serbia*

**12.15 – 13.00 Lunch break**

**13.00 – 14.30 12<sup>th</sup> Session – Materials for High-technology Application I  
Chairpersons: Dr. Zoran Jovanović and Ljubinka Vasić**

**13.00 – 13.15 Utilization of carbon fiber in the context of microbial fuel cell systems**

Kristina Joksimović<sup>1</sup>, Aleksandra Žerađanin<sup>1</sup>, Branka Lončarević<sup>1</sup>, Marija Lješević<sup>1</sup>, Danijela Randjelović<sup>1</sup>, Vladimir Beškoski<sup>2</sup>  
<sup>1</sup>University of Belgrade, Institute for chemistry, metallurgy and technology, National Institute of the Republic of Serbia, Njegoševa 12, Belgrade, <sup>2</sup>University of Belgrade, Faculty of chemistry, Studentski trg 12-16, Belgrade, Serbia

**13.15 – 13.30 Polycrystalline nickel modified with rhodium as an effective electrocatalyst for hydrogen-based energy conversion technologies**

Ljubinka Vasić, Nikola Tričković, Zaharije Bošković, Aleksandar Z. Jovanović, Igor A. Pašti  
*University of Belgrade – Faculty of Physical Chemistry, Belgrade, Serbia*

**13.30 – 13.45 Perspective of Ni-Sn modified Ni foams in industrial scale alkaline water electrolysis**

Jelena Gojčić<sup>1</sup>, Aleksandar Petričević<sup>1</sup>, Mila Krstajić Pajić<sup>1</sup>, Thomas Rauscher<sup>2</sup>, Christian Immanuel Bernaecker<sup>2</sup>, Vladimir Jović<sup>3</sup>  
<sup>1</sup>University of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4, 11000 Belgrade, Serbia, <sup>2</sup>Fraunhofer Institute for Manufacturing Technology and Advanced Materials IFAM, Branch Lab Dresden, Winterbergstraße 28, 01277 Dresden, Germany,

<sup>3</sup>*University of Belgrade, Institute for Multidisciplinary Research, Kneza Višeslava 1, 11030 Belgrade, Serbia*

#### **13.45 – 14.00 Ni-MoO<sub>2</sub> as electrocatalyst for hydrogen evolution reaction**

A. Petricevic<sup>1</sup>, Jelena Gojic<sup>1</sup>, Mila Krstajic Pajic<sup>1</sup>, T. Rauscher<sup>2</sup>, Christian Immanuel Bernaecker<sup>2</sup>, Vladimir Jovic<sup>3</sup>

<sup>1</sup>*University of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4, 11000*

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<sup>3</sup>*University of Belgrade, Institute for Multidisciplinary Research, Kneza Višeslava 1, 11030 Belgrade, Serbia*

#### **14.00 – 14.15 The influence of ZnCl<sub>2</sub> on the capacitance of hydrothermally synthesized vine shoots-derived carbon**

Minea Kapidžić<sup>1</sup>, Jana Mišurović<sup>1</sup>, Veselinka Grudić<sup>1</sup>, Milica Vujković<sup>2</sup>

<sup>1</sup>*University of Montenegro – Faculty of Metallurgy and Technology, Cetinjski put bb, 81000 Podgorica, Montenegro,* <sup>2</sup>*University of Belgrade – Faculty of Physical Chemistry, Studentski trg 12-16, 11158, Belgrade, Serbia*

#### **14.15 – 14.30 Hydrothermal carbonization of olive mill waste to electrode materials**

Sonja Kastratović<sup>1</sup>, Minea Kapidžić<sup>1</sup>, Danilo Marković<sup>1</sup>, Veselinka Grudić<sup>1</sup>, Milica

Vujković<sup>2</sup>, Jana Mišurović<sup>1</sup>

<sup>1</sup>*University of Montenegro, Faculty of Metallurgy and Technology, Cetinjski put 2, 81000,*

*Podgorica, Montenegro,* <sup>2</sup>*University of Belgrade – Faculty of Physical Chemistry, Studentski trg 12-16, 11158, Belgrade, Serbia*

#### **14.30 – 14.45 Break**

#### **14.45 – 16.15 13<sup>th</sup> Session – Materials for High-technology Application II**

**Chairpersons: Dr. Marina Vuković and Natalia Majewska**

#### **14.45 – 15.00 Environmentally friendly cell with a rechargeable CF/AgCl-PPy cathode**

Aleksandra S. Popović, Branimir N. Grgur

*TMF, University of Belgrade, Serbia, Karnegijeva 4*

#### **15.00 – 15.15 The effect of homogenization conditions on microstructure and recrystallization behavior of AA5182 alloy**

Aleksandar Ćitić<sup>1</sup>, Miljana Popović<sup>2</sup>, Tamara Radetić<sup>2</sup>, Muhamad Ghulam Isaq Khan<sup>2</sup>

<sup>1</sup>*Military-technical Institute, Belgrade, Serbia,* <sup>2</sup>*Faculty of Technology and Metallurgy, University of Belgrade, Serbia*

#### **15.15 – 15.30 Geopolymerisation of the kaolin from Bosnia and Herzegovina: Synthesis, characterization and potential application in high-tech ceramics**

Marija Stojaković<sup>1</sup>, Sunčica Sukur<sup>1</sup>, Elvir Babajić<sup>2</sup>, Esad Salčin<sup>3</sup>, Zvezdana Sandić<sup>1</sup>, Ferenc Madai<sup>4</sup>, Viktor Madai<sup>4</sup> and Suzana Gotovac Atlagić<sup>1</sup>

<sup>1</sup>University of Banja Luka, Faculty of Natural Sciences and Mathematics, Mladena Stojanovića 2, 78 000 Banja Luka, Bosnia and Herzegovina, <sup>2</sup>University of Tuzla, Faculty of Mining, Geology and Civil Engineering, Univerzitetska 2, Tuzla 75000, Bosnia and Herzegovina, <sup>3</sup>Ministry of Energy and Mining of Republic of Srpska, Trg Republike Srpske 1, 78 000 Banja Luka, Bosnia and Herzegovina, <sup>4</sup>University of Miskolc, Institute of Mineralogy and Geology, H-3515 Miskolc Egyetemváros, Hungary

### **15.30 – 15.45 Dependence of alumina/ascorbate oxidase biosensor electrocatalytic activity on alumina type**

Barbara Ramadan<sup>1</sup>, Sonja Novaković<sup>1</sup>, Miloš Mojović<sup>1</sup>, Zorica Mojović<sup>2</sup>

<sup>1</sup>University of Belgrade Faculty of Physical Chemistry, Studentski trg 12-16, Belgrade, Republic of Serbia, <sup>2</sup>University of Belgrade – Institute of Chemistry, Technology and Metallurgy, Department of Catalysis and Chemical Engineering, Njegoševa 12, Belgrade, Republic of Serbia

### **15.45 – 16.00 Influence of chemical and mechanical pressure on luminescence properties of Cr<sup>3+</sup>-activated near-infrared phosphors**

Natalia Majewska<sup>1</sup>, Ru-Shi Liu<sup>2</sup>, Sebastian Mahlik<sup>1,3</sup>

<sup>1</sup>Institute of Experimental Physics, Faculty of Mathematics, Physics and Informatics, University of Gdansk, Wita Stwosza 57, 80-308 Gdansk, Poland, <sup>2</sup>Department of Chemistry, National Taiwan University, Taipei 106, Taiwan, <sup>3</sup>International Centre for Theory of Quantum Technologies (ICTQT), University of Gdansk, 80-308 Gdańsk, Poland

### **16.00 – 16.15 Utilizing absorption spectroscopy for investigating radiochromic films in radiation dosimetry**

Stevan Pecić<sup>1</sup>, Miloš Vičić<sup>1</sup>, Ivan Belča<sup>1</sup>, Ljubomir Kurij<sup>2</sup>, Strahinja Stojadinović<sup>3</sup>, Slobodan Dević<sup>4</sup>

<sup>1</sup>Faculty of Physics, Belgrade, Serbia, <sup>2</sup>University Clinical Center of Serbia, Belgrade, Serbia, <sup>3</sup>University of Texas Southwestern Medical Center, Dallas TX, USA, <sup>4</sup>McGill University, Montreal, Canada

### **16.15 – 16.30 Break**

### **16.30 – 17.45 14<sup>th</sup> Session – Materials for High-technology Application III and Materials for New Generation Solar Cells**

**Chairpersons: Dr. Vuk Radmilović and Dr. Lazar Rakočević**

### **16.30 – 16.45 Characterization and hydrogen evolution on Pt/nanoplatelets**

Lazar Rakočević<sup>1</sup>, Jelena Golubović<sup>2</sup>, Vladimir Rajić<sup>1</sup>, Svetlana Štrbac<sup>2</sup>

<sup>1</sup>INN Vinca, Laboratory of Atomic Physics, University of Belgrade, Serbia, Mike Alasa 12-14, 11001 Belgrade, Serbia, <sup>2</sup>Institute of Chemistry, Technology and Metallurgy, Department of Electrochemistry, University of Belgrade, Njegoševa 12, 11000 Belgrade, Serbia

**16.45 – 17.00 Investigation of varied dip-coating methods for the deposition of TiO<sub>2</sub> blocking layer of the photoanode of Dye-Sensitized Solar Cells**

Evgenija Milinković, Vladislav Jovanov and Katarina Cvetanović

*Department of Microelectronic Technologies, Institute of Chemistry Technology and Metallurgy, National Institute of the Republic of Serbia, University of Belgrade, Njegoseva 12, 11000 Belgrade, Serbia*

**17.00 – 17.15 Spin-coated TiO<sub>2</sub> thin films: Fabrication and characterization study**

Nastasija Conic<sup>1,2</sup>, Evgenija Milinkovic<sup>3</sup>, Vladislav Jovanov<sup>3</sup>, Jovana Gojanovic<sup>1</sup>

*<sup>1</sup>University of Belgrade, School of Electrical Engineering, Bulevar kralja Aleksandra 73, 11120 Belgrade, Serbia, <sup>2</sup>University of Belgrade, Faculty of Physics, Studentski trg 12, 11001 Belgrade, Serbia, <sup>3</sup>University of Belgrade, Institute of Chemistry, Technology and Metallurgy, Department of Microelectronic Technologies, Njegoševa 12, 11000 Belgrade, Serbia*

**17.15 – 17.30 Metal complexes as potential new materials for dye-sensitized solar cells – Synthesis and characterization of Zn(II) complex with asymmetric Schiff base of 2,6-diacetylpyridine**

Marijana S. Kostić, Vukadin M. Leovac, Milica G. Bogdanović, Marko V. Rodić, Mirjana M. Radanović

*University of Novi Sad, Faculty of Sciences, Novi Sad, Serbia*

**17.30 – 17.45 The analysis of roof-integrated PV plant with the possible usage of battery energy storage system**

Đorđe Jovanović<sup>1</sup>, Branislav Milenković<sup>2</sup>

*<sup>1</sup>Mathematical Institute of SASA, Department of Computer Sciences, Kneza Mihaila 36, Belgrade, Faculty of Applied Sciences, Department of Mechanical Engineering, Dušana Popovića 22a, Niš*

**18.00 Closing Ceremony**



3-1

**Nanofabrication and characterisation of magnetic Fe<sub>3</sub>O<sub>4</sub> nanostructures for potential environmental and biomedical applications**

Dušan Milojkov<sup>1</sup>, Ana Mraković<sup>2</sup>, Gvozden Jovanović<sup>1</sup>, Nikola Vuković<sup>1</sup>,  
Mladen Bugarčić<sup>1</sup>, Anja Antanasković<sup>1</sup>, Vukosava Živković-Radovanović<sup>3</sup>

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Magnetic iron oxide nanomaterials, which enable a multitude of uses, are given special focus in the fields of biomedicine and environmental protection. The detection, sorption, and/or degradation of inorganic (lead, chromium, arsenic, and cadmium), organic (dyes, pharmaceuticals, pesticides, phenols, and benzene), and biological (viruses and bacteria) pollutants can all be effectively accomplished with the use of magnetic nanoparticles. Magnetic iron oxide nanomaterials are in particular focus for use as hyperthermia media in cancer treatment and as magnetic resonance imaging (MRI) contrast agents. The possibility of magnetic separation of such materials, due to their essential properties under the influence of an external magnetic field, reduces production costs and also prevents the production and accumulation of toxic waste. Among the many metal oxide nanomaterials, magnetite (Fe<sub>3</sub>O<sub>4</sub>) and maghemite (γ-Fe<sub>2</sub>O<sub>3</sub>) are currently the only two magnetic materials approved by the US Food and Drug Administration (FDA) for human use as iron deficiency therapeutics and as contrast agents for MRI. Here, we synthesized nanoparticles of magnetite (Fe<sub>3</sub>O<sub>4</sub>) by the method of reduction-precipitation and characterized. Additionally, potential binding of brilliant green dye on Fe<sub>3</sub>O<sub>4</sub> and construction of innovative magnetic composite was investigated. The physicochemical features were explored using X-ray diffraction (XRD), Fourier-transform infrared spectroscopy (FTIR), and field emission scanning electron microscopy (FESEM). XRD analysis confirms formation of the crystal phase of magnetite. The presence of magnetite nanoparticles is shown by typical groups for the peaks of iron compounds at a lower wavelength ( $\leq 700 \text{ cm}^{-1}$ ) that are characteristic of the Fe-O bond. Morphological analyzes with FESEM showed that magnetite is a composite of nanospheres and nanorods that provide a large surface area. Dye binding study was performed using UV-visible and FTIR spectrometer.