

TWENTY-SECOND ANNUAL CONFERENCE

YUCOMAT 2021

Program

and

Book of Abstracts

endorsed by

FEMS

FEDERATION OF EUROPEAN
MATERIALS SOCIETIES

SERBIA
MRS

Materials Research
Society of Serbia



TWENTY-SECOND ANNUAL CONFERENCE

YUCOMAT 2021

Hunguest Hotel Sun Resort, Herceg Novi, Montenegro

August 30 - September 3, 2021

<http://www.mrs-serbia.org.rs>

Program and Book of Abstracts

Organised by:

Materials Research Society of Serbia

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WELCOME SPEECH BY THE PRESIDENT OF MRS-SERBIA

Dear Attendees,



It is my great pleasure to greet you on behalf of the Conference hosts and wish you a solid program, lots of happiness and good health, which we all need in these times. Not a single prior YUCOMAT Conference has been organized with as much uncertainties as this one. Some remember the Third YUCOMAT Conference held right after the NATO bombing of Serbia and Montenegro, which lasted from the end of March 1999 until mid-June that same year. That Conference was held with a single foreign participant – Giovanni Battiston, CNRS, Padua, Italy, who said back then, “I promised that I would come and now I am here”. Last year was the first one to have a YUCOMAT Conference cancelled, not long before it was scheduled to be held,

after it was clear that the risk for the participants would be too large.

As we reached the 100th submission during June and July this year, we decided that the Conference should be organized, hoping that the positive epidemiological situation would continue throughout the summer and that all of us would do it all to respect the measures in place. A number of plenary lecturers had to cancel their lectures and postpone them for the next year (YUCOMAT, August 29 – September 2, 2022), considering the travel limitations in many countries. There are still around 10 plenary lecturers in the Program, some of whom would talk here and some of whom sent their presentations, which are posted on the MRS webpage. Out of 100 authors who will present their research orally and via posters, the majority are from Serbia, around 30 %, followed by participants from Poland, Czech Republic, Slovenia and Russia, accounting for about 40 % in total, whereas no other country has more than 3-4 participants. The coronavirus has done its fair share and as a result we have a very different structure compared to earlier years, when the predominant participants were from USA, Korea, Taiwan and the Far East.

After five winners of the Big Award of our Society for the lasting and outstanding contribution to materials science who originated from the region of former Yugoslavia, the last year's winner was Robert Sinclair, Charles M. Piggot Professor in the School of Engineering at Stanford and the first the win this award after its internationalization and opening to all our members. Robert Sinclair gave a significant contribution to our field and our Society as a long-term President of the International Advisory Board and a participant at all recent YUCOMAT Conferences. Since the last year's Conference was not held and was postponed and since Bob could not attend this year's conference, he sent his talk and the certificate and the medal will be given to him next year. This year's winner of the Award is Prof. Yuri Gogotsi, director of the Drexel Nanotechnology Institute, for his contribution to the field of nonoxide materials with a special emphasis on MAXene family of 2D metal carbides and carbonitrides and a long-term successful cooperation with our country through MRS-Serbia and the International Institute for the Science of Sintering. The decision for both winners is found in the Program and the Book of Abstracts.

One of the very important activities of our Society since its beginning was the recognition of the young researchers as Conference participants. As of this year, MRS – Singapore as one of the most active MRS in the world and the one which will be the headquarters of the International Union of MRS (IUMRS) has joined us in the financial segment of this award. Tuesday will be dedicated to this activity and 20 young people will compete for the best oral presentation, whereas in the afternoon 20 of them will compete for the best poster presentation. In both cases we will select 5 best presenters and their names will be announced on Friday at the Conference Closing, whereas the certificates and the financial rewards will be handed to them at the opening of the first following Conference.

This is Tenth YUCOMAT Conference to be held in this Hunguest Sun Resort Hotel. At this very same location, which used to be the Nuclear Center belonging to the Nuclear Commission of former Yugoslavia, starting from 1969, the World Round Table Conferences of Sintering were held, where, just like today, world-renowned scientists from both West and East used to congregate. In the Iron Curtain era, in fact, it was the only place where they could meet. This part of Herceg-Novi is called Topla and some of the most intellectual people from this region have occasioned it. Our famous poet and statesman, Petar II Petrović Njegoš, for example, was educated in a little house near the Church of Saint George, not far from here, whereas directly on the opposite side our Nobel Laureate in literature, Ivo Andrić, used to live and work. Our hosts at the Hunguest Hotel maintain the memory of those people and those times by helping us organize these conferences. There is a lot of examples of their highly positive attitude toward this meeting, including the traditional cocktail party they organize on Monday evening, which is always memorable. I hope that this Conference will also go well and will be worth remembering and that we will all happily and healthily return to our homes from it.

Sincerely Yours,
Dragan Uskoković

2020 MRS-SERBIA AWARD FOR A LASTING AND OUTSTANDING CONTRIBUTION TO MATERIALS SCIENCE AND ENGINEERING

We are pleased to announce that the laureate of the **2020 MRS-Serbia Award for a Lasting and Outstanding Contribution to Materials Science and Engineering** is

Prof. Robert Sinclair of the Stanford University, California, USA.



He is awarded for his contribution to electron microscopy applied to materials science and engineering.

This is the decision of the MRS-Serbia Executive Board:
The Executive Board of the MRS-Serbia Presidency, at their meeting on March 30th, 2020, considered the submitted nomination for the MRS-Serbia's 2020 Award for a Lasting and Outstanding Contribution to Materials Science and Engineering and concluded that the procedure was conducted in accordance with the Awarding Rulebook, that the Call was announced on the MRS-Serbia's website on January 1, 2020, and that in the stipulated period of 45 days only one nomination was submitted.

Having received the opinion from the Expert Committee members, Prof. Dr. Ivan Božović (2015 Laureate), Prof. Dr. Gordana Vunjak-Novaković (2016 Laureate), Prof. Dr. László Forró (2018 Laureate) and Prof. Dr. Danilo Suvorov (2019 Laureate), the Executive Board of the MRS-Serbia Presidency took the decision that Prof. Robert Sinclair should be granted MRS-Serbia's 2020 Award for a Lasting and Outstanding Contribution to Materials Science and Engineering.

Prof. Sinclair was nominated by Prof. Dr. Velimir Radmilović, strongly supported by Dr. Slobodan Milonjić, Prof. Dr. Đorđe Janačković, Prof. Dr. Petar Uskoković, Prof. Dr. Nenad Ignjatović, Dr. Smilja Marković, Prof. Dr. Dejan Raković.

Prof. Robert Sinclair's invited plenary lecture "In situ High Resolution Electron Microscopy of Material Reactions, at the Atomic Level" will be presented during the Opening Ceremony of the 22nd MRS-Serbia Annual Conference YUCOMAT 2021, as a Virtual Lecture, starting at 9.00 a.m. on Monday, August 30, 2021.

President of MRS-Serbia, Prof. Dr. Dragan Uskoković
Vice-President of MRS-Serbia, Dr. Slobodan Milonjić
Vice-President of MRS-Serbia, Prof. Dr. Velimir Radmilović
Vice-President of MRS-Serbia, Prof. Dr. Dejan Raković

2021 MRS-SERBIA AWARD FOR A LASTING AND OUTSTANDING CONTRIBUTION TO MATERIALS SCIENCE AND ENGINEERING

We are pleased to announce that the laureate of the **2021 MRS-Serbia Award for a Lasting and Outstanding Contribution to Materials Science and Engineering** is

Prof. Yury Gogotsi of the Drexel University, Philadelphia, USA.



He is awarded for his contributions to the field of non-oxide nanomaterials and specially MXene family of compounds.

This is the decision of the MRS-Serbia Executive Board:

The Executive Board of the MRS-Serbia Presidency, at their meeting on March 13th, 2021, considered the submitted nomination for the MRS-Serbia's 2021 Award for a Lasting and Outstanding Contribution to Materials Science and Engineering and concluded that the procedure was conducted in accordance with the Awarding Rulebook, that the Call was announced on the MRS-Serbia's website on January 1st, 2021, and that in the stipulated period of 45 days only one nomination was submitted.

Having received the opinion from the Expert Committee members: Prof. Dragan Uskokovic (President of MRS-Serbia), Prof. Robert Sinclair (Chair of YUCOMAT Conferences International Advisory Board and as 2020 Laureate), Prof. Dejan Rakovic (Vice-President of MRS-Serbia), Dr. Slobodan Milonjić (President of the Council and Member of the Presidency of MRS-Serbia), Prof. Dr. Nenad Ignjatovic (Member of the Presidency and Secretary General of MRS-Serbia) and Prof. Dr. Ivan Bozovic, as 2015 Laureate, Prof. Dr. Gordana Vunjak-Novaković, 2016 Laureate, Prof. Dr. Velimir Radmilović, 2017 Laureate, Prof. Dr. László Forró, 2018 Laureate and Prof. Danilo Suvorov 2019 Laureate, the Executive Board of the MRS-Serbia Presidency took the decision that Prof. Yury Gogotsi should be granted MRS-Serbia's 2021 Award for a Lasting and Outstanding Contribution to Materials Science and Engineering. Prof. Gogotsi was strongly supported by Prof. Dragan Uskoković, Dr. Slobodan Milonjić, Prof. Yuri Solonin, Prof. Masahiro Yoshimura, Prof. Paul Weiss, Prof. Michael W. Barsoum, Prof. Eugene A. Olevsky and Dr. Vuk Uskokovic.

Prof. Yury Gogotsi's invited plenary lecture will be presented during the Opening Ceremony of the 22nd MRS-Serbia Annual Conference YUCOMAT 2021, starting at 9.00 a.m. on Monday, August 30, 2021.

President of MRS-Serbia, Prof. Dr. Dragan Uskoković
Vice-President of MRS-Serbia, Prof. Dr. Velimir Radmilović
Vice-President of MRS-Serbia, Prof. Dr. Dejan Raković
Vice-President of MRS-Serbia, Dr. Smilja Marković
General Secretary of MRS-Serbia, Prof. Dr. Nenad Ignjatović

MRS-Serbia

President of the Council: Slobodan Milonjić
President: Dragan Uskoković
Vice-presidents: Velimir Radmilović, Dejan Raković, Smilja Marković
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Zoran Petrović, Milenko Plavšić, Zoran Popović, Vladimir Srdić,
Jovan Šetrajić, Petar Uskoković, Miodrag Zlatanović.

International Advisory Board

Chair: Robert Sinclair (USA)
Members: Fritz Aldinger (Germany), Rostislav A. Andrievski[†] (Russia), Aline Auroux (France), Xavier Batlle (Spain), Serena Best (UK), Ivan Božović (USA), Philippe Colombari (France), Uli Dahmen (USA), Miha Drogenik (Slovenia), Rafal Dunin-Borkowski (Germany), Mauro Ferrari (USA), László Forró (Switzerland), Yury Gogotsi (USA), Horst Hahn (Germany), Paul Harrison (UK), Felix T. Hong (USA), Robert Hull (USA), Wolfgang Jaeger (Germany), Josè M. Kenny (Italy), Alexander H. King (USA), Feng-Huei Lin (Taiwan), Toshiaki Makabe (Japan), Amelia Montone (Italy), Eva Olsson (Sweden), Eiji Osawa (Japan), Davor Pavuna (Switzerland), Doug Perovic (Canada), Zoran S. Petrović (USA), Robert Ritchie (USA), Peter Franz Rogl (Austria), Frances Ross (USA), Richard W. Siegel (USA), Mamoru Senna (Japan), Valeriy V. Skorohod[†] (Ukraine), Danilo Suvorov (Slovenia), Enrico Traversa (Italy), Vuk Uskoković (USA), Gordana Vunjak Novaković (USA), Jackie Ying (Singapore)

YUCOMAT GENERAL INFORMATION

Conference Organising Committee

Chairpersons: Đorđe Veljović, Zoran Jovanović

Members: Branko Matović, Irena Nikolić, Bojana Obradović, Vuk Radmilović,
Nebojša Romčević, Veljko Đokić, Ljiljana Damjanović,
Aleksandar Dekanski, Mira Vukčević.

Conference Secretary: Jasmina Jevtić

Conference Technical Committee

Sonja Jovanović, Ivana Dinić, Željko Mravik, Željko Radovanović, Vukašin Ugrinović, Tamara Matić, Jelena Rmuš, Marija Milivojević, Milica Stefanović, Ivana Banićević, Dušana Nedović.

HISTORY

The First Conference on materials science and engineering, including physics, physical chemistry, condensed matter chemistry, and technology in general, was held in September 1995, in Herceg Novi. An initiative to establish Yugoslav Materials Research Society was born at the conference and, similar to other MR societies in the world, the programme was made, and objectives determined. The Yugoslav Materials Research Society (Yu-MRS), a non-government and non-profit scientific association, was founded in 1997 to promote multidisciplinary goal-oriented research in materials science and engineering. Main task and objective of the Society is to encourage creativity in materials research and engineering to reach a harmonic coordination between achievements in this field in our country and analogous activities in the world with an aim to include our country into the global international projects. Until 2003, Conferences were held every second year and then they grew into Annual Conferences that were traditionally held in Herceg Novi in September of every year. Following the political separation between Serbia and Montenegro, in 2007 Yu-MRS formed two new MRS: MRS-Serbia (official successor of Yu-MRS) and MRS-Montenegro (in founding). In 2008 MRS-Serbia became a member of FEMS (Federation of European Materials Societies).

YUCOMAT 2021 GENERAL INFORMATION

DATE AND VENUE: The conference will be held on August 30 - September 3, 2021, at the **Hunguest Hotel Sun Resort**, in Herceg Novi, Montenegro. Participants will also be accommodated there. The conference will begin on Monday, August 30th, at 09.00 and end on Friday, September 3rd, 2021, at 12.00.

REGISTRATION: Registration, registration fee payment, conference materials distribution, etc, will take place at the conference desk (Conference Secretariat) open on Sunday, August 29, and Monday, August 30, from 8.00 to 19.00, on Tuesday, Wednesday and Thursday 8.00-13.00 and 19.00-20.00, and on Friday from 8.00 to 12.00. At registration, the participants are requested to submit a proof of their advance registration fee payment.

VIRTUAL PRESENTATIONS: The abstracts of the Virtual Presentations are within the abstracts of the Plenary, Oral and Poster Sections in this book. Lectures are located on the YUCOMAT 2021 Conference site: <https://www.mrs-serbia.org.rs/index.php/virtual-offline-presentations> from August 23, 2021, to 7 days after the deadline for the end of the Conference (September 10, 2021).

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INSTRUCTION FOR AUTHORS: The conference will feature Plenary Sessions, Oral Sessions, Poster Sessions, Virtual Offline Session. Time of papers' presentations to be given in Oral Sessions is limited. Time available for delivery is 30 min for plenary and 15 min for other papers, including discussion. Video-beam is available. PowerPoint presentations, recorded on CD or USB flash-memory, should be given at the start of session. In Poster Sessions, the authors are requested to display their posters minimum one hour before the session and to be present beside their posters during the session. Poster sessions' venue will be open from Tuesday to Wednesday.

CONFERENCE AWARDS: Joint Award by MRS-Singapore and MRS-Serbia at the YUCOMAT 2021 Conference. Sponsorship of the ten Awards in the financial amount by the MRS-Singapore, to the authors not older than 35 for the best: Five Oral presentation and Five Posters presentation. Awarded authors will be announced at the Closing Ceremony of the Conference. Each award consists of a financial amount honorarium, diploma, meeting registration fee to attend the next YUCOMAT 2022 Conference, and a one-year MRS Serbia membership.

ADDITIONAL ACTIVITIES: Traditional Cocktail Party on Monday evening and excursion on Thursday afternoon (boat trip around Boka Kotorska Bay) will be organized again.

GENERAL CONFERENCE PROGRAM

Sunday, August 29, 2021

08.00-19.00 **Registration**

Monday, August 30, 2021

08.00-19.00 **Registration**

09.00-10.30 **OPENING CEREMONY**

- Introduction and Welcome, Main Conference Hall
- **The Laureate of the 2020 MRS-Serbia**, Award for a Lasting and Outstanding Contribution to Materials Science and Engineering
Robert Sinclair, Virtual lecture
- **The Laureate of the 2021 MRS-Serbia**, Award for a Lasting and Outstanding Contribution to Materials Science and Engineering
Yury Gogotsi

11.00-12.30 **First Plenary Session**, Main Conference Hall

13.00-13.30 **Photo Session**

15.00-19.00 **Second Plenary Session (Virtual Offline)**, Main Conference Hall

19.30-21.30 **Cocktail Party**

Tuesday, August 31, 2021

08.00-12.45 **First Oral Session**, Main Conference Hall

Competition for the best Oral presentation of young researchers

15.00-18.00 **First Poster Session**, National Restaurant Jadranka Terrace

Competition for the best Poster presentation of young researchers

Wednesday, September 1, 2021

08.00-10.00 **Second Poster Session**, National Restaurant Jadranka Terrace

10.30-13.00 **Third Plenary Session**, Main Conference Hall

15.00-18.00 **Third Poster Session**, National Restaurant Jadranka Terrace

Thursday, September 2, 2021

08.30-13.00 **Second Oral Session**, Main Conference Hall

15.00-19.00 **Boat-trip around Boka Kotorska Bay**

Friday, September 3, 2021

09.00-10.30 **Third Oral Session**, Main Conference Hall

10.30-11.00 **Awards and Closing of the Conference**

11.00 **Cocktail and Greetings for Goodbye to all YUCOMAT participants**

Virtual Presentations

The abstracts of the Virtual Presentations are within the abstracts of the Plenary, Oral and Poster Sections in this book. Presentations can be accessed from the YUCOMAT 2021 Conference site: <https://www.mrs-serbia.org.rs/index.php/virtual-offline-presentations>, from August 23, 2021, to 7 days after the deadline for the end of the Conference (September 10, 2021).

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SCIENTIFIC PROGRAM

Monday, August 30, 2021

Main Conference Hall

OPENING CEREMONY

09.00-09.30 **Welcome Speech**

Dragan Uskoković, President of MRS-Serbia, Belgrade, Serbia

Presentation of YUCOMAT 2019 Awards

Velimir Radmilović, Vice President of MRS-Serbia

09.30-10.00 **MRS-Serbia 2020 Award for a Lasting and Outstanding Contribution to Materials Science and Engineering**

Robert Sinclair, Stanford University, Stanford, CA, USA

In situ High Resolution Electron Microscopy of Material Reactions at the Atomic Level

Virtual Lecture

10.00-10.30 **MRS-Serbia 2021 Award for a Lasting and Outstanding Contribution to Materials Science and Engineering**

Yury Gogotsi, Drexel University, Philadelphia, USA

MXenes - Two-Dimensional Materials for Future Technologies

10.30-11.00 **Break**

FIRST PLENARY SESSION

Main Conference Hall

Session I: 11.00 -12.30

Chairpersons: Hamish Fraser and Ruslan Valiev

11.00-11.30 **The Lithium Battery, from a Dream to a Readiness to Take on Climate Change - Materials Opportunities and Challenges, Virtual lecture**

Michael Stanley Whittingham, *Nobel Laureate in Chemistry 2019 for the development of lithium-ion batteries*

Binghamton University, State University of New York, US

11.30-12.00 **Bulk nanostructured metallic materials with multifunctional properties: innovative applications and challenges in commercialization**

Ruslan Z. Valiev, Ufa State Aviation Technical University, 12 Karl Marx Street, Ufa 450008, Russia; Saint Petersburg State University, Saint Petersburg, Russia

12.00-12.30 **Exploiting structural and compositional instabilities in titanium alloys to optimize properties of components fabricated by additive manufacturing**

Hamish Fraser¹, Brian Welk¹, Nevin Taylor¹, Zachary Kloenne¹, Yufeng Zheng², Rajarshi Banerjee³

¹The Ohio State University; ²University of Nevada-Reno; ³University of North Texas

13.00-13.30 **Photo session**

13.00-15.00 **Break**

Main Conference Hall

SECOND PLENARY SESSION (**VIRTUAL OFFLINE**)

Session I: 15.00-16.30

Chairpersons: Đorđe Janačković and Petar Uskoković

15.00-15.30 **Bioinspired Super-wettability System and Beyond Quantum-confined Superfluid: Energy Conversion, Chemical Reaction and Biological Information Transfer**

Lei Jiang, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing, P. R. China

15.30-16.00 **Engineering advanced materials through polyphenol-mediated assembly**

Frank Caruso, ARC Centre of Excellence in Convergent Bio-Nano Science and Technology, and the Department of Chemical Engineering, The University of Melbourne, Parkville, Victoria 3010, Australia

16.00-16.30 **Intelligent Biomaterials**

Seeram Ramakrishna, Center for Nanotechnology & Sustainability, National University of Singapore

16.30-17.00 **Break**

Session II: 17.00-19.00

Chairpersons: Đorđe Janačković and Petar Uskoković

17.00-17.30 **Engineering human tissues for medical impact**

Gordana Vunjak-Novakovic, The Mikati Foundation Professor of Biomedical Engineering and Medical Sciences, Columbia University in the City of New York

17.30-18.00 **Cluster-assembled materials**

Horst Hahn, Karlsruhe Institute of Technology (KIT), Germany

18.00-18.30 **Stabilization of metastable states for sustainable functionalization -From molecular dispersion to spintronics**

Mamoru Senna, Faculty of Science and Technology, Keio University

18.30-19.00 **Constitution and Structural Chemistry of T-Mn Systems (T = Sc to Ta)**

P. Rogl¹, X. Yan¹, X.Q. Chen¹, P. Brož², J. Vrestal², J. Bursik³, J. Pavlu², B. Smetana⁴, G. Rogl¹, A. Grytsiv¹, H. Michor⁵

¹Institute of Materials Chemistry, University of Vienna, 1090 Wien, Austria, ²Department of Chemistry, Faculty of Science, Masaryk University, Brno, Czech Republic, ³Institute of Physics of Materials, Czech Acad. of Sci., Brno, Czech Republic, ⁴Faculty of Materials Science and Technology, VSB-TU Ostrava, Czech Republic, ⁵Institute of Solid State Physics, TU-Wien, 1040 Wien, Austria

19.30-21.30 **COCKTAIL PARTY**

Tuesday, August 31, 2021

Main Conference Hall

FIRST ORAL SESSION

Competition for the best Oral presentation of young researchers

Session I: 08.00-10.30

Chairpersons: Bojana Obradović and Zoran Jovanović

08.00-08.15 **Phase Transformations in a Heterogeneous Ti-xNb-7Zr-0.8O Alloy Prepared by a Field-assisted Sintering Technique**

Jiří Kozlík¹, Tomáš Chráska², Miloš Janeček¹, Dalibor Preisler¹, Josef Stráský¹, Jozef Veselý¹, Anna Veverková¹

¹Charles University, Department of Physics of Materials, Prague, Czechia, ²Institute of Plasma Physics, Materials Engineering Department, Prague, Czechia

08.15-08.30 **Tuning the thermoelectric performance of CaMnO₃-based ceramics by controlled exsolution and micro-structuring**

Nikola Kanas^{1,2}, Benjamin A. D. Williamson², Richard Hinterding³, Mari-Ann Einarsson², Sverre Magnus Selbach², Armin Feldhoff³, and Kjell Wiik²

¹Institute Biosense, University of Novi Sad, Novi Sad, Serbia, ²Department of Materials Science and Engineering, NTNU Norwegian University of Science and Technology, Trondheim, Norway, ³Institute of Physical Chemistry and Electrochemistry, Leibniz University, Hannover, Germany

08.30-08.45 **Low dimensional properties of transition metals with 1H-1,2,4-Triazole**

Shiraz Ahmed Siddiqui¹, Jana Kalbáčová Vejpravová², Hidetsugu, Shiozawa^{1,3}

¹University of Vienna & VDS, Vienna, Austria, ²Charles University, Prague, Czech Republic, ³J. Heyrovsky Institute of Physical Chemistry, Prague, Czech Republic

08.45-09.00 **Odd-Even Effect in Molecular Packing of Self-Assembled Monolayers of Biphenyl-Substituted Fatty Acid on Ag(111)**

A. Krzykawska, J. Ossowski, M. Szwed, P. Cyganik

Department of Physics of Nanostructures and Nanotechnology, Jagiellonian University, Krakow, Poland

09.00-09.15 **An in-situ study on phase transformations in metastable β titanium and zirconium alloys**

A. Veverková, D. Preisler, V. Valešová, P. Harcuba, J. Šmilauerová, J. Strásk

Department of Physics of Materials, Charles University, Ke Karlovu 5, 12116, Prague, Czech Republic

09.15-09.30 **Fronts of the Deformation Phase Transformation in TRIP-steel**

Lidiya Danilova, Dina Orlova, Vladimir Danilov

Institute of Strength Physics and Materials Science SB RAS, Tomsk, Russia

09.30-09.45 **Magneto-optic Janus nanoplatelets**

Jelena Papan^{1,2}, Patricija Hribar Boštjančič^{1,3}, Alenka Mertelj¹, Darja Lisjak¹

¹Jožef Stefan Institute, Jamova cesta 39, Ljubljana, Slovenia, ²Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, P.O. Box 522, Belgrade, 11001 Serbia, ³Jožef Stefan International Postgraduate School, Jamova cesta 39, Ljubljana, Slovenia

09.45-10.00 **Facile Microwave Assisted Synthesis of Silica Based Nanocoatings with Tunable Wettability**

Maria Antonia Tănase¹, Adina Răducan¹, Petruța Oancea¹, Cătălin Ionuț, Mihăescu², Claudia Ninciuleanu², Elvira Alexandrescu², Cristina Scomoroscenco², Cristian Petcu², Ludmila Otilia Cintează¹

¹University of Bucharest, Physical Chemistry Department, 4-12 Elisabeta Blvd, Bucharest, Romania, ²INCDCP-ICECHIM, Polymer Department, 202 Splaiul Independentei, Bucharest, Romania

10.00 -10.15 **Oscillation in Stability of Consecutive Chemical Bonds in Self – Assembled Monolayers with Carboxylic Binding Group**

Mateusz Wróbel¹, Jakub Ossowski¹, Mariusz Krawiec², Krzysztof Koziel³, Paweł Dąbczyński¹, Piotr Cyganik¹

¹Smoluchowski Institute of Physics, Jagiellonian University, Łojasiewicza 11, 30-348 Kraków, Poland, ²Faculty of Chemistry, Jagiellonian University, Gronostajowa 2, 30-387 Kraków, Poland, ³Marie Curie Skłodowska University, Institute of Physics, Pl. M. Curie-Skłodowskiej 1, 20-031 Lublin, Poland

10.15 -10.30 **The Odd-Even Effect in Electron Beam Irradiation of Hybrid Aromatic-Aliphatic Self-Assembled Monolayers of Fatty Acid**

Monika Kruk¹, Christof Neumann², Martha Frey², Krzysztof Koziel³, Andrey Turchanin², Piotr Cyganik¹

¹Smoluchowski Institute of Physics, Jagiellonian University, 30-348 Krakow, Poland, ²Institute of Physical Chemistry, Friedrich Schiller University Jena, 07743 Jena, Germany, ³Faculty of Chemistry, Jagiellonian University, Krakow 30-387, Poland

10.30-11.00 **Break**

Session II: 11.00-12.45

Chairpersons: Bojana Obradović and Zoran Jovanović

11.00-11.15 **Super porous hydrogels based on poly(N-isopropylacrylamide) for potential application as soft actuators with extreme-fast volume responsive temperature- and pH-sensitive properties**

S. Horodecka, K. Hishchak, B. Strachota, A. Strachota, M. Šlouf

Institute of Macromolecular Chemistry, Czech Academy of Sciences, Heyrovského nám. 2, CZ-162 06 Praha 6, Czech Republic

11.15-11.30 **Electrochemical reduction of CO₂ on electrodeposited copper-based nanoparticles: Stability Study**

Stefan Popović^{1,2}, Marjan Bele¹, Nejc Hodnik^{1,2}

¹Department of Materials Chemistry, National Institute of Chemistry Hajdrihova 19, 1000 Ljubljana, Slovenia, ²University of Nova Gorica Vipavska 13, 5000 Nova Gorica, Slovenia

11.30-11.45 **Catalyst Screening for Homogeneous and Heterogeneous Carboxylation of Lignin-derived Model Compounds**

Aleksa Kojčinović, Gorica Ivaniš, Blaž Likozar, Miha Grilc

Department of Catalysis and Chemical Reaction Engineering, National Institute of Chemistry, Hajdrihova 19, 1000 Ljubljana, Slovenia

- 11.45-12.00 **Novel Magnesium Alloy Mg-4Gd-4Y-2Ca with enhanced ignition temperature and mechanical properties**
Jitka Stráská¹, Jiří Kubásek², Peter Minárik¹, Klára Hosová², Stanislav Šašek¹, Michal Knapek¹, Jozef Veselý¹, Drahomír Dvorský², Dalibor Vojtěch²
¹Charles University, Faculty of Mathematics and Physics, Department of Physics of Materials, Ke Karlovu 5, 121 16 Praha 2, Czech Republic, ²University of Chemistry and Technology, Faculty of Chemical Technology, Department of Metals and Corrosion Engineering, Technická 5, 166 28 Praha 6, Czech Republic
- 12.00-12.15 **Properties of belite-calcium sulfoaluminate cements synthesized from various industrial residues**
Katarina Šter, Maruša Borštnar, Sabina Dolenc
Slovenian National Building and Civil Engineering Institute, Dimičeva ulica 12, 1000 Ljubljana, Slovenia
- 12.15-12.30 **Microkinetic Study of Furfural Hydrotreatment over Various MoO_x-Based Catalysts**
Miha Grilc, Aleksa Kojčinović, Žan Kovačič, Matej Huš, Blaž Likozar
Department of Catalysis and Chemical Reaction Engineering, National Institute of Chemistry, Hajdrihova 19, 1000 Ljubljana, Slovenia
- 12.30-12.45 **Microstructure and corrosion properties of a novel biomedical WN43 Magnesium alloy prepared by spark plasma sintering**
Mária Zemková¹, František Lukáč², Jan Bohlen³, Robert Král¹, Peter Minárik¹
¹Charles University, Prague, Czech Republic; ²Institute of Plasma Physics, Czech Academy of Science, Prague, Czech Republic; ³Magnesium Innovation Center, Geesthacht, Germany
- 12.45-15.00 **Break**

National Restaurant Jadranka Terrace

FIRST POSTER SESSION

Competition for the best Poster presentation of young researchers

Session I: 15.00-18.00

Chairpersons: Smilja Marković and Dragana Jugović

P.S.I.1.

Utilization of nitrogen doped carbon cryogel for efficient removal of pharmaceutical residues from water

Aleksandar Krstić¹, Aleksandar Lolić², Miljana Mirković¹, Ana Kalijadis¹

¹University of Belgrade, Vinča Institute of Nuclear Sciences - National Institute of the Republic of Serbia, Mike Petrovića Alasa 12-14, Belgrade, Serbia, ²University of Belgrade, Faculty of Chemistry, Studentski trg 12-16, Belgrade, Serbia

P.S.I.2.

Mercerized jute fabrics suitable for technical textiles

Aleksandra Ivanovska¹, Koviļjka Asanović², Maja Jankoska³, Mirjana Kostić²

¹University of Belgrade, Innovation Center of the Faculty of Technology and Metallurgy, Karne-gijeva 4, 11000 Belgrade, Serbia, ²University of Belgrade, Faculty of Technology and Metallurgy, Karne-gijeva 4, 11000 Belgrade, Serbia, ³Ss. Cyril and Methodius University in Skopje, Faculty of Technology and Metallurgy, Ruger Boskovic 16, 1000 Skopje, North Macedonia

P.S.I.3.

Oxygen diffusion in doped Ti-Al alloys

Alexander V. Bakulin^{1,2}, Ekaterina V. Matyskina², Svetlana E. Kulkova^{1,2}

¹ISPMS SB RAS, Tomsk, Russia, ²TSU, Tomsk, Russia

P.S.I.4.

Mechanochemical synthesis of TiO₂-CeO₂ powder for the purpose of building an oxygen sensor

Jelena N. Stevanović¹, Srđan Petrović¹, Marko V. Bošković¹, Dana Vasiljević Radović¹, Ivana O. Mladenović¹, Biljana Šljukić^{2,3}, Milija Sarajlić¹

¹Institute of Chemistry, Technology and Metallurgy, Njegoševa 12, Belgrade, Serbia, ²Faculty of Physical Chemistry, Studentski trg 12-16, University of Belgrade, Belgrade, Serbia, ³CeFEMA, Instituto Superior Técnico, Universidade de Lisboa, 1049-001 Lisbon, Portugal

P.S.I.5.

Understanding the photopolymerization and post-processing as a way to enhance thermomechanical properties of 3D printed auxetic structures

Martina Štaffová, František Ondreaš

Central European Institute of Technology, Brno, University of Technology, Purkynova 656/123, Brno 612 00, Czech Republic

P.S.I.6.

Stability of Pt-based alloy ORR electrocatalysts for PEM fuel cells: Temperature dependent metal dissolution

Tina Đukić, Léonard Jean Moriau, Martin Šala, Luka Pavko, Mitja Kostelec, Matija Gatalo, Nejc Hodnik

National Institute of Chemistry, Hajdrihova 19, 1000 Ljubljana, Slovenia

P.S.I.7.

High entropy materials for electrochemical applications

David Stenze, Abhishek Sarkar, Qingsong Wang, Horst Hahn, Ben Breitung

Karlsruhe Institute of Technology, Institute of Nanotechnology, Hermann-von-Helmholtz-Platz 1, 76344 Eggenstein-Leopoldshafen, Germany

P.S.I.8.

Resistive Switching Memory Devices based on 2D Halide Perovskites

Hyojung Kim, Ho won Jang

Department of Materials Science and Engineering, Seoul National University, Seoul, South Korea

P.S.I.9.

Electrochemical control of magnetism: on the conversion of hydrated FeF₃ with Li to Fe and LiF

Ruby Singh^{1,2}, Ralf Witte¹, Xiaoke Mu^{1,3}, Torsten Brezesinski¹, Ben Breitung^{1,2}, Robert Kruk¹, Horst Hahn^{1,2}

¹Institute of Nanotechnology, Karlsruhe Institute of Technology (KIT), 76344 Eggenstein-Leopoldshafen, Germany, ²Joint Research Laboratory Nanomaterials, Technische Universität Darmstadt & Karlsruhe Institute of Technology (KIT), 64287 Darmstadt, Germany, ³Karlsruhe Nano-Micro Facility (KNMF), Karlsruhe Institute of Technology (KIT), 76344 Eggenstein-Leopoldshafen, Germany

P.S.I.10.

Electrical properties of epoxy composites based on carbon black and multi-walled carbon nanotubes

Artyom A. Shestakov¹, Alexander G. Bannov¹, Andrey E. Brester¹, Nikita I. Lapekin¹, Arina V. Ukhina², Evgeniy A. Maksimovskii^{1,3}

¹Novosibirsk State Technical University, Novosibirsk, 630073, Russia, ²Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, 630128, Russia, ³Nikolaev Institute of Inorganic Chemistry SB RAS, Novosibirsk, 63009, Russia

P.S.I.11.

Increasing catalytic activity of molybdenum disulfide for hydrogen evolution reaction

Jelena Rmuš¹, Anđela Mitrović¹, Ana Mraković², Željko Mravik¹, Tijana Pantić¹, Ivana Stojković Simatović³, Sandra Kurko¹

¹Center of excellence for hydrogen and renewable energy (CONVINCE), Department of Physics, "Vinča" Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, ²Department of Theoretical Physics and Condensed Matter Physics, "Vinča" Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, ³Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia

P.S.I.12.

Investigation of thermodynamic parameters of high concentration alkaline activators in the geopolymerization process of metakaolin

Marija Ivanović¹, Snežana Nenadović¹, Nataša Mladenović Nikolić², Miljana Mirković¹, Ljiljana Kljajević¹

¹Department of Materials Science, Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia University of Belgrade, Serbia, ²Department of Nuclear and Plasma Physics, Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, University of Belgrade, Serbia

P.S.1.13.

Morphology and mechanical properties of the nanotubular oxide coating formed on the ultra-fine-grained Ti-13Nb-13Zr alloy

Dragana R. Barjaktarević, Veljko R. Đokić, Đorđe N. Veljović, Marko P. Rakin

¹University of Belgrade, Faculty of Technology and Metallurgy, 11120 Belgrade, Serbia

P.S.I.14.

Optimization of in vitro conditions for 3D culture of rat glioma cells

Jelena Petrović^{1,2}, Mia Radonjić^{1,2}, Jasmina Stojkowska^{1,2}, Bojana Obradović¹

¹Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, ²Innovation Center of the Faculty of Technology and Metallurgy, Belgrade, Serbia

P.S.I.15.

A Possible Approach in Wound Management – An Exfoliated Hydrogel Layer, Based On Polysaccharide Gum Karaya Modified With Carboxymethyl Cellulose, Covered by Natural Hydrophobic Layer

Katarína Kacvinská¹, Lucy Vojtová¹, Petr Poláček¹, Šárka Kobzová², Lubomír Janda², Petr Sedláček³

¹CEITEC-Central European Institute of Technology, Advanced Biomaterials, Purkyňova 656/123, 612 00 Brno Brno, Czech Republic; ²Veterinary Research Institute, Hudcova 296/70, 621 00 Brno, Czech Republic; ³Brno Univ. of Technol., Purkyňova 464/118, Královo Pole, 61200, Brno, Czech Republic

P.S.I.16.

Pro-healing protein release from 3D-printed „smart“ hydrogel carriers applicable in regenerative medicine

Klára Lysáková¹, Kristýna Valová¹, Nikola Křivánková¹, Lucy Vojtová¹

¹Brno University of Technology, CEITEC-Central European Institute of Technology, Advanced Biomaterials, Purkyňova 656/123, 612 00 Brno, Czech Republic

P.S.I.17.

Viscoelastic properties of resorbable PLGA-PEG-PLGA based bioinks for additive manufacturing technology in regenerative medicine

Kristýna Valová, Klára Lysáková, Nikola Křivánková, Lucy Vojtová

Brno University of Technology, CEITEC-Central European Institute of Technology, Advanced Biomaterials, Purkyňova 656/123, 612 00 Brno, Czech Republic

P.S.I.18.

Synthesis, characterization and possible application of bacterial cellulose-ceria composite

Svetlana Butulija¹, Jelena Filipović Tričković¹, Ana Valenta¹, Željko Radovanović², Bojana Četenović¹, Danica Zmejkoski¹, Bratislav Todorović³, Branko Matović¹

¹Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, ²Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia, ³Faculty of Technology, University of Niš, Leskovac, Serbia

P.S.I.19.

Hydroxyapatite based inserts in restorative dentistry: Effects of calcium substitutions on the bonding ability

Tamara Matić¹, Maja Ležaja Zebić², Vesna Miletić², Rada Petrović³, Đorđe Janačković³, Đorđe Veljović³

¹University of Belgrade, Innovation Center of the Faculty of Technology and Metallurgy, Belgrade, Serbia, ²University of Belgrade, School of Dental Medicine, Belgrade, Serbia, ³University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia

P.S.I.20.

Poly (methacrylic acid)/gelatin/hydroxyapatite composite hydrogels for bone tissue engineering

Vukašin Ugrinović¹, Bojan Božić², Rada Petrović³, Đorđe Janačković³, Đorđe Veljović³

Innovation Center of Faculty of Technology and Metallurgy, Belgrade, Serbia, ²Institute of Physiology and Biochemistry „Ivan Đaja“, Faculty of Biology, Belgrade, Serbia, ³Department of Inorganic Chemical Technology, Faculty of Technology and Metallurgy, Belgrade, Serbia

P.S.I.21.

Wettability of polysiloxane-CNTs composite coatings deposited on glass supports activated by cold plasma

Michał Chodkowski¹, Iryna Sulym², Konrad Terpiłowski¹

¹Department of Interfacial Phenomena, Institute of Chemical Sciences, Faculty of Chemistry, Maria Curie-Skłodowska University in Lublin (UMCS) pl. Marii Curie-Skłodowskiej 3, 20-031 Lublin, Poland. ²Laboratory of Oxide Nanocomposites, Chuiko Institute of Surface Chemistry, NASU, 17 General Naumov Str., 03164 Kyiv, Ukraine.

P.S.I.22.

Compacted carbon nanomaterials and their conductivity

Nikita I. Lapekin, Artyom A. Shestakov, Andrey E. Brester, Alexander G. Bannov
Novosibirsk State Technical University, 630073, Novosibirsk, Russian Federation

Wednesday, September 1, 2021

National Restaurant Jadranka Terrace

SECOND POSTER SESSION

Session I: 08.00-10.00

Chairperson: Sonja Jovanović and Đorđe Veljović

P.S.II.1.

Structural characterization of TiO₂/CNTs nanocomposites aimed for incorporation in facial masks

Anita Grozdanov, Perica Paunovic

Faculty of Technology and Metallurgy, University Ss Cyril and Methodius in Skopje, Rugjer Boskovic 16, 1000 Skopje, North Macedonia

P.S.II.2.

Densification of boron carbide under high pressures and temperatures

Branko Matović

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

P.S.II.3.

Detection of Glyphosate by Surface-Enhanced Raman Spectroscopy

L. Mikac^{1,2}, M. Gotić^{1,2}, I. Rigó³, M. Veres³, M. Ivanda^{1,2}

¹Center of Excellence for Advanced Materials and Sensing Devices, Ruđer Bošković Institute, Bijenička c. 54, Zagreb, Croatia, ²Molecular Physics and New Materials Synthesis Laboratory, Ruđer Bošković Institute, Bijenička 54, 10000 Zagreb, Croatia, ³Department of Applied and Nonlinear Optics, Institute for Solid State Physics and Optics, Wigner Research Centre for Physics, Budapest, Hungary

P.S.II.4.

High Torsion Pressure effect on cast and wrought technical grade pure magnesium

Pavel Doležal¹, Jakub Poloprudský^{1,2}, Jan Čupera¹

¹Faculty of Mechanical Engineering, Brno University of Technology, Brno, Czech Republic, ²Institute of Physics of Materials Czech Academy of Sciences, Brno, Czech Republic

P.S.II.5.

Highly hydrophobic self-assembled monolayers on aluminium – carboxylate vs. phosphonate

Daria M. Cegiętka and Piotr Cyganik

Smoluchowski Institute of Physics, Jagiellonian University, Łojasiewicza 11, 30-348 Kraków, Poland

P.S.II.6.

Degradation of textile dyes by Oxone® activated by cobalt supported chitosan-derived carbon-smectite catalyst

G. Stevanović, N. Jović-Jovičić, B. Dojčinović, A. Milutinović-Nikolić, S. Marinović, P. Banković, M. Ajduković

Institute of Chemistry, Technology and Metallurgy, National Institute, Njegoševa 12, University of Belgrade, Serbia

P.S.II.7.

Spectroscopic characterization and redox behaviour of electroconducting poly(p-ADPA) synthesized by simple and eco-friendly method using magnetite nanoparticles as a catalyst

Jana Mišurović¹, Budimir Marjanović², Gordana Čirić-Marjanović³

¹University of Montenegro-Faculty of Metallurgy and Technology, Cetinjski put bb, 81000 Podgorica, Montenegro, ²Centrohem, Vuka Karadžića bb, 22300 Stara Pazova, Serbia, ³University of Belgrade-Faculty of Physical Chemistry, Studentski Trg 12–16, 11158 Belgrade, Serbia

P.S.II.8.

Magnetic characteristics of nanocrystalline electrodeposit of Ni_{86.0}Fe_{9.8}W_{1.3}Cu_{1.9}

Milica Spasojević¹, Milan Plazinić², Nemanja Stojanović², Milentije Luković², Aleksa Maričić², Miroslav Spasojević²

¹Innovation Center of the Faculty of Chemistry, University of Belgrade, Belgrade, Serbia, ²Joint Laboratory for Advanced Materials of SASA, Section for Amorphous Systems, Faculty of Technical Sciences, Čačak, University of Kragujevac, Čačak, Serbia

P.S.II.9.

The effect of grinding time, pressing and sintering of the powders 16% Fe₂O₃, 4% BaCO₃, 80% BaTiO₃ on the morphology, microstructure, magnetic and electrical properties

Milentije Luković¹, Milica Spasojević², Suzana Arnaut¹, Slobodan Đukić¹, Siniša Randić¹

¹Joint Laboratory for Advanced Materials of SASA, Section for Amorphous Systems, Faculty of Technical Sciences, Čačak, University of Kragujevac, Čačak, Serbia, ²Innovation Center of the Faculty of Chemistry, University of Belgrade, Belgrade, Serbia

P.S.II.10.

Frequency behavior of Co-based amorphous wire MI-element

Jelena Oreli¹, Nebojša Mitrović¹, Vladimir Pavlović²

¹ Faculty of Technical Sciences Čačak, University of Kragujevac, Joint Laboratory of Advanced Materials of Serbian Academy of Sciences and Arts, Svetog Save 65, 32 000, Čačak, Serbia, ²Institute of Technical Sciences of Serbian Academy of Sciences and Arts, Knez Mihailova 35, 11 000, Belgrade, Serbia

P.S.II.11.

Luminescence response of YAP:Mn crystal to the ionizing and visible radiation

Oleksandr Poshyvak¹, Denis Afanassyev¹, Sergii Ubizskii¹, Andriy Luhechko²

¹Lviv Polytechnic National University, ²Ivan Franko National University of Lviv

P.S.II.12.

Activated Carbon Derived from Vine Shoots as Electrode Material for High-Performance Supercapacitors

Veselinka Grudić¹, Aleksandra Gezović¹, Jana Mišurović¹, Jugoslav Krstić², Milica Vujković³

¹Faculty of Metallurgy and Technology, University of Montenegro, Cetinjski put bb, 81000 Podgorica, Montenegro, ²Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Njegoševa 12, Belgrade, Serbia, ³Faculty of Physical Chemistry, University of Belgrade, Studentski trg 12–16, 11158 Belgrade, Serbia

P.S.II.13.

X-ray properties spectroscopy and electron structure of Ca₃Ga₂Ge₄O₁₄ garnet with doped Ce (Eu)

Ivan Shcherba¹, Lyudmyla Kostyk¹, Henryk Noga², Dragan Uskokovic³, Lev Bekenov⁴, Vitalij Denys¹

¹The Ivan Franko National University of Lviv, Kyryla & Metodiya Str. 8, 79-005 Lviv, Ukraine, ²Institute of Technology, the Pedagogical University of Cracow, Podchorazych Str. 2 Cracow 30-084 Poland, ³Institute of Technical Sciences of SASA Knez Mihailova 35/IV, PO Box 377, 11000 Belgrade, Serbia, ⁴G. V. Kurdyumov Institute for Metal Physics of the N.A.S.U. Kyiv, Ukraine

P.S.II.14.

Sol-gel based synthesis and magnetic, dielectric and optical properties study of nanocrystalline Sr₃Co₂WO₉ triple perovskite

Igor Djerdi¹, Jelena Bijelić¹, Martina Medvidović-Kosanović¹, Pascal Cop², Ákos Kukovecz³, Zvonko Jagličić⁴, Sugato Hajra⁵, Bernd M. Smarsly²

¹Josip Juraj Strossmayer University of Osijek, Department of Chemistry, Cara Hadrijana 8/A, 31000 Osijek, Croatia, ²Justus-Liebig-Universität, Physikalisch-Chemisches Institut, Heinrich-Buff-Ring 17, D-35392 Gießen, Germany, ³University of Szeged, Interdisciplinary Excellence Centre, Department of Applied and Environmental Chemistry, Rerrich Bélatér 1, H-6720 Szeged, Hungary, ⁴University of Ljubljana, Faculty of Civil and Geodetic Engineering, Jamova 2, SI-1000 Ljubljana, Slovenia, ⁵Institute of Technical Education and Research Siksha O Anusandhan (Deemed to be University), 751030 Bhubaneswar, India

P.S.II.15.

Sonochemical synthesis of up-converting β -NaYF₄: Yb, Er nanoparticles

Ivana Dinić¹, Marina Vuković², Paula Mendes Jardim³, Marko Nikolić⁴, Lidija Mančić¹

¹Institute of Technical Sciences of SASA, Belgrade, Serbia, ²Innovative Centre Faculty of Chemistry Belgrade, University of Belgrade, Serbia, ³Department of Metallurgical and Materials Engineering, Federal University of Rio de Janeiro, Brazil, ⁴Photonic Center, Institute of Physics Belgrade, University of Belgrade, Serbia

P.S.II.16.

Optoelectronic Processes through Molecular Nanofilms

Jovan P. Šetrajčić¹, Stevo K. Jaćimovski², Siniša M. Vučenović^{1,3}, Ana J. Šetrajčić–Tomić¹, Nikola R. Vojnović⁴, Igor J. Šetrajčić¹

¹Academy of Sciences and Arts of the Republic of Srpska, Banja Luka, Republic of Srpska – B&H, ²University of Criminal Investigation and Police Studies, Zemun, Vojvodina – Serbia, ³University of Banja Luka, Faculty of Sciences, Banja Luka, Republic of Srpska – B&H, ⁴University of Novi Sad, Faculty of Technical Sciences, Novi Sad, Vojvodina – Serbia

P.S.II.17.

History and new trends in nanoSPD-related research

Zarema Safargalina, Lyubov Egorova, Igor A. Alexandrov

Institute of Physics of Advanced Materials, Ufa State Aviation Technical University, Ufa, 450008, Russia

P.S.II.18.

Anisotropic iron oxide nanostructures with potential applications in biomedicine

Marin Tadić¹, Lazar Kopanja^{2,3}, Biljana Vucetic Tadić⁴, Slavko Kralj⁵

¹Condensed Matter Physics Laboratory, Vinca Institute of Nuclear Science, University of Belgrade, POB 522, 11001 Belgrade, Serbia, ²Faculty of Technology and Metallurgy, University of Belgrade, Karnegijeva 4, PO Box 3503, 11120 Belgrade, Serbia, ³Faculty of Mathematics and Computer Science, Alfa BK University, Palmira Toljatija 3, 11070 Belgrade, Serbia, ⁴Institute for Mother and Child Healthcare of Serbia, Belgrade, Serbia, ⁵Jozef Stefan Institute, Jamova 39, 1000 Ljubljana, Slovenia

P.S.II.19.

The influence of heteroatoms on physicochemical properties of cobalt ferrite nanoparticles

Sonja Jovanović^{1,2}, Marija Vukomanović², Matjaž Spreitzer², Zoran Jovanović¹, Marjeta Maček-Kržmanc², Davide Peddis^{3,4}

¹Laboratory of Physics, Vinča Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, ²Advanced Materials Department, Jožef Stefan Institute, Ljubljana, Slovenia, ³nM2-Lab, Istituto di Struttura della Materia, CNR, Monterotondo Scalo (Roma) 00015, Italy, ⁴Department of Chemistry and Industrial Chemistry, University of Genova, Genova, Italy

P.S.II.20.

Journey to the Center of a Perovskite Solar Cell

Vuk V. Radmilović¹, Yi Hou², Christoph J. Brabec², Erdmann Spiecker³, Velimir R. Radmilović⁴

¹Faculty of Technology and Metallurgy, University of Belgrade, Belgrade, Serbia, ²Institute of Materials for Electronics and Energy Technology, Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany, ³Center for Nanoanalysis and Electron Microscopy, Friedrich –Alexander - University of Erlangen-Nuremberg, Germany, ⁴Serbian Academy of Sciences and Arts, Belgrade, Serbia

10.00-10.30 **Break**

Main Conference Hall

THIRD PLENARY SESSION

Session II: 10.30-13.00

Chairpersons: Velimir Radmilović and Arben Merkoçi

10.30-11.00 **Two-dimensional empty space and its unique properties**

Sir Andre K. Geim, *Nobel Laureate in Physics 2010 for his work on graphene*
University of Manchester, United Kingdom

11.00-11.30 **Advances in molecular beam epitaxy of superconducting materials, Virtual Lecture**

Ivan Bozovic, Brookhaven National Laboratory, Department of Chemistry,
NY and Yale University Connecticut, USA

11.30-12.00 **Nanobiosensors for diagnostics applications**

Arben Merkoçi, Catalan Institute of Nanoscience and Nanotechnology (ICN2), CSIC
and The Barcelona Institute of Science and Technology, Campus UAB, Bellaterra,
08193 Barcelona, Spain. ICREA - Institutio Catalana de Recerca i Estudis Avançats,
Barcelona, Spain

12.00-12.30 **The “Chemistree” of Porous Solids**

Michael Zaworotko, Department of Chemical Sciences and Bernal Institute, University
of Limerick, Ireland

12.30-15.00 **Break**

National Restaurant Jadranka Terrace

THIRD POSTER SESSION

Session III: 15⁰⁰-18⁰⁰

Chairpersons: Irena Nikolić and Branko Matović

P.S.III.1.

Thermodynamic characteristics of graphene

S. Jačimovski¹, D. Raković²

¹Academy of Criminalistic and Police Studies, Belgrade, Serbia, ²University of Belgrade, Faculty of
Electrical Engineering, Serbia

P.S.III.2.

Ion beam irradiation of 12-tungstophosphoric acid – influence of energy of accelerated ions on structural properties

Željko Mravik¹, Danica Bajuk-Bogdanović², Andrzej Olejniczak^{3,4}, Milica Pejčić², Jasmina
Lazarević⁵, Nenad Lazarević⁵, Zoran Jovanović¹

¹Center of excellence for hydrogen and renewable energy (CONVINCE), Department of Physics,
Vinča Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of
Belgrade, P.O. Box 522, 11001 Belgrade, Serbia, ²Faculty of Physical Chemistry, University of
Belgrade, P.O. Box 47, 11158 Belgrade, Serbia, ³Flerov Laboratory of Nuclear Reactions, Joint
Institute for Nuclear Research, 141980 Dubna, Moscow region, Russia, ⁴Faculty of Chemistry,
Nicolaus Copernicus University, Toruń, Poland, ⁵Center for Solid State Physics and New Materials,
Institute of Physics Belgrade, University of Belgrade, Pregrevica 118, Belgrade 11080, Serbia

P.S.III.3.

Synthesis and deposition of MAPbBr₃ perovskite on titania nanotube arrays

Milica Stefanović¹, Jelena Vujančević², Rada Petrović³, Đorđe Janačković³

¹University of Belgrade, Innovation Center of Faculty of Technology and Metallurgy, Belgrade, Serbia, ²Institute of Technical Sciences of SASA, 11000, Belgrade, Serbia, ³University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia

P.S.III.4.

Application of biomass pyrolysis to obtain biofuels

Dajana Savić¹, Vesna Antić¹, Mališa Antić¹ and Branimir Jovančević²

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P.S.III.5.

Solubility of hydrogen in biomass-derived compounds relevant for hydrodeoxygenation process

Gorica Ivaniš, Ljudmila Fele Žilnik, Blaž Likozar, Miha Grile

Department of Catalysis and Chemical Reaction Engineering, National Institute of Chemistry, Hajdrihova 19, SI-1000 Ljubljana, Slovenia

P.S.III.6.

New environmentally acceptable materials based on flay ash, steelmaking slag and Zn-reach electric arc furnace dust

Irena Nikolić¹, Dijana Đurović², Smilja Marković³, Ljiljana Veselinović³, Ivona Janković-Častvan⁴, Vuk Radmilović⁴, Velimir Radmilović⁵

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P.S.III.7.

Effect of filler type on the physico-chemical and mechanical properties of metakaolin-based geopolymer composites

Ljiljana Kljajević¹, Marija Ivanović¹, Miljana Mirković¹, Miloš Nenadović², Mira Vukčević³, Ivana Bošković³, Snežana Nenadović¹

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P.S.III.8.

Synthesis and characterization of Schiff-base containing Metal-organic frameworks

Nikola Radnović¹, Chris Hawes², Marko Rodić¹, Mirjana Radanović¹, Berta Barta Holló¹, Branko Kordić¹, Srđan Rakić¹, Branislav Jović¹, Jelena Tričković¹

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P.S.III.9.

PVC Composites Reinforced by Metallurgical Waste from Ferro-Nickel Industry

Perica Paunovic, Anita Grozdanov

Faculty of Technology and Metallurgy, University Ss Cyril and Methodius in Skopje, Rugjer Boskovic 16, 1000 Skopje, North Macedonia

P.S.III.10.

Effect of temperature and relative humidity on NO_x reaction with CaCO₃: competition between nitrite/nitrate formation on filter sheets

Nemanja Barać¹, Patrick Gane^{2,3}, Katarina Dimić-Mišić², Imani Monireh², Đorđe Janačković³, Petar Uskoković³, Ernest Barceló^{2,4}

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P.S.III.11.

Functionalization of polycaprolactone fibers by addition of yarrow extract powder

Anđela N. Radisavljević¹, Marija Jovanović², Dušica Stojanović², Ivana Radović³, Vesna Radojević², Petar Uskoković², Mirjana Rajilić-Stojanović²

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P.S.III.12.

Citric acid, polyethylene glycol, and hydroxypropyl methylcellulose as modifiers of doped calcium phosphate cement properties

Tamara Vlajić¹, Đorđe Veljović², Aleksa Milovanović³, Vesna Miletić¹

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P.S.III.13.

Effect of Nb, Zr and Ta content on properties of Ti-Nb-Ta-Zr-O

Kristián Šalata¹, Dalibor Preisler¹, Lucie Bodnárová², Kristýna Halmešová³, Petr Harcuba¹, Miloš Janeček¹, Josef Stráský¹

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P.S.III.14.

3D printed mucoadhesive gelatin based buccal films

Marija N. Jovanović¹, Anđela N. Radisavljević², Miloš M. Petrović³, Dušica B. Stojanović¹, Svetlana R. Ibrić⁴, Petar S. Uskoković¹

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P.S.III.15.

Improvement of bioactivity, biocompatibility, and antibacterial properties of titanium scaffold by coating with bioactive glasses and Ag-doped HAP

Marija Miliwojević¹, Željko Radovanović¹, Suzana Dimitrijević², Rada Petrović², Danica Marković³, Đorđe Janačković²

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P.S.III.16.

Modelling of catalytic activity and enzyme-MOF interactions using combined *in silico* approach

Milan Senčanski¹, Radivoje Prodanović², Predrag Ristić², Ana Marija Balaž³, Marija Stanišić², Tamara Todorović²

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P.S.III.17.

Synthesis and characterization of Zn(II) and Bi(III) complexes with N-substituted glycine hydrazones

Nevena Stevanović¹, Snežana Selaković¹, Temiloluwa Adejumo², Maja Šumar-Ristović², Božidar Čobeljić², Katarina Anđelković²

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P.S.III.18.

Promising Hydroxyapatite/Nifuroksazid Conjugate

Željko Radovanović¹, Katarina Mihajlovska², Lidija Radovanović¹, Rada Petrović², Đorđe Janačković²

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P.S.III.19.

New biomaterials with Saccharide components. III. The influence of trehaloses on cell membrane enzyme activity and some application in vaccine production

M. M. Plavšić^{1,2}, D. S. Savić¹, S. R. Savić¹, M. B. Plavšić³

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P.S.III.20.

Electrospun composite nanofibers containing biocompatible inorganic tungsten disulfide nanoparticles

Dušica B. Stojanović¹, Sergej Tomić², Marina Bekić², Snežana Zečević³, Darinka Popović³, Miodrag Čolić³, Petar S. Uskoković¹

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Thursday, September 2, 2021

Main Conference Hall

SECOND ORAL SESSION

Session I: 08.30-13.00

Chairpersons: Milan Stojanović and Konrad Terpiłowski

08.30-08.45 Are high-entropy alloys better than conventional ones?

E. Babić¹, Đ. Drobac², I. A. Figueroa³, M. Laurent-Brocq⁴, Ž. Marohnić², S. Michalik⁵,
V. Mikšić-Trontl², L. Perriere⁴, P. Pervan², R. Ristić⁶, K. Zadro¹

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08.45-09.00 Photocatalytic and Photoelectrocatalytic Degradation of Organic Compounds in TiO₂-nanotubes-based Reactors

Luka Suhadolnik¹, Živa Marinko^{1,2}, Miran Čeh^{1,3}

¹Nanostructured Materials, Jozef Stefan Institute, Ljubljana, Slovenia, ²Jozef Stefan International Postgraduate School, Ljubljana, Slovenia, ³Center for Electron Microscopy and Microanalysis, Jozef Stefan Institute, Ljubljana, Slovenia

09.00-09.15 Self-organization of plasma in DC and RF magnetron sputtering

Matjaž Panjan

Jozef Stefan Institute, Jamova 39, 1000 Ljubljana, Slovenia

09.15-09.30 PLD growth of functional oxides on graphene oxide-buffered silicon surface

Zoran Jovanović^{1,2}, Urška Trstenjak¹, Binbin Chen³, Elena Tchernychova⁴, Matejka Podlogar⁵, Gertjan Koster³, Matjaž Spreitzer¹

¹Advanced Materials Department, Jozef Stefan Institute, Ljubljana, Slovenia, ²Laboratory of Physics, Vinča Institute of Nuclear Sciences, Belgrade, Serbia, ³MESA+ Institute for Nanotechnology, University of Twente, Enschede, The Netherlands, ⁴National Institute of Chemistry, Ljubljana, Slovenia, ⁵Department for nanostructured materials, Jozef Stefan Institute, Ljubljana, Slovenia

09.30-09.45 Deposition of metal hydride films by hydrogen transport via a hollow cathode discharge

Stephen Muhl¹, Argelia Perez²

¹Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México, CDMX, México, ²Unidad de Investigación y Desarrollo Tecnológico (UIDT-CCADET), Hospital General de México, CDMX, México

09.45-10.00 Combustion synthesis of multilayer Ti-Ta-Ni-Ceramic Composite

Olga K. Kamynina, S. G. Vadchenko, N. F. Shkodich, I. D. Kovalev

ISMAN, Chernogolovka, Russia

10.00-10.15 Reversible intercalation/deintercalation of lithium ions within γ -LiV₂O₅ polymorph

Miloš Milović¹, Milica Vujković², Dragana Jugović¹, Miodrag Mitrić³

¹Institute of Technical Sciences of SASA, 11 000 Belgrade, Serbia, ²Faculty of Physical Chemistry, University of Belgrade, 11 000 Belgrade, Serbia, ³Vinča Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, 11 000 Belgrade, Serbia

- 10.15-10.30 **TRIP/TWIP effect in beta Ti alloys with high oxygen content**
Josef Stráský, Dalibor Preisler, Michal Knapek, Jiří Kozlík, Petr Harcuba
Department of Physics of Materials, Charles University, KeKarlovu 5, 121 16 Prague,
Czech Republic
- 10.30-11.00 **Break**
- 11.00-11.15 **Non-oxidative dehydrogenation of propane on chromium(III) oxide: an ab initio study of reaction kinetics and catalyst deactivation**
Matej Huš, Drejc Kopač, Blaž Likozar
National Institute of Chemistry, Department of Catalysis and Chemical Reaction
Engineering, Hajdrihova 19, SI-1001 Ljubljana, Slovenia
- 11.15-11.30 **Correlation between the evolution of precipitates and microhardness in Inconel 625 fabricated by laser powder bed fusion - transferred to Virtual Offline Presentations**
Kewin Gola, Beata Dubiel, Izabela Kalemba-Rec
AGH University of Science and Technology, Faculty of Metals Engineering and
Industrial Computer Science, Cracow, Poland
- 11.15-11.30 **Thin and Thermally Stable SAMs for Formation of Highly Conductive or Highly Insulating Organic Monolayers on Metals**
Mateusz Wróbel¹, Anna Krzykawska¹, Eric Sauter Eric², Mariusz Krawiec³, Krzysztof Kozielec⁴, Michael Zharnikov², Piotr Cyganik¹
¹Smoluchowski Institute of Physics, Jagiellonian University, Łojasiewicza 11, 30-348 Kraków, Poland, ²Angewandte Physikalische Chemie, Universität Heidelberg, Im Neuenheimer Feld 253, 69120 Heidelberg, Germany, ³Institute of Physics, Maria Curie-Skłodowska University, Pl. M. Curie Skłodowskiej 1, 20-031 Lublin, Poland, ⁴Faculty of Chemistry, Jagiellonian University, 30-387 Krakow, Poland
- 11.30-11.45 **Porous monolithic 3D nanostructures and nanocomposites based on alumina hydroxides**
Anatole. N. Khodan¹, A. Kanaev², R. Sh. Askhadullin³, A. A. Osipov³, A. A. Angeluts⁴, A. A. Konovko⁴
¹Frumkin Institute for Physical Chemistry and Electrochemistry RAS, Moscow, Russia, ²Laboratoire des Sciences des Procédés et des Matériaux CNRS, Villeurbanne, France, ³Leypunsky Institute for Physics and Power Engineering - IPPE JSC, Obninsk, Russia, ⁴Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia
- 11.45-12.00 **Ordered structures formation in multicomponent polysaccharide systems; effect of graphene oxide**
Ivan Kelnar, Alexander Zhigunov, Sabina Krejčíková, Jiří Dybal
Institute of Macromolecular Chemistry, Czech Academy of Sciences, Heyrovského nám.
2, 162 06 Praha, Czech Republic
- 12.00-12.15 **ZnO nanoparticles with optimized surface-to-bulk defect ratio for potential biomedical application**
S. Marković,¹ A. Stanković,¹ I. Drvenica,² B. Ristić,³ S.D. Škapin⁴
¹Institute of Technical Sciences of SASA, Belgrade, Serbia, ²Institute for Medical Research, University of Belgrade, Belgrade, Serbia, ³Institute of Microbiology and Immunology, Faculty of Medicine, University of Belgrade, Belgrade, Serbia, ⁴Jožef Stefan Institute, Ljubljana, Slovenia

12.15-12.30 **Identical Location Transmission Electron Microscopy Coupled with Modified Floating Electrode Characterisation of Pt-Co/C Electrocatalyst for Oxygen Reduction Reaction**

Armin Hrnjić^{1,2}, Ana-Rebeka Kamšek¹, Andraž Pavličič³, Fransisco Ruiz-Zapeda¹, Matija Gatalo¹, Leonard Moriau¹, Primož Jovanovič¹, Nejc Hodnik^{1,2}

¹Department for Materials Chemistry, National Institute of Chemistry, Hajdrihova 19, SI-1000 Ljubljana, Slovenia, ²University of Nova Gorica, Vipavska 13, 5000 Nova Gorica, Slovenia, ³Department of Catalysis and Chemical Reaction Engineering, National Institute of Chemistry, Hajdrihova 19, 1000 Ljubljana, Slovenia

12.30-12.45 **Aptamers on Surfaces: Making of Perfect Bioreceptors for Sensors**

Milan N. Stojanović

Columbia University, Departments of Medicine, and Bioengineering and Systems Biology

Friday, September 3, 2021

Main Conference Hall

THIRD ORAL SESSION

Session I: 09.00-10.30

Chairpersons: Vilma Bursikova and Waldemar Swiderski

09.00-09.15 **Deposition of nanocomposite diamond-like carbon films under dusty plasma conditions**

Vilma Bursikova¹, Štěpánka Bittnerová¹, Roman Příbyl¹, Richard Václavík¹, Monika Stupavská¹, Pavel Šťáhel¹, Anna Charvatova Campbell², Marek Havlíček^{2,3}, Petr Klapeček², Romana Mikšová⁴, Vratislav Perina⁴

¹Institute of Physical Electronics, Faculty of Science, Masaryk University, Kotlarska 2, CZ-611 37 Brno, Czech Republic, ²Czech Metrology Institute, Okružní 31, CZ-63800 Brno, Czech Republic, ³CEITEC BUT, Purkyňova 123, Brno, CZ-61200, Czech Republic, ⁴Institute of Nuclear Physics, Academy of Sciences of the Czech Republic, CZ-25068 Rez near Prague, Czech Republic

09.15-09.30 **The effect of the biopolymers addition on the stability of emulsions of essential oils**

Konrad Terpiłowski¹, Tatiana Demina², Michał Chodkowski¹, Elżbieta Grządka³, Anna Wawryniuk⁴, Karolina Czerniejowska⁴, Maciej Nastaj⁵

¹Department of Interfacial Phenomena, Institute of Chemical Sciences, Faculty of Chemistry, Maria Curie Skłodowska University in Lublin, Poland, ²Laboratory of Solid-State Chemical Reactions, Enikolopov Institute of Synthetic Polymer Materials, Russian Academy of Sciences, Moscow, Russia, ³Department of Radiochemistry and Environmental Chemistry, Institute of Chemical Sciences, Faculty of Chemistry, Maria Curie-Skłodowska University in Lublin, Poland, ⁴Chemical Advisory, Warsaw, Poland, ⁵Department of Milk Technology and Hydrocolloids, University of Life Sciences in Lublin, Poland

09.30-09.45 **Processing infrared images as a result of Thermal Non-destructive Testing**

Waldemar Swiderski

Military Institute of Armament Technology, Zielonka, Poland

- 09.45-10.00 **D-Xylose Dehydration to Furfural in presence of H-Beta Zeolite in water**
Emilija Rakić^{1,2}, Andrii Kostyniuk¹, Nikola Nikačević², Miha Grilc¹, Blaž Likozar¹
¹Department of Catalysis and Chemical Reaction Engineering, National Institute of Chemistry, 19, Hajdrihova, 1001, Ljubljana, Slovenia, ²Faculty of Technology and Metallurgy, University of Belgrade, Karnegijeva 4, 11000, Belgrade, Serbia
- 10.00-10.15 **pH-Responsive giant polymeric vesicles prepared via polydimethylsiloxane (PDMS) microfluidics**
Vladimir Sincari, Eliézer Jäger, Jiří Pánek, Martin Hruby and Alessandro Jäger
Institute of Macromolecular Chemistry, Czech Academy of Sciences, Heyrovsky Sq. 2, 16206 Prague, Czech Republic
- 10.15-10.30 **Electrochemical detection of dihydroxybenzene isomers using carbon supported catalysts**
Kristina Žagar Soderžnik¹, Abhilash Krishnamurthy^{1,2}
¹Jožef Stefan Institute, Jamova cesta 39, 1000 Ljubljana, Slovenia, ²Jožef Stefan International Postgraduate School, Jamova cesta 39, 1000 Ljubljana, Slovenia
- 10.30-11.00 **Awards and Closing of the Conference**
- 11.00 **Cocktail and Greetings for Goodbay to all YUCOMAT participants**

V.P.S.9.

Virtual Offline Poster Presentation

Swelling and deswelling kinetics of Au-PNiPAAm hydrogel nanocomposite photoactuators obtained by gamma irradiation

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

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In recent years, photoactuators as a class of smart materials that can produce a reversible mechanical deformation under light stimuli have attracted tremendous interest due to their potential applications in soft robotics, artificial muscles, and smart devices. Currently, the fabrication of photoactuators is mainly based on photothermal actuation mechanisms which include expansion/contraction, molecule sorption/desorption, and phase transition. Thermosensitive hydrogels with gold nanoparticles (AuNPs) are probably the most commonly used active layers that absorb light energy and convert it to thermal energy, causing reversible mechanical deformation such as bending, curling, and spiraling. This work describes hydrogel nanocomposite photoactuators based on AuNPs and thermosensitive poly(N-isopropylacrylamide) (Au-PNiPAAm), obtained by gamma irradiation. The different shapes of AuNPs were incorporated into PNiPAAm hydrogel, nanospheres with radius ≈ 5 -10 nm and nanorods with aspect ratio ~ 5 (radius ≈ 10 nm, length ≈ 50 nm). Swelling and deswelling kinetics of Au-PNiPAAm hydrogel nanocomposite photoactuators were investigated in water at 25°C and 48°C, respectively. All samples showed non-Fickian diffusion (both diffusion and polymer chains relaxation processes control the fluid transport) indicating that incorporation of different shapes of AuNPs into matrices has no influence on the diffusion model. On the other hand, the volume phase transition temperature (VPTT) of photoactuators can be adjusted by the incorporation of different shapes of AuNPs. It has been observed that VPTT decreases from $\approx 32.5^\circ\text{C}$ for Au nanorods to $\approx 30.5^\circ\text{C}$ for Au nanospheres, causing a more pronounced photothermal effect in the case of nanospheres.

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