

**TWENTY-THIRD ANNUAL CONFERENCE
YUCOMAT 2022
&
TWELFTH WORLD ROUND TABLE CONFERENCE
ON SINTERING
XII WRTCS**

**Hunguest Hotel Sun Resort, Herceg Novi, Montenegro
August 29 - September 2, 2022**

**Program
and
the Book of Abstracts**

Organised by:
**Materials Research Society of Serbia
&
International Institute for the Science of Sintering**

Endorsed by:
Federation of European Material Societies

CIP - Каталогизacija публикаcija
Народна библиотека Србије, Београд

66.017/.018(048)

621.762.5(048)

DRUŠTVO za istraživanje materijala Srbije (Beograd). Godišnja konferencija (23 ; 2022 ; Herceg Novi)

Program ; and The Book of abstracts / Twenty-third Annual Conference YUCOMAT 2022 & Twelfth World Round Table Conference on Sintering XII WRTCS 2022, Herceg Novi, Montenegro, August 29 - September 2, 2022 ; organised by Materials Research Society of Serbia & International Institute for the Science of Sintering ; [editor Dragan P. Uskoković]. - Belgrade : Materials Research Society of Serbia, 2022 (Herceg Novi : Biro Konto). - XLV, 185 str. : ilustr. ; 23 cm

Tiraž 200. - Bibliografija uz pojedine apstrakte. - Registar.

ISBN 978-86-919111-7-1

1. World Round Table Conference on Sintering (12 ; 2022 ; Herceg Novi) а) Наука о материјалима -- Апстракти б) Технички материјали -- Апстракти в) Синтеровање -- Апстракти

COBISS.SR-ID 71996169

Title: TWENTY-THIRD ANNUAL CONFERENCE **YUCOMAT 2022** &
TWELFTH WORLD ROUND TABLE CONFERENCE ON SINTERING **XII WRTCS**
Program and the Book of Abstracts

Publisher: Materials Research Society of Serbia
Knez Mihailova 35/IV, P.O. Box 433, 11000 Belgrade, Serbia
Phone: +381 11 2185-437; <http://www.mrs-serbia.org.rs>

Editor: Prof. Dr. Dragan P. Uskoković

Technical editor: Ivana Kovačević

Typesetting & prepress: Dr. Aleksandar Dekanski

Cover page: Nenad Ignjatović

Covers: Images on front & back covers are the property of MRS-Serbia

ISBN-978-86-919111-7-1

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MRS Serbia is member of the
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Printed in: Biro Konto
Sutorina bb, Igalo – Herceg Novi, Montenegro
Phones: +382-31-670123, 670025, E-mail: bkonto@t-com.me
Circulation: 200 copies. The end of printing: August 2022

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WELCOME SPEECH BY THE PRESIDENT OF MRS-SERBIA & IISS

Dear Colleagues, Ladies, and Gentlemen,



It is my great pleasure to greet you on behalf of the organizers of the Materials Research Society of Serbia (MRS-Serbia) and the International Institute for the Science of Sintering (IISS) and welcome you to the 23rd YUCOMAT and the 12th World Round Table Conference on Sintering (WRTCS). I wish for the rewarding program of the two parallel conferences, a plenty of pleasant conversations with other participants, and wonderful walks in this beautiful city where we have enjoyed the hospitality of our hosts for many years now.

In the long history of organization of YUCOMAT and WRTCS, the last three years may have been the most dramatic. They have entirely changed everything we know about the organization of our special "Herceg Novi Gordon Research Conferences" with great plenary speakers and 80% of foreign participants. First, we postponed YUCOMAT 2020 to 2021 at the last moment due to the COVID-19 pandemic, when it became obvious that proceeding with it would be risky for everyone. Last year we held YUCOMAT 2021 with a smaller number of plenary sessions and about a hundred participants, full of hope that we were finally free of COVID, which would make our lives easier, just as it was before the pandemic. And indeed, by the end of 2021, we had 25 confirmed plenary speakers for YUCOMAT and 10 for WRTCS.

However, things suddenly got complicated. Not only did we not get rid of COVID, but another global threat emerged with the war in Ukraine. Since March we have been overwhelmed with a series of cancellations of plenary sessions for both Conferences, and we have also experienced a smaller number of applications for oral and poster presentations than the anticipated. The feeling of uncertainty is ever-present. Having learnt from the last year's experience, I am afraid that we would not know the real situation before the conference starts to take place.

The Program includes 13 plenary speakers for the YUCOMAT Conference, 3 of which will have an online presentation, and 7 for the WRTCS. The number of oral and poster presentations is about 150, of which 47 is from Serbia, 31 from Ukraine, 17 from the Czech Republic, 11 from Poland, 8 from South Korea, 6 from Turkey, 4 from Montenegro, 3 from Latvia and 3 from Slovenia, whereas 9 more countries are represented by 1 or 2 presenters each. Compared to the years prior to 2021, when most of the researchers came from the USA, the European Union, and the Far East, the structure of the participants is similar to the last year, when most participants came from Serbia, the Czech Republic, and Poland.

This year's winner of the MRS-Serbia Award for Lasting and Outstanding Contribution to Materials Science and Engineering is Richard W. Siegel, Rensselaer Polytechnic Institute Professor, Member of the International Advisory Board of our Society, and a plenary speaker at many YUCOMAT Conferences. He is a scientist and innovator with an enormous contribution to Materials Science and Engineering, and the complete nomination can be found in the Program and the Book of Abstracts. Professor Siegel is here and he will present his lecture to us a little later.

One of the important activities of our Society, ever since its establishment, has been the encouragement of young researchers through the competition for the best doctoral thesis between the two Conferences, and the best oral and poster presentations. The total number of winners so far is close to 100, with an almost equal number of domestic and foreign award winners (<https://www.mrs-serbia.org.rs/index.php/about-us-m/mrs-serbia-past-present-and-future-1995-2020>).

As of 2021, MRS-Singapore joined us in this activity, and now they also financially support 10 award winners. At this Opening Ceremony, immediately after this speech, last year's winners will receive a diploma and a small compensation. At this year's Conference, we have 47 young researchers, 31 competing for the best poster presentations and 16 for the best oral presentations. They will receive 10 awards in total and the winners will be announced at the Closing of the Conference on Friday.

It is my great pleasure to tell you that after fifteen years of inactivity, we have renewed the work of the International Institute for Sintering Science (<https://www.iiss-sci.org/index.php>). In 2019, together with YUCOMAT, we organized the 11th WRTCS and that was when we elected fifteen new active IISS members. This year, we have elected approximately thirty new members, including the full, the corresponding, and the honorary. From the time IISS was formed, in 1969, until now, a total of more than 200 distinguished "sinterers" were selected, which makes it a kind of an Academy. The total number of active members is currently more than 100, which gives us a hope and justifies our expectation of return to the old paths of glory. At the Managing Board Meeting on Tuesday, August 30, we will discuss how to make this happen. All suggestions are welcome.

Many participants from all over the world paraded through this and other halls within the YUCOMAT and the WRTCS conferences. During the 25 years of existence of MRS-Serbia, 4,200 lectures were held by authors from around 60 countries, of which more than 400 were plenary. The first Sintering Conference was held in 1969 at this very building, and despite the fifteen-year long hiatus, more than 2500 lectures were held in total, be it here, in Herceg-Novi, the cities of the former Yugoslavia or across Europe, North America, Far East, *etc.* The First Yugoslav-Ukrainian school (conference) was held in this hall on powder metallurgy in 1966, which, with the input of German and USA colleagues, formed the nucleus for the formation of IISS in 1969. At that time, researchers like I. N. Francevich, I. M. Fedorchenko, Ya. E. Geguzin, V. V. Skorohod, P. S. Kisliy, V. A. Lavrenko and others wrote bright pages of the sintering history. Many of their followers in Ukraine and abroad still do it.

To reduce the strained relations that might have arisen between Russian scientists and the international research community, immediately after the invasion of Ukraine, the Ministry of Science and Higher Education of the Russian Federation made a decision (March 21, 2022) that Russian scientists would not participate at international conferences in 2022. On the other side, in these difficult moments for our colleagues in Ukraine, about thirty of them will be with us, some here in the hall, some with online lectures. I want to take a moment and personally thank Drexel University, AFOSR, Office in London, and MRS-Serbia for the support given to our Ukrainian colleagues.

Finally, I wish us all a pleasant stay in Herceg-Novi, another successful and memorable conference, and of course, a safe journey home.

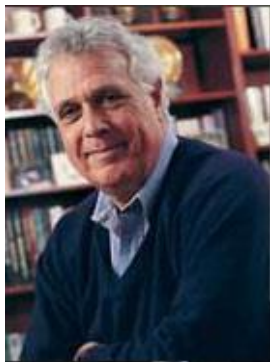
Sincerely Yours,

Dragan Uskoković

2022 MRS-SERBIA AWARD FOR A LASTING AND OUTSTANDING CONTRIBUTION TO MATERIALS SCIENCE AND ENGINEERING

We are pleased to announce that the laureate of the 2022 **MRS-Serbia Award for a Lasting and Outstanding Contribution to Materials Science and Engineering** is

Prof. Dr. Richard W. Siegel



He is awarded for his achievements in the materials science and nano-technology- science and innovation.

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

The Executive Board of the MRS- Serbia Presidency, at their online meeting on 15. 02. 2022, considered the submitted nomination for the MRS-Serbia's 2022 Award for a Lasting and Outstanding Contribution to Materials Science and Engineering. It is concluded that the procedure was conducted in accordance with the Awarding Rulebook, that the Call was announced on the MRS- Serbia's website on December 31st, 2021, and that in the stipulated period of 45 days two candidates were submitted:

- **Prof. Dr. Richard W. Siegel**
- **Prof. Dr. Knut Urban**

Having received the opinion from the Expert Committee members: Prof. Dr. Dragan Uskoković (President of MRS- Serbia), Prof. Yury Gogotsi (Chair of YUCOMAT Conferences International Advisory Board and as 2021 Laureate), Prof. Robert Sinclair (Honorary Chair of YUCOMAT Conferences International Advisory Board and as 2020 Laureate), Prof. Dejan Raković (Vice-President of MRS-Serbia), Dr. Slobodan Milonjić (President of the Council and Member of the Presidency of MRS-Serbia), Prof. Dr. Nenad Ignjatović (Member of the Presidency and Secretary General of MRS-Serbia) and Prof. Dr. Ivan Bozovic as 2015 Laureate, Prof. Dr. Gordana Vunjak- Novaković as 2016 Laureate, Prof. Dr. Velimir Radmilović as 2017 Laureate, Prof. Dr. László Forró as 2018 Laureate and Prof. Danilo Suvorov as 2019 Laureate, the Executive Board of the MRS-Serbia Presidency took the decision that Prof. Dr. Richard W. Siegel should be granted MRS-Serbia's 2022 Award for a Lasting and Outstanding Contribution to Materials Science and Engineering while Prof. Dr. Knut Urban should be Laureate of 2023 MRS- Serbia Award. Prof. Dr. Richard W. Siegel was strongly supported by Prof. Dr. Dragan Uskoković, Dr. Slobodan Milonjic, Prof. Dr. Velimir Radmilović, Prof. Dejan Raković, Prof. Dr. Nenad Ignjatović, Prof. Dr. Đorđe Janačković and Prof. Dr. Petar Uskoković. Prof. Dr. Richard W. Siegel's invited plenary lecture will be presented during the Opening Ceremony of the 23rd MRS-Serbia Annual Conference YUCOMAT 2022, starting at 9.00 a.m. on Monday, August 29, 2022.

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

MATERIALS RESEARCH SOCIETY OF SERBIA

President of the Council: Slobodan Milonjić
President: Dragan Uskoković
Vice-presidents: Velimir Radmilović, Dejan Raković, Smilja Marković
General Secretary: Nenad Ignjatović
Members: Gordana Ćirić-Marjanović, Vera Dondur, Đorđe Janačković, Dragana Jugović, Đuro Koruga, Slavko Mentus, Bojana Obradović, Zoran Petrović, Milenko Plavšić, Zoran Popović, Vladimir Srđić, Jovan Šetrajčić, Petar Uskoković, Miodrag Zlatanović

International Advisory Board

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Chair: Yury Gogotsi (USA)

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YUCOMAT 2022

Conference Organising Committee

Chairpersons: Đorđe Veljović, Zoran Jovanović

Members: Branko Matović, Irena Nikolić, Bojana Obradović, Vuk Radmilović,
Veljko Đokić, Ljiljana Damnjanović, Sonja Jovanović, Aleksandar
Dekanski, Mira Vukčević, Željko Radovanović

Conference Managers: Ivana Kovačević, Dušana Nedović, Jasmina Jevtić

Conference Technical Committee

Ivana Dinić, Željko Mravik, Vukašin Ugrinović, Tamara Matić, Marija Milivojević, Milica Stefanović,
Ivana Banićević, Marija Stevanović, Jelena Petrović, Anđela Radisavljević, Nemanja Barać, Marko Jelić

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).

INTERNATIONAL INSTITUTE FOR THE SCIENCE OF SINTERING

Managing Board

President: Prof. Danilo Suvorov
President of Managing Board: Prof. Dragoljub P. Uskoković
Members of Managing Board: Prof. Rajendra Bordia, Prof. Suk-Joong L. Kang, Prof. Bernd Kieback, Prof. Zoran S. Nikolić, Prof. Eugen A. Olevsky, Prof. Andrey B. Ragulya, Prof. Masahiro Yoshimura

Conference Local (Serbia)

Co- chair: Biljana Stojanović, Đorđe Janačković

The International Institute for the Science of Sintering (IISS <https://www.iiss-sci.org>) was originally established in 1968 as the International Team of Study of Sintering, based in Belgrade, Yugoslavia (today the Republic of Serbia) at the Vinča Institute of Nuclear Science. The founding assembly was held next year in Herceg Novi, and it brought about one hundred scientists from different parts of the world. This was an open symposium where all the founders gave plenary lectures on their most up-to-date research. The team decided to organize this conference at the same place every other year. After the first one, the interest grew rapidly in the world, so by 1973 many new members joined. The International Team for the Study of Sintering soon became the International Institute for the Science of Sintering. At the initiative of the President of the Serbian Academy of Science and Arts (SASA), Pavle Savić, the Institute received the patronage of SASA and eminent institutions from the member countries. At that time, the Institute played an enormous role in bringing scientists from all over the world closer together. This was especially important during the Cold War when Yugoslavia was the only place where scientists from the East and from the West could meet. The 11th conference was held in 2019 in Herceg Novi, Montenegro (<https://www.mrs-serbia.org.rs/files/50.pdf>) in the same hotel resort where the first conference was organized more than 50 years ago. It re-established the activity of the Institute and marked the new beginning of new series of famous Yugoslav Sintering Conferences.

A significant rejuvenation of IISS membership was achieved during the previous XI WRTCS, 2019 in Herceg Novi, and a major revival during this year 2022. Due to intense work of the IISS members, despite the many challenges we faced due to the COVID pandemic, more than thirty reputable scientists were elected. In this relatively short period, the IISS Composes close to 100 active members now, which confirms and justifies our expectations about the restoration of the Institute. All of us are now certain we'll reinstate it to its full glory of the 1980 and the 1990s of the last century.

XII WRTCS

Conference Organising Committee

Chairpersons: Đorđe Veljović, Zoran Jovanović

Members: Branko Matović, Irena Nikolić, Bojana Obradović, Vuk Radmilović, Veljko Đokić, Ljiljana Damnjanović, Sonja Jovanović, Aleksandar Dekanski, Mira Vukčević, Željko Radovanović

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GENERAL INFORMATION

DATE AND VENUE: The joint event YUCOMAT 2022 & XII WRTCS conferences will be held on August 29 - September 2, 2022, at the Hunguest Hotel Sun Resort, in Herceg Novi, Montenegro. Participants will also be accommodated there. The conference will begin on Monday, August 29th, at 09.00 and end on Friday, September 2nd, 2022, at 12.30.

REGISTRATION: Registration, registration fee payment, conference materials distribution, etc, will take place at the conference desk (Conference Secretariat) open on Sunday, August 28, and Monday, August 29, from 8.00 to 19.00, on Tuesday, Wednesday and Thursday 8.00-12.00 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 2022 Conference site: <https://www.mrs-serbia.org.rs/index.php/virtual-presentation> from August 23, 2022, to 7 days after the deadline for the end of the Conference (September 10, 2022).

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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 2022 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 2023 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 YUCOMAT 2022 & XII WRTCS CONFERENCE PROGRAM

Sunday, August 28, 2022

08.00-19.00 **Registration**

Monday, August 29, 2022

08.00-19.00 **Registration**

09.00-09.30 **OPENING CEREMONY**, Main Conference Hall

Welcome Speech - **Dragan Uskoković**, president of IISS and MRS-Serbia

Welcome Address - **Yury Gogotsi**, Chair of International Advisory Board

Presentation of the YUCOMAT 2021 Awards for young authors of the best oral and poster presentation

09.30-10.15 The Laureate of the 2022 MRS-Serbia, Award for a Lasting and Outstanding Contribution to Materials Science and Engineering, **Richard W. Siegel**

10.45-13.15 **First YUCOMAT Plenary Session**, Main Conference Hall

13.15 **Photo Session**

15.00-18.45 **Second YUCOMAT Plenary Session** , Main Conference Hall

19.30-21.30 **Cocktail Party**

Tuesday, August 30, 2022

08.30-10.00 **First YUCOMAT Poster Session**, National Restaurant Jadranka Terrace
Competition for the best Oral presentation of young researchers

10.30-14.00 **First WRTCS Plenary Session**

15.00-19.15 **First YUCOMAT Oral Session, Main Conference Hall**

Competition for the best YUCOMAT Oral presentation of young researchers

Wednesday, August 31, 2022

08.30-10.00 **Second YUCOMAT Poster Session**, National Restaurant Jadranka Terrace

10.30-12.00 **Third YUCOMAT Plenary Session**, Main Conference Hall

12.30-14.00 **Fourth YUCOMAT PLENARY** Virtual Session

Thursday, September 1, 2022

08.30-09.45 **Third YUCOMAT Poster Session**, National Restaurant Jadranka Terrace

10.00-12.45 **Second WRTCS Plenary Session**, Main Conference Hall

14.00-19.00 **Boat-trip around Boka Kotorska Bay**

Friday, September 2, 2022

08.30-11.15 **Second YUCOMAT Oral Session**, Main Conference Hall

08.30-11.45 **Third YUCOMAT Oral Session**, Small Conference Hall

12.00 **Awards and Closing of the Conference**

12.30 **Cocktail and Greetings for Goodbye**

SCIENTIFIC PROGRAM

Sunday, August 28, 2022

08⁰⁰ - 19⁰⁰ Registration

Monday, August 29, 2022

OPENING CEREMONY, Main Conference Hall

09.00-09.30 Welcome Speech - **Dragan Uskoković**, president of IISS and MRS-Serbia,
Welcome Address - **Yury Gogotsi**, Chair of International Advisory Board
Presentation of YUCOMAT 2021 Awards for young authors of the best oral and
poster presentation

09.30-10.15 **MRS-Serbia 2022 Award for a Lasting and Outstanding Contribution to Materials
Science and Engineering**

Richard W. Siegel

Materials Science and Engineering, Rensselaer Polytechnic Institute, Troy, New York, USA

Looking Back, Moving Forward: On safari in materials with gun and camera

10.15-10.45 **Break**

FIRST YUCOMAT PLENARY SESSION, Main Conference Hall

Session I: 10.45 -13.15

Chairpersons: Sir Andre K. Geim, *Nobel Prize Winner*, Pulickel M. Ajayan

10.45-11.30 **Y.PL.S.I.1.**

Two-dimensional emptiness and its unique properties

Sir Andre K. Geim, *Nobel Prize Winner in Physics*

University of Manchester, United Kingdom

11.30-12.15 **Y.PL.S.I.2.**

Materials science with 2D atomic layers

Pulickel M. Ajayan

*Department of Materials Science and NanoEngineering, Rice University, Houston,
Texas, USA 77005*

12.15-12.45 **Y.PL.S.I.3.**

Cluster-assembled materials

Horst Hahn, Gleb Iankevich, Ramin Shadkam

Institute of Nanotechnology (INT), Karlsruhe Institute of Technology (KIT), Germany

12.45-13.15 **Y.PL.S.I.4.**

**Probing structure and dynamic behaviors of topological polar solitons by electron
microscopy**

Xiaoqing Pan

*Department of Materials Science and Engineering, Department of Physics and
Astronomy, Irvine Materials Research Institute (IMRI), University of California, Irvine,
CA 92697, USA*

13.15-13.30 **Photo session**

13.30-15.00 **Break**

SECOND YUCOMAT PLENARY SESSION Main Conference Hall

Session I: 15.00-18.45

Chairpersons: Robert Sinclair, Yury Gogotsi, John A. Rogers

15.00-15.45 **Y.PL.S.II.1.**

Two-dimensional carbides and nitrides pave the road to future technologies

Yury Gogotsi

A.J. Drexel Nanomaterials Institute, and Department of Materials Science and Engineering, Drexel University, Philadelphia, PA 19104, USA

15.45-16.30 **Y.PL.S.II.2.**

Advanced materials for health monitoring and haptic interactions

John A. Rogers

Northwestern University, Evanston, IL, USA

16.30-17.00 **Break**

17.00-17.30 **Y.PL.S.II.3.**

Correlative imaging of mineral deposits in brain tissue of Alzheimer's disease patients: application to the valence state of iron deposits by STEM-EELS

Robert Sinclair¹, Yitian Zeng¹, Philip S. Digiaco², Michael M. Zeineh³

Departments of ¹Materials Science and Engineering, ²Bioengineering and ³Radiology, Stanford University, Stanford, CA 94305, USA

17.30-18.00 **Y.PL.S.II.4.**

Advances in engineering novel materials for nanomedicine

Vladimir Torchilin

Center for Pharmaceutical Biotechnology and Nanomedicine, Northeastern University, Boston, MA 02115, USA

18.00-18.30 **Y.PL.S.II.5.**

SARS-CoV-2: Molecular interaction specifics viewed through the prism of nanotechnologies

Vuk Uskoković

TardigradeNano LLC, Irvine, CA 92604, USA and Department of Mechanical Engineering, San Diego State University, San Diego, CA, USA

18.30-18.45 **Y.PL.S.II.6.**

Air force office of scientific research grant funding opportunities

David Swanson

U.S. Air Force Office of Scientific Research, European Office of Aerospace Research and Development

19.30-21.30 **Cocktail Party**

Tuesday, August 30, 2022

**First YUCOMAT Poster Session, National Restaurant Jadranka Terrace
Competition for the best Poster Presentation of young researchers**

Session I: 08.30-10.00

Chairpersons: Bojana Obradović and Zoran Jovanović

YUCOMAT SYMPOSIUM A:

ADVANCED METHODS IN SYNTHESIS AND PROCESSING OF MATERIALS

P.S.I.A.1.

Silica-based organo-inorganic hybrid materials with carboxyl groups for water purification

Viktoriiia Kyshkarova^{1,2}, Zbigniew Wzorek³, Anna K. Nowak³, Inna Melnyk¹

¹*Institute of Geotechnics, Slovak Academy of Sciences, Košice, Slovakia;* ²*Technical University of Košice, Faculty of Materials, Metallurgy and Recycling, Košice, Slovakia,* ³*Cracow University of Technology, Krakow, Poland*

P.S.I.A.2.

Mg/Fe layered double hydroxides-based adsorbents for removal of inorganic toxicants commonly found in aquatic environments

Tetiana Hubetska, Victor Demchenko, Natalia Kobylinska

A.V. Dymansky Institute of Colloid and Water Chemistry NAS of Ukraine, Kyiv, Ukraine

P.S.I.A.3.

Supercritical CO₂ assisted deposition of MAPbBr₃ perovskite onto TiO₂ nanotubes

Milica Stefanović¹, Ivana Lukić², Jelena Vujančević³, Rada Petrović² and Đorđe Janačković²

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YUCOMAT SYMPOSIUM B:

ADVANCED MATERIALS FOR HIGH-TECHNOLOGY APPLICATION

P.S.I.B.1.

Crystal structure prediction and investigation of mechanical properties of the SiB₆ compound through ab initio calculations

Tamara Škundrić^{1,2}, Dejan Zagorac^{1,2}, Aleksandra Zarubica³, Jelena Zagorac^{1,2}, Milan Pejić^{1,2}, Dušica Jovanović^{2,3}, Peter Tatarko⁴, Branko Matović^{1,2}

¹*Materials Science Laboratory, Institute of Nuclear Sciences "Vinča", University of Belgrade, Belgrade, Serbia,* ²*Center for synthesis, processing and characterization of materials for application in the extreme conditions "CextremeLab", Belgrade, Serbia,* ³*Department of Chemistry, Faculty of Sciences and Mathematics, University of Niš, Niš, Serbia,* ⁴*Institute of Inorganic Chemistry, Slovak Academy of Sciences, 845 36 Bratislava, Slovakia*

P.S.I.B.2.

The influence of high-temperature annealing on the evolution of precipitates in Inconel 625 superalloy additively manufactured by laser powder bed fusion

Sylwia Staroń, Kewin Gola, Beata Dubiel

AGH University of Science and Technology, Faculty of Metals Engineering and Industrial Computer Science, Al. A. Mickiewicza 30, 30-059 Kraków, Poland

P.S.I.B.3.

The kinetics of γ' and δ phase precipitation during the high temperature annealing of Inconel 625 additively manufactured by laser powder bed fusion

Hubert Pasiowiec, Beata Dubiel, Kewin Gola

AGH University of Science and Technology, Faculty of Metals Engineering and Industrial Computer Science, Al. A. Mickiewicza 30, 30-059 Kraków, Poland

P.S.I.B.4.

Cellulose nanocrystals with different surface functionalities as outstanding scaffolds for supercapacitor materials

Gordana Backović, Wim Thielemans

Sustainable Materials Lab, Department of Chemical Engineering, KU Leuven, campus Kulak Kortrijk, Etienne Sabbelaan 53, 8500 Kortrijk, Belgium

P.S.I.B.5.

A hierarchically porous all-polysaccharide composite anode for an asymmetric supercapacitor

Julien Lemieux, Wim Thielemans

Sustainable Materials Lab, Department of Chemical Engineering, KU Leuven, campus Kulak Kortrijk, Etienne Sabbelaan 53, 8500 Kortrijk, Belgium

P.S.I.B.6.

Aqueous multivalent-ion chemistry of vanadium oxides: Novelty and Challenges

Milica J. Vujković

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

P.S.I.B.7.

pH-triggered sol-gel synthesis of $\text{Na}_4\text{Fe}_3(\text{PO}_4)_2\text{P}_2\text{O}_7$ cathode material

Aleksandra Gezović¹, Miloš Milović², Danica Bajuk-Bogdanović³, Veselinka Grudić¹, Slavko Mentus^{3,4}, Milica Vujković³

¹University of Montenegro, Faculty of Metallurgy and Technology, Cetinjski put bb, Podgorica, Montenegro, ²Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Knez Mihajlova 35/IV, 11158 Belgrade, Serbia, ³University of Belgrade, Faculty of Physical Chemistry, Studentski Trg 12–16, Belgrade, Serbia, ⁴Serbian Academy of Sciences and Arts, Knez Mihajlova 35, Belgrade, Serbia

P.S.I.B.8.

Experimental evaluation of mechanical anisotropic material behaviour of carbon reinforced PET-G material

Milan Janković¹, A. Petrović¹, V. Lojpur², S. Dikić³, M. Miloš¹, I. Balać¹

¹Faculty of Mechanical Engineering, University of Belgrade, Kraljice Marije 16, 11000 Belgrade, Serbia, ²Vinča Institute of Nuclear Sciences, University of Belgrade, Mike Pertovića Alasa 12-14, Vinča, 11000 Belgrade, Serbia, ³Faculty of Technology and Metallurgy, University of Belgrade, Karnegijeva 4, 11000 Belgrade, Serbia

P.S.I.B.9.

Fluidising low temperature thermochemical energy storage materials: degradation and damage assesment

Louis F. Marie, Tadhg S. O'Donovan

Heriot-Watt University, Edinburgh, EH14 4AS, United Kingdom

YUCOMAT SYMPOSIUM C:
NANOSTRUCTURED MATERIALS

P.S.I.C.1.

Investigation of 3D printing and thermomechanical properties of free-radical resin filled with TiO₂ nanoparticles

Juraj Svatík, Martina Korčušková, Martina Štaffová, Veronika Sevriugina, František Ondreáš, Petr Lepcio

Central European Institute of Technology, Brno University of Technology, Purkyňova 656/123, 61200 Brno, Czech Republic

P.S.I.C.2.

Thiocarbocyanine dye TCC: features of J-aggregation in aqueous solutions and polymer films

Polina Pisklova^{1,2}, Iryna Ropakova¹, Svitlana Yefimova¹, Alexander Sorokin¹

¹Institute for Scintillation Materials of NAS of Ukraine, Kharkiv, Ukraine, ²Institute of Physics, University of Rostock, Rostock, Germany

P.S.I.C.3.

Influence of physical cross-linking by montmorillonite on structure and thermostability of hydrogel composites based on polyacrylamide

Olena Siryk¹, Katarzyna Szewczuk-Karpisz², Olena Goncharuk¹, Yuri Samchenko¹, Dariusz Sternik³

¹Ovcharenko Institute of Biocolloidal Chemistry National Academy of Sciences of Ukraine, Akademika Vernadskogo Blvd. 42, 03680, Kyiv, Ukraine, ²Institute of Agrophysics, Polish Academy of Sciences, Doświadczalna 4, 20-290 Lublin, Poland, ³Maria Curie-Skłodowska University, M.C. Skłodowska Sq.3, 20031 Lublin, Poland

P.S.I.C.4.

Effect of polymer molecular weight on thermal and surface structural characteristics of MWCNTs/PDMS nanocomposites

Iryna Sulym¹, Mykola Borysenko¹, Yuriy Sementsov¹, Dariusz Sternik², Anna Derylo-Marczewska²

¹Chuiko Institute of Surface Chemistry of NASU, 17 General Naumov Str., 03164 Kyiv, Ukraine, ²Maria Curie-Skłodowska University, pl. Maria Curie-Skłodowskiej 3, 20-031 Lublin, Poland

YUCOMAT SYMPOSIUM D:
ECO-MATERIALS AND ECO-TECHNOLOGIES

P.S.I.D.1.

Waterborne polyurethanes based on poly(dimethylsiloxane)

Ivan Stefanović¹, Jasna Džunuzović¹, Enis Džunuzović², Carla Marega³

¹Institute of Chemistry, Technology and Metallurgy, Department of Chemistry, University of Belgrade, Njegoševa 12, 11000 Belgrade, Serbia, ²Faculty of Technology and Metallurgy, University of Belgrade, Karnegijeva 4, 11000 Belgrade, Serbia, ³Department of Chemical Sciences, University of Padova, via Marzolo 1, 35131 Padova, Italy

P.S.ID.2.

Structural characterization of geopolymers with the addition of egg shell

Sanja Knežević¹, Marija Ivanović¹, Miljana Mirković¹, Ljiljana Kljajević¹, Miloš Nenadović², Vladimir Pavlović³, Snežana Nenadović¹

¹Department Department of Materials, Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, University of Belgrade, Mike Petrovića Alasa 12-14, Vinča, 11000 Belgrade, Serbia, ²Department of Atomic Physics, Vinča Institute of Nuclear Sciences, National Institute of the Republic of Serbia, Mike Petrovića Alasa 12-14, Vinča, 11000 Belgrade, Serbia, ³Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, University of Belgrade, Belgrade, Serbia

P.S.ID.3.

Sequential extractions and leaching tests as methods for characterization of mine tailings for the purpose of their probable application in eco-friendly geopolymers

Lyudmila Angelova, Darya Ilieva, Temenuzhka Radoykova, Andriana Surleva

University of Chemical technology and Metallurgy, 8 „St. Kl. Ohridski” blvd., 1756 Sofia, Bulgaria

P.S.ID.4.

Obtaining and characterising Cu-infused antimicrobial films formed from regenerated cellulose-CaCO₃ composite

Aleksandra Ivanovska¹, Nemanja Barac¹, Vesna Radojević², Petar Uskoković², Đorđe Janacković^{1,2}, Ernest Barcelo^{3,4}, Patrick Gane^{2,4}, Mirjana Kostić¹

¹University of Belgrade, Innovation Center of the Faculty of Technology and Metallurgy in Belgrade Ltd., Karnegijeva 4, 11000 Belgrade, Serbia, ²University of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4, 11000 Belgrade, Serbia, ³Omya International AG, Baslerstrasse 42, 4665 Oftringen, Switzerland, ⁴Aalto University, Department of Bioproducts and Biosystems, School of Chemical Engineering, 00076 Aalto, Helsinki, Finland

P.S.ID.5.

Comparative study of biomass-derived carbon interfacial processes in Aluminum-based and conventional acidic electrolyte

Jana Mišurović¹, Aleksandra Gezović¹, Jugoslav Krstić², Branislav Milovanović³, Veselinka Grudić¹, Slavko Mentus³, 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

YUCOMAT SYMPOSIUM E: BIOMATERIALS

P.S.IE.1.

Laser-induced chemical and morphological changes of the titanium alloy surface under different irradiation parameters

Slađana Laketić¹, Marko Rakin², Miloš Momčilović¹, Jovan Ciganović¹, Đorđe Veljović², Ivana Cvijović-Alagić¹

¹Institute of Nuclear Sciences „Vinča“, University of Belgrade, P.O. Box 522, 11001 Belgrade, Serbia; ²Faculty of Technology and Metallurgy, University of Belgrade, Karnegijeva 4, 11120 Belgrade, Serbia

P.S.I.E.2.

Search for "needles" of hydroxyapatite in the "haystack" of ovarian cancer

Ruslana Chyzhna, Roman Moskalenko
Sumy State University, Sumy, Ukraine

P.S.I.E.3.

The role of oxalate nanocrystalline for the differential diagnostics of the breast pathology

Olena Kolomiets¹, Artem Piddubnyi^{1,2}, Serhey Danilchenko³, Roman Moskalenko²
¹*Department of Pathology, Sumy State University, Sumy, Ukraine,* ²*Ukrainian-Swedish Research center SUMEYA, Sumy State University, Sumy, Ukraine,* ³*Institute of Applied Physics, NAS of Ukraine, Sumy, Ukraine*

P.S.I.E.4.

Optimisation of a 3D in vitro model for osteosarcoma cell cultivation

Ivana Banićević¹, Jelena Petrović², Milena Milivojević³, Milena Stevanović^{3,4,5}, Radmila Janković⁶, Jasmina Stojkowska^{1,2}, Bojana Obradović¹
¹*University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia,* ²*Innovation Center of the Faculty of Technology and Metallurgy, Belgrade, Serbia,* ³*University of Belgrade, Institute of Molecular Genetics and Genetic Engineering, Belgrade, Serbia,* ⁴*University of Belgrade, Faculty of Biology, Belgrade, Serbia,* ⁵*Serbian Academy of Sciences and Arts, Belgrade, Serbia,* ⁶*University of Belgrade, School of Medicine, Belgrade, Serbia*

P.S.I.E.5.

Development of a 3D in vitro model based on alginate microfibers with immobilized cancer cells for cancer research and anticancer drug testing

Jelena Petrović^{1,2}, Ivana Banicević¹, Jasmina Stojkowska^{1,2}, Miodrag Dragoj³, Milica Pešić³, Milena Milivojević⁴, Milena Stevanović^{4,5,6}, Bojana Obradović¹
¹*University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia,* ²*Innovation Center of the Faculty of Technology and Metallurgy, Belgrade, Serbia;* ³*University of Belgrade, Institute for Biological Research "Sinisa Stanković" - National Institute of the Republic of Serbia, Belgrade, Serbia,* ⁴*University of Belgrade, Institute of Molecular Genetics and Genetic Engineering, Belgrade, Serbia,* ⁵*University of Belgrade, Faculty of Biology, Belgrade, Serbia,* ⁶*Serbian Academy of Sciences and Arts, Belgrade, Serbia*

P.S.I.E.6.

PCL-MXene composite electrospun membrane for nerve regeneration: structural and biological assessment

Kateryna Diedkova¹, Yevhen Samokhin¹, Veronika Zahorodna², Ivan Baginskiy², Vitalii Balitskiy², Oleksiy Gogotsi², Viktoriia Korniienko¹
¹*Sumy State University, 31 Sanatorna St, Sumy 40007, Ukraine,* ²*Materials Research Centre, 3 Krzhizhanovskogo St, Kyiv 03680, Ukraine*

P.S.I.E.7.

3D printed calcium phosphate cement scaffolds loaded with liposomal antibacterial enzymes for the prevention of osteomyelitis

Zuzana Kadlecová, Kristýna Hlináková, Lucy Vojtová
Central European Research Institute, Brno University of Technology

P.S.I.E.8.

Hydrogel dressings for phage therapy of chronic wounds

E. Černá¹, L. Vacek², F. Růžička², B. Lipový³, M. Benešík⁴, T. Botka⁴, R. Pantůček⁴, L. Vojtová¹

¹Central European Institute of Technology, Brno University of Technology, Brno, Czech Republic;

²Department of Microbiology, St. Anne's University Hospital Brno and Faculty of Medicine, Masaryk University, Brno, Czech Republic;

³Department of Burns and Plastic Surgery, University Hospital Brno and Faculty of medicine, Masaryk University, Brno, Czech Republic;

⁴Section of Genetics and Molecular Biology, Faculty of Science, Masaryk University, Brno, Czech Republic

P.S.I.E.9.

Biomechanical DMA characterization of calcium and barium alginate hydrogel scaffolds

Alexandra Zühlke¹, Ivana Banićević², Bojana Obradović², Michael Gasik¹

¹Aalto University Foundation, Espoo, Finland. ²University of Belgrade, Belgrade, Serbia

P.S.I.E.10.

Hydroxyl radical scavenging activity of titanium oxide nanocrystals

Pavel Maksimchuk¹, Kateryna Hubenko¹, Vladyslav Seminko¹, Andrey Onishchenko², Iryna Bespalova¹, Anatolii Onishchenko³, Volodymyr Prokopiuk³, Anton Tkachenko³, Svetlana Yefimova¹

¹Department of Nanostructured Materials, Institute for Scintillation Materials NAS of Ukraine, Kharkiv, Ukraine,

²Department of Physics, Kharkiv National University of Radio Electronics, Kharkiv, Ukraine,

³Research Institute of Experimental and Clinical Medicine, Kharkiv National Medical University, Kharkiv, Ukraine

P.S.I.E.11* Magnesium alloy with yttrium, gadolinium and calcium alloying elements designed for aviation applications

Jitka Stráská¹, Stanislav Šašek¹, Peter Minárik¹, Robert Král¹, Jozef Veselý¹, Jiří Kubásek²

¹Charles University, Faculty of Mathematics and Physics, Department of Physics of Materials, Ke Karlovu 5, 121 16 Praha, Czech Republic,

²University of Chemistry and Technology, Faculty of Chemical Technology, Department of Metals and Corrosion Engineering, Technická 5, 166 28 Praha, Czech Republic

P.S.I.E.12* Resonance ultrasound spectroscopy measurements of elastic modulus of biomedical Ti-based alloys prepared by SPS

Josef Stráský^a, Jiří Kozlík^a, Dalibor Preisler^a, Hanuš Seiner^b, Michaela Janovská^b, Martin Koller^b, Miloš Janeček^a

^aDepartment of Physics of Materials, Faculty of Mathematics and Physics, Charles University, Czechia, ^bInstitute of Thermomechanics, Czech Academy of Sciences, Czechia

***They do not participate in the Competition for the best Poster Performance of young researchers**

10.00-10.30 **Break**

First WRTCS Plenary Session, Main Conference Hall

Session I: 10.30-14.00

Chairpersons: Eugene A. Olefsky, Suk-Joong L. Kang

10.30-11.00 **W.PL.S.I.1**

Sintering assisted additive manufacturing

Eugene A. Olefsky

San Diego State University

- 11.00-11.30 **W.PL.S.I.2.**
Challenges and opportunities for machine learning approaches for sintering and microstructure development
Rajendra Bordia, Fei Peng
Materials Science and Engineering, Clemson University, Clemson, SC 29634 USE
- 11.30-12.00 **W.PL.S.I.3.**
Electric field assisted sintering of oxide ceramics: fields matter!
Olivier Guillon
*Institute of Energy and Climate Research: Materials Synthesis and Processing
Forschungszentrum Jülich GmbH & RWTH Aachen University, Germany*
- 12.00-12.30 **Break**
- 12.30-13.00 **W.PL.S.I.4.**
Enhancing powder metallurgy processing using advanced microstructural characterization and physical metallurgy
*Hamish L. Fraser
Center for the Accelerated Maturation of Materials, Department of Materials Science and Engineering, The Ohio State University, Columbus OH, USA*
- 13.00-13.30 **W.PL.S.I.5.**
The role of sintering in process design for aerosol synthesis of nanostructured materials
Sotiris E. Pratsinis
Particle Technology Laboratory, Institute of Process Engineering, Swiss Federal Institute of Technology (ETH Zurich), CH-8092 Zurich, Switzerland
- 13.30-14.00 **W.PL.S.I.6.**
Grain growth: the mixed control mechanism of atom transport
Suk-Joong L. Kang
KAIST, Daejeon, Korea
- 14.00-15.00 **Break**
- First YUCOMAT Oral Session, Main Conference Hall**
Competition for the best Oral Presentation of young researchers
- Session I: 15.00-19.15**
Chairpersons: Snežana Lazić, Vuk Radmilović
- YUCOMAT SYMPOSIUM A:
ADVANCED METHODS IN SYNTHESIS AND PROCESSING OF MATERIALS
- 15.00-15.15 **O.S.I.A.1.**
Characterization of thin films obtained using pulsed laser deposition technique
Agnieszka Radziszewska, Kazimierz Kowalski, Tomasz Moskalewicz
AGH University of Science and Technology, Krakow, Poland
- 15.15-15.30 **O.S.I.A.2.**
Selective laser melting technology of hot work tool steel influenced by remelting method without preheating of the base plate
K. Fryzowicz, R. Dziurka, R. Bardo, P. Bała
AGH Univeristy of Science and Technology, Cracow, Poland

15.30-15.45 **O.S.I.A.3.**

Effect of sodium on phase transformation of gamma-alumina

Darya Farrokhmoun

Materials Science and Nanoengineering, Sabanci University, Orta Mahalle, Tuzla, Istanbul, 34956, Turkey

15.45-16.00 **O.S.I.A.4.**

Densification and microstructural evolution of Na-doped alphaalumina

Shahrzad Sajjadivand, Mehmet Ali Gülgün

Sabanci University, Tuzla, Istanbul, 34956, Turkey

YUCOMAT SYMPOSIUM B: ADVANCED MATERIALS FOR HIGH-TECHNOLOGY APPLICATION

16.00-16.15 **O.S.I.B.1.**

Graphene supported PdAu nanoparticles as catalyst for hydrogen evolution reaction

Lazar Rakočević¹, Irina Srejić¹, Aleksandar Maksić¹, Jelena Golubović², Svetlana Štrbac²

¹INS Vinca, Department of Atomic Physics, University of Belgrade, Mike Alasa 12-14, 11001 Belgrade, Serbia, ²Institute of Chemistry, Technology and Metallurgy, Department of Electrochemistry, University of Belgrade, Njegoseva 12, 11000 Belgrade, Serbia

16.15-16.30 **O.S.I.B.2.**

Metal-ceramic composites based on reinforced ceramics

Ievgen Solodkyi, Sergii Tesla, Iurii Bogomol, Petro Loboda

Igor Sikorsky Kyiv Polytechnic Institute, 35 Politechnichna Str., Kyiv, 03056, Ukraine

16.30-16.45 **O.S.I.B.3.**

Suspension plasma spraying of BaTiO₃ and BaTiO₃/ZrO₂

Vojtech Marak¹, Daniel Drdlik^{1,2}, Dapeng Zhou³, Robert Vaßen³

¹CEITEC BUT, Brno University of Technology, Purkynova 123, 612 00 Brno, Czech Republic, ²Faculty of Mechanical Engineering, Brno University of Technology, Technicka 2, 616 69 Brno, Czech Republic, ³Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research IEK-1, 524 25 Jülich, Germany

16.45-17.00 **O.S.I.B.4.**

Investigation of the dynamics of deformation mechanisms in Mg-Gd alloys

Andrea Szabóová¹, Kristián Máthis¹, Daria Drozdenko¹, Michal Knapek¹, Gergely

Farkas², Gergely Németh², Petr Harcuba¹

¹Department of Physics of Materials, Faculty of Mathematics and Physics, Charles University, 121 16 Prague 2, Ke Karlovu 5, Czech Republic, ²Nuclear Physics Institute, Czech Academy of Sciences, 250 68 Řež, Husinec - Řež, čp. 130, Czech Republic

17.00-17.15 **O.S.I.B.5.**

Investigations of pressed and sintered components using 17-4PH powder collected in the chamber of an SLM printer

Mohammed Qasim Kareem, Tamás Mikó, Gréta Gergely, Zoltán Gács

Institute of Physical Metallurgy, Metalforming and Nanotechnology, University of Miskolc, Hungary

17.15-17.45 **Break**

**YUCOMAT SYMPOSIUM C:
NANOSTRUCTURED MATERIALS**

17.45-18.00 **O.S.1.C.1.**

Electrochemically-grown Cu₂O nanocubes favorably electroreduce CO₂ to methane: What triggers the activity?

S. Popović^{1,2}, M. A. Nazrulla¹, N. 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

18.00-18.15 **O.S.1.C.2.**

N-Heterocyclic carbenes - the design concept for densely packed and thermally ultra-stable aromatic self-assembled monolayers

Mateusz Wróbel,¹ Daria M. Cegiłka,¹ Andika Asyuda,² Krzysztof Koziol,³ Michael Zharnikov² and Piotr Cyganik¹

¹Smoluchowski Institute of Physics, Jagiellonian University, Łojasiewicza 11, 30-348 Krakow, Poland, ²Angewandte Physikalische Chemie, Universität Heidelberg, Im Neuenheimer Feld 253, D-69120 Heidelberg, Germany, ³Faculty of Chemistry, Jagiellonian University, Gronostajowa 2, 30-387 Krakow, Poland

18.15-18.30 **O.S.1.C.3.**

Probing improper ferroelectricity in oxygen-deficient YMnO₃ ultrathin films

Alexander Vogel^{1,2}, Alicia Ruiz-Caridad¹, Johanna Nordlander^{2,3}, Morgan Trassin², Marta D. Russell¹

¹Electron Microscopy Center, Empa, Swiss Federal Laboratories for Material Science and Technology, Dübendorf, Switzerland, ²Department of Materials, Eidgenössische Technische Hochschule Zürich, Zürich, Switzerland, ³Department of Physics, Harvard University, Cambridge, MA, United States of America

**YUCOMAT SYMPOSIUM D:
ECO-MATERIALS AND ECO-TECHNOLOGIES**

18.30-18.45 **O.S.1.D.1.**

Effect of metakaolin and lime on strength development of blended cement paste

Kosar Hassannezhad, Yasemin Akyol, Mehmet Can Dursun, Cleve Ow-Yang, Mehmet Ali Gulgun

Sabanci University, Istanbul, Turkey

**YUCOMAT SYMPOSIUM E:
BIOMATERIALS**

18.45-19.00 **O.S.I.E.1.**

Nanoparticles in our brains

Anastasiia Denysenko, Roman Moskalenko

Department of Pathology, Sumy State University, Sumy, Ukraine

19.00-19.15 **O.S.I.E.2.**

Sintering of biodegradable Mg-Y and Mg-Nd magnesium alloys fabricated for medical applications

¹Mária Zemková, ²František Lukáč, ²Zdeněk Dlabáček, ¹Robert Král, ¹Peter Minárik
¹Charles University, Prague, Czech Republic, ²Institute of Plasma Physics, Czech Academy of Science, Prague, Czech Republic

Wednesday, August 31, 2022

Second YUCOMAT Poster Session, National Restaurant Jadranka Terrace

Session I: 08.30-10.00

Chairperson: Đorđe Veljović, Sonja Jovanović

YUCOMAT SYMPOSIUM A:

ADVANCED METHODS IN SYNTHESIS AND PROCESSING OF MATERIALS

P.S.II.A.1.

Synthesis and characterization of glass-ceramic-metal composite materials obtained by sintering

Vladimir Pavkov¹, Gordana Bakić², Vesna Maksimović¹, Dušan Bučevac¹, Marija Prekajski Đorđević¹, Branko Matović¹

¹Vinča Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, ²Faculty of Mechanical Engineering, University of Belgrade, Serbia

P.S.II.A.2.

Positronics science in the contemporary nanocomposites engineering: towards guided functionality of PVP-nanosized glassy arsenoselenides

Oleh Shpotyuk^{1,2}, Adam Ingram³, Yaroslav Shpotyuk^{4,5}, Jacek Filipecki¹

¹O.G.Vlokh Institute of Physical Optics, Lviv, Ukraine, ²Jan Dlugosz University in Czestochowa, Czestochowa, Poland, ³Opole University of Technology, Opole, Poland, ⁴University of Rzeszow, Rzeszow, Poland, ⁵Ivan Franko National University of Lviv, Lviv, Ukraine

P.S.II.A.3.

Novel technology for production of nanopowders by electroerosion dispersion method

Gennadii Kochetov, Mykola Monastyrov, Tetiana Prikhna, Dmytro Samchenko

Kyiv National University of Construction and Architecture, Kyiv, Ukraine

P.S.II.A.4.

New directions of arylamines oxidation with H₂O₂: polymerization of aniline in the presence of para-aminodiphenylamine

Jana Mišurović¹, Gordana Čirić-Marjanović²

¹University of Montenegro-Faculty of Metallurgy and Technology, Cetinjski put bb. 81000 Podgorica, Montenegro, ²University of Belgrade-Faculty of Physical Chemistry, Studentski Trg 12–16, 11158 Belgrade, Serbia

P.S.II.A.5.

Laser processing structure optimization of the metal materials created using additive technologies

I. Galstian, Y. Len, M. Shevchenko, O. Gerasimov, S. Mulyenko, I. Sydorchenko, M. Yakymchuk, D. Savvakina, M. Rud, S. Smolnik

G. V. Kurdyumov Institute for Metal Physics of the N.A.S. of Ukraine

YUCOMAT SYMPOSIUM B:
ADVANCED MATERIALS FOR HIGH-TECHNOLOGY APPLICATION

P.S.II.B.1.

Reduced mobility for H₃ + in n-Butanol gas

Željka Nikitović

Institute of Physics University of Belgrade, Pregrevica 118, 11080 Belgrade, Serbia

P.S.II.B.2.

Intrinsic magnetic properties of the RFe₁₁Ti (R = Y, Gd and Pr) by Zr, Co and C doping

Diana Benea, Razvan Hirian, Simona Gutoiu¹ and Viorel Pop

Babes-Bolyai University, Cluj-Napoca, Romania, ¹INCDTIM Cluj-Napoca, Romania

P.S.II.B.3.

Lanthanides-doped tellurite glasses: A new screen material candidate for volumetric 3D display applications

Naji Vahedigharehchopogh, Orhan Kıbrıslı, Miray Çelikkilek Ersundu, Ali Erçin Ersundu

Yildiz Technical University, Faculty of Chemical and Metallurgical Engineering, Department of Metallurgical and Materials Engineering, Glass Research and Development Laboratory, Istanbul, 34220, Turkey

P.S.II.B.4.

Phosphorescence decay kinetics of the Becquerel type in YAP:Mn

Sergii Ubizskii¹, Oleh Buryy¹, Volodymyr Degoda², Halyna Podust²

¹Lviv Polytechnic National University, Lviv, Ukraine, ²Taras Shevchenko National University of Kyiv, Kyiv, Ukraine

P.S.II.B.5.

Organic and Perovskite Solar Cells-Which Wet Will Win the Bet?

Vuk V. Radmilović¹, Yi Hou², Fei Guo², Christoph J. Brabec², Erdmann Spiecker³, Velimir R.

Radmilović⁴

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P.S.II.B.6.

Synthesis and properties of stable nitrogen-doped MWCNTs for thermoelectric applications

Mikhail V. Katkov¹, Krisjanis Buks¹, Jana Andzane², Anatolijs Šarakovskis³, Krišjānis Šmits³ and Donats Erts²

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P.S.II.B.7.

Fabrication and characterization of high entropy pyrochlore ceramics

Branko Matović¹, Dejan Zagorac¹, Ivana Cvijović-Alagić¹, Jelena Zagorac¹, Svetlana Butulija¹, Jelena Erić¹, Ondrej Hanzel², Richard Sedlák³, Maksym Lisnichuk⁴, Peter Tatarko²

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P.S.II.B.8.

Discrimination of the exhaled compound of lung cancer patients and healthy subjects by a biosensor based on essential 20 amino acids.

Gyeong-Ha Bak¹, Eun Jung- Choi², Thanh Mien Nguyen¹, Minsu Jang¹, Jung-Geun Lee³, Nayeoung Kim², Yeong Ju Lee², Jin-Woo Oh^{1,2,3}

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P.S.II.B.9.

Three-dimensional plasmonic nanoclusters for high sensitivity SERS platform development

Minsu Jang¹, Gyeong-Ha Bak¹, Thanh Mien Nguyen¹, Jung-Geun Lee², Nayeoung Kim³, Yeong Ju Lee³, Eun-Jung Choi³, Jin-Woo Oh^{1,2,3}

¹Department of Nano fusion technology, Pusan National University, Busan 46241, Republic of Korea, ²Department of Nano energy engineering, Pusan National University, Busan 46241, Republic of Korea, ³Bio-IT Fusion Technology Research Institute, Pusan National University, Busan 46241, Republic of Korea

P.S.II.B.10.

Dielectric properties of polyvinyl alcohol composites with improved ionic conductivity

T. A. Filip^{1,2}, C. Hamciuc³, T. Vlad-Bubulac³, I. Turcan^{1,2}, M. Olariu^{1,2}

¹Technical University of Iasi, Faculty of Electrical Engineering, Bld. Prof.dr.doc. D. Mangeron 21-23, 700090, Iasi, Romania, ²Academy of Romanian Scientists, 050094 Bucharest, Romania, ³"Petru Poni" Institute of Macromolecular Chemistry, Aleea Gr. Ghica Voda 41A, 700487 Iasi, Romania

P.S.II.B.11.

Synthesis and characterization of iridium oxide based films

Ljiljana Gajić-Krstajić, Mila Krstajić Pajić¹, Piotr Zabinski², Vladimir Jović³, Uroš Lacnjevac³, Nevenka R. Elezović³

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P.S.II.B.12.

3D printed auxetic structures with enhanced energy absorption

Martina Štaffová, Petr Lepcio, Juraj Svatík, Martina Korčušková, František Ondreaš

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

P.S.II.B.13.

Effect of molten salts and high temperatures on the corrosion resistance of materials

Jana Rejková, Marie Kudrnová

Department of Power Engineering, University of Chemistry and Technology, Prague, Czech Republic

P.S.II.B.14.

Surface characterization of chromium nickel alloys in molten salts using x-ray photoelectron spectroscopy (XPS)

Marie Kudrnová^{1,2}, Jana Rejková¹, Hana Jukličková¹

¹University of Chemistry and Technology, Department of Power Engineering¹, Central Laboratories², Technická 5, Prague 6, 16628, Czech Republic

P.S.II.B.15.

Selection of container materials for deep repositories of radioactive waste in connection with microbial corrosion

Jana Rejková, Hana Jukličková

Department of Power Engineering, University of Chemistry and Technology, Prague, Czech Republic

YUCOMAT SYMPOSIUM C:

NANOSTRUCTURED MATERIALS

P.S.II.C.1.

Photocatalytic activity of g- and n-C₃N₄ in phodegradation of textile dye Acid Orange 7

Nadica Abazović, Tatjana Savić and Mirjana Čomor

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

P.S.II.C.2.

Band gap engineering in novel fluorite-type rare earth high-entropy oxides (RE-HEOs) with computational and experimental validation for photocatalytic water splitting applications

Igor Đerd, Dalibor Tatar, Jelena Kojčinović, Srijita Nundy¹, Habib Ullah¹, Aritra Ghosh¹, Tapas K. Mallick¹, Asif Ali Tahir¹, Rafael Meinus², Bernd Smarsly²

Department of Chemistry, Josip Juraj Strossmayer University of Osijek, Cara Hadrijana 8/A, HR-31000 Osijek, Croatia, ¹Environment and Sustainability Institute, University of Exeter, Penryn TR10 9FE, United Kingdom, ²Institute of Physical Chemistry and Center of Materials Research, Justus Liebig University, Heinrich-Buff-Ring 17, D-35392 Giessen, Germany

P.S.II.C.3.

Influence of different synthesis methods on morphological and optical properties of the rare earth doped fluorides

Ivana Dinić¹, Marina Vuković², Maria Eugenia Rabanal³, Lidija Mancic¹

¹Institute of Technical Sciences of Serbian Academy of Sciences and Arts, Belgrade, Serbia,

²Innovative Centre, Faculty of Chemistry, University of Belgrade, Serbia, ³Materials Science and Engineering Department and IAAB, Universidad Carlos III de Madrid, Leganes, Madrid, Spain

P.S.II.C.4.

Possibilities of application of green's function methods to research of nanoscopic crystal structures

Jovan P. Šetrajić¹, Siniša M. Vučenović², Dušan I. Ilić³, Stevo K. Jaćimovski⁴

¹Academy of Sciences and Arts of Republic of Srpska, Banja Luka, Republic of Srpska, Bosnia and Herzegovina, ²University of Banja Luka, Faculty of Natural Sciences and Mathematics, Banja Luka, Republic of Srpska, Bosnia and Herzegovina, ³University of Novi Sad, Faculty of Technical Sciences, Novi Sad, Vojvodina - Serbia, ⁴University of Criminal Investigation and Police Studies, Zemun-Belgrade, Serbia

P.S.II.C.5.

Characterization of magnetron sputtered Ti-Al-N thin films

Kwang Ho Kim and Kyung Mox Cho

GFHIM, School of Materials Science and Engineering, Pusan National University, Busan, 46241 Korea

P.S.II.C.6.

Characterization of adsorption site heterogeneity in gas sensors based on LPE graphene by using sensor noise analysis

Stevan Andrić, Ivana Jokić, Miloš Frantlović, Katarina Radulović, Marko Spasenović

University of Belgrade, Institute of Chemistry, Technology and Metallurgy-National Institute of the Republic of Serbia, 11000 Belgrade, Serbia

P.S.II.C.7.

Impact of TiO₂ nanoparticles on the kinetics of free-radical and cationic photopolymerization in Vat 3D printing

Martina Korčušková, Juraj Svatík, Veronika Sevrugina, Martina Štaffová, František Ondreaš, Petr Lepcio
Brno University of Technology, Central European Institute of Technology, Purkyňova 656/123, Brno, 612 00, Czech Republic

P.S.II.C.8.

Study of influence of Mn dopant on dielectric response of SrTiO₃ ceramics

J. Živojinović¹, D. Kosanović¹, V. P. Pavlović², N. Tadić³, V. B. Pavlović⁴

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P.S.II.C.9.

Physicochemical properties of copper-doped bismuth vanadate nanoparticles

Marko Jelić¹, Igor Pašti², Bojana Nedić Vasiljević², Jelena Erčić³, Danica Bajuk-Bogdanović², Zoran Jovanović¹, Sonja Jovanović¹

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P.S.II.C.10.

The effect of heat treatment and pulsed laser treatment on the morphology of Au and Ag nanoparticles and nanowires

B. Polyakov¹, E. Butanovs¹, S. Oras², V. Zadin², S. Vlassov²

¹*Institute of Solid State Physics, University of Latvia, Kengaraga street 8, LV-1063 Riga, Latvia,*

²*Institute of Physics, University of Tartu, W. Ostwaldi tn 1, 50412, Tartu, Estonia*

P.S.II.C.11.

Structural chemistry, electrical and x-ray spectroscopic properties of the ternary Ce-Ni-P compounds

Ivan Shcherba¹, Vitaliy Denys¹, Volodymyr Babizhetskyy¹, Viktor Antonov², Dragan Uskoković³, Henryk Noga⁴, Bohdan Jatsyk⁵

¹*Ivan Franko National University of Lviv, Ukraine,* ²*Institute of Physics of Metals, NASU, Kyiv, Ukraine,* ³*Institute of Technical Sciences of the SASA, Belgrade, Serbia,* ⁴*Institute of Technology, the Pedagogical University of Cracow, Cracow, Poland,* ⁵*Lviv National University of Veterinary Medicine and Biotechnologies, Lviv, Ukraine*

10.00-10.30 **Break**

Third YUCOMAT Plenary Session, Main Conference Hall

Session I: 10.30-11.45

Chairperson: Kwang Ho Kim, Peter Rogl

10.30-11.00 **Y.PL.S.III.1.**

Hard films for industrial applications: design-synthesis-evaluation

Kwang Ho Kim

Global Frontier R&D Center for Hybrid Interface based future Materials, School of Materials Science and Engineering, Pusan National University, Busan 46241, Korea

11.00-11.30 **Y.PL.S.III.2.**

Structure and properties of the compounds TZnSb, T = Ti, V, Cr

P.F. Rogl¹, R. Podloucky¹, G. Rogl¹, H. Michor², X. Yan², V. Bursikova³, P. Broz⁴, J. Bursik⁵, R. Vaclavik³, Z. Abbasi⁶, E. Schafler⁶, G. Giester⁷

¹*Institute of Materials Chemistry, Universität Wien, Währingerstr. 42, A-1090 Wien, Austria,* ²*Institute of Solid State Physics, TU Wien, Wiedner Hauptstr. 8-10, A-1040 Wien, Austria,* *Institute of Physical Electronics, Masaryk Univ., Kotlářská 2, 61137 Brno, Czech Republic,* ⁴*Dep. Chemistry, Faculty of Sci., Masaryk Univ., Kotlarska 2, 61137 Brno, Czech Republic,* ⁵*Institute of Physics of Materials, Czech Acad. of Sci., Žitkova 22, 61662 Brno, Czech Republic,* ⁶*Dynamik Kondensierter Systeme, Univ. Wien, A 1090 Wien, Botzmannng. 5, Austria,* ⁷*Inst. of Mineralogy and Crystallography, Univ. Wien, Althanstr.14, A-1090 Wien, Austria.*

11.30-11.45 **Y.PL.S.III.3.**

Electrical resistivity and thermal expansion (4.2-820 K) of nanostructured skutterudites after severe plastic deformation

Gerda Rogl^{1,2}, Viktor Soprunyuk² and Peter Rogl¹

¹*Institute of Materials Chemistry, Universität Wien, A-1090 Wien, Austria;* ²*Physics of Nanostructured Materials, Universität Wien, A-1090 Wien, Austria*

11.45-12.30 **Break**

Fourth YUCOMAT Plenary Session, Main Conference Hall

Session I: 12.30-14.00

Chairperson: Đorđe Janačković, Petar Uskoković

12.30-13.00 **Y.PL.S.IV.1. virtual**

The fundamental science and technology applications of triboelectric nanogenerators

Zhong Lin Wang

Beijing Institute of Nanoenergy and Nanosystems, Chinese Academy of Sciences, Beijing, China, School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, Georgia USA

13.00-13.30 **Y.PL.S.IV.2. virtual**

Carbon dot luminophores

Andrey L. Rogach

Department of Materials Science and Engineering, and Center for Functional Photonics, City University of Hong Kong, Hong Kong SAR

13.30-14.00 **PL.S.IV.3. virtual**

Electron liquid crystals: a Materials science minefield

Ivan Božović

Brookhaven National Laboratory, Upton, NY 11973, USA, Yale University, New Haven, CT 06520, USA

Thursday, September 1, 2022

Third YUCOMAT Poster Session, National Restaurant Jadranka Terrace

Session I: 08.30-09.45

Chairperson: Željko Radovanović, Jelena Vujančević

YUCOMAT SYMPOSIUM C:

NANOSTRUCTURED MATERIALS

P.S.III.C.12.

Electrochemical properties of composites of graphene oxide and cobalt ferrite doped with zink and gallium

Marija Grujičić¹, Željko Mravik¹, Danica Bajuk-Bogdanović², Damjan Vengust³, Zoran Jovanović¹, Ivana Stojković Simatović², Sonja Jovanović¹

¹Laboratory of Physics, Vinca Institute of Nuclear Sciences-National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, ²Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia, ³Advanced Materials Department, Jožef Stefan Institute, Ljubljana, Slovenia

P.S.III.C.13.

Electrochemical charge storage properties of thermally treated and ion-beam irradiated graphene oxide/12-tungstophosphoric acid nanocomposites

Željko Mravik¹, Marko Gloginjčić¹, Jelena Rmuš¹, Milica Pejčić¹, Danica Bajuk-Bogdanović², Maria Vesna Nikolić³, Nemanja Gavrilov², Zoran Jovanović¹

¹Center 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,

²Faculty of Physical Chemistry, University of Belgrade, P.O. Box 47, 11158, Belgrade, Serbia, ³Institute for Multidisciplinary Research, University of Belgrade, 1 Kneza Višeslava, 11000 Belgrade, Serbia

P.S.III.C.14.

Mechanochemical synthesis of MgH₂-V nanocomposites

Z. Sekulić¹, I. Milanović², B. Babić², M. Prvulović², J. Grbović Novaković², V. Asanović³

¹Ministry of Capital Investments, The Government of Montenegro, Directorate for Energy and Energy Efficiency, Rimski trg 46, 81 000 Podgorica, Montenegro, ²Vinča Institute of Nuclear Sciences, National Institute of Republic of Serbia, Centre of Excellence for Renewable and Hydrogen Energy, University of Belgrade, POB 522, 11000 Belgrade, Serbia, ³Faculty of Metallurgy and Technology, University of Montenegro, Cetinjski put 2, 81000 Podgorica, Montenegro

¹Ministry of Capital Investments, The Government of Montenegro, Directorate for Energy and Energy Efficiency, Rimski trg 46, 81 000 Podgorica, Montenegro, ²Vinča Institute of Nuclear Sciences, National Institute of Republic of Serbia, Centre of Excellence for Renewable and Hydrogen Energy, University of Belgrade, POB 522, 11000 Belgrade, Serbia, ³Faculty of Metallurgy and Technology, University of Montenegro, Cetinjski put 2, 81000 Podgorica, Montenegro

P.S.III.C.15.

Structural, optical and mechanical characterization of the PMMA- ZrO₂ nanocomposites

Ivan Pešić¹, Miloš Petrović¹, Dragana Pejčić¹, Maja S. Rabasović², Dragutin Šević², Vesna Radojević¹

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YUCOMAT SYMPOSIUM D:

ECO-MATERIALS AND ECO-TECHNOLOGIES

P.S.III.D.1.

Synthesis and characterization of thermally treated geopolymer composite materials

Miljana Mirković¹, Mira Vukčević², Ivana Bošković², Snežana Nenadović¹, Ljiljana Kljajević¹, Dunja Đukić³, Vladimir Pavlović⁴

¹Department of Materials, „VINČA“ Institute of Nuclear Sciences - National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, ²University of Montenegro, Faculty of Metallurgy and Technology, Cetinjski put bb, 81000 Podgorica, Montenegro, ³University of Belgrade, Faculty of Biology, Studentski trg 16, 11000 Belgrade, Serbia, ⁴University of Belgrade, Faculty of Agriculture, Nemanjina 6, 11080 Belgrade, Serbia

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P.S.III.D.2.

Photocatalytic activity of N-TiO₂ nanotubes decorated with CdS QD

Jelena Vujančević¹, Anđelika Bjelajac², Endre Horváth³, László Forró³, Vladimir B. Pavlović⁴, Đorđe Janačković⁵

¹Institute of Technical Sciences of SASA, Belgrade, Serbia, ²Innovation Center of Faculty of Technology and Metallurgy, Ltd, Belgrade, Serbia, ³Ecole Polytechnique Fédérale de Lausanne, Laboratory of Physics of Complex Matter, Lausanne, Switzerland, ⁴University of Belgrade, Faculty of Agriculture, Belgrade-Zemun, Serbia, ⁵University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia

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P.S.III.D.3.

Study of oil type pollutant adsorption on Vrbas river sediments (Bosnia and Herzegovina)

Sanja Pržulj¹, Gorica Veselinović², Marko Ivanišević¹, Slobodan Gnjato¹, Milica Balaban¹, and Branimir Jovančičević³

¹Faculty of Natural Sciences and Mathematics, University of Banja Luka, Mladena Stojanovića 2, 78000 Banja Luka, Bosnia and Herzegovina; ²Center of Chemistry, Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Njegoševa 12, 11001 Belgrade, Serbia; ³University of Belgrade, Faculty of Chemistry, Studentski trg 12-16, 11001 Belgrade, Serbia

P.S.III.D.4.

Evaluation of photocatalytic activity of Sr_{0.9}La_{0.1}TiO₃ and Sr_{0.25}Ca_{0.25}Na_{0.25}Pr_{0.25}TiO₃ nano-sized ceramic powders for water treatment

Nikola Kanas¹, Aleksandra Jovanoski², Vladimir Rajić³, Annu Sharma⁴, Subramshu S. Bhattacharya⁴, Stevan Armaković^{5,6}, Maria Savanović^{2,6}, Sanja J. Armaković^{2,6}

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P.S.III.D.5.

Performance of ternary cement binders containing high volume of fly ash and fluid catalytic cracking catalyst residue

Jelena Rakić¹, Zvezdana Bašcarević¹, Rada Petrović²

¹Institute for Multidisciplinary Research, University of Belgrade, Serbia, ²Faculty of Technology and Metallurgy, University of Belgrade, Serbia

P.S.III.D.6.

Comparative assessment of chemically and 'green' synthesized magnetic nanoparticles and their use for removal of pollutants

Natalia Kobylinska¹, Dmytro Klymchuk², Anatolij Shakhovskiy³, Yakiv Ratushnyak³, Volodymyr Duplij³, Nadiia Matvieieva³

¹A.V. Dumansky institute of colloidal chemistry and water chemistry NAS of Ukraine, ²Institute of Botany NAS of Ukraine, Kyiv, Ukraine, ³Institute of Cell Biology and Genetic Engineering NAS of Ukraine, Kyiv, Ukraine

P.S.III.D.7.

Environmentally friendly hybrid poly(methyl methacrylate)-wood-poly(ethylene terephthalate)-alumina composite material

Anđela N. Radisavljević¹, Marija Vuksanović², Aleksandar Grujić³, Srđan Perišić¹, Vesna Radojević⁴

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P.S.III.D.8.

Initial characterization and evaluation of two tailing dumps in Bulgaria for application as precursors for geopolymers

Darya Ilieva, Lyudmila Angelova, Temenuzhka Radoikova, Andriana Surleva

University fo Chemical technology and Metallurgy, 8 „St. Kl. Ohridski” blvd., 1756 Sofia, Bulgaria

YUCOMAT SYMPOSIUM E:

BIOMATERIALS

P.S.III.E.1.

Synthesis, characterization and DFT calculations of Schiff base Co(III) complexes

Milica Savić¹, Mima Jevtović², Matija Zlatar³, Maja Gruden¹, Dragana Mitić², Božidar Čobeljić¹, Katarina Anđelković¹

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Belgrade, Serbia; University of Belgrade-³Institute of Chemistry, Technology and Metallurgy,

Department of Chemistry, Njegoševa 12, 11000 Belgrade, Serbia

P.S.III.E.2.

Osteogenic potential of diluted blood and bone marrow in ectopic osteogenesis

Marija Vukelić-Nikolić¹, Stevo Najman¹, Jelena Živković¹, Jelena Najdanović¹, Sanja Stojanović¹, Vladimir Cvetković², Perica Vasiljević²

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²*Department of Biology and Ecology, Faculty of Science and Mathematics, University of Niš, Serbia*

P.S.III.E.3.

Novel antimicrobial composites based on calcium- and zinc-alginate hydrogels and activated charcoal

Andrea Osmokrović¹, Ivan Jancic², Ivona Janković- Častvan¹, Predrag Petrović³, Marina Milenković², Bojana Obradović¹

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Belgrade, Faculty of Pharmacy, Belgrade, Serbia, ³Innovation Center of the Faculty of Technology

and Metallurgy, Belgrade, Serbia

P.S.III.E.4.

Characterization and drug release of Zn-Al layered double hydroxyde–nifuroxazide composite

Željko Radovanović¹, Lidija Radovanović¹, Đorđe Janačković², Rada Petrović²

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Belgrade, Serbia

P.S.III.E.5.

Bio-mimetic bone-like surface structure of Ti-based implants

Yevheniia Husak^{1,2}, Pal Terek³, Sanja Kojić³, Zoran Bobić³, Bojan Petrović⁴, Sergiy Kyrylenko¹, Maksym Pogorielov^{1,5}, Wojciech Simka²

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Medicine, University of Novi Sad, Novi Sad, Serbia, ⁵University of Latvia, Institute of Atomic Physics and Spectroscopy, LV-1004 Riga, Latvia

P.S.III.E.6.

3D printed scaffold with bisphosphonate for tissue regeneration

Marija N. Jovanović¹, Miloš M. Petrović¹, Anđela N. Radisavljević², Dušica B. Stojanović¹, Vesna J. Radojević¹, Svetlana R. Ibrić³, Petar S. Uskoković¹

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P.S.III.E.7.

Processing and characterization of hybrid chitosan (Ch)/polylactic acid (PLA) composite nanofibrous scaffolds for biomedical application

Viktorija Kornienko¹, Yevhen Samokhin¹, Julia Varava¹, Kateryna Diedkova¹, Bojan Petrović², Maksym Pogorielov^{1,3}

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P.S.III.E.8.

Nanostructured surface modification and characterization of titanium based materials for medical application

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

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P.S.III.E.9.

Electrospun poly(ϵ -caprolactone) nanofiber mats with cefazolin or yarrow extract powder as urinary catheter-coating materials

Anđela N. Radisavljević¹, Marija Jovanović², Dušica Stojanović², Miloš Petrović², Vesna Radojević², Petar Uskoković², Mirjana Rajlić-Stojanović²

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P.S.III.E.10.

The effect of liposomal pro-healing protein on the rheological properties of mucoadhesive injectable hydrogel

Veronika Sevrugina¹, Zuzana Kadlecová¹, Lucy Vojtová¹

¹Central European Research Institute, Brno University of Technology

P.S.III.E.11.

Encapsulation of bioactive proteins into thermosensitive biodegradable copolymer nanoparticles based on PLGA-PEG-PLGA

Klára Lysáková¹, Monika Obršlíková², Zuzana Kadlecová¹, Lucy Vojtová¹

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P.S.III.E.12.

Composite hydrogels based on gelatin, hydroxypropyl methylcellulose and Mg-doped biphasic calcium phosphate for biomedical applications

Vukasin Ugrinović¹, Veroniki Hristara², Maja Marković¹, Predrag Petrović², Rada Petrović², Đorđe Jančević², Đorđe Veljović²

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P.S.III.E.13.

Antibiofilm activity of the bioactive ceramic coatings on the 3D printed TC4 scaffold

Marija Milivojević¹, Milena Radunović², Marija Stevanović¹, Željko Radovanović¹, Rada Petrović³, Đorđe Janačković³

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P.S.III.E.14.

Multicomponent hemostatic dressing may improve bleeding stop and wound regeneration

Katarína Kacvinská¹, Marian Sedlár¹, Radim Dvořák², Tomáš Sopuch³, Lucy Vojtová¹

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P.S.III.E.15.

Quantum-informational macrophenomena in biomedicine & holistic psychosomatics: quantum-holographic framework

D. I. Raković

Faculty of Electrical Engineering, University of Belgrade, Serbia

P.S.III.E.16.

Chitosan/tripolyphosphate capsule-forming gelation monitored via light scattering curves: determination of particle forming phases and their effect on physico-chemical and biological parameters

Jana Dorazilová^{1,*}, Lucy Vojtova¹, Kaja Kasemets²

¹*Central European Institute of Technology of Brno University of Technology, Research Group of Advanced Biomaterials, Brno, Czech Republic,* ²*National Institute of Chemical Physics and Biophysics, Laboratory of Environmental Toxicology, Estonia.*

SYMPOSIUM F:

WRTCS

W.P.S.F.1.

Biodegradable coatings improved mechanical properties and bioactivity of sintered calcium phosphate scaffolds

Đorđe Veljović¹, Vukašin Ugrinović², Tamara Matic², Julijana Tadić³, Olivera Dragutinović¹, Teodora Jakovljević¹, Jelena Stanisavljević¹

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W.P.S.F.2.

Composite scaffolds based on magnesium doped hydroxyapatite and mesoporous nanosized bioactive glass

Tamara Matic¹, Zvezdana Bašcarević², Đorđe Janačković³, Đorđe Veljović³

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W.P.S.F.3.

Sinterability study of the zeolite-based porous ceramics for water filter application

Ivan Stijepović, Marija Milanović, Jelena Vukmirović, Andrea Nesterović, Danica Piper, Vladimir V. Srdić

University of Novi Sad, Faculty of Technology Novi Sad, Department of Materials Engineering, Bulevar cara Lazara 1, 21000 Novi Sad, Serbia

W.P.S.F.4.

Influence of aluminium anodizing wastes on Flash sintering of alumina

I. S. Vilarinho, R. Pinho, M. P. Seabra, P. M. Vilarinho, A. M. R. Senos

CICECO – Aveiro Institute of Materials, Department of Materials and Ceramic Engineering, University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal

09.45-10.00 **Break**

Second WRTCS Plenary Session, Main Conference Hall

Session I: 10.00-12.45

Chairperson: Biljana Stojanović, Boris Feigelson

10.00-10.30 **W.P.L.S.II.1.**

From nanoparticles to nanocrystalline solids with designed functionalities

Boris N. Feigelson, James A. Wollmershauser, Kevin P Anderson, Benjamin L Greenberg, Alan G Jacobs

U.S. Naval Research Laboratory, 4555 Overlook Ave., SW, Washington, DC 20375, USA

10.30-11.00 **W.P.L.S.II.2.**

Studies on the flash sintering of KNN: flash variables, mechanisms and material's properties

Ricardo Serrazina¹, Luis Pereira², Paula M. Vilarinho¹, Ana Senos¹

¹Department of Materials and Ceramic Engineering, CICECO-Aveiro Materials Institute, University of Aveiro, 3810-193 Campus Santiago, Portugal, ²CENIMAT-13N, School of Science and Technology, FCT-NOVA, Universidade NOVA de Lisboa, Campus da Caparica. 2829-516 Caparica, Portugal

11.00-11.30 **W.P.L.S.II.3.**

Capsule free hot isostatic pressing as a way towards transparent structural and functional ceramics

Karel Maca, Tomáš Spusta, Katarína Drdlíková, Martin Trunec, Daniel Drdlík, Róbert Klement

Brno University of Technology, Brno, Czech Republic, Funglass Centre of Excellence, Trenčín, Slovakia

11.30-12.00 **Break**

12.00-12.15 **W.PL.S.II.4.**

Additive manufacturing and spark plasma sintering: fabrication of powder components with cooling channels

Elisa Torresani¹, Maricruz Carrillo^{1,2}, Eugene Olevsky^{1,2}, Chris Haines³, Darold Martin⁴
¹San Diego State University, San Diego, CA, USA, ²University of California San Diego, CA, USA, ³US Army DEVCOM - Army Research Laboratory, Aberdeen Proving Ground, MD, USA, ⁴US Army DEVCOM-Armaments Center, Picatinny Arsenal, NJ, USA

12.15-12.30 **W.PL.S.II.5. virtual**

Thermal stress and deformation in SiC power chip systems having Ag sintered bonding layers for advanced power conversion

Masaaki Aoki^{1,2}, Ryouzuke Aoki¹, Akihiro Mochizuki², Yoshio Murakami², Mutsuharu Tsunoda², Goro Yoshinari², Maurizio Fenech³, and Nobuhiko Nakano¹
¹Department of Electronics and Electrical Engineering, Faculty of Science and Technology, Keio University, Yokohama, Kanagawa 223-8521, Japan, ²MacDermid Alpha Electronics Solutions / MacDermid Performance Solutions Japan, ³MacDermid Alpha Electronics Solutions / Alpha Assembly Solutions Germany GmbH

12.30-12.45 **W.PL.S.II.6. virtual**

Excellent heat dissipation performance of power device structures having Ag sintered bonding layers

Kazuma Yamashita¹, Masaaki Aoki^{1,2}, Goro Yoshinari², Nobuhiko Nakano¹
¹Department of Electronics and Electrical Engineering, Faculty of Science and Technology, MKeio University, Yokohama, Kanagawa 223-8521, Japan, ²MacDermid Alpha Electronics Solutions / MacDermid Performance Solutions Japan, Hiratsuka, Kanagawa 254-0082, Japan

14.00-19.00 **Boat-trip around Boka Kotorska Bay**

Friday, September 2, 2022

Second YUCOMAT Oral Session, Main Conference Hall

Session I: 08.30-11.15

Chairperson: Tetiana Prikhna, Patrick Gane

YUCOMAT SYMPOSIUM A:

ADVANCED METHODS IN SYNTHESIS AND PROCESSING OF MATERIALS

08.30-08.45 **O.S.II.A.1.**

Influence of brazing conditions on crystallization mechanism and mechanical properties of the TiAlV/TiCuZrPd/TiAlV brazed joints

Anna Sypien

¹Institute of Metallurgy and Materials Science, Polish Academy of Sciences, Reymonta 25 St. 30-059 Krakow, Poland

- 08.45-09.00 **O.S.II.A.2.**
Structure integrity of high-entropy alloys (HEA) manufactured by Selective Laser Melting (SLM) using in-situ alloying of elementary powders
R. Bardo, R. Dziurka, P. Bała
AGH University of Science and Technology, A. Mickiewicza 30 Av., 30059 Krakow, Poland
- 09.00-09.15 **O.S.II.A.3.**
Non-destructive testing of composites using terahertz radiation
Waldemar Swiderski, Martyna Strag, Pawel Hlosta
Military Institute of Armament Technology, Poland
- 09.15-09.30 **O.S.II.A.4.**
The role of compensation defects in the stabilization of multivalent inorganic systems doped with europium ions
Karol Szczodrowski, Natalia Górecka, Justyna Barzowska, Agata Lazarowska, Marek Grinberg
Institute of Experimental Physics, University of Gdańsk, Wita Stwosza 57, 80-952 Gdańsk, Poland
- 09.30-09.45 **O.S.II.A.5.**
Enhancing the environmental aspect of mineral recovery: separation of metal carbonate on micro nanofibrillated cellulose
Patrick Gane^{1,2}, Katarina Dimić Mišić¹, Monireh Imani¹, Ernest Barceló¹
¹Aalto University, Department of Bioproducts and Biosystems, School of Chemical Engineering, 00076 Aalto, Helsinki, Finland, ²University of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4, 11000 Belgrade, Serbia
- 09.45-10.15 **Break**
- 10.15-10.30 **O.S.II.A.6.**
Multiscale enhancement to aramid fabric-reinforced composites: electrospun P(An-co-GMA) nanofibrous interlayers
Farzin A. Arpatappeh¹, Cem Ünsal¹, Kaan Bilge², Farzin Javanshour¹, Sıla Güngör³, Melih Papila⁴
¹Sabancı University, Istanbul, Turkey, TR-34956, Tuzla-Istanbul, Turkey, ²Piri Reis University, Faculty of Engineering, Department of Naval Architecture and Marine, TR-34940, Tuzla-Istanbul, Turkey, ³ROKETSAN Industries, Istanbul, Turkey, TR-06780, Elmadag-Ankara, Turkey, ⁴BaX Composites, Istanbul, Turkey, TR-34025 Istanbul, Turkey
- 10.30-10.45 **O.S.II.A.7.**
Structural instabilities of complex oxides and intermetallics probed by in situ x-ray synchrotron powder diffraction
Leonid Vasylechko
Lviv Polytechnic National University, 12 Bandera St., 79013 Lviv, Ukraine

10.45-11.00 **O.S.II.A.8.**

MAX phases-based electro conductive and were resistant coating for application in oxidizing environment at high-temperatures

T. A. Prikhna^{1,4}, T. B. Serbenyuk¹, O. P. Ostash², A. S. Kuprin³, V. Ya. Podhurska², B. Büchner⁴, V. B. Sverdun¹, S. S. Ponomaryov⁵, M. V. Karpets^{1,6}, V. E. Moshchil¹, G. N. Tolmachova³, M. A. Bortnitskaya³, A. V. Matsenko¹

¹*Institute for Superhard Materials of the National Academy of Sciences of Ukraine, Kiev, Ukraine,* ²*Karpenko Physico-Mechanical Institute of the National Academy of Sciences of Ukraine, Lviv, Ukraine,* ³*National Science Center Kharkov Institute of Physics and Technology, Kharkov, Ukraine,* ⁴*Leibniz-Institut für Festkörper und Werkstofforschung Dresden 01069, Germany,* ⁵*Institute of Semiconductor Physics of the National Academy of Sciences of Ukraine (NASU), Kyiv, Ukraine,* ⁶*National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine*

YUCOMAT SYMPOSIUM B:

ADVANCED MATERIALS FOR HIGH-TECHNOLOGY APPLICATION

11.00-11.15 **O.S.II.B.1.**

The influence of substrate and thermal annealing on catalytic activity and stability of Pt thin film catalysts

D. V. Tripković, S. I. Stevanović, K. Đ. Popović

Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Njegoševa 12, 11 000 Belgrade, Serbia

12.00 **Awards and Closing of the Conference**

12.30 **Cocktail and Greetings for Goodbay**

Third YUCOMAT Oral Session, Small Conference Hall

Session I: 08.30-11.45

Chairpersons: Piotr Cyganik, Maxim Pogorielev

YUCOMAT SYMPOSIUM C:

NANOSTRUCTURED MATERIALS

08.30-08.45 **O.S.III.C.1.**

(Gd,Y)VO₄:Eu³⁺ nanoparticles as promising theranostic agents

Svetlana Yefimova¹, Pavel Maksimchuk¹, Vladimir Klochkov¹, Kateryna Hubenko¹, Alexander Sorokin¹, Anton Tkachenko², Anatolii Onishchenko²

¹*Institute for Scintillation Materials, NAS of Ukraine, Ukraine,* ²*Research Institute of Experimental and Clinical Medicine, Kharkiv National Medical University, Ukraine*

08.45-09.00 **O.S.III.C.2.**

Mechanical behaviour and hydrogen permeability of carbon steel with surface nanocrystalline structure

Olha Zvirko, Olha Maksymiv, Volodymyr Kyryliv

Karpenko Physico-Mechanical Institute of the NAS of Ukraine; Lviv, Ukraine

09.00-09.15 **O.S.III.C.3.**

Improvement of electrochemical properties of ZnO nanoparticles via composites with graphene oxide

S. Marković,¹ A. Stanković,¹ I. Stojković Simatović²

¹*Institute of Technical Sciences of SASA, Belgrade, Serbia,* ²*University of Belgrade, Faculty of Physical Chemistry, Belgrade, Serbia*

09.15-09.30 **O.S.III.C.4.**

On the contribution of surface chemistry, structure and interactions in GO/WPA nanocomposites for the electrochemical charge storage applications

Zoran Jovanović¹, Željko Mravik¹, Milica Pejčić¹, Sonja Jovanović¹, Milica Vujković², Smilja Marković³, Danica Bajuk-Bogdanović²

¹*Laboratory of Physics, Vinča Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia,* ²*Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia,* ³*Institute of Technical Sciences, Serbian academy of sciences and arts, Belgrade, Serbia*

09.30-09.45 **O.S.III.C.5.**

Features of Influence of the magnetic field on the structure and properties of epoxy composites with lead oxide

Yuliia Bardadym

Institute of Macromolecular Chemistry of the NAS of Ukraine, Ukraine

09.45-10.15 **Break**

10.15-10.30 **O.S.III.C.6.**

The odd-even effect in peptide SAMs-competition of secondary structure and molecule-substrate interaction

Agnieszka Grabarek,¹ Łukasz Walczak,² and Piotr Cyganik¹

¹*Smoluchowski Institute of Physics, Jagiellonian University, Łojasiewicza 11, 30-348 Krakow, Poland,* ²*Science & Research Division, PREVAC sp. z o.o., Raciborska 61, 44-362 Rogow, Poland*

10.30-10.45 **O.S.III.C.7.**

Dynamic tuning of quantum light emission from GaN/InGaN nanowire quantum dots by surface acoustic waves

Snežana Lazić¹, Enrique Calleja²

¹*Departamento de Física de Materiales, Instituto 'Nicolás Cabrera' and Instituto de Física de Materia Condensada, Universidad Autónoma de Madrid, 28049 Madrid, Spain,* ²*ISOM-DIE, Universidad Politécnica de Madrid, 28040 Madrid, Spain*

YUCOMAT SYMPOSIUM D:

ECO-MATERIALS AND ECO-TECHNOLOGIES

10.45-11.00 **O.S.III.D.1.**

Properties of phthalate-free alumina tape prepared by tape casting method

Kostja Makarovič^{1,2,3}, Matej Klemenčič¹, Robert Dular¹, Barbara Malič²

¹*Keko-Equipment d.o.o., Grajski trg15, 8360 Žužemberk, Slovenia,* ²*Jožef Stefan Institute, Jamova cesta 39, 1000 Ljubljana, Slovenia,* ³*CoE NAMASTE, Jamova cesta 39, 1000 Ljubljana, Slovenia*

11.00-11.15 **O.S.III.D.2.**

Electronic structure, magnetic properties and magnetocaloric effect of $GdCo_{2-x}Ni_x$
Gabriela Souca¹, Roxana Dudric¹, Karsten Küpper², Coriolan Tiusan^{1,3}, Romulus Tetean¹
¹*Faculty of Physics, Babes-Bolyai University, Kogalniceanu 1, 400084 Cluj-Napoca, Romania,* ²*University of Osnabrück, Fachbereich Physik, 49069 Osnabrück, Germany,* ³*National Center of Scientific Research, France*

YUCOMAT SYMPOSIUM E:

BIOMATERIALS

11.15-11.30 **O.S.III.E.1.**

A platform for reliable preclinical testing of anticancer drugs

Jasmina Stojkowska^{1,2}, Ivana Banićević¹, Jelena Petrović^{1,2}, Milena Milivojević³, Milena Stevanović^{3,4,5}, Miodrag Dragoj⁶, Milica Pešić⁶, Radmila Janković⁷, Bojana Obradović¹
¹*University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia* ²*Innovation Center of the Faculty of Technology and Metallurgy, Belgrade, Serbia,* ³*University of Belgrade, Institute of Molecular Genetics and Genetic Engineering, Belgrade, Serbia,* ⁴*University of Belgrade, Faculty of Biology, Belgrade, Serbia,* ⁵*Serbian Academy of Sciences and Arts, Belgrade, Serbia,* ⁶*University of Belgrade, Institute for Biological Research "Sinisa Stanković", National Institute of the Republic of Serbia, Belgrade, Serbia,* ⁷*University of Belgrade, School of Medicine, Belgrade, Serbia*

11.30-11.45 **O.S.III.E.2.**

Pulsed NIR laser for photo-thermal ablation of MXene-loaded cells

Maksym Pogorielov^{1,2}, Sergiy Kyrylenko¹, Oleksiy Gogotsi³, Ivan Baginskiy³, Vitalii Balitskyi³, Veronika Zahorodna³, Yevheniia Husak^{1,4}, Ilya Yanko¹, Mykolay Pernakov¹, Anton Roshchupkin¹, Mykola Lyndin¹, Bernhard B. Singer⁵, Volodymyr Buranych¹, Oksana Sulaieva⁷, Oleksandr Solodovnyk^{1,8}, Alexander Pogrebnjak^{1,6}, Yury Gogotsi^{1,9}
¹*Sumy State University, 31 Sanatorna St, Sumy 40007, Ukraine,* ²*University of Latvia, 3 Jelgavas St, Riga LV-1004, Latvia,* ³*Materials Research Centre, 3 Krzhizhanovskogo St, Kyiv 03680, Ukraine,* ⁴*Silesian University of Technology, 2A Akademicka St, Gliwice 44-100, Poland,* ⁵*University Duisburg-Essen, 171 Virchowstraße, Essen 45147, Germany,* ⁶*Al-Farabi Kazakh National University, Almaty, Kazakhstan,* ⁷*Medical Laboratory CSD, 45 Vasylkivska St, Kyiv 02000, Ukraine,* ⁸*VERBA MEDICAL LTD, 31A Lushpy St, Sumy 40035, Ukraine,* ⁹*Drexel University, 3141 Chestnut St, Philadelphia, PA 19104, United States*

12.00 **Awards and Closing of the Conference**

12.30 **Cocktail and Greetings for Goodbay**

P.S.III.C.12.

Electrochemical properties of composites of graphene oxide and cobalt ferrite doped with zink and gallium

Marija Grujičić¹, Željko Mravik¹, Danica Bajuk-Bogdanović², Damjan Vengust³,
Zoran Jovanović¹, Ivana Stojković Simatović², Sonja Jovanović¹

¹*Laboratory of Physics, Vinca Institute of Nuclear Sciences – National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia*

²*Faculty of Physical Chemistry, University of Belgrade, Belgrade, Serbia*

³*Advanced Materials Department, Jožef Stefan Institute, Ljubljana, Slovenia*

The possibility of surface functionalization and formation of stable aqueous suspensions make graphene oxide (GO) suitable as base for composite materials, especially with nanoparticles. Cobalt ferrite (CFO) has attracted attention due to its unique properties such as large magnetic anisotropy, high coercivity, moderate saturation magnetization, excellent chemical stability, mechanical hardness, etc. This study presents the electrochemical properties of GO and CFO composites, as well as CFO doped with zinc (CFO_Zn) and gallium (CFO_Ga). Magnetic nanoparticles were synthesized using the solvothermal method, after which the oleic acid was exchanged with dihydrocaffeic acid to obtain the hydrophilic material. GO was synthesized using a modified Hummer's method. Composites of GO and magnetic nanoparticles were synthesized by the hydrothermal method ($T = 120\text{ }^{\circ}\text{C}$, $t = 3\text{ h}$), with nominal fractions of 5 and 15 wt.% of magnetic nanoparticles. X-ray structural diffraction, as well as FTIR analysis, confirmed the complete oxidation of graphene layers. SEM and TEM images showed deposition of magnetic nanoparticles on GO layer with the different distribution density between 5 wt.% and 15 wt.% composites. Also, shape and size of magnetic nanoparticles remained unchanged. Based on FTIR analysis of hydrothermally treated GO and composites a partial reduction of epoxy groups was found along with hydrogen bond established between the components of the composite. The electrochemical charge storage of composites is mainly of pseudocapacitive nature, which originates from the oxidoreduction reactions of H^+ ions from electrolytes and surface functional groups of GO. The best electrochemical properties, in terms of the highest specific capacity, were shown by the composite which contains 15 wt.% CFO, which value is 36.86 F g^{-1} at a polarization rate of 5 mV s^{-1} .