

**NINETEENTH YOUNG RESEARCHERS' CONFERENCE
MATERIALS SCIENCE AND ENGINEERING**

December 1-3, 2021, Belgrade, Serbia

Program and the Book of Abstracts

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

2021

Book title:

Nineteenth Young Researchers' Conference - Materials Science and Engineering:
Program and the Book of Abstracts

Publisher:

Institute of Technical Sciences of SASA
Knez Mihailova 35/IV, 11000 Belgrade, Serbia
Tel: +381-11-2636994, 2185263, <http://www.itn.sanu.ac.rs>

Conference organizers:

Materials Research Society of Serbia, Belgrade, Serbia
Institute of Technical Sciences of SASA, Belgrade, Serbia

Editor:

Dr. Smilja Marković

Technical Editor:

Aleksandra Stojičić

Cover page: Aleksandra Stojičić and Milica Ševkušić

Cover: Milica Ševkušić

Printing:

Gama digital centar
Autoput No. 6, 11070 Belgrade, Serbia
Tel: +381-11-6306992, 6306962
<http://www.gdc.rs>

Publication year: 2021

Print-run:

120 copies

CIP - Каталогизacija у публикацији
Народна библиотека Србије, Београд
66.017/.018(048)

YOUNG Researchers Conference Materials Sciences and Engineering (19 ; 2021 ; Beograd)

Program ; and the Book of abstracts / Nineteenth Young Researchers' Conference Materials
Science and Engineering, December 1-3, 2021, Belgrade, Serbia ; [organized by] Materials Research
Society of Serbia & Institute of Technical Sciences of SASA ; [editor Smilja Marković]. - Belgrade :
Institute of Technical Sciences of SASA, 2021 (Belgrade : Gama digital centar). - XVIII, 86 str. : ilustr.
; 23 cm

Tiraž 120. - Registar.

ISBN 978-86-80321-36-3

а) Наука о материјалима -- Апстракти б) Технички материјали – Апстракти

COBISS.SR-ID 51231241

Aim of the Conference

Main aim of the conference is to enable young researchers (post-graduate, master or doctoral student, or a PhD holder younger than 35) working in the field of materials science and engineering, to meet their colleagues and exchange experiences about their research.

Topics

Biomaterials
Environmental science
Materials for high-technology applications
Materials for new generation solar cells
Nanostructured materials
New synthesis and processing methods
Theoretical modelling of materials

Scientific and Organizing Committee

Committee President

Smilja Marković Institute of Technical Sciences of SASA, Belgrade, Serbia

Vice-presidents

Dragana Jugović Institute of Technical Sciences of SASA, Belgrade, Serbia
Magdalena Stevanović Institute of Technical Sciences of SASA, Belgrade, Serbia
Đorđe Veljović Faculty of Technology and Metallurgy, Belgrade, Serbia

Members

Tatiana Demina Enikolopov Institute of Synthetic Polymeric Materials,
Russian Academy of Sciences
Jasmina Dostanić Institute of Chemistry, Technology and Metallurgy, Belgrade,
Serbia
Xuesen Du Chongqing University, Chongqing, China
Branka Hadžić Institute of Physics, Belgrade, Serbia
Ivana Jevremović Norwegian University of Science and Technology, Trondheim,
Norway
Sonja Jovanović Institute of Nuclear Sciences “Vinča”, Belgrade, Serbia
Snežana Lazić Universidad Autónoma de Madrid, Spain
Lidija Mančić Institute of Technical Sciences of SASA, Belgrade, Serbia
Marija Milanović Faculty of Technology, Novi Sad, Serbia
Miloš Milović Institute of Technical Sciences of SASA, Belgrade, Serbia
Nebojša Mitrović Faculty of Technical Sciences, Čačak, Serbia
Irena Nikolić Faculty of Metallurgy and Technology, Podgorica, Montenegro
Marko Opačić Institute of Physics, Belgrade, Serbia
Vuk Radmilović Faculty of Technology and Metallurgy, Belgrade, Serbia
Tatjana D. Savić Institute of Nuclear Sciences “Vinča”, Belgrade, Serbia
Ana Stanković Institute of Technical Sciences of SASA, Belgrade, Serbia
Srečo Škapin Institute Jožef Stefan, Ljubljana, Slovenia
Boban Stojanović Faculty of Sciences, Kragujevac, Serbia

Ivana Stojković-Simatović Faculty of Physical Chemistry, Belgrade, Serbia
Konrad Terpiłowski Department of Interfacial Phenomena, Institute of Chemical Sciences, Faculty of Chemistry, Maria Curie-Skłodowska University in Lublin, Poland

Vuk Uskoković TardigradeNano, Irvine, CA, USA
Rastko Vasić Faculty of Physics, Belgrade, Serbia
Ljiljana Veselinović Institute of Technical Sciences of SASA, Belgrade, Serbia
Siniša Vučenović Faculty of Sciences, Department of Physics, Banja Luka, B&H
Marija Vukomanović Institute Jožef Stefan, Ljubljana, Slovenia

Conference Secretary

Aleksandra Stojičić Institute of Technical Sciences of SASA, Belgrade, Serbia

Conference Technical Committee

Milica Ševkušić, Ivana Dinić, Marina Vuković, Vukašin Ugrinović, Tamara Matić

Results of the Conference

Beside printed «Program and the Book of Abstracts», which is disseminated to all conference participants, selected and awarded peer-reviewed papers will be published in journal “Tehnika – Novi Materijali”. The best presented papers, suggested by Session Chairpersons and selected by Awards Committee, will be proclaimed at the Closing Ceremony. Part of the award is free-of-charge conference fee at YUCOMAT 2022.

Sponsors



ANALYSIS
LABORATORY EQUIPMENT

Acknowledgement

The editor and the publisher of the Book of abstracts are grateful to the Ministry of Education, Sciences and Technological Development of the Republic of Serbia for its financial support of this book and The Nineteenth Young Researchers' Conference - Materials Sciences and Engineering, held in Belgrade, Serbia.

2-2

Electrochemical composite bioceramic coatings based on hydroxyapatite, chitosan and polyvinyl alcohol loaded with gentamicin

Nevena Jaćimović¹, Marija Došić², Ana Janković¹, Vesna Mišković – Stanković¹

¹Faculty of Technology and Metallurgy, University of Belgrade, Karnegijeva 4, Belgrade, Serbia, ²Institute for Technology of Nuclear and Other Mineral Raw Materials, Bulevar Franš d'Eperea 86, Belgrade, Serbia

Composite bioceramic coatings have been attracting increasing attention of the scientific public in recent decades due to the good potential of their use for medical purposes. The main goal of this scientific research is to show the characterization of the obtained hydroxyapatite (HAP), chitosan (CS) and polyvinyl alcohol (PVA) bioceramic composite coatings loaded with gentamicin (Gent), on titanium (Ti) substrate using the single-step electrophoretic deposition process. Titanium, traditionally used for the purpose of replacing parts of damaged bone tissue, has shown good mechanical properties and biocompatibility through many years of orthopedic practice. Hydroxyapatite provided the HAP/CS/PVA/Gent composite coating with osteoinductivity, while the presence of chitosan and polyvinyl alcohol contributed to its adhesive and mild analgesic properties. The antibacterial agent gentamicin was added to the HAP/CS/PVA composite, which ensured its direct antibacterial effect at the implantation site. The coatings were deposited using the cathodic electrophoretic deposition process, with the Ti plate as the cathode, at a constant voltage of 7V, in the range of the deposition time from 5 to 12 min. To demonstrate the presumed bioactivity, HAP/CS/PVA/Gent coatings were immersed in simulated body fluid (SBF) at 37°C for periods of 7 and 14 days. Characterization of HAP/CS/PVA/Gent coatings after immersion was performed through employment of Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD), and field emission scanning electron microscopy (SEM) techniques. Antibacterial activity was tested by agar diffusion method on two bacterial strains, *Echerichia coli* and *Staphylococcus aureus* with a positive response to both bacterial strains. The final conclusions of this research suggest a good potential for utilization of HAP/CS/PVA/Gent bioceramic composite coating, applied through electrophoretic deposition process on Ti substrate, for medical purposes in the replacement and healing of damaged bone tissue.

Abramov, I. G.		76
Adamović, Vladimir		23
Ahmetović, Sanita	sanita.ahmetovic@imsi.rs	24
Ajduković, Marija		59
Aleksić, Katarina	katarina.aleksic96@gmail.com	72
Antanasković, Anja	anja.antanaskovic@yahoo.com	23
Bajuk Bogdanović, Danica		36, 37, 38, 39, 52, 53
Banićević, Ivana	ivanaib100@gmail.com	6
Banković, Predrag		59
Barać, Nemanja		61
Baum, A.		64
Bella, Marie		69
Bijelić, Lazar	20170032@student.ffh.bg.ac.rs	56
Blawert, Carsten		66
Blažić, Larisa		11
Bobić, Zoran	zoranbobic@uns.ac.rs	62, 63
Bogosavljević, Marica		34
Bohlen, Jan		10
Božinović, Nevena	nevena.bozinovic@vin.bg.ac.rs	9
Božović, Nikola		66
Branislav, Milovanović	branislavm@ffh.bg.ac.rs	46
Brzić, Saša		34
Budimir, Milica		36
Chernysheva, Anna		40
Chodkowski, Michał	michal.chodkowski@poczta.umcs.lublin.pl	28
Cvetanović, Katarina		55, 71
Cvjetičanin, Nikola		24
Ćirković, Jovana		74
Ćujić-Nikolić, Nada		16

Damjanović-Vasilić, Ljiljana		66
Dikić, Jelena		75
Dimić, Dušan		42, 43
Dimitrijević, Silvana		27
Dimitrijević-Branković, Suzana		12, 14, 25
Dinic, Ivana	ivana.dinic@itn.sanu.ac.rs	29, 33
Dinić, Čedomir		65
Djordjić Mijin, S.	sanja@ipb.ac.rs	64
Dobrota, Ana S.		45, 47
Dojčinović, Milena	milena.p.dojcinovic@gmail.com	32
Dorontić, Slađana	sladjanaseatovic93@gmail.com	35
Drinić, Zorica		16
Drnovšek, Aljaž		62
Đorđević, Dragan		65
Đorđević, Ivona	djordjevicivo3@gmail.com	19
Đurđić Mijin, Sanja	sanja@ipb.ac.rs	68
Etinski, Mihajlo		46
Fras-Zemljič, Lidija		67
Galić, Aleksa	aleksagalic99@gmail.com	15
Gavran, Andjela	andjela.gavran@gmail.com	43
Gavrilov, Nemanja		38
Gilić, Martina		74
Glojinjić, Marko		38
Grbović Novaković, Jasmina		27
Grozđanić, Nikola		19
Grujičić, Marija	marijagrujicic64@gmail.com	39
Grujić, Bojana	bojana.grujic@aggf.unibl.org	22

Grujić, Dušan		11
Grujić, Žarko		22
Gržetić, Jelena D.	jrusmirovic@tmf.bg.ac.rs	34
Gutić, Sanjin J.		58
Hafsi, Zahreddine	zahreddine.hafsi@enis.tn	51
Herberg, A.		76
Jablonska, Eva		10
Jačimović, Nevena	nevena.jacimovic.99@gmail.com	7
Janačković, Đorđe		12, 13, 14, 61, 70
Janković, Teodora		16
Jelić, Marko	marko.jelic@vinca.rs	44
Jevtić, Sanja		75
Jocić, Milan	mjocic@ipb.ac.rs	50
Joksović, Ljubinka		60
Jovanović, Aleksandar		44, 56
Jovanović, Aleksandar Z.	a.jovanovic@ffh.bg.ac.rs	58
Jovanović, Đorđe	bmilenkovic92@gmail.com	51
Jovanović, Miloš	mjovanovic@mocbilja.rs	16
Jovanović, Sonja		37, 39
Jovanović, Svetlana		35, 36
Jovanović, Zoran		37, 38, 39
Jurak, M.		3
Jurak, Małgorzata		5
Kačarević-Popović, Zorica		31
Károly, Zoltan		28
Kisić, Danilo		9
Klébert, Szilvia		28
Kleut, Duška		35
Knežević-Jugović, Zorica		20
Kojić, Sanja		63

Korica, Matea	mkorica@tmf.bg.ac.rs	67
Kostić, Marija	mkostic607@gmail.com	1
Kostić, Mirjana		67
Kostjuk, Sergei		40
Koteska, Bojana		54
Kovač, Janez		32
Kovačević, Lazar		62, 63
Kovačević, Tihomir		34
Kral, Robert		10
Krstić, Jugoslav		32
Krstić, Mladen		51
Kukuruzar, Andrej	andrejkukuruzar.so@gmail.com	26
Kuzmanović, Maja		4
Kuznetsov, A. A.		76
Ładniak, Agata	agata.gozdecka@poczta.umcs.lublin.pl	5
Lainović, Tijana		11
Lazarević, N.		64
Lazarević, Nenad		68
Lazarević-Pašti, Tamara		21
Leblanc, Roger M.		41
Ležaja Zebić, Maja		13
Liu, Hongzhi		40
Liu, Y.		64
Liu, Yu		68
Lojpur, Vesna		33
Lopičić, Zorica		23
Lotin, Thierry	dipita_lolo@yahoo.com	69
Lukić, Ivana		70
Lukić, Jovan	jovanlukickg@gmail.com	73
Madevska Bogdanova, Ana		54
Maksić, Aleksandar		57

Maksimović, Jelena		60
Maksimović, Tijana	tijana.maksimovic@pmf.kg.ac.rs	60
Mančić, Lidija		29, 33
Marinković, Dalibor		18
Marinović, Sanja		59
Marković, Olivera		35
Marković, Smilja		16, 32, 72
Matić, Tamara	tmatic@tmf.bg.ac.rs	13, 15
Medić Ilić, Mirjana		27
Mijailović, Daniel		4
Mijatov, Slavko		34
Milanković, Vedran	milankovicvedran@gmail.com	21
Milanović, Igor		27
Milanović, Vitomir		48, 49
Milenković, Branislav		51
Miletić, Aleksandar		62
Miletić, Vesna		13
Milić, Marija		25
Milinda Abeykoon, AM		64
Milinković, Evgenija	evgenija@nanosys.ihtm.bg.ac.rs	71
Milivojević, Marija	mmilivojevic@tmf.bg.ac.rs	12
Milivojević, Milan		23
Milivojević, Milena		6
Milojković, Jelena		23
Milosavljević, A.		64
Milosavljević, Ana	anam@ipb.ac.rs	68
Milovanović, Biljana	biljana.milovanovic@ihtm.bg.ac.rs	59
Milovanović, Dubravka		9
Milović, Miloš		52, 53
Milutinović-Nikolić, Aleksandra		59
Minarik, Peter		10
Mirković, Mihailo	mihailo.mirkovic17@gmail.com	61

Mišković-Stanković, Vesna		30
Mišović, Aleksandra	aleksandra.misovic@vin.bg.ac.rs	36
Mitić Čulafić, Dragana		4
Mitrić, Jelena	jmitric@ipb.ac.rs	74
Mitrić, Miodrag		74
Mladenović, Mihailo	mihailo.mladenovic99@gmail.com	25
Mojović, Miloš		2
Mojsilović, Kristina	kristina.mojsilovic@ff.bg.ac.rs	66
Mravik, Željko	mravik@vin.bg.ac.rs	37, 38, 39
Mroccka, R.		3
Mudrinić, Tihana		59
Nakarada, Đura	djura@ffh.bg.ac.rs	2
Nedić Vasiljević, Bojana		37
Nedić, Zoran		60
Nešović, Katarina		30
Nikodijević, Milena	nikmilena94@gmail.com	65
Nikolic, Marko		29
Nikolić, Maria Vesna		24, 32, 38
Nikolić, Nikolina	nnikolina@vin.bg.ac.rs	31
Novaković, Nikola		27
Novta, Evgenije	evgenije.novta@mf.uns.ac.rs	11
Obradovic, Jovana	jovanaobradovic988@gmail.com	48
Obradović, Bojana		6, 8
Obradović, Nataša		15
Olejniczak, Andrzej		38
Opsenica, Marko	marko.opsenica44@gmail.com	30
Pagnacco, Maja		60
Palusińska-Szys, Marta		5
Pantelić, Dejan		11
Paskaš Mamula, Bojana		27

Pašti, Igor A.		44, 47, 54, 56, 58
Paunović, Novica		74
Pavlović, Marija		6
Pavlović, Stefan	stefan.pavlovic@ihm.bg.ac.rs	18
Pavlović, Vladimir B.		24
Pejčić, Milica	pejcic97m@gmail.com	37
Peršin, Zdenka		67
Pešić, J.		64
Pešić, Jelena		68
Petković, Milena		46
Petrovic, Jelena	jelenapetrovic.co@gmail.com	8
Petrović, Bojan		63
Petrović, C.		64
Petrović, Čedomir		68
Petrović, Ivana		65
Petrović, Rada		12, 13, 14, 70
Petrović, Srđan		55
Petrović, Suzana		9
Petrović, Tamara	tamara@ffh.bg.ac.rs	53
Podkościelna, Joanna	terpil@umcs.pl	17
Popović, Miljana		12
Popović, Z. V.		64
Popović, Zoran V.		68
Prekajski-Dorđević, Marija		33
Przykaza, Kacper		5
Radmilović, Nadežda		33
Radmilović, Vuk V.		73
Radonjic, Mia		6, 8
Radosavljević, Aleksandra		31
Radovanovic, Jelena		48, 49
Radovanović, Željko		12
Radović, Ivona		19

Rafailović, Lidija		58
Rajić, Vladimir		9, 57
Rakočević, Lazar	lazar.rakocevic@vin.bg.ac.rs	55, 57
Rakočević, Lazar		55
Rašljić Rafajilović, Milena		54
Ristivojević, Nikola	20210324@student.ffh.bg.ac.rs	42
Ritopečki, Milica S.	milica.ritopecki@gmail.com	45
Romčević, Maja		74
Romčević, Nebojša		74
Sarajlić, Milija		55
Savić, Slađana		26
Savić-Šević, Svetlana		11
Serdechnova, Maria		66
Serushkina, O.V.		76
Shakhnes, A. Kh.		76
Skorodumova, Natalia V.		47
Smiljanić, Danijela		75
Sokić, Katarina	ksokic@tmf.bg.ac.rs	75
Soldatov, Mikhail	soldat89.89@gmail.com	40
Soldatova, A. E.	soldatova.anastasia92@gmail.com	76
Spasenović, Marko		54
Spasojević, Jelena		31
Spreitzer, Matiaž		32
Srejić, Irina		57
Stamenković, Tijana	tijanas@vinca.rs	33
Stanisavljev, Dragomir		71
Stanković, Ana		72
Stanković, Dalibor		26
Stanković, Miroslav		18
Stanojević, Novak	novakstanojevic1@gmail.com	49
Stefanović, Milica	mstefanovic@tmf.bg.ac.rs	70
Stevanović, Jelena N.	jelena@nanosys.ihtm.bg.ac.rs	55

Stevanović, Magdalena M.		4
Stevanović, Marija	marija.stevanovic@tmf.bg.ac.rs	14
Stevanović, Milena		6
Stojadinović, Stevan		66
Stojanović, Dušica		61
Stojanović, Goran		63
Stojanović, Jovica		75
Stojanović, Srna		66
Stojković Simatović, Ivana		39, 57, 72
Stojkovska, Jasmina		6, 8
Supić, Ivan		72
Szafran, K.	klaudia.wozniak@poczta.umcs.lublin.pl	3
Šavikin, Katarina		16
Šekuljica, Nataša		20
Šćepanović, M.		64
Škorić, Branko		62, 63
Šolajić, A.		64
Šolajić, Andrijana		68
Šoštarić, Tatjana		23
Štrbac, Svetlana		57
Tadić, Nenad B.		24, 32, 55
Tančić, Pavle		60
Terek, Pal		62, 63
Terek, Vladimir	vladimirterek@uns.ac.rs	62, 63
Terpiłowski, Konrad		28, 17
Tomić, Nina	nina.tomic@itn.sanu.ac.rs	4
Tošić, Dragana		9
Tošić, Katarina	tosickatarina32@gmail.com	27
Trajković, Vladimir		2
Tsegelskaya, A. Ya.		76

Uskoković, Petar		61
Uskoković-Marković, Snežana		37
Vasić, Milica M.	mvasic@ffh.bg.ac.rs	52
Vasilić, Rastko		66
Vasiljević, Zorka Ž.		24, 32
Vasiljević-Radović, Dana		55, 71
Veljović, Đorđe		12, 13, 14, 15, 75
Vesely, Jozef		10
Vićentić, Teodora	teodora@nanosys.ihtm.bg.ac.rs	54
Višić, Bojana		68
Vlahović, Filip		26
Vlahović, Jovana	jovana.vlaha@gmail.com	47
Vučković, Kristina		23
Vujančević, Jelena		24, 70
Vujković, Milica		52, 53
Vukmirović, Nenad		50
Vukočić, Olivera	oliveravukoicic.olja@gmail.com	20
Vukovic, Marina		29
Wiącek, Agnieszka Ewa		3, 5
Woźniak, Klaudia		5
Zemkova, Maria	maria.zemkova@mff.cuni.cz	10
Zheludkevich, Mikhail L.		66
Zhou, Yiqun	YXZ431@miami.edu	41