



20th HSKIKi

**28th CROATIAN MEETING
OF CHEMISTS & CHEMICAL
ENGINEERS**

6th SYMPOSIUM VLADIMIR PRELOG

MARCH 28–31, 2023
HOTEL LONE • ROVINJ
CROATIA

**BOOK OF
ABSTRACTS**



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& CHEMICAL ENGINEERS**

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6th Symposium Vladimir Prelog

Book of Abstracts

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Prof. Tatjana Gazivoda Kraljević

Chair of the Scientific and Organizing committee

Dear Colleagues, Partners and Friends,

On behalf of the Scientific and Organizing Committee of the 28th Croatian Conference of Chemists and Chemical Engineers, I am honoured and pleased to invite you to support the Conference which will be held from the 28th to 31st of March 2023 in Hotel Lone, Rovinj, Croatia.

Since its first edition in 1969, the meeting has been traditionally organized every two years by the Croatian Society of Chemical Engineers and the Croatian Chemical Society. It gathers around 400–500 chemists and chemical engineers from Croatia and neighbouring countries that, coming from academia, institutes and industry, actively participate and contribute to the success of the meeting with posters and oral presentations.

The Meeting will provide an interdisciplinary platform for leading academic scientists, researchers and research scholars to present and share both their experiences and research results on all aspects of chemistry and related fields in a friendly, interactive and collaborative atmosphere, while discussing the latest achievements and novel approaches, the most recent innovations, trends as well as challenges and adopted solutions.

An exhibition of chemical industrial and laboratory equipment and instrumentation, computer software and hardware, literature and other relevant material, will be organized as an accompanying manifestation.

We will be glad to host you at this Meeting as we believe, other participants and coming delegates would love to hear and learn from your experience.

We look forward to welcoming you at the 28HSKIKI in Rovinj!



Tatjana Gazivoda Kraljević

CONTENTS

PLENARY LECTURES

PL-1	<u>Tony McNally</u>, Syeda Abbas, Valentina Guerra, Jaipal Gupta, Eimear Magee Towards useful composites of polymers and nanoparticles	1
PL-2	<u>Karl Gademann</u> Microbiome metabolites: Syntheses and surprises	2
PL-3	<u>Ljiljana Fruk</u> Bio-nano tools in medicine: From <i>in vivo</i> biosensors to drug delivery	3
PL-4	<u>Nuno Maulide</u> The beautiful simplicity of rearrangements: Towards ideal reactions?	4
PL-5	<u>Aurelio Hidalgo</u> The best of both worlds: How to combine chemistry and biology to discover greener biocatalysts using artificial, cell-like compartments	5
PL-6	<u>Robert Dominko</u> The sustainable approach in battery research and development	6

INVITED LECTURES

IL-1	<u>Roland Ludwig</u> Redox biochemistry for biopolymer degradation	7
IL-2	<u>Višnja Vrdoljak</u>, Mirna Mandarić, Jana Pisk, Edi Topić, Mirta Rubčić, Tomica Hrenar, Nikol Bebić, Dino Kuzman, Marina Cindrić Metallosupramolecular architectures and inorganic-organic polyoxometalate-based hybrids	8
IL-3	<u>Anamarija Rogina</u> Biodegradable composite materials as scaffolds and drug delivery systems for bone tissue engineering application	9
IL-4	<u>Ivana Capan</u>, José Coutinho, Luka Snoj, Takahiro Makino Silicon carbide for radiation detection	10
IL-5	<u>Ilija Čorić</u> Direct C–H arylation	11
IL-6	<u>Gregor Talajjić, Edi Topić, Jerko Meštrović, Nikola Cindro</u> Total synthesis of penicyclone A	12
IL-7	<u>Marko Cigler</u>, Hana Imrichova, Fabian Frommelt, Andrea Rukavina, Chrysanthi Kagiou, Sonja Sievers, Luca Laraia, Giulio Superti-Furga, Herbert Waldmann, Georg E. Winter Probing leukemic vulnerabilities via small molecules inspired by natural products withanolides	13
IL-8	<u>Milena Zorko, Pedro Farinazzo Bergamo Dias Martins, Dževad Kozlica, Boštjan Genorio, Dušan Strmčnik</u> Governing principles behind interfacial processes in energy conversion and storage systems	14
IL-9	<u>Ivan Halasz, Stipe Lukin</u> Hydrogen isotope exchange and the kinetic isotope effect in mechanochemical reactions of bulk solids	15
IL-10	<u>Momir Mališ, Eva Vandaele, Sandra Luber</u> Nonadiabatic processes in condensed phase systems with Δ SCF	16
IL-11	<u>Selin Kara</u> Process engineering strategies towards efficient biotransformations	17

IL-12	<u>Stela Jokić</u> Insights into green techniques for the extraction of bioactive compounds: Current research and future challenges	18
IL-13	<u>Gabriela Kalčíkova</u> Effective approaches to limit the input of microplastics into the aquatic environment	19
IL-14	<u>Panaghiotis Karamanis</u> From nanoscale to bulk: Nonlinear optical properties of materials	20
IL-15	<u>Marco Rabuffetti</u> Sustainable synthesis of biosurfactants from renewable resources	21
IL-16	<u>Anita Šalić</u> Process intensification through miniaturization	22

ORAL PRESENTATIONS

O-1	<u>Christoforos G. Kokotos</u> Organic synthetic photochemistry: Providing novel and green organic transformations	23
O-2	<u>Željka Car, Matias Bliznac, Vesna Petrović Peroković, Monika Kovačević, Rosana Ribić, Lidija Barišić</u> Preparation of diamide derivatives of a disubstituted ferrocene with desmuramyl peptide and mannose subunit	24
O-3	<u>Anja Beč, Leentje Persoons, Els Vanstreels, Dirk Daelemans, Kristina Starčević, Marijana Hranjec</u> Synthesis and biological activity of novel benzazole acrylonitriles	25
O-4	<u>Dajana Gašo-Sokač, Valentina Bušić, Sunčica Roca, Antonio Sabljic</u> Synthesis of hydrazone derivatives of vitamin B6, pyridine-4-carbaldehyde and 2-quinolinecarbaldehyde	26
O-5	<u>Blaž Likozar, Sašo Gyergyek, Andraž Pavličič, Anže Prašnikar, Matej Huš</u> Chemical energy storage utilising catalysis: Hydrogen, ammonia, CCU and beyond	27
O-6	<u>Vanja Kosar, Karlo Sklepić, Vesna Tomašić</u> Process intensification in the photocatalytic degradation of imidacloprid by permanent magnets	28
O-7	<u>Ivan Karlo Cingesar, Iva Katalinić Paić, Marijan-Pere Marković, Domagoj Vrsaljko</u> Effect of static mixers on biodiesel synthesis in microreactors	29
O-8	<u>Žarko Olujić</u> Reducing energy demand and carbon footprint of distillation columns	30
O-9	<u>Nevena Milčić, Martina Sudar, Irena Dokli, Maja Majerić Elenkov, Zvezdana Findrik Blažević</u> Biocatalytic synthesis of enantiopure fluorinated building blocks: Discovering the bottlenecks by enzyme reaction engineering approach	31
O-10	<u>Martina Trtinjak, Ivana Stojmilović, Tomislav Domanovac, Monika Šabić Runjavec, Marija Vuković Domanovac</u> Bioremediation modelling of highly polluted wastewater using microorganisms	32
O-11	<u>Dino Skendrović, Ivana Petrić, Ana Vrsalović Presečki</u> Kinetic modelling of aldolase immobilized on magnetic nanoparticles	33
O-12	<u>Nikša Bekavac, Ana Jurinjak Tušek, Mia Radović, Marina Cvjetko Bubalo, Bruno Zelić, Anita Šalić</u> Selection of the natural deep eutectic solvent for extraction of the <i>Aspergillus oryzae</i> lipase from liquid formulations	34
O-13	<u>Juraj Nikolić, Ana Ivančić, Tin Klačić, Davor Kovačević</u> Importance of the precursor layer for tuning the properties of chitosan/carboxymethyl cellulose polyelectrolyte multilayers	35

O-14	<u>Ivan Pucko, Rafael Anelić, Fabio Faraguna</u>	36
	Influence of methacrylic polymer additives with different composition and molecular weight on the low-temperature behaviour of diesel fuel	
O-15	<u>Izabela Đurasović, Goran Dražić, Goran Štefanić, Marijan Marciuš, Mile Ivanda, Marijan Gotić</u>	37
	Influence of Pt/SnO ₂ synthesis procedures on the catalytic reduction of 4-nitrophenol to 4-aminophenol	
O-16	<u>Ena Pezić, Branka Mihaljević, Jordi Sancho Parramon, Pavo Dubček, Damir Kralj, Katarina Marušić</u>	38
	Radiation crosslinking of self-assembled monolayers for corrosion protection of metals	
O-17	<u>Dubravka Madunić-Čačić, Blaženka Čiško-Anić, Nikola Sakač, Marija Jozanović</u>	39
	Potentiometric determination of QAC based biocides and PHMB in multi-component mixtures using highly sensitive homemade ionic surfactant sensors	
O-18	<u>Lara Jurković, Ivana Čarapar, Daniel Mark Lyons</u>	40
	Synthesis and characterisation of polymer nanoparticles and their behaviour in aquatic environments	
O-19	<u>Sara Krivačić, Marko Zubak, Petar Kassal</u>	41
	The preparation and optimization of poly(vinyl butyral) based membranes for <i>in-situ</i> formation of solid-state Ag/AgCl reference electrode	
O-20	<u>Ivica Cvrtila, Ivan Halasz</u>	42
	2-formylpyridine blue out of the blue	
O-21	<u>Barbara Panić, Ivana Biljan, Ivan Kodrin</u>	43
	Synthesis and characterization of porous organic polymers with different organic building units bridged by azo bonds	
O-22	<u>Petra Stanić, Krešimir Molčanov</u>	44
	Variable-temperature crystallography and X-ray charge density study of π -stacking in single crystals of organic salts	
O-23	<u>Ivona Krošl Knežević, Marta Jurković, Karla Ribičić, Biserka Žinić, Dragomira Majhen, Ksenija Božinović, Ivo Piantanida</u>	45
	Impact of the histidine-triazole and tryptophan-pyrene exchange in the WHW peptide: Cu(II) binding, DNA/RNA interactions and bioactivity	
O-24	<u>Eszter Kása, Bence Kutus, Pál Sipos</u>	46
	Synthesis and neutralization of sodalites with different anion content	
O-25	<u>Mario Lovrić, Michael Widdowson, Bo Chawes, Morten A. Rasmussen</u>	47
	QSAR bioactivity prediction in clinical metabolomics	
O-26	<u>Anja Rakas, Dajana Kučić Grgić, Leentje Persoons, Els Vanstreels, Dirk Daelemans, Tatjana Gazivoda Kraljević</u>	48
	Synthesis and biological activity of novel 1,2,3-triazole derivatives of benzoxazole	
O-27	<u>Kristina Bule Možar, Viktorija Martinjak, Martina Miloloža, Matija Cvetnić, Tomislav Bolanča, Dajana Kučić Grgić, Marinko Markić, Dora Matijašec, Šime Ukić</u>	49
	Determination of significant parameters of the UV-C/S ₂ O ₈ ²⁻ process for the degradation of LDPE and PP microplastics	
O-28	<u>Tatjana Šolević Knudsen, Mila Ilić, Jelena Milić, Jelena Avdalović, Sandra Bulatović, Nenad Marić, Miroslav M. Vrvic</u>	50
	Environmental risk assessment of volatile organic contaminants in the Sava river aquifer, Belgrade, Serbia	
O-29	<u>Suzana Sopčić, Ivana Jakovljević, Gordana Pehneć</u>	51
	Organic compounds in particulate matter collected at Plitvice Lakes	
O-30	<u>Anamarija Pulitika, Marin Kovačić, Panagiotis Karamanis, Ana Lončarić Božić, Hrvoje Kušić</u>	52
	Computational study of microPET adsorption mechanism for benzene derivatives in water	

POSTER PRESENTATIONS – CHEMISTRY

P-A1	<u>Arijeta Bafti</u>, Jana Vapaavuori, Tapio Lokki, Floren Radovanović-Perić, Vilko Mandić Cellulose aerogels and their acoustic properties	53
P-A2	<u>Ines Bašić</u>, Ana Mikleušević, Matija Gredičak Dearomative two-component cascade for pyrrolo [3,4- <i>b</i>] indole preparation	54
P-A3	<u>Charikleia S. Batsika</u>, Charalampos Koutsilieris, Giorgos S. Koutoulogenis, Maroula G. Kokotou, Christoforos G. Kokotos, George Kokotos Sunlight or UVA-light-induced oxidation of aldehydes to carboxylic acids under aerobic conditions without the use of external photocatalyst	55
P-A4	<u>Nea Baus Topić</u>, Dominik Cincić Perhalogenated aromatic amines as bifunctional donor molecules in cocrystals with ditopic nitrogen-containing acceptors	55
P-A5	<u>Ivana Biljan</u>, Laura Nuić, Barbara Panić, Iva Šrut Rakić, Marko Kralj Insights into the polymerization of aromatic dinitroso derivatives initiated by nitroso-terminated monolayer on Au(111) surface	57
P-A6	<u>Alen Bjelopetrović</u>, Stipe Lukin, Sara Morasi-Piperčić, Manda Ćurić, Marina Juribašić Kulcsár Solid-state synthesis and structure of <i>o</i> - and <i>p</i> -substituted azobenzene amides	58
P-A7	<u>Ida Boček Pavlinac</u>, Mirna Dragić, Kristina Starčević, Marijana Hranjec New hydroxy substituted acrylonitrile imidazo[4,5- <i>b</i>]pyridines as potential antioxidants and pH sensors	59
P-A8	<u>Lidija Brkljačić</u>, Kristina Pregiban, Ivanka Jerić Method development for the determination of water-soluble vitamins in enteral food with LC-MS	60
P-A9	<u>Petra Brzović</u>, Greta Krešić, Nikolina Liović, Tea Bilušić The influence of drying process on the phenolic, flavonoids and anthocyanins content of chokeberry extract obtained by microwave-assisted extraction	61
P-A10	<u>Dražen Čavuzić</u> Very weak base pK _a determination	62
P-A11	<u>Mario Cetina</u>, Manuel Petroselli, Corrado Bacchiocchi, Massimo Cametti, Zoran Džolić Influence of biphenyl-bis-urea receptor terminal substituents on anion binding properties	63
P-A12	<u>Ivona Čipor</u>, Marcela Šišić, Ruža Frkanec, Leo Frkanec <i>N,N</i> -di(2-picolyl)amine functionalized amino acid based supramolecular hydrogels: Synthesis, characterisation and potential biomedical application	64
P-A13	<u>Ivana Colić</u>, Ivanka Jerić Synthesis of oligomers with embedded C-glycosyl α -amino acids	65
P-A14	<u>Ivan Ćorić</u>, Jelena Bijelić, Dalibor Tatar, Martina Šrajer Gajdošik, Elvira Kovač-Andrić Sonochemical synthesis and characterization of ZrO ₂ nanoparticles	66
P-A15	<u>Vladimir Damjanović</u>, Danijela Musija, Igor Picek, Blaženka Foretić Equilibrium and kinetic studies on the reactions of aquapentacyanoferrate(II) with 4-imidazoline-2-thiones	67
P-A16	<u>Lucija Dončević</u>, Renata Biba, Mario Cindrić Data independent acquisition <i>de novo</i> sequencing technique	68
P-A17	<u>Josip Draženović</u>, Đani Škalamera, Nikola Basarić Carbazole derivatives as precursors of aza- <i>o</i> -quinone methides	69
P-A18	<u>Nikolina Filipović</u>, Berislav Marković, Stjepan Šarić, Katarina Mišković Špoljarić Dinuclear copper(II) complexes derived from benzopyrone ligand: Synthesis, structural characterization and antiproliferative activity	70

P-A19	Eirini M. Galathri, Lorenzo Di Terlizzi, Maurizio Fagnoni, Stefano Protti, Christoforos G. Kokotos Friedel-Crafts type arylation of aldehydes with indoles utilizing a photoacid generator and blue LED irradiation	71
P-A20	Olivera Galović, Ivan Pritišanac, Renata Dončić, Manuela Košević, Zlata Kralik, Gordana Kralik Extraction of vitamin E from hens feed mixture	72
P-A21	Nika Gazdek Serdar, Iva Zonjić, Ivana Nikšić-Franjić, Leo Frkanec, Ivo Piantanida A model for acute poisoning detoxification – binding of aristolochic acid with various cyclodextrins	73
P-A22	Petros L. Gkizis, Christoforos G. Kokotos Novel, sustainable and green photooxidation protocols: Easy access to sulfoxides and phenols	74
P-A23	Martina Gudelj, Matija Tomšič, Perica Bošković Surfactant free microemulsion composed of heptanol, ethanol and water	75
P-A24	Lucija Hok, Robert Vianello Selective deuteration improves the affinity of adenosine A _{2A} receptor ligands: A computational case study with istradefylline and caffeine	76
P-A25	Gordan Horvat Chemometric analysis of adaptive titrant addition procedure for spectrophotometric stability constant measurements	77
P-A26	Irena Ivanišević, Petar Kassal Development of a planar printed lactate biosensor	78
P-A27	Zoe Jelić Matošević, Katarina Radman, Ivo Crnolatac, Nikola Bregović, Ivo Piantanida, Ivana Leščić Ašler, Branimir Bertoša Computational and experimental study of transcription factors that control manganese homeostasis in bacteria	79
P-A28	Mario-Livio Jeličić, Daniela Amidžić Klarić, Jelena Kovačić, Vladimir Stankov, Marija Gulan Čičak, Boris Bučar, Nikša Turk, Željko Krznarić, Ana Mornar Determination of ethylene oxide in botanical dietary supplements used in the treatment of IBD by gas chromatography-tandem mass spectrometry	80
P-A29	Marijana Jurić, Ana Lozančić, Lidija Molčanov, Sanja Burazer, Lidija Androš Dubraja, Martina Vrankić Single-step preparation of mixed metal oxides from heterometallic compounds	81
P-A30	Marta Jurković, Vilko Smrečki, Ivo Piantanida High selectivity of fluorescent (triazole)coumarin peptides to metal cations – fluorimetric and NMR approach	82
P-A31	Maja Karnoš, Karolina Vrandečić, Jasenka Ćosić, Vesna Rastija, Dejan Agić, Domagoj Šubarić, Maja Molnar Synthesis and antifungal activity of novel 1,2,4-triazolyl coumarins	83
P-A32	Ivana Kekez, Mihovil Faletar, Mario Kekez, Laura Cendron, Giuseppe Zanotti, Dubravka Matković-Čalogović Exploring the cooper affinity toward the CrdA protein from <i>Helicobacter pylori</i>	84
P-A33	Adriana Kendžel, Ivana Radoslavić Enhancement of Raman scattering on gold nanoparticles prepared in HEPES buffer	85
P-A34	Ivan Kodrin, Tea Frey, Petar Šutalo, Barbara Panić, Ivana Biljan Pyridine and amine-based porous organic materials with azo, azoxy and azodioxy linkages for selective CO ₂ adsorption	86
P-A35	Maria Kolympadi Markovic, Dario Matulja, Marija Jozanović, Nikola Sakač, Gabriela Ambrožić, Davor Šakić, Valerije Vrček, Dean Marković Catalytic conversion of CO ₂ into organic cyclic carbonates	87

P-A36	Mario Komar, Valentina Pavić, Dragica Suknović, Maja Molnar Mechanochemical synthesis of quinazolinone Schiff bases in deep eutectic solvents	88
P-A37	Davor Kovačević, Tajana Begović Stability of nanoparticles and their interactions with polyelectrolytes	89
P-A38	Monika Kovačević, Sunčica Roca, Mojca Čakić Semenčić, Nikolina Orešković, Maj Mezić, Evelin Radešić, Lidija Barišić Hydrogen bonding patterns in ferrocene tripeptides	90
P-A39	Tatjana Kovačević, Krunoslav Nujić, Milan Mesić Chemical proteomics approach for detection of potential off-targets associated with the EGFRi erlotinib	91
P-A40	Jelena Kovačić, Daniela Amidžić Klarić, Mario-Livio Jeličić, Matea Perko, Ilija Klarić, Snježana Zubčić, Ana Mornar Oral dosage testing of dietary supplements used in the treatment of IBD according to the United States Pharmacopeia	92
P-A41	Luka Krstulović, Marijana Leventić, Ljubica Glavaš-Obrovac Novel 7-chloro-4-aminoquinoline-benzimidazole hybrids as inhibitors of cancer cells growth	93
P-A42	Jurij Lah, Domen Oblak, San Hadži, Črtomir Podlipnik Describing G-quadruplex DNA stability phase space	94
P-A43	Ivana Landeka, Marina Ratkaj API cocrystal formation: Evaluation of COSMOtherm predictions	95
P-A44	Jasmina Lapić, Ivana Kuzman, Ruža Frkanec, Leo Frkanec, Valerije Vrčec, Senka Djaković Synthesis and biological evaluations of ferrocene-pyrimidine hybrids	96
P-A45	Vilma Lovrinčević, Dragana Vuk, Irena Škorić, Nikola Basarić Photoheterolysis reactions of meta-substituted aminonaphthalene photocages	97
P-A46	Petra Maleš, Danijela Bakarić The signature of inverse hexagonal phase of phosphoethanolamine lipids	98
P-A47	Nives Matijaković Mlinarić, Anamarija Zore, Aleksander Učakar, Anže Abram, Andrijana Sever Škapin, Klemen Bohinc ZnO and CuO nanomaterials for antibacterial application	99
P-A48	Mateja Matišić, Matija Gredičak Organocatalytic synthesis of isoindolinone derivatives containing 3-alkyl tetrasubstituted stereogenic center	100
P-A49	Dario Matulja, Gabrijele Matijević, Sanja Babić, Petra Grbčić, Krunoslav Bojanić, Sylvain Laclef, Ozren Jović, Tomislav Šmuc, Iris Car, Mirela Sedić, Rozelindra Čož-Rakovac, Sandra Kraljević Pavelić, Dean Marković Bioprospecting of the Adriatic coral <i>Eunicella cavolini</i>	101
P-A50	Mia Mesić, Tin Klačić, Davor Kovačević Effect of divalent cations on formation and properties of polyelectrolyte nanofilms: Robot side of the story	102
P-A51	Milena Mlakić, Ilijana Odak, Danijela Barić, Borislav Kovačević, Lajos Fodor, Ottó Horváth, Irena Škorić Resveratrol hybrids as cholinesterase inhibitors and antioxidants: Synthesis, bio-metal chelating capability and computational study	103
P-A52	Zvonimir Mlinarić, Katarina Sladonja, Lu Turković, Miranda Sertić Optimization of separation of six anticancer drugs by micellar electrokinetic chromatography-tandem mass spectrometry using a volatile surfactant	104
P-A53	Matija Modrušan, Emilija Petrović Hađar, Lucija Glazer, Mirko Duvnjak, Nikolina Vidović, Nikola Cindro, Giovanna Speranza, Vladislav Tomišić, Gordan Horvat Affinity of linear and cyclic peptides towards bivalent cations	105
P-A54	Krešimir Molčanov, Lidija Molčanov, Dijana Žilić, Luka Pavić, Marijana Jurić Charge transfer between transition metal and quinone through a π -hole interaction	106

P-A55	Danijela Musija, Vladimir Damjanović, Blaženka Foretić, Dubravka Matković-Čalogović Synthesis and characterization of thioamide pentacyanoferrate(III) complexes	107
P-A56	Dragana Mutavdžić Pavlović, Lu Turković, Zvonimir Mlinarić, Kristina Javorić, Juraj Vuić, Anamarija Skenderović, Sandro Makarić, Vladimir Radić, Tajana Silovski, Miranda Sertić Preparation of molecularly imprinted polymers for the extraction of fulvestrant from human plasma samples	108
P-A57	Danijel Namjesnik, Tea Juračić, Eva Josić, Tajana Begović Adsorption of polyions on TiO ₂ surface	109
P-A58	Marko Novaković, Dani Škalamera Synthesis of D-glucose and cholesterol conjugate for targeted delivery of pharmaceuticals by modified liposomes	110
P-A59	Mario Pajić, Manda Ćurić, Marina Juribašić Kulcsár Solid-state synthesis and catalytic potential of dicyclopalladated azobenzenes	111
P-A60	Lea Pašalić, Danijela Bakarić, Qi qian Liu, Marc Lamy de la Chapelle Physical-chemical properties of DPPC liposomes in the presence of gold nanoparticles aggregates	112
P-A61	Marija Paurević, Aleksandra Maršavelski, Ranko Stojković, Rosana Ribić Synthesis and immunostimulating activity of dimannosylated desmuramyl peptide	113
P-A62	Vesna Petrović Peroković, Željka Car, Nikola Cindro, Barbara Panić, Ivan Kodrin, Ivana Biljan Synthesis and characterization of aromatic trinitroso compounds – potential building blocks for new porous organic polymers	114
P-A63	Petra Petrović, Patricia Tikvenjak, Snežana Miljanić SERS spectra of berberine and papaverine	115
P-A64	Martina Piškorić, Silvio Jakopec, Marijana Buljubašić, Lejla Ferhatović Hamzić, Mirela Sedić, Berislav Perić, Ljubica Glavaš-Obrovac, Srećko Kirin, Silvana Raić-Malić Synthesis, characterization and antiproliferative activity of coumarin-based derivatives and their metal complexes	116
P-A65	Marina Poljak, Tomica Hrenar, Ines Primožič Deep reinforcement learning classification model for fragrant compounds based on ATR spectroscopy	117
P-A66	Kristina Pregiban, Lidija Brkljačić, Ivanka Jerić Stability of water-soluble vitamins in enteral food	118
P-A67	Katarina Radman, Ivana Leščić Ašler, Zoe Jelić Matošević, Ivo Crnolatac, Ivo Piantanida, Branimir Bertoša Influence of Mn ²⁺ ion binding on structural changes in metalloregulatory proteins SloR (<i>S. mutans</i>) and ScaR (<i>S. gordonii</i>)	119
P-A68	Vesna Rastija, Karolina Vrandečić, Jasenka Ćosić, Maja Karnaš, Maja Molnar Antifungal effects of fluorinated pyrazole aldehydes: Biological activity evaluation and molecular docking studies	120
P-A69	Magda Relić, Mario Herceg, Mihajlo Banjanac, Vedrana Radovanović, Leentje Persoons, Dirk Daelemans, Livio Racané Synthesis of novel benzothiazole azo dyes and <i>in vitro</i> biological evaluation of antibacterial and antitumor activity	121
P-A70	Antonio Sablijić, Doris Crnčević, Matilda Šprung, Renata Odžak The influence of amide group addition on the bioactivity of new soft 3-amidoquinuclidine QACs	122
P-A71	Davor Šakić, Gabrijel Zubčić, Jiangyang You, Erim Bešić visualEPR: free, online and open-source visualisation and simulation software for fast processing of EPR spectra	123

P-A72	Mirela Samardžić, Mateja Peršić, Aleksandar Széchenyi, Mateja Budetić Applicability of the new solid-state sensor based on functionalized carbon nanomaterials for promethazine hydrochloride determination	124
P-A73	Marcela Šišić, Tomislav Friganović, Mario Gabričević, Leo Frkanec, Ruža Frkanec SPRi study of <i>N</i> -acetyl glucosamine specific lectin interactions with peptidoglycan monomer functionalized gold biochips	125
P-A74	Elpida Skolia, Christoforos G. Kokotos The reaction between alkenes and maleimides: [2+2] cycloadditions using UVA or visible light	126
P-A75	Ivana Sokol, Hanja Mlinar, Dajana Kučić Grgić, Tatjana Gazivoda Kraljević Synthesis and antibacterial activity of new hydrazone-bridged benzothiazole derivatives	127
P-A76	Željka Soldin, Ozana Mišura, Antonela Bikić, Marijana Đaković Mechanical responsiveness of crystals of copper(II) coordination polymers	128
P-A77	Monika Šoltić, Nikola Baran, Goran Dražić, Goran Štefanić, Marijan Marciuš, Mile Ivanda, Marijan Gotić Synthesis and gas sensing properties of platinum nanoparticles dispersed on α -Fe ₂ O ₃ and Fe ₃ O ₄ supports	129
P-A78	Leo Štefan, Ana Čikoš, Ivica Đilović Reactivity of 2,3-dihydro-1-methyl-2 <i>H</i> -benzimidazole-2-thione towards 1,2-dichloroethane	130
P-A79	Naya A. Stini, Petros L. Gkizis, Christoforos G. Kokotos Bio-based solvents for cross-coupling reactions	131
P-A80	Domagoj Šubarić, Maja Karnaš, Ivana Majić, Vesna Rastija Triazole derivatives as potential eco-friendly pesticides – an <i>in vitro</i> and <i>in vivo</i> study	132
P-A81	Lana Topalović, Petra Gurović, Aleksandar Bajrović, Ivan Vrban, Damir Šahnjić, Jasna Prlić Kardum Methods of enhancing physical properties of active pharmaceutical ingredients	133
P-A82	Nikola Topolovčan, Mateja Matišić, Arben Beriša, Danijel Glavač, Matija Gredičak Organocatalytic strategies for the installation of the congested stereogenic centers in isoindolinone structural cores	134
P-A83	Valentina Travančić, Domagoj Prlić, Aleksandra Sander The influence of antisolvent addition on powder properties of API	135
P-A84	Lu Turković, Martina Papić, Zvonimir Mlinarić, Tajana Silovski, Miranda Sertić Evaluation of extraction efficacy and matrix effects for six anticancer drugs in human plasma using different sample preparation techniques with LC-MS	136
P-A85	Marko Viskić, Ana Rapljenović, Neven Cukrov, Vlado Cuculić Trace metal adsorption on plastic pellets and fibers in the marine and estuarine environment	137
P-A86	Leonarda Vugrin, Maria Carta, Francesco Delogu, Ivan Halasz Hammett correlation and reaction mechanisms in mechanochemical imine formation	138
P-A87	Marina Zekić, Ani Radonić Ultrasonic solvent extraction of traditional Croatian cheeses matured in a lamb skin sack	139
P-A88	Pavo Živković, Borna Miklošević, Aleksandar Széchenyi Application of narrow-gap electrodes for electrochemical determination of antioxidants in high-resistance solvents	140
P-A89	Gabrijel Zubčić, Maria Kolypadi Marković, Dean Marković, Tomislav Portada, Erim Bešić, Davor Šakić Detecting elusive radicals using spin traps. Case study on Hofmann-Löffler-Freytag reaction	141
P-A90	Ida Boček Pavlinac, Lucija Hok, Tana Tandarić, Marijana Hranjec, Robert Vianello Photophysical and computational study of iminocoumarin and imidazo[4,5- <i>b</i>]pyridines conjugates as novel pH sensitive probes	142

POSTER PRESENTATIONS – CHEMICAL AND BIOCHEMICAL ENGINEERING

P-B1	<u>Jelena Avdalović, Tatjana Šolević Knudsen, Biljana Dojčinović, Vesna Conić, Jun Yao, Jelena Milić, Mila Ilić, Miroslav M. Vrvčić</u> Two-stage process for extraction useful metals from a polymetallic ore flotation concentrate: A laboratory study	143
P-B2	<u>Matea Bajo, Mia Radović, Marina Cvjetko Bubalo, Ana Jurinjak Tušek, Anita Šalić, Bruno Zelić, Dunja Šamec</u> Development and optimization of bioflavonoids extraction from ginkgo (<i>Ginkgo biloba</i> L.) leaves using deep eutectic solvents	144
P-B3	<u>Mladen Brnčić, Iva Šarić, Mario Božić, Domagoj Gabrić, Mirna Tadić, Damir Ježek</u> The physicochemical characteristics of non-thermally treated fruit juice	145
P-B4	<u>Filip Car, Domagoj Vrsaljko, Zoran Gomzi, Vesna Tomašić</u> Analysis and modelling of a 3D-printed ceramic monolithic reactor for oxidation of aromatic volatile organic compounds	146
P-B5	<u>Ivana Čevid, Nevena Milčić, Maja Majerić Elenkov, Zvezdana Findrik Blažević</u> Optimization of the biocatalytic cascade synthesis of (<i>R</i>)-3-hydroxy- γ -butyrolactone by means of kinetic modelling	147
P-B6	<u>Marija Čosić, Antonija Čelan, Mia Ramljak, Nenad Kuzmanić</u> Influence of ultrasound amplitude on borax nucleation kinetics in a batch crystallizer at different cooling rates	148
P-B7	<u>Matko Erceg, Matej Marić, Dubravka Bojanić Varezić, Pero Tutman</u> Characterization of microplastics from Zaglav beach on the island of Vis	149
P-B8	<u>Matea Gavran, Monika Klier, Nenad Bolf, Damir Šahnić</u> Raman spectroscopy for ceritinib solution concentration and slurry density estimation	150
P-B9	<u>Mia Gotovuša, Ivona Pečurlić, Valentino Petrić, Paula Huzjak, Marta Krasić, Martina Zadavec, Lucija Konjević, Fabio Faraguna</u> The influence of the reaction parameters and the feedstock type on the synthesis of fatty acid propyl, butyl, isobutyl, pentyl, and isopentyl esters	151
P-B10	<u>Petra Gurović, Lana Topalović, Aleksandar Bajrović, Damir Šahnić, Aleksandra Sander</u> Continuous crystallization: Improving product quality and consistency in the pharmaceutical industry	152
P-B11	<u>Sofija Ivković, Maša Safundžić Kučuk, Leo Štefan</u> Particle size analysis in pharmaceutical suspensions: Use of different methods from active pharmaceutical ingredient to final formulation	153
P-B12	<u>Jelena Jakić, Miroslav Labor, Marija Grgičević, Vanja Martinac, Anđela Čović</u> Effect of surfactant addition on precipitation of magnesium oxide from sea bittern	154
P-B13	<u>Marisa Koci, Lorena Dauti</u> Extraction of <i>Pinus halepensis</i> essential oil and characterization by IR and UV-Vis spectroscopy	155
P-B14	<u>Krešimir Kos, Nevena Milčić, Maja Majerić Elenkov, Zvezdana Findrik Blažević</u> Synthesis of valuable building block with immobilized biocatalyst in rotating bed reactor	156
P-B15	<u>Želimir Kurtanjek</u> Structural equation modelling (SCM) and causality of chemical engineering models	157
P-B16	<u>Emerik Leaković, Isabel Their, Karsten Siems, Lorena Mateša, Martina Sudar, Zvezdana Findrik Blažević, Ana Vrsalović Presečki</u> Optimizing the reaction conditions of enzyme-catalysed betuloside hydrolysis	158
P-B17	<u>Goran Lukač, Žarko Olujić, Igor Dejanović</u> Dual condenser configuration of a four-product dividing wall column	159
P-B18	<u>Marijan-Pere Marković, Leonarda Bambić, Ivan Karlo Cingesar, Elizabeta Forjan, Domagoj Vrsaljko</u> Preparation and characterization of litmus-based sensor films	160

P-B19	Lorena Mateša, Emerik Leaković, Ivana Bigor, Martina Sudar, Ana Vrsalović Presečki, Zvezdana Findrik Blažević Synthesis of galactooligosaccharides in batch and enzyme membrane reactor	161
P-B20	Mihovil Medić, Lucija Rebrović, Fabio Faraguna, Elvira Vidović, Ante Jukić Effect of functionalised groups containing oxygen or nitrogen on lubricity of methacrylate based copolymer solutions in lubricant oil	162
P-B21	Dajana Mikić, Helena Otmačić Ćurković The efficiency of organic coating protection of bronze samples exposed to outdoor environment and in simulated laboratory conditions	163
P-B22	Ana Petračić, Antonela Šipek, Aleksandra Sander Characterisation and purification of crude glycerol after biodiesel production	164
P-B23	Ivana Petrić, Sara Hriberski, Pavo Jakešević, Dino Skendrović, Ana Vrsalović Presečki Optimization of aldolase immobilization on magnetic nanoparticles	165
P-B24	Mateja Prpić, Joško Barbarić The effect of particle size and morphology on <i>in vitro</i> drug release	166
P-B25	Lucija Rebrović, Leona Krmpotić, Mihovil Medić, Fabio Faraguna, Ante Jukić Thermal and lubricating properties of canola oil nanofluid and corresponding biodiesel-based nanofluid	167
P-B26	Marko Rogošić, Anja Damjanović, Marina Cvjetko Bubalo, Tomislava Vukušić Pavičić, Višnja Stulić, Mia Ivanov Determining solid liquid equilibria in some systems comprising common osmolytes by differential scanning calorimetry	168
P-B27	Josip Sacher, Matea Gavran, Nenad Bolf, Željka Ujević Andrijić The rapid development of calibration models for supersaturation tracking using <i>in situ</i> ATR-FTIR spectroscopy	169
P-B28	Damir Šahnić, Ivan Vrbanić, Petra Gurović, Aleksandar Bajrović, Lana Topalović Utilization of in-line process microscopy in crystallization process development of active pharmaceutical ingredients	170
P-B29	Aleksandra Sander, Katarina Belošević, Bruna Babić Visković, Ana Petračić, Danijela Ašperger Microwave and ultrasound assisted extraction of piperine from different piper species	171
P-B30	Katarina Sokač, Luka Baždarić, Jakša Devčić, Krunoslav Žižek By mechanochemical activation to a drug with an improved solubility and release rate	172
P-B31	Martina Šrajcer Gajdošik, Marko Šimić, Marija Paurević, Elvira Kovač-Andrić, Dajana Gašo-Sokač, Djuro Josić <i>Yersinia enterocolitica</i> proteome profiling after treatment with disinfectants based on quaternary ammonium salts	173
P-B32	Marija Trkmić, Jasna Petranović, Marija Fucak, Marijana Zlatec Application of spectrometric methods in determining the composition of ceramics	174
P-B33	Ana Tutić, Viktorija Prevarić, Martina Miloloža, Šime Ukić, Matija Cvetnić, Dajana Kučić-Grgić, Marinko Markić Photo-oxidative degradation of phenol, cyanide and thiocyanate by UV-C/H ₂ O ₂ and UV-C/S ₂ O ₈ ²⁻ processes	175
P-B34	Željka Ujević Andrijić, Nikola Rimac Comparison of NTU and neural network models for fouling monitoring of heat exchangers in the preheat train section of a Crude Distillation Unit	176
P-B35	Elvira Vidović, Roko Blažić Cellulose-based hydrogels modified with poly(vinylpyrrolidone)	177
P-B36	Jelena Vladić, Martina Kovač, Igor Jerković, Stela Jokić, Alexandre Paiva, Ana Rita Duarte, Ivona Kujundžić, Valentina Pavić Supercritical CO ₂ and deep eutectic solvents for sequential extraction of <i>Lavandula stoechas</i> L. and attainment of antioxidant and antibacterial agents	178

P-B37	Kristina Zagajski Kučan, Marko Rogošić Betaine:glycerol deep eutectic solvent modified with zinc chloride for extractive gasoline purification	179
P-B38	Krunoslav Žižek, Paula Priselec, Jelena Barač, Katarina Sokač By the principles of green chemistry to a drug with improved properties	180
P-B39	Iva Zokić, Jasna Prlić Kardum, Katarina Mužina Selecting solvent systems for spherical crystallization of API	181
POSTER PRESENTATIONS – MATERIAL		
P-C1	Branka Andričić, Danijela Dragičević, Irena Krešić, Nataša Stipanelov Vrandečić Preparation of poly(3-hydroxybutyrate) plasticized with mixture of methyl esters derived from waste edible oils	182
P-C2	Rafael Anelić, Fabio Faraguna, Ante Jukić Thermal conductivity, electrical resistivity and dynamic mechanical analysis of polyester-imide resin/nanocellulose composites	183
P-C3	Marin Božičević, Lucija Fiket, Zvonimir Katančić Synthesis and characterization of stretchable and conductive PEDOT- <i>g</i> -PCL copolymers for wearable electronics	184
P-C4	Matej Bubaš, Ivana Fabijanić, Adriana Kenđel, Snežana Miljanić, Maria Chiara Spadaro, Jordi Arbiol, Vesna Janicki, Jordi Sancho Parramon Improving stability and SERS performance of Au-Ag nanoislands	185
P-C5	Matej Ercegović, Filip Brleković, Deni Hršak, Juraj Šipušić Porosity – a key parameter of acoustic wood wool cement board	186
P-C6	Lucija Fiket, Marin Božičević, Anamarija Horvat, Zvonimir Katančić Development of new generation of stretchable conductive polymers for wearable flexible electronics	187
P-C7	Mateja Filković, Josip Bibić, Domagoj Vrsaljko Problems in stability of the inner surface of glass vials leading to glass leaching and delamination	188
P-C8	Petra Gorišek, Martina Filipović, Angela Kapitanović, Helena Otmačić Ćurković A study on the influence of waterborne coating application parameters on its protective properties	189
P-C9	Mila Ilić, Tamara Tadić, Sandra Bulatović, Bojana Marković, Aleksandra Nastasović Validation of an adsorption kinetic model for lindane removal by a porous polymer	190
P-C10	Hrvoje Ivanković, Leonard Bauer, Dajana Milovac Lerga, Marica Ivanković Hydrolytic degradation of poly(lactic acid)/hydroxyapatite composites	191
P-C11	Dražan Jozić, Anđela Čović Synthesis of nanostructured TiO ₂ and its application in self-crosslinking water-dispersive acrylic coatings	192
P-C12	Dora Kolman, Ivan Gabrijel, Petra Štefanec, Šime Pulić Analysis of chloride penetration in concrete exposed to marine environment	193
P-C13	Lucija Konjević, Fabio Faraguna, Petar Ilinčić Effects of higher alcohol/diesel blends on engine performance	194
P-C14	Ivana Landripet, Josip Bronić Combining hierarchization and cations insertion in mordenite	195
P-C15	Sanja Lučić Blagojević, Martina Zeljko Eco-friendly UV-protective polyacrylate/rutile TiO ₂ coatings	196
P-C16	Gabrijela Ljubek, Magdalena Kralj, Marijana Kraljić Roković Green synthesis of Ti ₃ C ₂ T _x MXene	197
P-C17	Branimir Ljubičić, Anđela Čović, Dražan Jozić The impact of reducing CO ₂ emissions in the industrial production of Portland cement clinker with increased sulfur content	198

P-C18	Vilko Mandić, Ivana Panžić, Marijana Kraljić Roković Indirect evaluation methodology of 1D self-organised charge transfer oxide thin films	199
P-C19	Anna Melekhova, Matthew Ellis, Ljiljana Fruk Flavin-clay hybrid materials for photodegradation of dye pollutants	200
P-C20	Lidija Molčanov, Lidija Androš Dubraja, Dijana Žilić, Krešimir Molčanov, Marijana Jurić Charge transfer in bimetallic oxalate-bridged coordination polymer with the $[\text{Fe}(\text{C}_2\text{O}_4)_3]^{3-}$ core induced by light irradiation	201
P-C21	Branka Mrduljaš, Irina Pucić, Katarina Didulica, Ana Baričević Alkaline resistance of recycled tyre polymer fibres for cement composites	202
P-C22	Ena Pezić, Jelena Vrhovec, Branka Mihaljević, Katarina Marušić Effect of the fatty acid double bond on the properties of crosslinked nanocoatings on metals	203
P-C23	Teodora Prebeg, Dinka Omerčić, Valentina Erceg, Gordana Matijašić Effect of sonication on decellularization of porcine liver with ionic detergent	204
P-C24	Floren Radovanović-Perić, Vilko Mandić, Dragana Vuk, Thomas Rath A GISWAXS study on supramolecular assembly of small molecule electron donating photoabsorbers	205
P-C25	Matea Raić, Krešimir Kvastek, Mile Ivanda The effects of silicon anode thickness on electrochemical characteristics of Li-ion battery	206
P-C26	Iva Rezić, Maja Somogyi Škoc, Pierre-Alexis Mouthuy Antimicrobially modified continuous yarns from electrospun fibers	207
P-C27	Marko Rukavina, Arijeta Bafti, Lucija Janković-Miloš, Ines Ljubičić, Andrea Tomić, Vilko Mandić Mechanochemical approach for the synthesis of LTA and SOD zeolites from (meta)kaolin	208
P-C28	Silvija Šafranko, Šimun Mandić, Drago Šubarić, Stela Jokić Quantum yield optimization of hybrid carbon quantum dots and their application as sensing nanomaterial	209
P-C29	Marina Samardžija, Vesna Alar, Ivan Stojanović, Marin Kurtela Application of EIS and SECM studies for investigation of anticorrosion properties of epoxy coatings	210
P-C30	Petra Štefanec, Ivan Gabrijel, Dora Kolman, Šime Pulić SEM-EDS analysis of powder from concrete elements exposed to the marine environment	211
P-C31	Ivan Stojanović, Mirta Logar, Ivan Fatović, Vesna Alar, Marin Kurtela, Ivan Juraga Physical and chemical properties of differently dried topcoats	212
P-C32	Kristina Sušac, Bruno Bušić, Lucija Svorcina, Elvira Vidović, Ante Jukić Mechanical properties of prepared methacrylate copolymer nanocomposites, synthesized in a green solvent cyrene TM	213
P-C33	Edi Topić, Pavla Šenjug, Dario Barišić, Ivor Lončarić, Damir Pajić, Mirta Rubčić Dimensionality-dependent magnetic order in hybrid anisidinium tetrachlorocuprates(II)	214
P-C34	Martina Vrankić, Takeshi Nakagawa, Jasminka Popović, Yang Ding Capturing the pressure driven PXRD features of selected inorganic and hybrid materials	215
P-C35	Marina Vukoje, Ivana Bolanča Mirković, Rahela Kulčar, Tomislav Cigula, Katarina Itrić Ivanda Thermochromic flexographic prints in paper recycling process	216
P-C36	Juro Živičnjak, Antoneta Tomljenović Comparative study of socks made of different cellulose fibers	217
P-C37	Marko Zubak, Irena Ivanišević, Domagoj Vrsaljko, Petar Kassal Optimization of thermal and photothermal sintering of inkjet printed amphiphilic silver nanoparticles on glass surfaces	218

POSTER PRESENTATIONS – ENVIRONMENTAL PROTECTION

P-D1	<u>Danijela Ašperger</u>, Bruna Babić Visković, Anamaria Maslač Application of simulated solar radiation and hydrogen peroxide to remove xenobiotics from aqueous solutions	219
P-D2	<u>Bruna Babić Visković</u>, Danijela Ašperger, Gracia Vukorepa Batch biodegradation of xenobiotics	220
P-D3	<u>Irena Bates</u>, Ivana Plazonić, Valentina Radić Seleš, Katja Petric Maretić, Maja Rudolf Evaluation of printability of paper substrates with agro-residues for graphic products	221
P-D4	<u>Anita Ivanković</u>, Marina Marić, Danijela Petrović, Stanislava Talić, Anita Martinović Bevanda Application of the prognostic model in the evaluation of the water quality of Lake Blidinje (B&H)	222
P-D5	<u>Ivana Jakovljević</u>, Zdravka Sever Štrukil, Gordana Pehnac, Marko Gerić, Katarina Matković, Mandica Sanković, Antun Šumanovac, Goran Gajski Identification of dominant PAHs sources at three different urban sites: Urban background, urban residential, urban industrial	223
P-D6	<u>Andreja Jurič</u>, Blanka Tariba Lovaković, Nataša Brajenović, Irena Brčić Karačonji, Ekaterina Šprajc, Sandy Lovković, Jasna Jurasović Effects of storage conditions on the migration of phthalates from plastic packaging to bottled natural mineral water	224
P-D7	<u>Zorana Kljaković-Gašpić</u>, Tatjana Orct, Ankica Sekovanić, Marijan Sudić, Ekaterina Šprajc, Jasna Jurasović Influence of storage conditions on the migration of metal(loid)s from polyethylene terephthalate (PET) packaging into bottled drinking water	225
P-D8	<u>Mario Kovač</u>, Vesna Ocelić Bulatović, Antun Jozinović, Dajana Kučić Grgić, Drago Šubarić Bioplastic based on thermoplastic potato starch citrate: Thermal properties	226
P-D9	<u>Dajana Kučić Grgić</u>, Martina Miloloža, Mirela Kovačević, Kristina Bule Možar, Viktorija Martinjak, Matija Cvetnić, Šime Ukić, Marinko Markić, Vesna Ocelić Bulatović, Tomislav Bolanča Optimization of microplastics polystyrene biodegradation by <i>Bacillus subtilis</i> isolated from compost sample	227
P-D10	<u>Marija Kuštro</u>, Dubravka Tavra, Kristina Bule, Martina Miloloža, Dajana Kučić Grgić Assessment of the ecotoxicological effects of microplastics with the study of a bioremediation strategy for its removal from the environment	228
P-D11	<u>Marinko Markić</u>, Kristina Bule Možar, Viktorija Martinjak, Martina Miloloža, Matija Cvetnić, Tomislav Bolanča, Dajana Kučić Grgić, Šime Ukić Comparison of different yeast cultures in the biodegradation of polyvinyl chloride microplastics	229
P-D12	<u>Viktorija Martinjak</u>, Martina Miloloža, Matija Cvetnić, Marinko Markić, Šime Ukić, Dajana Kučić Grgić, Josipa Papac Zjačić, Hrvoje Kušić, Tomislav Bolanča Interreg Danube Hazard m ³ c – key project findings concerning current national policies	230
P-D13	<u>Kristina Miklec</u>, Ivan Karlo Cingesar, Ivana Grčić, Domagoj Vrsaljko Determination of perfluorooctane sulfonic acid (PFOS) by-products after TiO ₂ solar photocatalysis over 3D-printed static mixers	231
P-D14	<u>Jelena Milić</u>, Nikoleta Lugonja, Tatjana Šolević Knudsen, Jelena Avdalović, Takeshi Nakano, Mila Ilić, Miroslav M. Vrvic Determination and assessment of new-born dietary intake of polychlorinated biphenyls in commercial infant formulae	232

P-D15	Martina Miloloža, Viktorija Martinjak, Matija Cvetnić, Marinko Markić, Šime Ukić, Dajana Kučić Grgić, Josipa Papac Zjačić, Hrvoje Kušić, Tomislav Bolanča Tackling hazardous substances pollution in the Danube River Basin by Measuring, Modelling-based Management and Capacity building	233
P-D16	Tatjana Orct, Ankica Sekovanić, Maja Lazarus, Branko Petrinec, Jasminka Senčar, Davor Rašeta, Nikica Šprem, Ivan Širić Lead, cadmium and radionuclide caesium (¹³⁷ Cs) in wild growing edible <i>Boletus</i> mushrooms from different areas of Croatia	234
P-D17	Katja Petric Maretić, Maja Rudolf, Valentina Radić Seleš, Ivana Plazonić, Irena Bates FTIR analysis of prints on paper substrates with virgin straw fibres	235
P-D18	Marin Popović, Tayebah Sharifi, Marin Kovačić, Igor Peternel, Hrvoje Kušić, Ana Lončarić Božić Influence of photodeposited silver and iron nanoparticles onto BiVO ₄ surface on ciprofloxacin photocatalytic degradation mechanism	236
P-D19	Irina Pucić, Ana Rapljenović, Željko Kwokal, Vlado Cuculić An attempt to quantitatively analyse submillimetre microplastics by DSC	237
P-D20	Maja Rudolf, Irena Bates, Ivana Plazonić, Valentina Radić Seleš, Katja Petric Maretić Comparison of the mechanical resistance of prints obtained by different printing techniques on papers containing cereal straw pulp	238
P-D21	Ankica Sekovanić, Tatjana Orct, Maja Lazarus, Jasminka Senčar, Branko Petrinec, Davor Rašeta, Nikica Šprem, Ivan Širić Assessment of toxic metal(loid)s content and ¹³⁷ Cs activity concentration in <i>Boletus</i> mushrooms obtained from Croatia and Eastern European countries	239
P-D22	Ana Šket, Katarina Muzica, Ana Čurić, Marija Vuković Domanovac Potential of environmental bacterial culture for the biodegradation of xenobiotics	240
P-D23	Andrea Špoljarić, Elvira Vidović Using nZVI particles and hydrogel incorporated nZVI for amoxicillin removal	241
P-D24	Tin Takač, Milena Jadrijević-Mladar Takač, Tomislav Jednačak Prediction of environmental microbial biotransformation of azithromycin, its thiosemicarbazone conjugates and their precursors	242
P-D25	Blanka Tariba Lovaković, Andreja Jurič, Nataša Brajenović, Irena Brčić Karačonji, Ekaterina Šprajc, Sandy Lovković, Jasna Jurasović Phthalate esters in polyethylene terephthalate (PET) bottled water stored under common conditions	243
P-D26	Kristina Tolić Čop, Dragana Mutavdžić Pavlović, Kristina Javorić Competitive sorption of imatinib and torasemide on the TiO ₂ photocatalyst	244
P-D27	Magdalena Ujević Bošnjak, Iva Šušić, Majda Meden, Silvio Giorgolo, Neven Hrzić, Filip Gajšak, Valentina Goričanec Big data analytics to understand and estimate the risks in drinking water distribution networks	245
P-D28	Mirela Uzelac, Barbara Sladonja, Josipa Bilić, Ivana Šola, Maja Mikulič Petkovšek, Slavica Dudaš, Danijela Poljuha <i>Robinia pseudoacacia</i> L. – invasive alien species as a source of phytopharmaceuticals	246
P-D29	Silva Žužul, Valentina Gluščić, Ivan Bešlić, Andrea Milinković, Abra Penezić, Sanja Frka The impact of anthropogenic and natural sources on particle-bound metals at the middle Adriatic	247

EDUCATION

EPL-1	<u>Vladimir Stilinović</u>	248
	Studying science through its history – the tale of the Chemical Revolution	
EIL-1	<u>Draginja Mrvoš-Sermek</u>	249
	The history of chemistry teaching in Croatia	
EIL-2	<u>Vesna Petrović Peroković</u>	250
	Stereochemistry: Configuration and chemistry teaching	
EO-1	<u>Mirta Malčić, Suzana Lovrić</u>	251
	Teaching Chemistry then and now	
EO-2	<u>Monika Pavić, Maja Jurić-Babaja</u>	252
	Experiment – forever and ever!	
EO-3	<u>Daria Stejskal, Renata Ruić Funčić</u>	253
	Teacher’s perception of support in stressful situations	
EO-4	<u>Darija Vištica, Melita Barić Tominac</u>	254
	From raw materials to useful products	
EP-1	<u>Lidija-Marija Tumir, Marijana Radić Stojković, Iva Orehovec, Danijel Glavač, Tomislav Portada, Ivo Crnolatac</u>	255
	Chemistry workshops as part of the Synecological STEM EDUCATION project in Klinča	
EP-2	<u>Iva Turkalj, Andrea Knežević, Ružica Šoić, Renata Kobetić</u>	256
	Multidisciplinary synthesis of small researchers	

Environmental risk assessment of volatile organic contaminants in the Sava river aquifer, Belgrade, Serbia

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The aim of this study was to investigate the environmental risk from the gasoline range volatile organic contaminants in the Sava river aquifer. The investigated area is located in New Belgrade, in the vicinity of the largest heating plant in Belgrade, the capital of Serbia. Our previous research on the oil pollutants in the groundwater at this locality was focused on the origin and spatial distribution of these contaminants, and estimation of potential human health risks from exposure to these compounds. [1] The purpose of our present study is a Tier I Environmental risk assessment in this part of the aquifer.

Groundwater samples were collected from 28 hydrogeological boreholes. Preliminary analyses of the organic compounds extracted from the groundwater samples were conducted by gas chromatography with flame ionization detection (GC-FID), and by gas chromatography – mass spectrometry (GC-MS). Volatile organic compounds (VOCs) were analyzed and identified by headspace gas chromatography – mass spectrometry. Chemicals of concern were quantified by headspace gas chromatography with flame ionization detection (HS-GC-FID).

In the groundwater samples analyzed, the most frequently detected VOCs were from the group of the gasoline range organics. Concentrations of the individual VOCs ranged from below detection limits to 5.2 mg/L. For each of the compounds quantified, the Risk Quotient (RQ) was calculated as the ratio of the measured concentration of that compound in the groundwater sample and the lowest Predicted Non-Effect Concentration for freshwater aquatic organisms (PNEC). The PNEC values were adopted from the European chemicals agency's (ECHA) Registration Dossier database. [2] At some of the sampling points, the detected concentrations of VOCs were higher than that of the PNEC values with resulting RQ > 1. Considering the fact that the VOC compounds analyzed were present as mixtures, the mixture RQ was calculated (as a sum of the individual RQs) for each sampling point. Out of 28 sampling points, at 7 of them the mixture RQs were higher than 1 which indicates a potentially medium to high ecological risk from these compounds in this part of the aquifer.

In addition to the conclusion from our previous study on the human risk assessment from exposure to the volatile organic compounds in the groundwater at this location, [1] this research emphasizes a necessity for a continuous monitoring of the water quality in the investigated area.

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[2] ECHA Registration Dossier database: <https://echa.europa.eu/registration-dossier>.