BASIC INFORMATION

Name and surname	Zoran Markovic
Year and place of birth	1958. Kragujevac
Title	Doctor of Science - Chemical Sciences
E-mail	zmarkovic@kg.ac.rs, zmarkovic@uni.kg.ac.rs
Educational-scientific / educational-artistic field	Natural science
University, faculty, organizational unit	University of Kragujevac, Institute for Information Technology Kragujevac, Department for natural and mathematical sciences
Research field and areas	Chemistry, Organic chemistry

EDUCATION

BACHELOR

Year	1981.
Place	Kragujevac
Institution	Faculty of Science and Mathematics, University of Kragujevac

MASTER STUDIES

Year	1989.
Place	Kragujevac
Institution	Faculty of Science and Mathematics, University of Kragujevac

DOCTORAL DISSERTATION

Year	1995.
Place	Kragujevac
Institution	Faculty of Science and Mathematics, University of Kragujevac

Title of doctoral dissertation	Study of the mechanism of phenylselenoetherification and conformational analysis of the obtained phenylselenoethers
Scientific title	Principal research fellow
Research area	Chemistry

PROFESSIONAL BIOGRAPHY – ELECTION IN RESEARCH OR SCIENTIFIC TITLE

Election date	Institution	Vocation
1997.	Faculty of Chemistry, Belgrade	Research associate
2003.	IHTM Belgrade	Senior research associate
2013.	Faculty of Technology, Novi Sad	Principal research fellow

PROFESSIONAL BIOGRAPHY - TRAINING

Year	Institution	Duration
1999-2001.	Technikon University Pretoria u Republic of South Africa	3 years

ENGAGEMENT IN THE FORMATION OF SCIENTIFIC PERSONNEL

Dr. Zoran Marković was a member of the committee for the defense of the doctoral dissertation of Milan Dekić at the Faculty of Physical Chemistry in Niš and of Dušica Simijonović at the Faculty of Science in Kragujevac, as well as the chairman of the committee for the defense of the doctoral dissertation of Tanja Brdarić at the Faculty of Physical Chemistry in In Belgrade, Jelena Đorović and Edine Avdović at the PMF in Kragujevac. He also a mentored to Dejan Milenković who defended his doctoral dissertation at the Faculty of Physical Chemistry in Kragujevac in 2014, as well as a mentor to Dušan Dimić who defended his doctoral dissertation at

the Faculty of Physical Chemistry in Belgrade in 2018. He is currently a mentor to Žiko Milanović and Marko Antonijević in the preparation of their doctoral dissertation at the Faculty of Science in Kragujevac.

PARTICIPATION IN NATIONAL PROJECTS FINANCED BY MINISTRY OF EDUCATION/MINISTRY OF SCIENCE AND TECHNOLOGICAL DEVELOPMENT/SCIENCE FUND OF THE REPUBLIC OF SERBIA:

2000-2005: Project ministries No. 1448 : Physics-chemistry dynamics of ch kih conditions i structure inequalities of women systems - self -organization multistability i oscillatory. In 2004, he received an award from the Ministry of Science and Environmental Protection for the results achieved on the project.
2005-2008: No. 371013, Technology of salad dressings and salads based on mayonnaise .
2006: No. 8146, Whey-based dietary mayonnaise, innovation project.
2006-2007: Project with Mlekara Ćendić in order to create a production line for the production of mayonnaise, which received a donation from the World Bank for Development.
2006-2010: Ministry project o. 142025: Physical chemistry of dynamic states and structures of non-equilibrium systems - from monotony to oscillatory evolution and chaos.
2011-2019: Ministry project No. OI172015, Dynamics of nonlinear physicochemical and biochemical systems with modeling and prediction of their behavior under non-equilibrium conditions.
2011-2019: Ministry project No. OI174028, Multiscale modeling methods with applications in biomedicine.

PARTICIPATION IN INTERNATIONAL PROJECTS

2009- IPA project Supply of Laboratory and IT Equipment, Furniture and other Equipment to Lecturing Buildings, Laboratories and Classrooms at the Faculties of the Universities of the Republic of Serbia,

2016 - 2019: ERASMUS+ project KA1 - Learning Mobility of Individuals
2011-2012 : Bilateral project SERBIA H RVATSKA no. N 07006 "Investigation of the relationship between structure and biological activity of polyphenols"; Ministry of Education and Science R. of Serbia, no. 69-00-74/2010-02/01 , which he manages.
2014-2015 : Bilateral project SERBIA FRANCE: Development of Theoretical Methodology for Polyphenol Antioxidant Evaluation: Towards real-word applications; cooperation between the University of Novi Pazar - project manager Zoran Marković and Universite de Limoges - project manager Patrick Trouillas; Registration no. 451-03-3455/2013-09/17.
2019-2020: Bilateral project SERBIA SLOVAKIA: Synergy of experiment and theory: antioxidative action of phenolic compounds derivatives; cooperation between the University of Novi Pazar - project manager Zoran Marković and Slovak University of Technology in Bratislava – project manager Vladimír Lukeš; Registration no. 337-00-107/2019-09/10.
2021: ERASMUS+ project at KA103
2021: Balkan-Network within the DAAD HAW project.

MEMBERSHIP IN SCIENTIFIC AND PROFESSIONAL ASSOCIATIONS

1990 : Member of Serbian Chemical Societies
1990-1999 : President of the Serbian Chemical Society Branch. He received the charter of the Serbian Chemical Society in 1997 "in recognition and gratitude for his contribution to the work and development of SHD".
2000 : Member of Physics and Chemistry- Societies-
2018: Member of the Scientific Society of Serbia
2021: Member of the National Council for Scientific and Technological Development

ORGANIZATION OF NATIONAL/INTERNATIONAL SCIENTIFIC MEETINGS (CONFERENCES, CONGRESSES...)

2007: Chairman of the organizing committee for the organization of the XII Conference on Biotechnology

2008: Chairman of the organizing committee for the organization of the XIII Conference on Biotechnology **2021:** Chairman of the organizing committee for the organization of the First Conference on Chemo and Bioinformatics

LIST OF SCIENTIFIC PAPERS:

Monographs, Monographic studies, Thematic anthologies	**Sum 3**

1. 1. **Zoran Marković,** Dejan Milenković, Chapter 7 - Different theoretical approaches in the study of antioxidative mechanisms, Computational Modeling in Bioengineering and Bioinformatics 2020, 211-256, doi.org/10.1016/B978-0-12-819583-3.00007-2 .
2. Jelena Đorović, **Zoran Marković** , Antioxidative Properties of Usnic Acid and Its Interaction with Tyrosyl-DNA Phosphodiesterase, Computational Bioengineering and Bioinformatics. ICCB 2019. ISBN: 978-3-030-43657-5, Springer, Cham, Learning and Analytics in Intelligent Systems, vol 11. Springer, Cham , doi.org/10.1007/978-3-030-43658-2_8, pp 80-91, 2020.
3. Svetlana Jeremic , **Zoran Marković** , Free Radical Scavenger Activity and P-glycoprotein Inhibition Capacity of 1,2,4-Trihydroxyxanthone, Computational Bioengineering and Bioinformatics. ICCB 2019. ISBN: 978-3-030-43657-5, Learning and Analytics in Intelligent Systems, vol 11. Springer, Cham , doi.org/10.1007/978-3-030-43658-2_9, pp 92-103, in 2020

Papers published in scientific journals of international scientific importance	**Sum 155**

1. Ivan Gutman, **Zoran Marković**, Truncated Hosoya index, J. Serb. Chem.Soc. 51, 455-458, 1986.
2. Ivan Gutman, V. R. Rosenfeld, **Zoran Marković**, Approximate formula for Hosoya's topological index, J. Serb. Chem. Soc. 52, 139-144, 1987.
3. Ivan Gutman, **Zoran Marković**, Svetlana Marković, A simple method for the approximate calculation of Hosoya's index, Chem. Phys. Lett. 134, 139-141, 1987.

4. Ivan Gutman, **Zoran Marković**, Approximate formulas for Hosoya's topologycal index, Bull. Chem. Soc. Jpn. 60, 2611-2614, 1987.
5. **Zoran Marković**, Stanimir Konstantinović, Ivan Gutman, The Dependence of Vicinal Proton-Proton Coupling Constants on Molecular Structure, Z. Naturforsch. A 49, 815-818, 1994. DOI: 10.1515/zna-1994-7-815
6. **Zoran Marković**, Ljiljana Mićović-Došen, Stanimir Konstantinović, Conformational Analysis. Theoretical Study of Phenylseleno-tetrahydropyrans based on Molecular Mechanics Methods, Ind. J. Chem. B 34, 695-701, 1995.
7. **Zoran Marković**, Stanimir Konstantinović, Ivan Gutman, The Dependece of Vicinal Proton-Proton Coupling Constants of Norbornenes on Molecular Structure, Z. Naturforsch. A 51, 1042-1044, 1996.
8. **Zoran Marković**, Stanimir Konstantinović, Ivan Juranić, Ljiljana Mićović-Došen, Molecular Orbital Study of the Rearrangement of Seleniranium Ions, Gazz. Chim. Ital. 127, 429-434, 1997.
9. Stanimir Konstantinović, Zorica Bugarcić, Rastko Vukićević, Z. Ratković, W. Wisnevsky, **Zoran Marković**, Mihailo Mihailović, Stereochemistry and 13C NMR Spectra of Some Phenyl Selenotetrahydrofuranes and Selenotetrahydropyranes, J. Serb. Chem. Soc. 62(4), 307-317, 1997.
10. Ivan Gutman, **Zoran Marković**, Slavica Solujić, Slobodan Sukdolak, On the Tautomers of Hypericin, Monatsh. Chem. 129, 481-486, 1998.
11. Ivan Gutman, **Zoran Marković**, On the Relative Stability of Dioxo Derivatives of Phenantro[1,10,9,8-opqra]perilene, Related to the Tautomers of Hypericin, Monash. Chem. 129, 1019-1024, 1998.
12. Rastko Vukićević, Ljubinka Joksović, Stanimir Konstantinović, **Zoran Marković**, Mihailo Mihailović, Use of a Sacrificial Aluminium Anode in Acylation of Some Olephines, B. Chem. Soc. Jpn. 71, 899-904, 1998. DOI: 10.1246/bcsj.71.899
13. Ivan Gutman, **Zoran Marković**, Ljiljana Marjanović, On factors influencing the geometry of hypericin and its tautomers, Ind. J. Chem. A 37, 856-864, 1998 DOI: 10.1515/zna-1994-7-815
14. Stanimir Konstantinović, Zorica Bugarčić, W. Wisniewski, Zoran Ratković, **Zoran Marković**, Mihailo Mihailović, Stereochemistry and 13C NMR spectra of some phenyl selenoethers obtained in

phenylselenoetherification of olefinic alcohols, Ind. J. Chem. B 37, 48-55, 1998. DOI: 10.1002/chin.199836051
15. Ivan Gutman, **Zoran Marković**, Dioxo derivatives of benzenoid hydrocarbons: Part IV - Dioxo-bisanthrenes, Ind. J. Chem. A 38, 407-410, 1999.
16. Ivan Gutman, **Zoran Marković**, Ivan Juranić, A Clar-Type Regularity for Dianions of Benzenoid Hydrocarbons, Polycyc. Arom. Comp. 13, 33-40, 1999. DOI: 10.1080/10406639908020541
17. **Zoran Marković**, Bogdan Šolaja, Dragan Milić, Ivan Juranić, Miroslav Gašić, Molecular Orbital Study of the Oxidation of Steroidal Phenols into Quinols and Epoxyquinols, J. Serb. Chem. Soc. 65, 491-496, 2000. DOI: 10.2298/JSC0007491M
18. **Zoran Marković**, Johan P. Engelbrecht, Parametrization of MMX force field for benzocyclobutenes, Ind. J. Chem. A 39, 787-791, 2000. DOI: 10.1515/zna-1994-7-815
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28. **Zoran Marković**, Svetlana Marković, Nebojša Begović, Influence of Alkali Metal Cations upon the Kolbe-Schmitt Reaction Mechanism, J. Chem. Inf. Model. 46(5), 1957-1964, 2006. DOI: 10.1021/ci0600556.
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30. Nataša Pejić, Slavica Blagojević, Slobodan Anić, Vladana Vukojević, Miroslav Mijatović, Jasna Ćirić, **Zoran Marković**, Svetlana Marković, Ljiljana Kolar-Anić, Kinetic determination of morphine by means of Bray-Liebhafsky oscillatory reaction system using analyte pulse perturbation technique, Anal. Chim. Acta. 582(2), 367-374, 2007. DOI: 10.1016/j.aca.2006.09.026
31. Jasmina Dimitrić-Marković, **Zoran Marković**, Jelisaveta Baranac, Marina Dašić, Delphinidin–Aluminum(III), Complexes in Aqueous and Non-Aqueous Media: Spectroscopic Characterization and Theoretical Study, Monatsh. Chem. 138, 1225-1232, 2007. DOI: 10.1007/s00706-007-0741-z
32. Svetlana Marković, **Zoran Marković**, Robert I. McCrindle, B. R. Simonović, Kinetics of Extraction of Coal-Tar Pitch Components with Supercritical Carbon Dioxide, Chem. Pap. 61, 46-50, 2007. DOI: 10.2478/s11696-006-0094-9
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and Sodium Phenoxides, Russ. J. Phys. Chem A+, 81, 1392-1397, 2007. DOI: 10.1007/s10404-008-0274-8
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37. **Zoran Marković**, Svetlana Marković, Igor Đurović, Formation of sodium 6-hidroxy-2-naphthoate in the Kolbe-Schmitt reaction, Monatsh. Chem., 139, 1169-1174, 2008. DOI: 10.1007/s00706-008-0911-7
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39. Jasmina Dimitrić-Marković, **Zoran Marković**, Dragan Veselinović, Jugoslav Krstić, Jasmina Predojević Simović, Study on fisetin-aluminium(III) interaction in aqueous buffered solutions by spectroscopy and molecular modeling, J. Inorg. Biochem. 103 (5), 723-730, 2009. DOI: 10.1016/j.jinorgbio.2009.01.005
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41. Nedeljko Manojlović, **Zoran Marković**, Wandee Gritsanapan, K. Boonpagob, High_Perfomance Liquid Chromatographic Analysis of Anthraquinone Compounds in the Lichen Laurera Bengulensis, Russ. J. Phys. Chem. 83, 1554–1557, 2009. DOI: 10.1134/S0036024409090258
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43. **Zoran Marković**, Nedeljko Manojlović, Analytical characterization of lichexanthone in lichen: HPLC, UV spectroscopic, and DFT analysis of lichexanthone extracted from Laurera benguelensis (Mull. Arg.)

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51. **Zoran Marković**, Jasmina Predojević, Nedeljko Manojlovic, Synthesis of C7-C16-alkyl maltosides in the presence of tin (IV) chloride as a Lewis acid catalyst, B. Chem. Soc. Ethiop. 25(1), 83-90, 2011.
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53. Nedeljko Manojlovic, Perica Vasiljević, Dragan Nikolić, Gordana Bogdanović-Dušanović, **Zoran Marković**, Stevo Najman, The isolation, analytical characterization by HPLC-UV and NMR spectroscopy, cytotoxic and antioxidant activities of baeomycesic acid from Thamnolia vermicularis var. subuliformis. Hem. Ind. 65, 591-598, 2011. DOI: 10.2298/HEMIND110414035M
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56. Jasmina Dimitrić-Marković, **Zoran Markvić**, Igor Pašti, Tanja Brdarić, Ana Popović Bijelić, Miloš Mojović, A joint application of spectroscopic, electrochemical and theoretical approaches in evaluation of the antiradical activity of 3-OH flavones and their iron complexes towards different radical species, Dalton T. 41, 7295-7303, 2012. DOI: 10.1039/c2dt30220a
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60. Višnja Stepanić, Koraljka Gall Trošelj, Bono Lučić, **Zoran Marković**, Dragan Amić, Bond dissociation energy as general parameter for flavonoid radical scavenging activity, Food Chem. 141, 1562–1570, 2013. DOI: 10.1016/j.foodchem.2013.03.072
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of flavonoids: why is the O–H bond dissociation enthalpy able to effectively represent free radical scavenging activity?, J. Mol. Model. 19, 2593–2603, 2013. DOI: 10.1007/s00894-013-1800-5

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64. Marina Stanić, Joanna Zakrzewska, Mirzeta Hadžibrahimović, Milan Žižić, **Zoran Marković**, Željko Vučinić, Miroslav Živić, Oxygen regulation of alternative respiration in fungus Phycomyces blakesleeanus: connection with phosphate metabolism, Res. Microbiol., 164, 770-778, 2013. DOI: 10.1016/j.resmic.2013.03.002
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69. Nenad Filipović, Miroslav Živić, Milica Obradović, Tijana Đukić, **Zoran Marković**, Mirko Rosić, Numerical and experimental LDL transport through arterial wall, Microfluidics and Nanofluidics 16, 455-464, 2014. DOI: 10.1007/s10404-013-1238-1

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CITATION OF SCIENTIFIC PAPERS

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BRIEF DESCRIPTION OF PERFORMANCE IN THE PREVIOUS PERIOD

Prof. Dr. Zoran Marković studies the mechanisms of antiradical action of natural compounds against free radical species using thermodynamic and kinetic approaches. The mechanism of antiradical action of coumarin derivatives towards OH and OOH radicals was examined. A new mechanism of radical adduct formation followed by hydrogen atom abstraction (**RAF-HAA**) was proposed. The result of this approach leads to obtaining stable and less toxic products than the starting compounds. The proposed mechanism was confirmed experimentally using electronic paramagnetic resonance (EPR) and UV-Vis spectroscopy. The results of this research were published in 2020, 2021 and 2022 in the prestigious

international scientific journal on the SCI list "Chemical Engineering Journal" (IF=16,744 for 2021).

BRIEF DESCRIPTION OF PLANNED RESEARCH IN THE NEXT PERIOD

Prof. Zoran Markovic in the following period will continue to deal with investigations at the level of structures - the antiradical activity of selected coumarin derivatives according to biologically important reactive oxygen species (hydroxy, peroxy, superoxide anion, ascorbyl and chlorinated methylperoxy), reactive nitrogen species (nitrogen monoxide), as well as model radicals (DPPH and ABTS). It will also deal with investigations of anti-radical mechanisms (**HAA**, **RAF**, **HAA-RA, RAF-HAA**, **RAF-SPLET, SPLET** and **SET-PT)**, in different solvents, and based on thermodynamic and kinetic parameters, the dominant mechanism of antiradical action will be determined. Based on the values of the kinetic parameters, an insight into the speed of the deactivation reaction of free radicals by the tested compounds will be obtained. In addition, prof. Marković will deal with the synthesis and characterization of coumarin derivatives and their transition metal complexes, as well as *in vitro* testing antioxidant/pro-oxidative activities. Additionally, it will deal with the investigation of protein-ligand interactions of coumarin derivatives with selected proteins.