NASTAVNO-NAUČNOM VEĆU
TEHNOLOŠKO-METALURŠKOG FAKULTETA
UNIVERZITETA U BEOGRADU

Na sednici Nastavno-naučnog veća Tehnološko-metalurškog fakulteta Univerziteta u Beogradu održanoj 11.04. 2019. godine imenovani smo za članove Komisije za podnošenje izveštaja o ispunjenosti uslova za sticanje naučno-istraživačkog zvanja **VIŠI NAUČNI SARADNIK** dr Slavice Lazarević, dipl. inž. tehnologije u skladu sa Zakonom o naučnoistraživačkoj delatnosti i Pravilnikom o postupku i načinu vrednovanja, i kvantitativnom iskazivanju naučno-istraživačkih rezultata istraživača i saglasno statutu Tehnološko-metalurškog fakulteta Univerziteta u Beogradu. Posle pregledanog materijala koji je dostavljen Komisiji i uvida u dosadašnji rad dr Slavice Lazarević, Komisija podnosi sledeći:

I Z V E Š T A J

1. BIOGRAFSKI PODACI

Slavica Lazarević je rođena 1977. godine u Aranđelovcu, gde je završila osnovnu i srednju školu. Tehnološko-metalurški fakultet u Univerziteta u Beogradu je upisala 1996. godine. Diplomirala je na ovom fakultetu 2003. godine. Školske 2003/04. godine upisala je poslediplomske studije na Tehnološko-metalurškom fakultetu Univerziteta u Beogradu na smeru Neorganska hemijska tehnologija. Magistarsku tezu pod nazivom "Proučavanje sorpcionih svojstava sepiolita" pod mentorstvom dr Rade Petrović uspešno je odbranila 2007. godine.

Izradu doktorske disertacije pod nazivom "Proučavanje uticaja različitih postupaka modifikacije na fizičko-hemijske karakteristike i sorpciona svojstva sepiolita**"** pod mentorstvom dr Rade Petrović, prijavila je 2010. godine na Tehnološko-metalurškom fakultetu Univerziteta u Beogradu. Doktorsku disertaciju je odbranila 05.12.2012. godine i time stekla zvanje doktora tehničkih nauka, za oblast hemija i hemijska tehnologija.

Kao istraživač pripravnik zasnovala je radni odnos 2004. godine na Tehnološko-metalurškom fakultetu Univerziteta u Beogradu. U zvanje istraživač saradnik izabrana je 2008. godine a u zvanje naučni saradnik 31.10. 2013. godine.

Školske 2011/2012. godine, Slavica Lazarević realizovala je vežbe iz predmeta "Kvalitet voda" na Katedri za hidrotehniku i vodno-ekološko inženjerstvo na Građevinskom fakultetu Univerziteta u Beogradu.

Dr Slavica Lazarević je bila uključena u praktični rad sa studentima na Katedri za neorgansku hemijsku tehnologiju školske 2014/2015, 2015/2016 i 2016/2017 godine, uz saglasnost NN veća Tehnološko-metalurškog fakulteta Univerziteta u Beogradu, realizujući vežbe iz predmeta: "Tehnologija vode" i "Priprema vode za piće", a asistirala je u izvođenju vežbi iz nekoliko drugih predmeta gde je bila potrebna primena

instrumentalnih metoda. Takođe, dr Slavica Lazarević učestvovala je u izradi više diplomskih i završnih radova, master teza i doktorskih disertacija iz oblasti neorganske hemijske tehnologije.

Slavica Lazarević je od 2004. godine radeći na Tehnološko-metalurškom fakultetu Univerziteta u Beogradu učestvovala u istraživanjima u okviru sedam projekata koje je finasiralo ili i dalje finansira Ministarstvo prosvete, nauke i tehnološkog razvoja i 3 međunarodna naučno-istraživačka projekta. br: FP7-REGPOT-2009-1 NANOTECH FTM, "Reinforcing of Nanotechnology and Functional Materials Centre", br 245916, EUREKA Project E!3303-BIONANOCOMPOSIT "Hydroxyapatite Nanocomposite Ceramics - New Implant Material for Bone Substitutes", EUREKA Project E!4141- ECOSAFETY- "Measures for providing a quality and safety in food chain". Autor je ili koautor ukupno 50 naučnih radova i saopštenja na međunarodnom nivou i 10 naučnih radova i saopštenja na nacionalnom nivou. Poseduje aktivno znanje engleskog jezika.

2. NAUČNO-ISTRAŽIVAČKI RAD

Slavica Lazarević je učestvovala u realizaciji dva projekta osnovnih istraživanja koje je finansiralo Ministarstvo za nauku i tehnološki razvoj Republike Srbije i to: "Molekularno dizajniranje monolitnih i kompozitnih materijala", evidencioni broj 1431 (2002-2005) i "Sinteza, struktura, svojstva i primena funkcionalnih nanostrukturnih keramičkih i biokeramičkih materijala", evidencioni broj 142070B (2006-2010). Od 2005. godine do 2007. godine bila je angažovana na projektu tehnološkog razvoja pod evidencionim brojem 7057B. Tokom 2004. godine bila je angažovana na realizaciji inovacionog projekta pod evidencionim brojem 2082, a tokom 2007. godine na realizaciji inovacionog projekta pod evidencionim brojem 401-00-218/2007-01/10-IP (Tip 1)/10. Takođe je učestvovala u realizaciji dva međunarodna EUREKA projekta i to: "E!3303 - BIONANOCOMPOSIT- Hydroxyapatite Nanocomposite Ceramics-New Implant Material for Bone Substitutes" i "E!4141- ECOSAFETY- Measures for providing a quality and safety in food chain" i projekta FP7-REGPOT-2009-1 NANOTECH FTM, "Reinforcing of Nanotechnology and Functional Materials Centre", br 245916.

Dr Slavica Lazarević je trenutno u svojstvu naučnog saradnika angažovana na projektu Ministarstva prosvete, nauke i tehnološkog razvoja programa integralnih i interdisciplinarnih istraživanja "Sinteza, razvoj tehnologija dobijanja i primena nanostrukturnih, multifunkcionalnih materijala definisanih svojstava", evidencioni broj III 45019 i projekta osnovnih istraživanja "Primena funkcionalizovanih ugljeničnih nanocevi i nanočestica zlata za pripremu dendritskih ćelija u terapiji tumora", evidencioni broj 175102. Tokom realizacije projekta III45019, uz saglasnost rukovodioca projekta, samostalno je organizovala i sprovodila realizaciju pojedinih potprojektnih zadataka u okviru potprojekta III45019-1 (Prilog).

Tokom realizacije navedenih naučno-istraživačkih projekata nabavljena je kapitalna oprema, na kojoj kandidat samostalno sprovodi istraživanja i koristi je za realizaciju nastave na akademskim studijama i u radu sa studentima master i doktorskih studija. U svom dosadašnjem radu pokazala je samostalnost i originalnost u kreiranju i

realizaciji eksperimentalnih zadataka, kao i u formiranju naučnih kadrova učestvujući aktivno u izradi više završnih master radova i doktorskih disetacija.

Naučno-istraživački rad dr Slavice Lazarević pripada oblastima hemije i hemijske tehnologije, nauke o materijalima i zaštite zivotne sredine.

U okviru svog naučno-istraživačkog rada dr Slavica Lazarević se bavila razvojem savremenih materijala i mogućnostima njihove primene. Poseban fokus istraživanja bio je na karakterizaciji i ispitivanju sorpcionih svojstava iz tečne i gasne faze prirodnih minerala (sepiolita i zeolita) kao i na proučavanju uticaja različitih postupaka modifikacije prirodnih sirovina i sintetisanih sorbenata na njihova fizičko-hemijska i sorpciona svojstva.

Tokom izrade magistarske teze i doktorske disertacije aktivnosti dr Slavice Lazarević bile su usmerene na ispitivanje sorpcije Pb^{2+}, Cd^{2+}, Sr^{2+}, Ni^{2+}, Co^{2+}, Cu^{2+} jona na prirodnim mineralima, na primeni različitih modifikatora i postupaka modifikacije na dobijanje sorbenta na bazi sepiolita i kiselinski aktiviranog sepiolita poboljšanih sorpcionih svojstava, kao i na primenu inverzne gasne hromatografije u uslovima nulte i konačne prekrivenosti za ispitivanje interakcije proučavanih sorbenata i organskih molekula iz gasovite faze. Iz ovih istraživanja proisteklo je 5 radova u vrhunskim međunarodnim časopisima (M21) i 1 rad u međunarodnom časopisu (M23).

Naučno-istraživački rad dr Slavice Lazarević, posle izbora u zvanje naučni saradnik obuhvata sledeće:

- ispitivanje uticaja modifikacije prirodnog i kiselinski aktiviranog sepiolita primenom organosilana na fizičko-hemijska svojstva, kao i na sorpciju Ni^{2+} i Cr(VI) jona iz vodenih rastvora
- modifikaciju prirodnih minerala sepiolita i zeolita hidratisanim gvožđe(III)-oksidom (primenom gvožđe(III)-hlorida u baznim uslovima) u cilju povećanja afiniteta i selektivnosti prema jonima iz vodenih rastvora
- dobijanje, karakterizacija kompozita prirodnog sepiolita i kiselinski aktiviranog sepiolita sa nanočestičnim elementarnim gvožđem i mehanizam sorpcije jona kadmijuma
- dobijanje, karakterizacija kompozita sepiolita i magnetita i ispitivanje sorpcije jona kadmijuma
- sinteza magnetita hidrotermalnim postupkom i ispitivanje sorpcije fosfata
- sinteza i karakterizacija nanokristalnog nikl-ferita
- ispitivanja poboljšanja mehaničkih svojstava papira dodatkom nanočestica sepiolita u disperziji skroba ili matrici polivinil butirala
- razvoj sorbenata za sorpciju boja iz tekstilne industrije.

Ukupna dosadašnja naučno-istraživačka aktivnost kandidata dr Slavice Lazarević obuhvata 62 bibliografske jedinice, od čega su 2 rada u međunarodnim časopisima izuzetnih vrednosti (M21a), 11 radova u vrhunskim međunarodnim časopisima (M21), 3 rada u istaknutim međunarodnim časopisima (M22), 11 radova u časopisu međunarodnog značaja (M23), jedan rad u međunarodnom časopisu van SCI liste, jedan rad u časopisu nacionalnog značaja (M51), 8 radova saopštenih na skupovima međunarodnog značaja štampanih u celini (M33), 14 radova saopštenih na skupovima međunarodnog značaja

štampanih u izvodu (M34), 2 saopštenja na skupu nacionalnog značaja štampana u celini (M63), 7 saopštenja na skupu nacionalnog značaja štampana u izvodu (M64), 1 bitno poboljšano tehničko rešenje na nacionalnom nivou (M84) i 1 objavljen patent na nacionalnom nivou (M94).

Radovi dr Slavice Lazarević do 21.04.2019. godine citirani su 489 puta, odnosno 423 puta ne računajući autocitate. Prema bazi "Scopus" dr Slavica Lazarević ima h indeks 11.

Rezultati koji su prikazani u naučnim radovima značajno su doprineli realizaciji više nacionalnih i međunarodnih naučno-istraživačkih projekata i potvrdili istraživačku kompetentnost kandidata.

3. NAUČNA KOMPETENTNOST

OBJAVLJENI I SAOPŠTENI NAUČNI RADOVI I DRUGI VIDOVI ANGAŽOVANJA U NAUČNO-ISTRAŽIVAČKOM I STRUČNOM RADU

3.1. Radovi objavljeni u naučnim časopisima međunarodnog značaja; naučna kritika; uređivanje časopisa (M20)

3.1.1. Radovi u međunarodnim časopisima izuzetnih vrednosti (M21a)

Pre izbora u prethodno zvanje (2x10=20):

3.1.1.1. V. Marjanović, **S. Lazarević**, I. Janković- Častvan, B. Potkonjak, Đ. Janaćković, R. Petrović, Chromium(VI) removal from aqueous solutions using mercaptosilane functionalized sepiolites, Chemical Engineering Journal, 166 (1) (2011) 198–206. (https://doi.org/10.1016/j.cej.2010.10.062) (ISSN 1385-8947, IF= 3,074), Engineering, Chemical (11/133), Engineering, Environmental (7/45) (47 citata)

3.1.1.2. I. Janković-Častvan, **S. Lazarević**, B. Jordović, R. Petrović, D. Tanasković, Dj. Janaćković, Electrical properties of cordierite obtained by non-hydrolytic sol-gel method, Journal of the European Ceramic Society, 27 (2007) 3659-3661 (https://doi.org/10.1016/j.jeurceramsoc.2007.02.018) (ISSN 0955-2219, IF= 1,562), Materials Science, Ceramics (2/56) (27 citata)

3.1.2. Radovi u vrhunskim međunarodnim časopisima (M21)

Posle izbora u prethodno zvanje (5x8=40):

3.1.2.1. Aysha Ali Ahribesh, **Slavica Lazarević**, Ivona Janković-Častvan, Bojan Jokić, Vojislav Spasojević, Tamara Radetić, Đorđe Janaćković, Rada Petrović, Influence of the synthesis parameters on the properties of the sepiolite-based

magnetic adsorbents, Powder Technology, 305 (2017) 260-269. (https://doi.org/10.1016/j.powtec.2016.09.086) (ISSN 0032-5910, IF (2017)= 3,230), Engineering, Chemical (30/137) (8 citata)

3.1.2.2. Amal Juma Habish, **Slavica Lazarević**, Ivona Janković-Častvan, Bojan Jokić, Janez Kovač, Jelena Rogan, Đorđe Janaćković, Rada Petrović, Nanoscale zerovalent iron (nZVI) supported by natural and acid-activated sepiolites: the effect of the nZVI/support ratio on the composite properties and Cd^{2+} adsorption, Environmental Science and Pollution Research, 24 (1) (2017) 628-643. (https://link.springer.com/article/10.1007%2Fs11356-016-7802-y) (ISSN 0944-1344, IF (2015) =2,760), Environmental Sciences (65/225) (6 citata)

3.1.2.3. Andrija B.Savić, Djuro Čokeša, **Slavica Lazarević**, Bojan Jokić, Djordje Janaćković, Rada Petrović, Ljiljana S. Živković, Tailoring of magnetite powder properties for enhanced phosphate removal: Effect of PEG addition in the synthesis process, Powder Technology, 301 (2016) 511-519. https://doi.org/10.1016/j.powtec.2016.06.028 (ISSN 0032-5910, IF (2016) = 2,942), Engineering, Chemical (30/135) (8 citata)

3.1.2.4. Aleksandar R. Ćosović, Tomaš Žak, Sandra B.Glisic, Miroslav D. Sokić, **Slavica S.Lazarević**,Vladan R. Ćosović, Aleksandar M. Orlović, Synthesis of nano-crystalline $NiFe_2O_4$ powders in subcritical and supercritical ethanol, The Journal of Supercritical Fluids, 113 (2016) 96-105.
(https://doi.org/10.1016/j.supflu.2016.03.014) (ISSN 0896-8446, IF (2016) = 2,991), Chemistry, Physical (55/146), Engineering Chemical (29/135) (5 citata)

3.1.2.5. V. Marjanović, **S. Lazarević**, I. Janković-Častvan, B. Jokić, Dj. Janaćković, R. Petrović, Adsorption of chromium(VI) from aqueous solutions onto amine-functionalized natural and acid-activated sepiolites, Appiled Clay Science, 80–81 (2013) 202-210.
(https://doi.org/10.1016/j.clay.2013.04.008) (ISSN 0169-1317, IF (2013) =2,703), Chemistry, Physical (52/146), Materials Science (68/275), Multidisciplinary Mineralogy (7/29) (26 citata)

Pre izbora u prethodno zvanje (6x8=48):

3.1.2.6. **Slavica Lazarević**, Ivona Janković-Častvan, Branislav Potkonjak, Djordje Janaćković, Rada Petrović, Removal of Co^{2+} ions from aqueous solutions using iron-functionalized sepiolite, Chemical Engineering and Processing: Process Intensification, 55 (2012) 40–47.
(https://doi.org/10.1016/j.cep.2012.01.004) (ISSN 0255-2701, IF (2012) = 1,950). Energy & Fuels (37/81), Engineering, Chemical (36/133) (16 citata)

3.1.2.7. **Slavica Lazarević**, Ivona Janković-Častvan, Antonije Onjia, Jugoslav Krstić, Djordje Janaćković, Rada Petrović, Surface Characterization of Iron-Modified Sepiolite by Inverse Gas Chromatography, Industrial and Engineering Chemistry Research, 50 (2011) 11467–11475.
(https://pubs.acs.org/doi/10.1021/ie200595n) (ISSN 0888-5885, IF (2011) = 2,237) Engineering, Chemical (30/133) (3 citata)

3.1.2.8. Slavica Lazarević, Ivona Janković-Častvan, Veljko Djokić, Željko Radovanović, Djordje Janaćković, Rada Petrović, Iron-Modified Sepiolite for Ni^{2+} Sorption from Aqueous Solution: An Equilibrium, Kinetic, and Thermodynamic Study, Journal of Chemical and Engineering Data, 55 (2010) 5681–5689.
(https://pubs.acs.org/doi/10.1021/je100639k) (ISSN 0021-9568, IF (2010)= 2,089), Chemistry, Multidisciplinary (44/147), Engineering, Chemical (28/135) (22 citata)

3.1.2.9. S. Lazarević, Ž. Radovanović, Dj. Veljović, A. Onjia, Dj. Janaćković, R. Petrović, Characterization of sepiolite by inverse gas chromatography at infinite and finite surface coverage, Applied Clay Science, 43 (2009) 41-48 (https://doi.org/10.1016/j.clay.2008.07.013) (ISSN 0169-1317, IF (2009)= 2,784), Mineralogy (4/27) (12 citata)

3.1.2.10. S.Lazarević, I.Janković-Častvan, D.Jovanović, S.Milonjić, Dj.Janaćković, R.Petrović, Adsorption of Pb^{2+}, Cd^{2+} and Sr^{2+} ions onto natural and acid-activated sepiolites, Applied Clay Science, 37 (2007) 47-57 (https://doi.org/10.1016/j.clay.2006.11.008) (ISSN 0169-1317, IF (2007)= 1,861) Mineralogy (6/25) (107 citata)

3.1.2.11. I.Janković-Častvan, **S.Lazarević**, D.Tanasković, A.Orlović, R.Petrović, Đ.Janaćković, Phase transformation in cordierite gel obtained by non-hydrolytic sol-gel route, Ceramics International, 33 (2007) 1263-1268. (https://doi.org/10.1016/j.ceramint.2006.05.003) (ISSN 0272-8842, IF (2007)=1,360), Materials Science, Ceramics (4/25) (28 citata)

3.1.3. Radovi u istaknutom međunarodnom časopisu (M_{22})

Posle izbora u prethodno zvanje (2x5=10):

3.1.3.1. Marija T. Mihajlović, **Slavica S. Lazarević**, Ivona M. Janković-Častvan, Janez Kovač, Bojan M. Jokić, Djordje T. Janaćković, Rada D. Petrovic, Kinetics, thermodynamics, and structural investigations on the removal of Pb^{2+}, Cd^{2+}, and Zn^{2+} from multicomponent solutions onto natural and Fe(III)-modified zeolites, Clean Technologies and Environmental Policy, 17 (2) (2015) 407-419.
(https://link.springer.com/article/10.1007%2Fs10098-014-0794-8) (ISSN 1618-954X, IF (2014)=1,934), Engineering, Environmental (21/47), Environmental Sciences (101/223) (17 citata)

3.1.3.2. Ivona Janković-Častvan, **Slavica Lazarević**, Dušica Stojanović, Predrag Živković, Rada Petrović and Đorđe Janaćković Improvement of the mechanical properties of paper by starch coatings modified with sepiolite nanoparticles, Starch, 67 (3-4) (2015) 373-380.
(https://onlinelibrary.wiley.com/doi/full/10.1002/star.201400171) (ISSN 0038-9056, IF (2014)=1,677), Food Science & Technology (49/122) (6 citata)

Pre izbora u prethodno zvanje (1x5=5):

3.1.3.3. S. Lazarevic, I. Jankovic-Castvan, D. Tanaskovic, V. Pavicevic, Dj. Janackovic, R. Petrovic, Sorption of Pb^{2+}, Cd^{2+}, and Sr^{2+} Ions on Calcium Hydroxyapatite Powder Obtained by the Hydrothermal Method, Journal of Environmental Engineering, 134 (2008) 683-688. (https://ascelibrary.org/doi/10.1061/%28ASCE%290733-9372%282008%29134%3A8%28683%29) (ISSN 0733-9372, IF (2007)= 1,174), Engineering, Civil (9/88), Engineering, Environmental (16/37), Environmental Sciences (92/160) (20 citata)

3.1.4. Radovi u časopisima međunarodnog značaja (M_{23})

Posle izbora u prethodno zvanje (10x3=30):

3.1.4.1. Slavica S. Lazarević, Ivona M. Janković-Častvan, Bojan M. Jokić, Djordje T. Janaćković Rada D. Petrović, Sepiolite functionalized with N-[3-(trimethoxysilyl)propyl]- ethylenediamine triacetic acid trisodium salt. Part II: Sorption of Ni^{2+} ions from aqueous solutions, Journal of the Serbian Chemical Society, 81 (2) (2016) 197–208. (http://www.doiserbia.nb.rs/Article.aspx?ID=0352-51391500086L#.XLBo8jAzaUl) (ISSN 0352-5139, IF (2015)=0,970), Chemistry, Multidisciplinary (120/163) (3 citata)

3.1.4.2. Ivona Janković-Častvan, **Slavica Lazarević**, Dušica Stojanović, Predrag Živković, Rada Petrović, Đorđe Janaćković, PVB/sepiolite nanocomposites as reinforcement agents for paper, Journal of the Serbian Chemical Society, 81 (11) (2016) 1295–1305. (http://www.doiserbia.nb.rs/img/doi/0352-5139/2016/0352-51391600067J.pdf) (ISSN 0352-5139, IF (2015)= 0,970), Chemistry, Multidisciplinary (120/163) (1 citat)

3.1.4.3. Nikola Ž. Knežević, Sanja Milenković, Danica Jović, **Slavica Lazarevic**, Jasminka Mrdjanović, Aleksandar Djordjević, Fullerenol-Capped Porous Silica Nanoparticles for pH-Responsive Drug Delivery, Advances in Materials Science and Engineering, volume 2015 (2015) Article ID 567350, 6 pages, (https://www.hindawi.com/journals/amse/2015/567350/) (ISSN 1687-8434, IF (2015)=1,010), Materials Science, Multidisciplinary (190/271) (3 citata)

3.1.4.4. Aysha Ali Ahribesh, **Slavica Lazarević**, Branislav Potkonjak, Andjelika Bjelajac, Djordje Janaćković, Rada Petrović, Sorption of cadmium ions from saline waters onto Fe(III)-zeolite, Hemijska Industrija 69 (3) (2015) 253–260. (http://www.doiserbia.nb.rs/Article.aspx?ID=0367-598X1400038A) (ISSN 0367-598X, IF(2013)=0,463), Engineering, Chemical (103/133)

3.1.4.5. Slavica S. Lazarević, Ivona M. Janković-Častvan, Bojan M. Jokić, Djordje T. Janaćković Rada D. Petrović, Sepiolite functionalized with N-[3-

(trimethoxysilyl)propyl]-ethylenediamine triacetic acid trisodium salt. Part I: Preparation and characterization, Journal of the Serbian Chemical Society, 80 (9) (2015) 1193-1202. (http://www.doiserbia.nb.rs/Article.aspx?ID=0352-51391500038L#.XLB24jAzaUk) (ISSN 0352-5139, IF (2015)=0,970), Chemistry, Multidisciplinary (120/163)

3.1.4.6. Amal Juma Habish, **Slavica Lazarević**, Ivona Janković-Častvan,, Branislav Potkonjak, Đorđe Janaćković, Rada Petrović, The effect of salinity on the sorption of cadmium ions from aqueous medium on Fe(III)-sepiolite, Chemical Industry and Chemical Engineering Quarterly, 21(2) (2015) 295-303. (http://www.doiserbia.nb.rs/Article.aspx?ID=1451-93721400028H#.XLB7-TAzaUk) (ISSN 1451-9372, IF (2014)=0,892), Chemistry, Applied (48/72), Engineering, Chemical (89/135) (2 citata)

3.1.4.7. Jelena A. Milovanović, Ruth Elisabeth Stensrod, Elisabeth M. Myhrvold, Roman Tschentscher, Michael Stocker, **Slavica S. Lazarević**, Nevenka Z. Rajić, Modification of natural clinoptilolite and ZSM-5 with different oxides and studying of the obtained products in lignin pyrolysis, Journal of the Serbian Chemical Society, 80 (5) (2015) 717–729. (http://www.doiserbia.nb.rs/Article.aspx?ID=0352-51391400109M) (ISSN 0352-5139, IF (2015)=0,970), Chemistry, Multidisciplinary (120/163) (3 citata)

3.1.4.8. Nikola I. Ilić, **Slavica S. Lazarević**, Vladana N. Rajaković-Ognjanović, Ljubinka V. Rajaković, Đorđe T. Janaćković, Rada D. Petrović, The adsorption of inorganic arsenic on modified sepiolite: effect of hydrated iron(III)-oxide, Journal of the Serbian Chemical Society, 79 (7) (2014) 815–828. (http://www.doiserbia.nb.rs/Article.aspx?ID=0352-51391400017I#.XLB84zAzaUk) (ISSN 0352-5139, IF (2012)=0,912), Chemistry, Multidisciplinary (100/152) (3 citata)

3.1.4.9. Mihajlović Marija T., **Lazarević Slavica S.**, Janković-Častvan Ivona M., Jokić Bojan M., Janaćković Đorđe T., Petrović Rada D., A comparative study of the removal of lead, cadmium and zinc ions from aqueous solutions by natural and Fe(III)-modified zeolite, Chemical Industry& Chemical Engineering Quarterly, 20 (2) (2014) 283−293. (http://www.doiserbia.nb.rs/Article.aspx?ID=1451-93721300010M#.XLCB1jAzaUk) (ISSN 1451-9372, IF (2014)=0,892), Chemistry, Applied (48/72), Engineering, Chemical (89/135) (8 citata)

3.1.4.10. V. Marjanović, **S. Lazarević**, I.Janković-Častvan, B. Jokić, A. Bjelajac, Đ.Janaćković, R.Petrović, Functionalization of thermo-acid activated sepiolite by amine-silane and mercapto-silane for chromium(VI) adsorption from aqueous solutions, Hemijska Industrija, 67 (5) (2013) 715–728. (http://www.doiserbia.nb.rs/Article.aspx?ID=0367-598X1200117M#.XLCAUTAzaUk) (ISSN 0367-598X, IF (2013)=0,463), Engineering, Chemical (103/133) (2 citata)

Pre izbora u prethodno zvanje (1x3=3):

3.1.4.11. **Slavica Lazarević**, Ivona Janković-Častvan, Željko Radovanović, Branislav Potkonjak, Đorđe Janaćković, Rada Petrović, Sorption of Cu^{2+} and Co^{2+} from aqueous solutions onto sepiolite: an equilibrium, kinetic and thermodynamic study, Journal of the Serbian Chemical Society, 76 (1) (2011) 101–112.
(http://www.doiserbia.nb.rs/Article.aspx?ID=0352-51391100005L#.XLB_AjAzaUk) (ISSN 0352-5139, IF (2011)=0,879), Chemistry, Multidisciplinary (103/154) (5 citata)

3.1.5. Radovi u međunarodnim časopisima van SCI liste

3.1.5.1. Smilja Marković, Ana Stanković, Zorica Lopicić, Slavica Lazarević, Mirjana Stojanović, Dragan Uskoković, Application of raw peach shell particles for removal of methylene blue, Journal of Environmental Chemical Engineering, 3 (2) (2015) 716-724.
(https://doi.org/10.1016/j.jece.2015.04.002) (ISSN 2213-2929) (34 citata)

3.2. Zbornici međunarodnih naučnih skupova (M30)

3.2.1. Saopštenja na međunarodnim skupovima štampana u celini (M33)

Posle izbora u prethodno zvanje (5x1=5):

3.2.1.1. I.Janković-Častvan, **S. Lazarević**, R. Petrović, Đ. Janaćković, The removal of cationic dye from water by adsorption on sepiolite, Zbornik radova 38. Međunarodnog stručno-naučnog skupa Vodovod i kanalizacija 17, Kragujevac, 10 –13. oktobar 2017., 21—26. (ISBN: 978-86-80067-36-0)

3.2.1.2. **S. Lazarević**, I. Janković-Častvan, R. Petrović, Đ. Janaćković, Simultaneous adsorption of Cd^{2+} ions and cationic dye from water by adsorption on sepiolite, Zbornik radova 38. Međunarodnog stručno-naučnog skupa Vodovod i kanalizacija ´17, Kragujevac, 10 ‑13. oktobar 2017, 27—32. (ISBN:978-86-80067-36-0)

3.2.1.3. Jelena Pavlović, Iva Kaplanec, **Slavica Lazarević**, Nevenka Rajić, Phosphate adsorption from aqueous solution usong iron-modifed clinoptilolite, 6th Croatian-Slovenian-Serbian Symposium on zeolites, Zagreb, 2015, 85-88. (ISBN: 978-953-55373-4-2)

3.2.1.4. Rada Petrović, Djordje Janaćković, **Slavica Lazarevic**, Ivona Janković-Častvan, Vesna Marjanović, Application of natural and modified sepiolites in wastewaters treatement, 7th International Conference Science and Higher Education in Function of sustainable development, Uzice, 2014. (ISBN: 978-86-83573-43-1)

3.2.1.5. I.Janković-Častvan, **S. Lazarević**, K. Trifković, P. Živković, R. Petrović, Đ. Janaćković, Improvement of mechanical properties of paper by using sepiolite nanoparticles, Proceedings of XIX International symposium in the field of pulp, paper, packaging and graphics, Zlatibor, 2013, 41-45. (ISBN: 978-86-7401-304-5)

Pre izbora u prethodno zvanje (3x1=3):

3.2.1.6. Vesna Marjanović, **Slavica Lazarević**, Đorđe Janaćković, Rada Petrović, Adsorption mechanisms of Cr (VI) on the organosilane functionalized materials, 44th International October Conference on Mining and Metallurgy, Bor, Serbia, 2012, 637-642. (ISBN:978-86-7827-042-0)

3.2.1.7. Marija Mihajlović, **Slavica Lazarević**, Ivona Janković-Častvan, Bojan Jokić, Đorđe Janaćković, Rada Petrović, Adsorption of zinc ions from aqueous solutions by natural and iron-oxide coated zeolite, 44th International October Conference on Mining and Metallurgy, Bor, Serbia, 2012, 339-342. (ISBN:978-86-7827-042-0)

3.2.1.8. **Slavica Lazarević**, Violeta Arsovski, Bojan Jokić, Ivona Janković-Častvan, Đorđe Janaćković, Rada Petrović, Adsorption of nickel ions from aqueous solutions by manganese oxide-coated sepiolite, 43th International October Conference on Mining and Metallurgy, Kladovo, 2011, 473-477. (ISBN:978-86-7827-033-8)

3.2.2. Saopštenja na međunarodnim skupovima štampana u izvodu (M34)

Posle izbora u prethodno zvanje (5x0,5=2,5):

3.2.2.1. Ž. Radovanović, B. Jokić, Đ. Veljović, **S. Lazarević**, I. Janković-Častvan, R. Petrović, Đ. Janaćković, Influence of disodium ethylenediamine-tetraacetate on the morphology of hydrothermally synthesized undoped and copper-doped calcium deficient hydroxyapatite, 3rd International Conference of The Serbian Society for Ceramic Materials, Belgrade, Serbia, June 15-17, 2015. (ISBN:978-86-80109-19-0)

3.2.2.2. A. Savić, D. Čokeša, **S. Lazarević**, B. Jokić, V. Kusigerski, R. Petrović, Lj. Živković, Effect of polyethylene glycol addition on the properties of hydrothermally synthsized magnetite powders, 3rd International Conference of The Serbian Society for Ceramic Materials, Belgrade, Serbia, June 15-17, 2015. (ISBN:978-86-80109-19-0)

3.2.2.3. A.J. Habish, **S. Lazarević**, B. Jokić, I. Janković-Častvan, Đ. Janaćković, R. Petrović, Synthesis and characterization of sepiolite-supported nano zero-valent iron, 3rd International Conference of The Serbian Society for Ceramic Materials, Belgrade, Serbia, June 15-17, 2015. (ISBN:978-86-80109-19-0)

3.2.2.4. A.A. Ahribesh, **S. Lazarević**, B. Jokić, I. Janković-Častvan, Đ. Janaćković, R. Petrović, Synthesis of magnetic sepiolite nanocomposites for the removal of

heavy metal ions from aqueous solutions, 3rd International Conference of The Serbian Society for Ceramic Materials, Belgrade, Serbia, June 15-17, 2015. (ISBN:978-86-80109-19-0)

3.2.2.5. **Slavica Lazarević**, Ivona Janković-Častvan, Tijana Kerić, Veljko Đokić, Djordje Janaćković, Rada Petrović, Adsorption of Reactive Orange 16 from aqueous solutions onto functionalized sepiolites, 8th International Conference of the Chemical Societies of the South-East European Countries, Belgrade, Serbia, 2013. (ISBN:978-86-7132-053-5)

<u>Pre izbora u prethodno zvanje (9x1=9):</u>

3.2.2.6. Vesna Marjanović, **Slavica Lazarević**, Đorđe Janaćković, Rada Petrović, Adsorption of Cr (VI) onto from aqueous solution onto organofunctionalized fully-acid activated sepiolite, Electra VII, Sedma međunarodna naučno-stručna konferencija o sistemu upravljanja zaštitom životne sredine u elektroprivredi i međusobno zavisnim kompanijama, Kopaonik,13 - 16.novembra 2012.

3.2.2.7. **Slavica Lazarević**, Ivona Janković-Častvan, Bojan Jokić, Rada Petrović, Djordje Janaćković, Preparation, Characterization and Sorption Properties of Sepiolite-Iron Oxide System, Second International Conference on Multifunctional, Hybrid and Nanomaterials, Strasbourg, France, 2011.

3.2.2.8. Jankovic-Castvan, **S. Lazarevic**, V. Djokic, R. Petrovic, Dj. Janackovic, Novel Nanocomposites Based on Sepiolite and Carbon, Second International Conference on Multifunctional, Hybrid and Nanomaterials, Strasbourg, France, 2011.

3.2.2.9. **S. Lazarević**, I. Janković-Častvan, V. Djokić, Ž. Radovanović, Dj. Janaćković, R. Petrović, Iron-modified sepiolite for Ni^{2+} sorption from aqueous solution, 1st International workshop: Processing of Nanostructured Ceramics, Polymers, and Composites, Book of Abstracts, p.63, Belgrade, Serbia, 2010. (ISBN: 978-86-7401-270-3)

3.2.2.10. Dj. Veljović, B. Jokić, D. Tanasković, I. Janković-Častvan, **S. Lazarević**, R. Petrović, Dj. Janaćković, Characterization of HAP Ceramics Obtained by Sintering and Hot Pressing, 5th International Conference of the Chemical Societies of the South-East European Countries, Ohrid, Macedonia, 2006.

3.2.2.11. I. Janković-Častvan, **S.Lazarević**, S. Orlović, R. Petrović, B. Jokić, Đ. Janaćković, Characterization of Cordierite Catalyst Support Synthesized by the Non-Hydrolytic Sol-Gel Process, International Symposium Catalytic processes an advanced micro- and mesoporous material, Book of Abstracts, p.108, Nessebar, Bulgaria, 2005, p.108.

3.2.2.12. **S. Lazarević**, D. Tanasković, I. Janković-Častvan, V. Pavićević, Đ.Janaćković, R. Petrović, Adsorption of Pb^{2+}, Cd^{2+} and Sr^{2+} ions on HAP powder obtained by hydrothermal decoposition of urea and calcium-EDTA chelates, 6th European Meeting of Environmental Chemistry, Belgrade, 2005, p.120.

3.2.2.13. **S. Lazarević**, B. Jokić, Đ. Veljović, D. Tanasković, R. Petrović, A. Orlović, Đ. Janaćković, Micro–and mesoporous spherical carbon particles obtained by

ultrasonic spray pyrolysis, International Symposium Catalitic processes on advanced micro-and mesoporous material, Book of Abstracts, p.109, Nessebar, Bulgaria, 2005, p.109.

3.2.2.14. D. Stojanović, Z. Stojanović, Z. Dubajić, I. Janković-Častvan, **S. Lazarević**, R. Petrović,Đ. Janaćković, Formation of bioactive glass-apatite coatings for titanium implant, 9th Congres of the Bakcan Stomatological Society, Abstract Book, Ohrid, Macedonia, 2004,p.269.

3.3. Radovi u časopisima nacionalnog značaja (M50)

3.3.1. Vrhunski časopisi nacionalnog značaja (M51)

Pre izbora u prethodno zvanje (1x2=2):

3.3.1.1. **S. Lazarević**, I. Janković-Častvan, M. Ilić, Đ. Janaćković, R. Petrović, "Sorpcija jona olova, kadmijuma i stroncijuma iz vodenih rastvora na sepiolitu", Hemijska industrija, 60 (2006) 15-22.
(http://www.doiserbia.nb.rs/img/doi/0367-598X/2006/0367-598X0602015L.pdf)
(ISSN 0367-598X)

3.4. Zbornici sa skupova nacionalnog značaja (M60)

3.4.1. Saopštenja sa skupova nacionalnog značaja štampana u celini (M63)

Pre izbora u prethodno zvanje (2x0,5=1):

3.4.1.1. **S. Lazarević**, I. Janković-Častvan, D. Tanasković, S. Drmanić, Đ. Janaćković, R. Petrović ,Primena sepiolita za dekolorizaciju sojinog ulja, Izvod radova XLV savetovanja Srpskog hemijskog društva, Novi Sad, 2007, str.178-181.

3.4.1.2. **S. Lazarević**, I. Janković-Častvan, B. Jokić, M. Ilic, R. Petrović, Đ. Janaćković, Ispitivanje sorpcije Pb^{2+}-jona na sepiolitu, XLIII savetovanje Srpskog hemijskog društva, Beograd, 2005, str. 267-270.

3.4.2. Saopštenja sa skupova nacionalnog značaja štampana u izvodu (M64)

Pre izbora u prethodno zvanje (7x0,2=1,4):

3.4.2.1. **S. Lazarević**, I. Janković-Častvan, B. Jokić, Đ. Veljović, Ž. Radovanović, R. Petrović, Đ. Janaćković, Ispitivanje sorpcionih svojstava aktivnih ugljeva "Trayal" i "Norit", Program i zbornik abstrakata, str. 200, 5 Simpozijum-Hemija i zaštita životne sredine, Tara, 2008.

3.4.2.2. **S. Lazarević**, I. Janković-Častvan, B. Jokić, Dj. Veljović, Ž. Radovanović, R. Petrović, Đ. Janaćković, "Karakterizacija površine sepiolita primenom

inverzne gasne hromatografije" Šesta konferencija mladih istraživača, SANU, Beograd, 2007.

3.4.2.3. I.Janković-Častvan, **S.Lazarević**, A.Orlović, R.Petrović, B. Jokić, Đ.Janaćković, "Sinteza kordijerita nehidrolitičkim sol-gel postupkom", Četvrti seminar mladih istraživača, Program i zbornik abstrakata, str. IV/1, SANU, Beograd, 2005.

3.4.2.4. **S. Lazarević**, B. Jokić, I. Janković-Častvan, J. Krstić, R. Petrović, A. Orlović, Đ. Janaćković, "Sinteza nanostrukturnih sfernih čestica ugljenika metodom ultrasonične sprej pirolize" Četvrti seminar mladih istraživača, Program i zbornik abstrakata, str. IV/2, SANU, Beograd, 2005.

3.4.2.5. **S. Lazarević**, R. Petrović, I. Janković-Častvan, B. Jokić, Đ. Veljović, Đ. Janaćković, "Ispitivanje površinskih svojstava sapiolita", Izvod radova XLII savetovanja Srpskog hemijskog društva, str. 114, Novi Sad, 2004.

3.4.2.6. D. Stojanović, R. Petrović, Đ. Janaćković I. Častvan-Janković, B. Jokić, Đ. Veljović, **S. Lazarević**, "Sinteza kalcijum-hidroksiapatita razlaganjem uree ureazom",Izvod radova XLII savetovanja Srpskog hemijskog društva, str. 108, Novi Sad, 2004.

3.4.2.7. D. Stojanović, R. Petrović, Đ. Janaćković I. Janković-Častvan, B. Jokić, Đ. Veljović, **S. Lazarević**, "Sinteza i karakterizacija kalcijum-hidroksiapatita katalitičkom razgradnjom uree ureazom", Drugi seminar mladih istraživača, Program i zbornik abstrakata,str. 12, SANU, Beograd, 2003.

3.5. Magistraske i doktorske teze (M70)

3.5.1. Odbranjena doktorska disertacija (M71)

<u>Pre izbora u prethodno zvanje: (1x6=6)</u>

3.5.1.1. **Slavica Lazarević**, "Proučavanje uticaja različitih postupaka modifikacije na fizičko-hemijske karakteristike i sorpciona svojstva sepiolita", TMF, Univerzitet u Beogradu, Beograd 2012.

3.5.2. Odbranjena magistarska teza (M72)

<u>Pre izbora u prethodno zvanje: (1x3=3)</u>

3.5.2.1. **Slavica Lazarević**, "Proučavanje sorpcionih svojstava sepiolita", TMF, Univerzitet u Beogradu, Beograd 2007.

3.6. Tehnička rešenja (M80)

3.6.1. Bitno poboljšano tehničko rešenje na nacionalnom nivou (M84)

<u>Posle izbora u prethodno zvanje: (1x3=3)</u>

3.6.1.1. I. Janković-Častvan, **S. Lazarević**, Ž. Radovanović, V. Đokić, D. Popović, A. Bjelajac, P. Živković, R. Petrović, Đ. Janaćković, "Primena nanočestica sepiolita za dobijanje papira poboljšanih mehaničkih svojstava", rukovodilac: Đ. Janaćković, naručilac: Fabrika Hartije Beograd; verifikovano od strane Matičnog naučnog odbora za materijale i hemijske tehnologije na sednici od 30. oktobra 2017. godine.

3.7. Patenti (M90)

3.7.1. Objavljen patent na nacionalnom nivou (M94)

Posle izbora u prethodno zvanje: (1x7=7)

3.7.1.1. D. Popović, S. Smiljanić, I. Janković-Častvan, **S. Lazarević**, V. Đokić, Ž. Radovanović, A. Bjelajac, K. Trivunac, Đ. Veljović, L. Radovanović, "Određivanje vrednosti rastvorljivosti izopiestičkom metodom", Patentna prijava P-2017/1111 A1, Zavoda za intelektualnu svojinu Republike Srbije; Glasnik intelektualne svojine 2018/11; Datum objavljivanja patentna 30.11.2018.

4. NAUČNA SARADNJA I SARADNJA SA PRIVREDOM

4.1. Učešće u projektima finansiranim od strane nadležnog Ministarstva

Naučno-istraživačka delatnost dr Slavice Lazarević, odvijala se u okviru sledećih projekata:

1. "Molekularno dizajniranje monolitnih i kompozitnih materijala", evidencioni broj:1431, 2002-2005.
2. "Razvoj tehnologije proizvodnje savremenih materijala na bazi sepiolita", evidencioni broj: 2082, 2004. (inovacioni projekat).
3. "Razvoj mineralnih sorbenata na bazi bentonita i sepiolita za potrebe prehrambene industrije, evidencioni broj: 7057B, 2005-2007.
4. "Sinteza, struktura, svojstva i primena funkcionalnih nanostrukturnih keramičkih i biokeramičkih materijala", evidencioni broj 142070B, 2006-2010.
5. "Izrada prototipa uređaja za regeneraciju iskorišćenih mineralnih elektroizolacionih ulja metodom sorpcije na mineralnom sorbentu", ev.br. 401-00-218/2007-01/10-IP (Tip 1)/10, 2007. (inovacioni projekat).
6. "Sinteza, razvoj tehnologija dobijanja i primena nanostrukturnih, multifunkcionalnih materijala definisanih svojstava", evidencioni broj: III 45019, 2011-
7. "Primena funkcionslizovanih ugljeničnih nanocevi i nanočestica zlata za pripremu dendritskih ćelija u terapiji tumora", evidencioni broj 175102, 2011-

4.2. Učešće u međunarodnim naučnim projektima

1. EUREKA Project E!3303 - BIONANOCOMPOSIT - Hydroxyapatite Nanocomposite Ceramics-New Implant Material for Bone Substitutes (evidencioni broj kod MNZŽ R Srbije 401-00-67/2005-01/02).
2. EUREKA Project E!4141- ECOSAFETY- Measures for providing a quality and safety in food chain (evidencioni broj kod MNTR R Srbije 404-02-00003/2008-01/01).
3. FP7-REGPOT-2009-1 NANOTECH FTM, "Reinforcing of Nanotechnology and Functional Materials Centre", br 245916, 2009-2012. http://cordis.europa.eu/result/rcn/56353_en.html

4.3. Učešće u projektima, studijama, elaboratima i sl. sa privredom

1. "Određivanje gustine neorganskih sedimenata u sirovoj nafti", korisnik NIS Rafinerija nafte Pančevo, naruđbenica broj PRE360000/ud-Ra/03380, 2016.
2. Đ.Janaćković, R.Petrović, I. Janković-Častvan, B.Jokić, Đ.Veljović, **S.Lazarević**, V.Rajaković, "Ispitivanje fizičko-hemijskih svojstava i mogućnosti primene sepiolita sa lokaliteta Slovići", TMF, januar 2004.
3. Đ.Janaćković, R.Petrović, I. Janković-Častvan, B.Jokić, Đ.Veljović, **S.Lazarević**, "Fizičko-hemijska i tehnološka ispitivanja sepiolita sa lokaliteta Tolića kosa-reka Smrduša", TMF, januar 2004.
4. Đ.Janaćković, R.Petrović, I. Janković-Častvan, B.Jokić, Đ.Veljović, **S.Lazarević**, "Kvalitatina i kvantitativna određivanja hemijskih elemenata odnosno jedinjenja", TMF, januar 2004.
5. Đ.Janaćković, R.Petrović, I. Janković-Častvan, B.Jokić, Đ.Veljović, **S.Lazarević**, "Fizičko-hemijska i tehnološka ispitivanja bentonita sa lokaliteta Suvi do, Ćirkovska kosa, Potočić, Sibnica, Beloljin i Petrovac na Mlavi , TMF, januar 2004.
6. Dj. Janaćković, R. Petrović, I. Janković-Častvan, B. Jokić, Dj. Veljović, S. Lazarević, "Određivanje kvaliteta rezervi opekarskih glina sa lokaliteta Okanj-Melenci", TMF, 2004.
7. Dj. Janaćković, R. Petrović, I. Janković-Častvan, B. Jokić, Dj. Veljović, S. Lazarević, "Određivanje kvaliteta rezervi opekarskih glina sa lokaliteta Morjan-Čalma", TMF, 2004.
8. Dj. Janaćković, R. Petrović, I. Janković-Častvan, B. Jokić, S. Lazarević, "Fizičko-hemijska i tehnološka ispitivanja bentonita sa lokaliteta Zvezdan-Đula, Šarbanovac-Velika Padina, Tijovac-Svrljig, Izvor-Svrljig i Bogovina", TMF, Beograd, 2005.
9. Dj. Janaćković, R. Petrović, I. Janković-Častvan, B. Jokić, S. Drmanić, S. Lazarević, "Fizičko-hemijska i tehnološka ispitivanja sepiolita sa lokaliteta Tolića Kosa i Reka Smrduša", TMF, Beograd, 2005.

5. ANALIZA PUBLIKOVANIH RADOVA

Radovi i saopštenja koje je u periodu od izbora u prethodno zvanje publikovala dr Slavica Lazarević mogu se podeliti u više grupa na osnovu tema istraživanja.

Prvu grupu čine radovi u kojima su prikazani rezultati proučavanja uticaja modifikacije prirodnog i kiselinski aktiviranog sepiolita primenom organosilana: 3-merkaptopropiltrimetoksisilana ($HS(CH_2)_3Si(OCH_3)_3$), [3-(2-aminoetilamino)propil]trimetoksisilana ($((CH_3O)_3Si(CH_2)_3NH(CH_2)_2NH_2)$), natrijumove soli N-[(3-trimetoksi)propil]etilendiamintriacetatne kiseline ($((CH_3O)_3Si(CH_2)_3N(CH_2COONa)N(CH_2)_2N(CH_2COONa)_2$), na fizičko-hemijska svojstva kao i na sorpciju Ni^{2+} i Cr(VI) jona iz vodenih rastvora.

Rezultati proučavanja uticaja funkcionalizacije prirodnog i kiselinski aktiviranog sepiolita [3-(2-aminoetil-amino)propil]trimetoksisilanom (amino-silanom), određivanje fizičko-hemijskih svojstava i proučavanje sorpcije Cr(VI) iz vodenih rastvora, dati su u radu 3.1.2.5. Sorpcija je ispitana pri različitim pH vrednostima, utvrđeni su dominantni mehanizmi sorpcije i određeni termodinamički parametri sorpcije. Najveći sorpcioni kapaciteti su postignuti pri pH vrednosti 2. Kapacitet sorpcije amino-funkcionalizovanog kiselinski aktiviranog sepiolita je veći od kapaciteta sorpcije amino-funkcionalizovanog prirodnog sepiolita za sve ispitane pH vrednosti. Ispitivanje kinetike sorpcije ukazuje da je proces sorpcije u skladu sa kinetičkim modelom drugog reda.

Funkcionalizacijom termo-kiselinski aktiviranog sepiolita primenom (3-merkaptopropil)trimetoksisilana (merkapto-silana) i [3-(2-aminoetil-amino)propil]trimetoksisilana (amino-silana) dobijeni su efikasni sorbenti za sorpciju Cr(VI) iz vodenih rastvora (3.1.4.10). Kapacitet sorpcije Cr(VI) amino-silaniziranog sorbenta je veći od kapaciteta merkapto-silaniziranog uzorka na svim ispitivanim početnim pH vrednostima Cr(VI) rastvora i naročito pri veoma niskoj početnoj pH vrednosti (2,0). Dominantan mehanizam sorpcije Cr(VI) pri početnoj pH rastvora 2,0 na amino-silaniziranom adsorbentu je elektrostatičko privlačenje između Cr(VI) anjona i protonovanih amino grupa. Sorpcija Cr(VI) na merkapto-silaniziranom adsorbentu se zasniva na elektrostatičkim interakcijama između Cr(VI) anjona i protonovanih merkapto grupa, kao i redukciji Cr(VI) do Cr^{3+} merkapto grupama, uz elektrostatičko privlačenje redukcijom nastalih Cr^{3+} i sulfonatnih grupa dobijenih oksidacijom merkapto grupa.

U radovima 3.1.4.1 i 3.1.4.5. prikazani su rezultati karakterizacije i ispitivanja sorpcije jona nikla iz vodenih rastvora na sorbentu dobijenom funkcionalizacijom prirodnog sepiolita primenom natrijumove soli N-[(3-trimetoksi)propil]etilendiamintriacetatne kiseline. Struktura i morfologija dobijenog sorbenta određena je primenom skenirajuće elektronske mikroskopije. Rezultati FTIR analize pokazali su prisustvo karboksilnih grupa koji potiču od molekula organosilana. Zadržavanje osnovne sepiolitske strukture kao i neznatna promena vrednosti specifične površine ukazali su da do modifikacije dolazi uglavnom na površini sepiolita, pri čemu dolazi do uspostavljanja kovalentne veze između površinskih Si-OH grupa sepiolita i alkoksi grupa organosilana.

Postupak modifikacije prirodnog sepiolita doveo je do porasta kapacitata sorpcije jona nikla (3.1.4.1.) usled povećanja broja površinskih funcionalnih grupa. Sorpcija je

rezultat istovremenog odigravanja procesa jonske izmene sa jonima magnezijuma iz strukture sepiolita i specifične sorpcije. Poređenjem eksperimentalnih rezultata sa tri modela sorpcionih izotermi utvrđeno je da je proces sorpcije Ni^{2+} jona na ispitanom sorbentu u skladu sa Langmuir-ovim modelom sorpcione izoterme. Ispitivanje kinetike sorpcije je pokazalo da je proces sorpcije u skladu sa kinetičkim modelom drugog reda.

Drugu grupu čine radovi u kojima su prikazani rezultati koji se odnose na modifikaciju prirodnih minerala sepiolita i zeolita primenom gvožđe(III)-hlorida u baznim uslovima, u cilju povećanja afiniteta i selektivnosti prema jonima i molekulima, i modifikaciju prirodnog i sintetskog zeolita različitim oksidima.

Ispitivanje uticaja modifikacije prirodnog zeolita hidratisanim gvožđe(III)-oksidom (primenom gvožđe(III)-hlorida u baznim uslovima) na mehanizam sorpcije i sorpcioni kapacitet za Pb^{2+} , Zn^{2+} i Cd^{2+} jone prikazano je u radovima 3.1.4.9. (za sorpciju iz jednokomponetnih) i 3.1.3.1. (iz višekomponetnih rastvora).

Karakterizacija sorbenata (3.1.4.9.) je obuhvatila određivanje faznog sastava, morfologije, specifične površine, kapaciteta izmene katjona i tačke nultog naelektrisanja. Sorpcioni eksperimenti iz jednokomponetnih rastvora, su izvođeni u šaržnim uslovima, pri konstantnoj pH vrednosti od 5,5±0,1, pri različitim početnim koncentracijama jona i na različitim temperaturama. Afinitet oba sorbenta na svim ispitanim temperaturama najveći je za Pb^{2+}, zatim za Zn^{2+} i najmanji za Cd^{2+} jone. Sorpcioni kapaciteti oba sorbenta za sva tri jona rastu sa povišenjem temperature. Rezultati ispitivanja su pokazali da je sorpcioni kapacitet Fe(III)-zeolita za Pb^{2+} , Zn^{2+} i Cd^{2+} znatno veći od kapaciteta prirodnog zeolita zahvaljujući: većoj specifičnoj adsorpciji zbog formiranja novih funkcionalnih grupa na površini zeolita, većoj jonskoj izmeni zbog prisustva jona koji se lakše izmenjuju i većoj precipitaciji hidroksida usled više tačke nultog naelektrisanja Fe(III)-zeolita.

Kapaciteti sorpcije iz višekomponetnih rastvora (3.1.3.1.), za prirodni i modifikovani uzorak, takođe se mogu prikazati nizom: $Pb^{2+} > Zn^{2+} > Cd^{2+}$. Uticaj kompeticije jona pri nižim koncentracijama je zanemarljiv, dok pri višim koncentracijama dolazi do značajnog smanjenja sorpcije Zn^{2+} i Cd^{2+} jona. Ispitivanje strukture sorbenata posle sorpcije Pb^{2+}, Zn^{2+} i Cd^{2+} jona primenom fotoelektronske spektroskopije X-zracima (XPS) ukazalo je na veći sadržaj jona na površini Fe(III)-zeolita. XPS dubinski profili Fe(III)-zeolita pokazali su da je površinska sorpcija dominatna u slučaju sorpcije Pb^{2+} i Cd^{2+} jona, dok je sorpcija Zn^{2+} jona uglavnom rezultat procesa jonske izmene.

Rezultati prikazani u radu 3.1.4.8., ukazali su da sepiolit modifikovan hidratisanim gvožđe(III)-oksidom predstavlja efikasan sorbent za uklanjanje As(III) и As(V) iz prirodnih voda. Korišćeni su rastvori arsena u demineralizovanoj i realnoj bunarskoj vodi. Maksimalni sorpcioni kapacitet pri sorpciji iz demineralizovane vode za As(III) postignut je pri početnoj pH vrednosti 7 i iznosio je 10 mg/g, dok je sorpcioni kapacitet za As(V) 4,2 mg/g. U slučaju sorpcije iz bunarske vode kapaciteti su iznosili 5,4 mg/g i 3,4 za As(V).

Sorpcija Cd^{2+} jona iz prirodne morske vode, laboratorijski pripremljene morske vode, destilovane vode i rastvora NaCl, iste jonske jačine kao morska voda, ispitana je primenom Fe(III)-zeolita (3.1.4.4.) i Fe(III)-sepiolita. Sorpcioni kapacitet oba sorbenta za Cd^{2+} pri početnoj pH 7 opada u sledećem nizu: destilovana voda > NaCl rastvor > laboratorijski pripremljena morska voda > prirodna morska voda. Modelovanje rezultata ispitivanja sorpcije na Fe(III)-zeolitu u ravnotežnim uslovima je pokazalo da se sorpcija iz

destilovane vode može opisati Langmir-ovim modelom, što ukazuje na homogenu sorpciju i formiranje monosloja na površini Fe(III)-zeolita. Rezultati sorpcije iz slanih voda se bolje opisuju Freundlich-ovim modelom, što ukazuje na višeslojnu sorpciju na heterogenoj površini sorbenta. Vrednosti Freundlich-ovog parametra n pokazuju da je sorpcija Cd^{2+} na Fe(III)-zeolitu favorizovan proces i da su veze između Cd^{2+} i površine Fe(III)-zeolita jače u NaCl rastvoru nego u prirodnoj i laboratorijski pripremljenoj morskoj vodi. Vrednosti parametra n_s u modelu Sipsa, koji najbolje opisuje eksperimentalne rezultate sorpcije Cd^{2+} na Fe(III)-sepiolitu, pokazuju da je heterogenost površine sorbenta najveća u destilovanoj vodi i najmanja u prirodnoj morskoj vodi.

U radu 3.1.4.7. prikazana je modifikacija prirodnog klinoptilolita i sintetskog zeolita, karakterizacija dobijenih materijala i ispitivanje istih kao katalizatora pri sagorevanju lignina. Prirodni klinoptilolit je dvostepenim postupkom koji se sastojao od jonske izmene i kalcinacije na 773 K modifikovan oksidima kalcijuma i magnezijuma. Prethodno sintetisan zeolit je modifikovan oksidima Ni, Cu, Ca i Mg korišćenjem vlažne impregnacije na temperaturi od 873 K. Pripremljeni katalizatori su karakterisani primenom skenirajuće elektronske mikroskopije, XRD analize i određivanjem specifične površine.

Najveći prinos fenola u bio-ulju (34,8 mas. %) ostvaren je sa katalizatorom koji je dobijen modifikacijom sintetskog zeolita oksidom nikla, koji ima najveću specifičnu površinu i najveću koncentraciju Brenštedovih i Luisovih kiselih mesta na površini. Prisustvo ispitanih katalizatora ne dovodi do značajnog povećanja sadržaja policikličnih aromatičnih ugljovodonika niti jedinjenja sa velikom molarnom masom u odnosu na nekatalizovan proces.

U trećoj grupi radova ispitivani su kompoziti prirodnog sepiolita i parcijalno kiselinski aktiviranog sepiolita sa nanočestičnim elementarnim gvožđem i mehanizam sorpcije jona kadmijuma na ovom kompozitu (3.1.2.2. i 3.2.2.3.), kao i sorbenati na bazi magnetita: kompoziti sepiolita i magnetita (3.1.2.1. i 3.2.2.4.) i magnetit koji je sintetisan hidrotermalno uz prisustvo polietilen glikola (PEG).

Kompoziti sepiolita ili kiselinski aktiviranog sepiolita sa nanočestičnim elementarnim gvožđem (nZVI) pripremljeni su pri različitim odnosima nosač/nZVI i karakterisani primenom XRD, FT-IR, DTA i TGA analize i elektronske mikroskopije (FESEM), u cilju dobijanja efikasnog sorbenta za Cd^{2+} jone (3.1.2.2. i 3.2.2.3). Sorpcioni kapacitet kompozita raste sa porastom količine nZVI. Prisustvo sepiolita, odnosno kiselinski aktiviranog sepiolita smanjuje formiranje agregata nanočestica elementarnog gvožđa, što rezultira velikim sorpcionim kapacitetom. Primenom fotoelektronske spektroskopije X-zracima (XPS) utvrđeno je da sadržaj elementarnog gvožđa posle sorpcije opada kao rezultat oksidacije. Dubinski XPS profil je pokazao da se Cd^{2+} nalazi kako na površini, tako i u oblasti ispod površine, pri čemu je koncentracija na površini veća. Uklanjanje Cd^{2+} jona rezultat je formiranja kompleksa sa Fe-OH grupama koje nastaju oksidacijom elementarnog gvožđa. U slučaju sepiolita kao nosača, mehanizam ukjučuje i interakciju sa Si-OH grupama i jonsku izmenu sa jonima Mg^{2+} iz strukture sepiolita.

Uticaj različitih parametara sinteze, kao što su vrsta baze koja je korišćena za koprecipitaciju magnetita (NaOH ili NH_3), vrste sepiolita koji je korišćen kao nosač (prirodni ili kiselinski aktiviran) i redosled mešanja reagensa, na svojstva nanokompozita

sepiolit/magnetit i na kapacitet sorpcije jona kadmijuma prikazan je u radovima 3.1.2.1. i 3.2.2.4. Kapacitet sorpcije na kompozitima je veći u poređenju sa čistim komponentama. Kompoziti dobijeni u prisustvu NaOH pokazuju lošija magnetna svojstva, ali veći sorpcioni kapacitet. Kompoziti dobijeni sa kiselinski aktiviranim sepiolitom pokazuju veću efikasnost za uklanjanje Cd^{2+} jona, u poređenju sa kompozitima sa prirodnim sepiolitom dobijenim pod istim uslovima.

Nanočestični prah magnetita je pripremljen hidrotermalnom metodom uz korišćenje soli gvožđa ($FeSO_4$) kao prekursora (3.1.2.3. i 3.2.2.2.i) i u prisustvu polietilen glikola (PEG) kao matrice. Prilikom sinteze korišćen je PEG različitih molarnih masa i različiti odnosi PEG:H_2O, tj. ispitan je uticaj količine i dužine lanca molekula PEG-a na teksturalne i magnetne osobine praha i kapacitet sorpcije fosfata. Utvrđeno je da kapacitet sorpcije raste sa porastom specifične površine i zapremine pora i da je najefikasniji uzorak dobijen sintezom u prisustvu PEG 20 000, pri odnosu PEG/voda 3:1.

Četvrta grupa radova obuhvata rezultate ispitivanja poboljšanja mehaničkih svojstava papira dodatkom nanočestica sepiolita u disperziju skroba (3.1.3.2., 3.2.1.3. i 3.6.1.1.) ili matricu polivinil butirala (3.1.4.2.). U interakciji sa skrobom, koji predstavlja agens za poboljšanje mehaničkih svojstava papira, sepiolit dodatno pozitivno utiče na mehanička svojstva papira. Ispitivan je papir tipa schrenz (110 g/m^2) a dodatkom sepiolita u disperziju skroba koji je korišćen kao premaz došlo je do povećanja vrednosti dužine kidanja, otpornosti na pritisak i otpornosti na pucanje do 20 %. Industrijska proba, nanošenja disperzije skroba i sepiolita na papir, urađena je u saradnji sa kompanijom Fabrika Hartije Beograd, i opisana je u tehničkom rešenju 3.6.1.1. Osim na mehanička svojstva papira dodatkom sepiolita na čiju površinu su dispergovane nanočestice srebra može se uticati i na antibakterijska svojstva papira i na taj način se dobiti antibakterijski papir poboljšanih mehaničkih svojstava. Dodatkom sepiolita u matricu polivinil butirala dobijen je nanokompozit čijim nanošenjem na papir takođe dolazi do poboljšanja mehaničkih svojstava koja su utvrđena ispitivanjem zatezne čvrstoće kidalicom i nanoindentacijom (3.1.4.2.). Uzorak papira na koji je nanešen polivinil butiral koji je sadržao 3 % sepiolita je pokazao najznačajnije poboljšanje mehaničkih svojstava.

Sledeća grupa obuhvata radove i saopštenja u kojima su analizirani sorbenti za sorpciju boja *Methylene Blue* (MB) (3.1.5.) i *CI Reactive Orange* 16, kao značajnih zagađujućih materija iz tekstilne industrije.

U radu 3.1.4.11. predstavljena je karakterizacija koštica breskve, kao i mogućnost primene istih kao biosorbenta, za uklanjanje boje MB iz vodenih rastvora. Uzorak je okarakterisan primenom XRD analize, FESEM analize i određivanjem specifične površine primenom BET metode. Sorpcija boje je ispitana u funkciji doze biosorbenta, koncentracije sorbata, vremena kontakta i početne pH vrednosti. Utvrđeni su optimalni uslovi za uklanjanje boje: količina biosorbenta od 400mg/100mL, pH vrednost 5,5, vreme kontakta 180 min. Modelovanje rezultata ispitivanja sorpcije boje na biosorbentu pokazalo je da se sorpcija može opisati Freundlich-ovim modelom sorpcione izoterme, što ukazuje na nehomogenu sorpciju. Rezultati FTIR analize ukazali su na formiranje vodonične veze između molekula boje i biosorbenta. Na osnovu sorpcionih izotermi zaključeno je da su koštice breskve efikasan sorbent niske cene za uklanjanje boje *Methylene Blue* iz vode.

U radu 3.2.2.5. ispitana je sorpcija boje CI *Reactive Orange* 16 iz vodenih rastvora na prirodnim i kiselinski aktiviranim sepiolitima funkcionalizovanim [3-(2-aminoetilamino)propil]trimetoksi-silanom. Sorpcioni eksperimenti su izvedeni u funkciji početne koncentracije boje, početne pH vrednosti i vremena uravnotežavanja. Sorpcija boje zavisi od početne pH rastvora i maksimum je postignut na pH 2. Ispitana je primenljivost Langmuir-ovog, Freundlich-ovog i Dubinin-Kaganer-Radushkevich-ovog (DKR) modela izotermi u fitovanju eksperimentalnih sorpcionih podataka. Eksperimentalni ravnotežni podaci dobijeni na 298 K su u dobroj korelaciji sa Langmuir-ovom sorpcionom izotermom. Kinetički model pseudo-drugog reda pruža najbolju korelaciju eksperimentalnih kinetičkih podataka. Na osnovu sorpcionih izotermi zaključeno je da je modifikacija sepiolita [3-(2-aminoetilamino)propil]trimetoksisilanom rezultirala formiranjem sorbenta sa primetno većim adsorpcionim kapacitetom boje od prirodnih i kiselinski aktiviranih sepiolita. Kiselinski aktivirani amino funkcionalizovani sepioliti su bili efikasniji od prirodnih amino funkcionalizovanih sepiolita.

Sinteza nanokristalnog nikl-ferita u subkritičnom i natkritičnom etanolu i karakterizacija dobijenih prahova prikazani su u radu 3.1.2.4. Dobijeni prahovi su termički tretirani na temperaturi od 650 ^{o}C tokom 4h i 8h, kao i na temperaturi od 900 ^{o}C tokom 4 h. Sintezom u natkritičnom etanolu dobijeni su prahovi sa većim sadržajem nikl-ferita i manjim sadržajem α–Fe_2O_3. Tokom procesa žarenja prahova dobijenih u subkritičnom i natkritičnom stanju etanola koje u nativnom stanju karakterišu aglomerati malih primarnih čestica sa mezoporama srednje veličine, dolazi do skoro potpunog gubitka mezoporoznosti. Sa povećanjem temperature i vremena žarenja značajano se smanjuju specifična površina, ukupna zapremina pora i zapremina mezopora kod obe vrste prahova. Veličina kristalita proporcionalna je temperaturi i vremenu žarenja. Za uzorke dobijene u subkritičnim uslovima ona se kreće u opsegu 37 – 80 nm, za natkritične 47 – 107 nm. Vrednosti saturacione magnetizacije žarenih prahova su slične vrednostima koje su zabeležene za prahove dobijene klasičnim keramičkim procesiranjem na nižim temperaturama.

Dobijanje i karakterizacija nanokompozita fularenola i poroznih nanočestica SiO_2 u cilju dobijanja efikasnog nosača leka 9-aminoacridine bili su predmet rada publikacije 3.1.4.3. Posle određivanja količine leka koja se sorbuje na nanokompozitu, praćeno je otpuštanje leka u zavisnosti od pH vrednosti. Pokazano je da se procenat otpuštanja leka smanjuje sa povišenjem pH vrednosti, od ~69 % pri pH 5,75 do ~ 50 % pri pH 7,35. Zaključeno je da se nanokompozit fulerenola i poroznih nanočestica SiO_2, u blago kiselim uslovima, može uspešno primeniti kao nosač leka u lečenju kancera.

Objavljeni patent na nacionalnon nivou (3.7.1.1.) predstavlja nov postupak za određivanje vrednosti rastvorljivosti soli u vodi primenom modifikovane aparature za izopiestička merenja.

5.1. Lista pet najznačajnijih naučnih rezultata dr Slavice Lazarević (posle izbora u zvanje naučni saradnik)

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6. CITIRANOST RADOVA KANDIDATA

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7. ELEMENTI ZA KVALITATIVNU OCENU NAUČNOG DOPRINOSA KANDIDATA I MINIMALNI KVANTITATIVNI USLOVI ZA IZBOR

7.1. Pokazatelji uspeha u naučnom radu

Pokazatelji uspeha u naučnom radu koji kvalifikuju kandidata dr Slavicu Lazarević za predloženo naučno zvanje su:

- Dr Slavica Lazarević je radeći na Tehnološko-metaluruškom fakultetu Univerziteta u Beogradu učestvovala u istraživanjima u okviru sedam naučno-istraživačkih projekata koje je finasiralo ili i dalje finansira Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije i na tri međunarodna naučno-istraživačka projekta EUREKA Project E!3303-BIONANOCOMPOSIT "Hydroxyapatite Nanocomposite Ceramics-New Implant Material for Bone Substitutes", EUREKA Project E!4141- ECOSAFETY-"Measures for providing a quality and safety in food chain", REGPOT-FP7 projekta "Reinforcing of Nanotechnology and Functional Materials Centre" (No: 245916).
- Ukupna dosadašnja naučno-istraživačka aktivnost kandidata dr Slavice Lazarević obuhvata 62 bibliografske jedinice, od čega su 2 rada u međunarodnim časopisima

izuzetnih vrednosti (M21a), 11 radova u vrhunskim međunarodnim časopisima (M21), 3 rada u istaknutim međunarodnim časopisima (M22), 11 radova u časopisima međunarodnog značaja (M23), jedan rad u međunarodnom časopisu van SCI liste, jedan rad u časopisu nacionalnog značaja (M51), 8 radova saopštenih na skupovima međunarodnog značaja štampanih u celini (M33), 14 radova saopštenih na skupovima međunarodnog značaja štampanih u izvodu (M34), 2 saopštenja na skupu nacionalnog značaja štampana u celini, 7 saopštenja na skupu nacionalnog značaja štampana u izvodu (M64), 1 bitno poboljšano tehničko rešenje na nacionalnom nivou (M84) i 1 objavljen patent na nacionalnom nivou (M94).

- Do sada je bila član komisije za ocenu i odbranu dve doktorske disertacije i član komisije za ocenu podobnosti teme jedne doktorske disertacije čija je izrada u toku, učestvovala je u izradi više diplomskih, završnih i master radova i doktorskih disertacija iz oblasti neorganske hemijske tehnologije i inženjerstva materijala.
- Recenzirala je radove u sledećim časopisima: u međunarodnom časopisu izuzetnih vrednosti Industrial & Engineering Chemistry Research (1 rad), u vrhunskim međunarodnim časopisima: Journal of Chromatography A (1 rad), Chemical Engineering and Processing: Process Intensification (1 rad), Geoderma (1 rad) i međunarodnim časopisima: Journal of Chemical and Engineering Data (4 rada), Chemical Engineering Communications (1 rad), International Journal of Industrial Chemistry (1 rad), Water Science and Technology (5 radova), Journal of Serbian Chemical Society (1 rad) i Global NEST Journal (1 rad).
- Rukovodila je projektnim zadatkom ”Razvoj i primena novih sorbenata na bazi prirodnih minerala”, koji se realizuje u okviru potprojekta 1, u okviru projekta III 45019.

7.2. Razvoj uslova za naučni rad, obrazovanje i formiranje naučnih kadrova

Tokom realizacije navedenih naučno-istraživačkih projekata na kojima je dr Slavica Lazarević učestvovala (sedam naučno-istraživačkih projekata koje je finasiralo ili i dalje finansira Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije i tri međunarodna naučno-istraživačka projekta) izvršena je nabavka kapitalne opreme, na kojoj kandidat samostalno sprovodi istraživanja i koristi je za realizaciju nastave na akademskim studijama i u radu sa studentima master i doktorskih studija.

U okviru realizacije FP7-REGPOT projekta, kandidat je učestvovao u realizaciji naučne saradnje sa centrima: Materials Design & Processing and Laboratory of the Material Science and Technology, University of Perugia, u Terniju i Institut de physique et chimie des matériaux de Strasbourg (IPCMS), u Strazburu. Uspešna saradnja ostvarena je i sa Institutom Jožef Stefan u Sloveniji (zajedničke publikacije 3.1.2.2. i 3.1.3.1.). Od domaćih institucija treba istaći saradnju sa Institutom tehničkih nauka SANU, Institutom za nuklearne nauke „Vinča“, Institutom za hemiju, tehnologiju i metalurgiju, itd.

Slavica Lazarević je učestvovala školske 2011/2012 u izvođenju vežbi iz predmeta “Kvalitet voda” na Katedri za hidrotehniku i vodno-ekološko inženjerstvo na Građevinskom fakultetu Univerziteta u Beogradu.

Na Tehnološko-metalurškom fakultetu Univerziteta u Beogradu, je bila uključena u praktični rad sa studentima školske 2014/2015, 2015/2016 i 2016/2017 godine, uz saglasnost NN veća Tehnološko-metalurškog fakulteta Univerziteta u Beogradu, kroz vežbe na osnovnim i master studijama na predmetima ”Tehnologija vode” i ”Priprema vode za piće”.

Dr Slavica Lazarević bila je član komisije za odbranu 2 doktorske disertacije i član jedne komisije za ocenu podobnosti teme i kandidata za izradu doktorske disertacije. Učestvovala je u izradi više diplomskih i završnih radova, master teza i doktorskih disertacija iz oblasti neorganske hemijske tehnologije i inženjerstva materijala.

Član komisije odbranjenih doktorskih disertacija

Odlukom Nastavno-naučnog veća Tehnološko-metalurškog fakulteta Univerziteta u Beogradu br. 35/516 od 24.11.2016. godine, dr Slavica Lazarević je imenovana za člana Komisije za ocenu i odbranu doktorske disertacije Ayshe Ali Ahribesh, pod nazivom ”Sinteza, karakterizacija i primena magnetnih adsorbenata na bazi sepiolita i zeolita” (Synthesis, characterization and application of magnetic adsorbents based on sepiolite and zeolite). Disertacija je napisana na engleskom jeziku, odbranjena je 2017. godine na Tehnološko-metalurškom fakultetu Univerziteta u Beogradu. Iz ove doktorske disertacije proistekle su 3 zajedničke publikacije: jedan rad kategorije M21, jedan rad kategorije M23 i jedno saopštenje kategorije M34:

Rad u vrhunskom međunarodnom časopisu (M21)

> Aysha Ali Ahribesh, **Slavica Lazarević**, Ivona Janković-Častvan, Bojan Jokić, Vojislav Spasojević, Tamara Radetić, Đorđe Janaćković, Rada Petrović, Influence of the synthesis parameters on the properties of the sepiolite-based magnetic adsorbents, Powder Technology, 305 (2017) 260-269. (ISSN 0032-5910, IF (2017) = 3,230)

Rad u međunarodnom časopisu (M23)

> Aysha Ali Ahribesh, **Slavica Lazarević**, Branislav Potkonjak, Andjelika Bjelajac, Djordje Janaćković, Rada Petrović, Sorption of cadmium ions from saline waters onto Fe(III)-zeolite, Hemijska Industrija 69 (3) 253–260 (2015) (ISSN 0367-598X, IF(2013)=0,463)

Saopštenje sa međunarodnog skupa štampano u izvodu (M34)

> A.A. Ahribesh, **S. Lazarević**, B. Jokić, I. Janković-Častvan, Đ. Janaćković, R. Petrović, „Synthesis of magnetic sepiolite nanocomposites for the removal of heavy metal ions from aqueous solutions“, 3rd International Conference of The Serbian Society for Ceramic Materials, Belgrade, Serbia, June 15-17, 2015.

Odlukom Nastavno-naučnog veća Tehnološko-metalurškog fakulteta Univerziteta u Beogradu br. 35/642, od 29.12.2016. godine, dr Slavica Lazarević je imenovana za člana

Komisije za ocenu i odbranu doktorske disertacije Amal Juma Habish, pod nazivom ”Uticaj parametara sinteze na svojstva kompozitnih adsorbenata na bazi sepiolita i nanočestica elementarnog gvožđa” (Influence of synthesis parametars on the properties of the composite adsorbents based on sepiolite and nano-zerovalent iron). Disertacija je napisana na engleskom jeziku, odbranjena je 2017. godine na Tehnološko-metalurškom fakultetu Univerziteta u Beogradu. Iz ove doktorske disertacije proistekle su 3 zajedničke publikacije: jedan rad kategorije M21, jedan rad kategorije M23 i jedno saopštenje kategorije M34:

Rad u vrhunskom međunarodnom časopisu (M21)

Amal Juma Habish, **Slavica Lazarević**, Ivona Janković-Častvan, Bojan Jokić, Janez Kovač, Jelena Rogan, Đorđe Janaćković, Rada Petrović, Nanoscale zerovalent iron (nZVI) supported by natural and acid-activated sepiolites: the effect of the nZVI/support ratio on the composite properties and Cd^{2+} adsorption, Environmental Science and Pollution Research, 24 (1) (2017) 628-643 (ISSN 0944-1344, IF (2015) =2,760)

Rad u međunarodnom časopisu (M23)

Amal Juma Habish, **Slavica Lazarević**, Ivona Janković-Častvan, Branislav Potkonjak, Đorđe Janaćković, Rada Petrović, The effect of salinity on the sorption of cadmium ions from aqueous medium on Fe(III)-sepiolite, Chemical Industry and Chemical Engineering Quarterly, 21 (2) (2015) 295-303, (ISSN 1451-9372, IF (2014)=0,892)

Saopštenje sa međunarodnog skupa štampano u izvodu (M34)

A.J. Habish, **S. Lazarević**, B. Jokić, I. Janković-Častvan, Đ. Janaćković, R. Petrović, „Synthesis and characterization of sepiolite-supported nano zero-valent iron“, 3rd International Conference of The Serbian Society for Ceramic Materials, Belgrade, Serbia, June 15-17, 2015.

Član komisije doktorske disertacije koja je u toku

Odlukom Nastavno-naučnog veća Tehnološko-metalurškog fakulteta Univerziteta u Beogradu br.35/33, od 22.02.2018. godine, dr Slavica Lazarević je imenovana za člana Komisije za ocenu podobnosti teme i kandidata Andrije Savića, pod nazivom ”Sinteza, karakterizacija i primena adsorbenata na bazi magnetita za uklanjanje fosfata iz vode“. Iz zajedničkog rada proistekli su jedan rad kategorije M21 i jedano saopštenje kategorije M34:

Rad u vrhunskom međunarodnom časopisu (M21)

Andrija B.Savić, Djuro Čokeša, **Slavica Lazarević**, Bojan Jokić, Djordje Janaćković, Rada Petrović, Ljiljana S. Živković, Tailoring of magnetite powder properties for enhanced phosphate removal: Effect of PEG addition in the synthesis

process, Powder Technology, 301 (2016) 511-519, (ISSN 0032-5910, IF (2016) = 2,942).

Saopštenje sa međunarodnog skupa štampano u izvodu (M34)

A. Savić, D. Čokeša, **S. Lazarević**, B. Jokić, V. Kusigerski, R. Petrović, Lj. Živković, „Effect of polyethylene glycol addition on the properties of hydrothermally synthsized magnetite powders“, 3rd International Conference of The Serbian Society for Ceramic Materials, Belgrade, Serbia, June 15-17, 2015.

Odbranjene doktorske disertacije u čijoj izradi je učestvovala

1. Ivona Janković-Častvan, „Svojstva nanostrukturnih, kompozitnih materijala na bazi sepiolita i primena u industriji papira”, Tehnološko-metalurški fakultet Univerziteta u Beogradu, 2016. Iz zajedničkog rada u toku izrade doktorske disertacije Ivone Janković-Častvan proistekli su jedan rad kategorije M22, jedan rad M23 i jedno saopštenje kategorije M33 (zahvalnica data u prilogu).
2. Željko Radovanović, „Uticaj jona srebra, bakra i cinka na svojstva biokeramičkih materijala na bazi kalcijum-hidroksiapatita i kalcijum-fosfata”, Tehnološko-metalurški fakultet Univerziteta u Beogradu, 2016. (zahvalnica data u prilogu).
3. Violeta Nikolić, „Imobilizacija olova i hroma geopolimerima na bazi elekrofilterskog pepela termoelektrana”, Tehnološko-metalurški fakultet Univerziteta u Beogradu, 2016. (zahvalnica data u prilogu).
4. Marija Mihajlović-Kostić, Sorpcija jona olova, kadmijuma i cinka iz vodenih rastvora na prirodnom i modifikovanom zeolitu”, Tehnološko-metalurški fakultet Univerziteta u Beogradu, 2016. Iz zajedničkog rada proistekli jedan rad kategorije M22, jedan rad M23 i jedno saopštenje kategorije M33.
5. Vesna Marjanović, „Proučavanje sorpcije hroma(VI) iz vodenih rastvora na funkcionalizovanim sepiolitima”, Tehnološko-metalurški fakultet, Univerzitet u Beogradu, 2013. Iz zajedničkog rada u toku izrade doktorske disertacije proistekli su jedan rad kategorije M21a, jedan rad kategorije M21, jedan rad M23 i jedno saopštenje kategorije M33.

7.3. Organizacija naučnog rada

Uz saglasnost rukovodica projekta ”Sinteza, razvoj tehnologija dobijanja i primena nanostrukturnih, multifunkcionalnih materijala definisanih svojstava”, koje finansira Ministarstvo prosvete, nauke i tehnološkog razvoja (evidencioni broj III 45019), dr Slavici Lazarević je povereno rukovođenje, planiranje i realizacija potprojektnog zadatka ”Razvoj i primena novih sorbenata na bazi prirodnih minerala” u okviru potprojekta 1 projekta III 45019. (Prilog).

7.4. Kvalitet naučnih rezultata

7.4.1. Uticajnost, pozitivna citiranost, ugled i uticajnost publikacija u kojima su kandidatovi radovi objavljeni

U svom dosadašnjem naučno-istraživačkom radu dr Slavica Lazarević je, kao autor ili koautor, objavila 2 rada u međunarodnim časopisima ranga M21a, 11 radova u međunarodnim časopisima ranga M21, 3 rada u časopisima M22 i 11 radova u časopisima kategorije M23. Radovi dr Slavice Lazarević do 21.04. 2019. godine citirani 489 puta, odnosno 423 puta ne računajući autocitate prema podacima baze "Scopus, (Author ID: 16744257900). Prema bazi "Scopus" dr Slavica Lazarević ima h indeks 11.

Radovi kandidata citirani su u prestižnim časopisima kao što su: ACS Sustainable Chemistry and Engineering (IF=6,140), Carbon (IF=7,082), Desalination (IF=6,603), Journal of Colloid and Interface Science (IF=5,091) Chemical Engineering Journal (IF=6,216), Journal of Hazardous Materials (IF=6,434), Chemosphere (IF=4,427), Microporous and Mesoporous Materials (IF=3,649) Industrial and Engineering Chemistry Research (IF=3,141) i dr. Pozitivna citiranost radova kandidata ukazuje na aktuelnost, uticajnost i ugled objavljenih radova.

Rad 3.1.4.11., u časopisu Applied Clay Science, na kom je dr Slavica Lazarević prvi autor, citiran je 123 puta (107 puta bez autocitata).

Kandidat je nakon izbora u zvanje naučni saradnik, objavio 17 radova, koji su publikovani u međunarodnim časopisima ranga M21, M22 i M23: Powder Technology, IF (2017) = 3,230), Environmental Science and Pollution Research, IF (2015) =2,760, The Journal of Supercritical Fluids, IF (2016)=2,991, Applied Clay Science, IF (2013) =2,703, Clean Technologies and Environmental Policy, IF (2014)=1,934, Starch, IF (2014)=1,677), Journal of the Serbian Chemical Society, IF (2015)= 0,970, Advances in Materials Science and Engineering IF (2015)=1,010, Hemijska Industrija IF(2013)=0,463, Chemical Industry and Chemical Engineering Quarterly, IF (2014)=0,892, i u časopisu Journal of Environmental Chemical Engineering (van SCI liste, bez IF). Ukupan impakt faktor časopisa u kojima su objavljene publikacije dr Slavice Lazarevic, u periodu posle izbora u zvanje naučni saradnik, iznosi 26,749.

7.4.2. Efektivan broj radova i broj radova normiran na osnovu broja koautora, ukupan broj kandidatovih radova, udeo samostalnih i koautorskih radova u njemu, kandidatov doprinos u koautorskim radovima

Dr Slavica Lazarević je u dosadašnjem naučnoistraživačkom radu publikovala 27 radova kategorije M20, 1 rad kategorije M51 i 35 saopštenja štampanih u celini ili izvodu. Bila je prvi autor na 9 radova kategorije M20 (5M21,1M22 i 3M23) i na 12 saopštenja (2 M33, 4M 34, 2M 63 i 4 M64) i na radu kategorije M51, drugi na 13 radova (2 M21a, 4 M21, 2 M22 i 6 M23) i na 15 saopštenja štampanih u celini ili izvodu.

Nakon izbora u prethodno naučno zvanje-naučni saradnik dr Slavica Lazarević je objavila 5 radova u vrhunskim međunarodnim časopisima (M21), 2 rada u istaknutim međunarodnim časopisima (M22), 10 radova u časopisima međunarodnog značaja (M23),

5 radova saopštenih na skupovima međunarodnog značaja štampanih u celini (M33), 5 radova saopštenih na skupovima međunarodnog značaja štampanih u izvodu (M34), 1 bitno poboljšano tehničko rešenje na nacionalnom nivou (M84) i 1 objavljen patent na nacionalnom nivou (M94). Kandidat je prvi autor u 2 M23 rada, drugi u 11 radova (3 M21, 2 M22 i 6 M23), treći u jednom M21 radu. U gotovo svim radovima kandidat je prvi ili drugi autor, što potvrđuje da su publikacije rezultat ili eksperimentalnog rada samog kandidata ili predmet rada doktorskih disertacija u kojima je kandidat učestvovao.

Prosečan broj autora po radu za ukupno navedenu bibliografiju iznosi 5,9, a za period posle izbora izbora u prethodno zvanje 6,3.

Doprinos dr Slavice Lazarević u svim koautorskim radovima je od velikog značaja, što podrazumeva učešće u formiranju teme, koncepta i ciljeva rada, učešće u eksperimentalnom radu, analizi i komentarisanju dobijenih rezultata i pisanju naučnih radova.

7.4.3. Stepen samostalnosti u naučnoistraživačkom radu i uloga u realizaciji radova u naučnim centrima u zemlji i inostranstvu

Slavica Lazarević je tokom dosadašnjeg naučno-istraživačkog rada pokazala visok stepen samostalnosti u idejama, kreiranju i realizaciji eksperimenata, obradi rezultata i pisanju naučnih radova. Rezultate svojih istraživanja je sistematski analizirala, objasnila i publikovala u uticajnim međunarodnim časopisima.

U okviru svog naučno-istraživačkog rada dr Slavica Lazarević se bavila razvojem savremenih materijala i mogućnostima njihove primene. Poseban fokus istraživanja bio je na karakterizaciji i ispitivanju sorpcionih svojstava iz tečne i gasovite faze prirodnih minerala (sepiolita i zeolita) kao i na proučavanju uticaja različitih postupaka modifikacije prirodnih minerala i sintetisanih sorbenata na fizičko-hemijska i sorpciona svojstva.

U svojim istraživanjima, realizaciji nastave na akademskim studijama i u radu sa studentima master i doktorskih studija potpuno samostalno koristi sledeće metode za karakterizaciju: visokorezulucionu skenirajuću elektronsku mikroskopiju (FE-SEM), odredjivanje specifične površine, veličine i raspodele veličina pora (BET), infracrvenu spektroskopsku analizu (FTIR), UV-Vis spektroskopiju, metode termijske analize materijala (termomikroskop, DTA-TGA), a samostalno tumači i u istraživanjima koristi rezultate dobijene: transmisionom elektronskom mikroskopijom (TEM/HRTEM), rendgenskom difrakcionom analizom (XRD), itd.

Tokom realizacije naučnih projekata dr Slavica Lazarević je aktivno učestvovala u realizaciji naučne saradnje sa institucijama u zemlji i inostranstvu. U okviru realizacije FP7-REGPOT projekta, kandidat je učestvovao u realizaciji naučne saradnje sa centrima: Materials Design & Processing and Laboratory of the Material Science and Technology, University of Perugia, u Terniju i Institut de physique et chimie des matériaux de Strasbourg (IPCMS), u Strazburu. Kandidat je ostvario i uspešna saradnju sa Institutom Jožef Stefan u Sloveniji (zajedničke publikacije 3.1.2.2. i 3.1.3.1.). Od domaćih institucija treba staći saradnju sa Institutom tehničkih nauka SANU, Institutom za nuklearne nauke „Vinča“, Institutom za hemiju, tehnologiju i metalurgiju, itd.

Ostvarenim rezultatima kandidat je doprineo realizaciji međunarodnih i domaćih projekata na kojima je učestvovao, dok je svojim radovima doprineo i definisanju novih tema i pravaca istraživanja u okviru istraživačke grupe kojoj pripada.

7.4.4. Sumarni prikaz dosadašnje naučno-istraživačke aktivnosti

Kvantitativno izražen uspeh dr Slavice Lazarević u dosadašnjem naučno-istraživačkom radu prikazan je u tabeli:

Kategorija rada	Koeficijent kategorije	Broj radova u kategoriji		Zbir	
		ukupno	posle izbora	ukupno	posle izbora
Radovi u međunarodnim časopisima izuzetnih vrednosti **(M21a)**	**10**	**2**	**-**	**20**	**-**
Radovi u vrhunskim međunarodnim časopisima **(M21)**	**8**	**11**	**5**	**88/ 85,33***	**40/ 37,33***
Radovi u istaknutim međunarodnim časopisima **(M22)**	**5**	**3**	**2**	**15**	**10**
Radovi u časopisima međunarodnog značaja **(M23)**	**3**	**11**	**10**	**33**	**30**
Radovi saopšteni na skupovima međunarodnog značaja štampani u celini **(M33)**	**1**	**8**	**5**	**8**	**5**
Radovi saopšteni na skupovima međunarodnog značaja štampani u izvodu **(M34)**	**0,5**	**14**	**5**	**7**	**2,5**
Naučni radovi objavljeni u vodećim časopisima nacionalnog značaja **(M51)**	**2**	**1**	**-**	**2**	**-**
Radovi saopšteni na skupovima nacionalnog značaja štampani u celini **(M63)**	**0,5**	**2**	**-**	**1**	**-**
Radovi saopšteni na skupovima nacionalnog značaja štampani u izvodu **(M64)**	**0,2**	**7**	**-**	**1,4**	**-**
Odbranjena doktorska disertacija **(M71)**	**6**	**1**	**-**	**6**	**-**
Odbranjen magistarski rad **(M72)**	**3**	**1**	**-**	**3**	**-**
Bitno poboljšano tehničko rešenje na nacionalnom nivou **(M84)**	**3**	**1**	**1**	**3/2,14***	**3/2,14***
Objavljen patent na nacionalnom nivou **(M94)**	**7**	**1**	**1**	**7/4,38***	**7/4,38***
UKUPAN KOEFICIJENT				**194,4/ 188,24***	**97,5/ 91,35***

Napomena: *- u skladu sa Pravilnikom Ministarstva normirano na broj autora prema formuli K/(1+0,2(n-7)), n>7

Uslov za izbor u zvanje viši naučni saradnik za tehničko-tehnološke i biotehničke nauke, koje propisuje Pravilnik o postupku i načinu vrednovanja, i kvantitativnom iskazivanju naučnoistraživačkih rezultata istraživača, je prikazan u tabeli:

Diferencijalni uslov od prvog izbora u prethodno zvanje do izbora u zvanje viši naučni saradnik	Potrebno je da kandidat ima najmanje xx poena, koji treba da pripadaju sledećim kategorijama:		
		Neophodno XX=	Ostvareno
Viši naučni saradnik	Ukupno	50	**97,5/ 91,35***
Obavezni (1)	M10+M20+M31+M32+M33+M41+M42 +M51+M80+M90+M100	40	**95/88,85***
Obavezni (2)	M21+M22+M23+M81-85+M90-96+ M101-103+M108	22	**90/83,85***
	M21+M22+M23	11	**80/77,33***
	M81-85+M90-96+M101-103+M108	5	**10/6,52***

Napomena: *- u skladu sa pravilnikom ministarstva normirano na broj autora prema formuli K/(1+0,2(n-7)), n>7

Na osnovu prikazanog, zaključujemo da rezultati prevazilaze potrebne kvantitativne uslove za predloženo zvanje, propisane Pravilnikom o postupku i načinu vrednovanja naučnoistraživačkih rezultata.

ZAKLJUČAK

Rezultati naučno-istraživačkog rada dr Slavice Lazarević, posle izbora u zvanje naučni saradnik, su objavljeni u 17 radova kategorije M20 (5 radova M21, 2 rada M22 i 10 radova M23 kategorije). Ukupan zbir bodova, koji uključuje sve publikacije u periodu posle izbora u prethodno zvanje iznosi 97,5 što pokazuje da njena stručna kompetentnost prevazilazi kvantitativne kriterijume za izbor u traženo zvanje (50 bodova).

Radovi dr Slavice Lazarević su citirani 423 puta bez autocitata u međunarodnim časopisima, što predstavlja značajan doprinos nauci i bitan pokazatelj kvaliteta rada kandidata. Kroz rukovođenje projektnim zadacima i učešće u izradama doktorskih disertacija kandidat je pokazao sposobnost samostalnog organizovanja naučnog rada.

U toku svog dosadašnjeg rada dr Slavica Lazarević pokazala je da poseduje izuzetno interesovanje za oblast kojom se bavi, kreativnost, preciznost i upornost u ostvarenju naučno-istraživačkih ciljeva i rešavanju naučno-istraživačkih problema.

Imajući u vidu broj i kvalitet publikovanih radova, ostvareni originalni naučni doprinos kandidata, visoku citiranost i iskazanu sposobnost organizacije naučnog rada, smatramo da dr Slavica Lazarević dipl. inž. tehnol., ispunjava sve uslove za izbor u zvanje **VIŠI NAUČNI SARADNIK**. Komisija predlaže Nastavno-naučnom veću Tehnološko-metalurškog fakulteta Univerziteta u Beogradu da usvoji ovaj Izveštaj i isti prosledi odgovarajućoj Komisiji Ministarstva prosvete, nauke i tehnološkog razvoja Republike Srbije na konačno usvajanje.

U Beogradu, 08.05. 2019. godine

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