

NASTAVNO-NAUČNOM VEĆU  
TEHNOLOŠKO-METALURŠKOG FAKULTETA  
UNIVERZITETA U BEOGRADU

Na sednici Nastavno-naučnog veća Tehnološko-metalurškog fakulteta održanoj 05.11.2020. godine određeni smo za članove Komisije za pripremu izveštaja o ispunjenosti uslova za izbor u naučno-istraživačko zvanje viši naučni saradnik za kandidata dr Branka Dunjića, dipl. inž. tehnologije. O ispunjenosti uslova za izbor dr Branka Dunjića u naučno-istraživačko zvanje VIŠI NAUČNI SARADNIK podnosimo sledeći

## IZVEŠTAJ

### 1. BIOGRAFSKI PODACI

Dr Branko Dunjić je rođen 4.08.1963. godine u Lučanima, gde je završio osnovnu školu. Srednju školu je završio u Gornjem Milanovcu 1982. godine i iste godine se upisao na Tehnološko-metalurški fakultet Univerziteta u Beogradu. Studije je završio 1988. godine na Organsko-tehnološkom odseku i Grupi tehnologija polimernih materijala sa prosečnom ocenom 9,36 i ocenom diplomskog rada 10. Na poslediplomske studije na Tehnološko-metalurškom fakultetu Univerziteta u Beogradu, smer Hemija i inženjerstvo polimera upisao se 1988/89. godine. Magistarski rad pod naslovom „Reološko ispitivanje stereoregularnih polifumarata” je uradio pod mentorstvom prof. dr. Mihaila S. Jaćovića i odbranio ga jula 1991. godine.

Od 1992. godine do 1995. godine bio je na specijalizaciji u Francuskoj. Prvu godinu je proveo u Laboratoriji za hemiju makromolekula na Univerzitetu Paris VI, gde je radio na sintezi i karakterizaciji stereoregularnih poliestara. Zatim je eksperimentalni deo doktorske disertacije iz oblasti sinteze i karakterizacije funkcionalizovanih polimera uradio u Laboratoriji za katalizu i organsku sintezu na Univerzitetu Claude Bernard Lyon I u Lionu, u grupi profesora dr Marc Lemaire. Doktorsku disertaciju pod nazivom „Sinteza funkcionalizovanih polimera i njihova primena u asimetričnoj katalizi i separaciji jona“ odbranio je maja 1997. godine na Tehnološko-metalurškom fakultetu Univerziteta u Beogradu.

Na Tehnološko-metalurškom fakultetu Univerziteta u Beogradu zaposlio se početkom 1991. godine kao asistent-pripravnik na Katedri za Opštu i neorgansku hemiju. U zvanje asistenta za predmete Hemija makromolekula i Opšta hemija izabran je 1992. Godine, a 1997. izabran je u zvanje docenta za predmete Hemija makromolekula i Opšta hemija. Od 1998. godine bio je angažovan u kompaniji „Duga-Holding a.d.”, prvo na poslovima upravnika Laboratorije za istraživanje, a od 2000. godine kao direktor preduzeća „Duganova”, a.d., i direktor Sektora za ravoj proizvoda i kapaciteta „Duga Holding” a.d. Sve vreme je bio angažovan na poslovima rukovođenja istraživanja i razvoja polimera i polimernih materijala u oblasti boja i lakova.

Od 2007. godine je direktor Centra za čistiju proizvodnju na Tehnološko-metalurškom fakultetu Univerziteta u Beogradu koji je osnovan u okviru projekta UNIDO (Organizacija UN za industrijski razvoj) gde se bavi uvođenjem preventivne strategije zaštite životne sredine u industriju u Srbiji.

U zvanje viši naučni saradnik izabran je u maju 2010. godine, a reizabran u februaru 2016. godine.

Dr Branko Dunjić govori francuski, ruski i engleski jezik, a služi se španskim. 1999. godine dr Dunjić je dobio Medalju za pregalaštvo i uspeh u nauci koju Srpsko hemijsko društvo dodeljuje mladim naučnim radnicima. Od 2009. do 2011. godine je bio sekretar Srpskog hemijskog društva, a od januara 2020. godine je područnu urednik za polimere časopisa Srpskog hemijskog društva (Journal od the Serbian Chemical Society). Od Srpskog hemijskog društva u decembru 2018. godine je dobio zahvalnicu za podršku u sprovođenju UNIDO projekta Zelena hemija.

U periodu od 1991. do 1997. godine učestvovao je u izvodjenju nastave na predmetima Opšta hemija i Hemija makromolekula. U radu na eksperimentalnim i računskim vežbama na predmetima Hemija makromolekula i Opšta hemija pokazao je punu odgovornost, smisao za pedagoški rad, kao i sklonost ka uvođenju inovacija u nastavu. Dr Branko Dunjić znanja stečena kroz naučno-istraživački rad sa entuzijazmom prenosi na studente i saradnike učestvovao je u izradi diplomskih i magistarskih radova i jedne doktorske disertacije. U periodu od 2007. godine do danas, dr Dunjić povremeno drži predavanja iz osnova sirovinski efikasnije i čistije proizvodnje studentima završnih godina TMF.

Naučno interesovanje dr Branka Dunjića može se po tematici svrstati u oblasti nauke o polimerima i obuhvata sintezu polimera reakcijama stupnjevitih polimerizacija, reokinetiku, odnosno izučavanje reakcije umrežavanja termoočvršćavajućih polimera analizom reoloških parametara, zatim sinteza i karakterizacija funkcionalizovanih polimera, hiperrazgranatih poliestara i nanokompozita sa puniocima prirodnog porekla. Od 2007., dr Dunjić istražuje i u oblasti sirovinski efikasnije i čistije proizvodnje i održivog razvoja.

Dr Branko Dunjić je od prethodnog izbora u zvanje Viši naučni saradnik, tj. u periodu od 2016. do 2020. godine publikovao sedam (7) naučnih radova u međunarodnim časopisima i jedno poglavlje u monografiji međunarodnog značaja. Na međunarodnim naučnim skupovima saopšto je 2, a na nacionalnim naučnim skupovima takođe je saopšto 2 rada, koji su štampani u izvodu. Dr Branko Dunjić znanja stečena kroz naučno-istraživački rad sa entuzijazmom prenosi i na saradnike učešćem u izradi jedne doktorske disertacije, kandidata Miloša Tomića pod nazivom „Uticaj hemijske modifikacije glina na strukturu i svojstva njihovih epoksidnih nanokompozita”.

Sveukupno, dr Branko Dunjić do sada je publikovao 51 naučni rad i to 40 u međunarodnim časopisima, 4 rada u međunarodnim časopisima van SCI liste i 7 u domaćim naučnim časopisima, a 8 radova je saopšto na međunarodnim i 2 na domaćim naučnim skupovima, koji su štampani u celini. Na domaćim i međunarodnim naučnim skupovima saopšto je još 38 radova, koji su štampani u izvodu. Objavljeni radovi u časopisima međunarodnog značaja su u periodu od 2016. do 2020. godine citirani 251 put, bez autocitata svih autora. Ukupno, radovi dr Branka Dunjića citirani su 870 puta, a bez autocitata svih autora 744 puta (Izvor SCOPUS na dan 02.12.2020.). Učestvovao je u realizaciji više naučno-istraživačkih projekta, a postignuti rezultati daju značajan doprinos razvoju nauke o polimerima u našoj zemlji, a posebno u oblasti hemije sintetskih funkcionalizovanih i hiperrazgranatih polimera za premaze.

## 2. PREGLED DOSADAŠNJEGL NAUČNOG I STRUČNOG RADA

U periodu od 2016. do 2020. godine naučno-istraživački i stručni rad dr Branka Dunjića se može podeliti u tri kategorije:

- Izučavanje sinteze, karakterizacije i primene nano-kompozita u epoksidnim premazima za antikorozionu zaštitu
- Izučavanje reološkog ponašanja modifikovanih hiperrazgranatih polimera
- Sirovinski efikasnija i čistija proizvodnja i upravljanje hemikalijama

U periodu od 1997. do 2016. godine naučno-istraživačka delatnost dr Branka Dunjića može se po tematici svrstati u sedam grupa:

- Prvu naučno-istraživačku oblast predstavljaju izučavanje mehanizma i kinetike reakcija polikondenzacije, sa posebnim akcentom na sintezu stereoregularnih poliestara kao i karakterisanje njihove molekulske strukture i reoloških svojstava.
- Drugu oblast čini reokinetika, odnosno izučavanje reakcije umrežavanja termoočvršćavajućih polimera, kao i svojstava umreženih proizvoda pomoću dinamičke mehaničke analize.
- Treća grupa naučno-istraživačkog rada obuhvata izučavanje reološkog ponašanja termoplastičnih elastomera, bitumena i skroba.
- Četvrtu oblast predstavljaju sinteza i karakterizacija funkcionalizovanih polimera, koji u lancu sadrže grupe sposobne da ispune ulogu katalizatora. Nanošenjem rodijuma na optički aktivne poliuree i poliamide dobijeni su heterogeni katalizatori.
- Peta oblast istraživanja su polimeri sa jonoselektivnim svojstvima. Za razliku od komercijalno raspoloživih umreženih polistirena hidrofobnog karaktera odabrani su hidrofilni polietri i poliuretani sa bočnim makrocikličnim ligandima (krunskim etrima) i proverena je njihova selektivnosti u separaciji jona.
- Šesta oblast istraživanja se odnosi na izučavanje sinteze, karakterizacije i primene polimera na bazi hiperrazgranatih poliestara (HRP) u premazima. HRP spadaju u grupu dendritskih polimera koju karakteriše jako razgranata struktura, slojevito organizovana struktura i veliki broj reaktivnih završnih grupa. Ovo za posledicu ima da materijali dobijeni polazeći od ovakvih polimera imaju mali viskozitet za datu molarnu masu, veliku rastvorljivost i reaktivnost. To ih čini idealnim za primenu u premazima.
- Izučavanje sinteze, karakterizacije i primene nano-kompozita u epoksidnim premazima za antikorozionu zaštitu

Dosadašnji naučni i stručni rad dr Branka Dunjića obuhvata objavljene naučne radove, saopštenja na skupovima u zemlji i inostranstvu u periodu 1991-2020. godine. Posebno su izdvojeni radovi posle poslednjeg izbora u zvanje viši naučni saradanik čija je klasifikacija izvršena prema Pravilniku o postupku i načinu vrednovanja i kvantitativnom iskazivanju naučno-istraživačkih rezultata istraživača („Službeni glasnik RS“, br. 24/2016, 21/2017 i 38/2017).

## **2.1 SPISAK OBJAVLJENIH RADOVA PRE POSLEDNJEG IZBORA U ZVANJE VIŠI NAUČNI SARADNIK**

### **2.1.1 Rad u vrhunskom međunarodnom časopisu – M21:**

1. J. Djonlagić, M.O. Sepulchre, M. Sepulchre, N. Spassky, **B. Dunjić**, M.S. Jaćović, "Synthesis of random, multi-bloc and alternating unsaturated copolyesters from fumaric,

- maleic and phtalic acid potassium salts and 1,4-dibromobutane", *Makromol. Chem.*, 191, 1529-1543. (1990) (ISSN 0025-116X; IF 1,662, (1998))
2. Jaćović, M.S., **Dunjić, B.**, Djonlagić, J., Spassky, N., Sepulchre, M., Sepulchre, M.-O. "Synthesis and rheological study of some maleic acid and fumaric acid stereoregular polyesters - 8. Unsaturated polyester fibers", *Polym. Bull.*, 28 (6), 621-626. (1992) (ISSN 0170-0839; IF 1,128)
3. Gamez, P., **Dunjic, B.**, Fache, F., Lemaire, M. "C2 diamine, pseudo-C2 poly(amide) and poly(urea) as chiral inductors in asymmetric catalysis" *J. Chem. Soc., Chem. Commun.*, (12) 1417-1418. (1994) (ISSN 0022-4936; IF 2.575)
4. **Dunjic, B.**, Favre-Réguillon, A., Duclaux, O., Lemaire, M. "New polyether-based ionoselective materials", *Adv. Mater.*, 6 (6), 484-486. (1994) (ISSN 0935-9648; IF 3,206)
5. Gamez, P., **Dunjic, B.**, Pinel, C., Lemaire, M. "Molecular imprinting effect' in the synthesis of immobilized rhodium complex catalyst (IRC cat)", *Tetrahedron Lett.*, 36 (48), 8779-8782. (1995) (ISSN 0040-4039; IF 2,321)
6. Gamez, P., **Dunjic, B.**, Fache, F., Lemaire, M. „Homogeneous and heterogeneous Pd-catalyzed enantioselective alkylation with C2-symmetric chiral nitrogen ligands“ *Tetrahedron Asymmetry*, 6 (5), 1109-1116. (1995) (ISSN 0957-4166; IF 2,801)
7. Favre-Réguillon, A., Dumont, N., **Dunjic, B.**, Lemaire, M. "Synthesis and evaluation of new polyurethane - Based material for ion separation", *Tetrahedron Lett.*, 36 (36), 6439-6442. (1995) (ISSN 0040-4039; IF 2,231)
8. Gamez, P., **Dunjic, B.**, Lemaire, M. "Diureas as ligands in asymmetric reduction of ketones", *J. Org. Chem.*, 61 (16), 5196-5197. (1996) (ISSN 0022-3263; IF 3,029)
9. Favre-Réguillon, A., Dumont, N., **Dunjic, B.**, Lemaire, M. "Polymeric and immobilized crown compounds, material for ion separation", *Tetrahedron*, 53 (4), 1343-1360. (1997) (ISSN 0040-4020; IF 2,160)
10. Fache, F., **Dunjic, B.**, Gamez, P., Lemaire, M. "Recent advances in homogeneous and heterogeneous asymmetric catalysis with nitrogen-containing ligands", *Topics in Catalysis*, 4 (3-4), 201-209. (1997) (ISSN 1022-5528; IF 2,436)
11. **Dunjic, B.**, Sepulchre, M.-O., Sepulchre, M., Spassky, N., Djonlagic, J. "Synthesis and rheological study of some maleic acid and fumaric acid stereoregular polyesters, 10: Synthesis and characterization of  $\alpha,\omega$ -dihydroxyoligo(alkylene maleate)s", *Macromol. Chem. Phys.*, 199 (6), 1051-1055. (1998) (ISSN 1022-1352; IF 1,662)
12. Djonlagic, J., Zlatanic, A., **Dunjic, B.** "Rheological behavior of cured acrylate-terminated unsaturated copolyesters", *Macromol. Chem. Phys.*, 199 (9), 2029-2039. (1998) (ISSN 1022-1352; IF 1,662)
13. Zlatanic, A., **Dunjic, B.**, Djonlagic, J. "Rheological study of the copolymerization reaction of acrylate-terminated unsaturated copolyesters with styrene", *Macromol. Chem. Phys.*, 200 (9), 2048-2058. (1999) (ISSN 1022-1352; IF 1,539)
14. Markovic, S., **Dunjic, B.**, Zlatanic, A., Djonlagic, J. "Dynamic mechanical analysis study of the curing of phenol-formaldehyde novolac resins", *J. Appl. Polym. Sci.*, 81 (8), 1902-1913. (2001) (ISSN 0021-8995; IF 0,992)
15. Dzunuzovic, E., Tasic, S., Bozic, B., Babic, D., **Dunjic, B.** "UV-curable hyperbranched urethane acrylate oligomers containing soybean fatty acids", *Progress in Organic Coatings*, 52 (2), 136-143. (2005) (ISSN 0300-9440; IF 1,535)

16. Džunuzović, E., Tasić, S., Božić, B., Jeremić, K., **Dunjić, B.**, „Photoreactive hyperbranched urethane acrylates modified with a branched saturated fatty acid”, *Reactive and Functional Polymers*, 66 (10), 1097-1105. (2006) (ISSN 1381-5148; IF 1,561)
17. Marinovic, S., Popovic, I., **Dunjić, B.**, Tasic, S., Bozic, B., Jovanovic, D.“ The influence of different components on interpenetrating polymer network's (IPN's) characteristics as automotive top coats“ (2010) *Progress in Organic Coatings*, 68 (4), pp. 293-298. (ISSN 0300-9440; IF 2,090)
18. Džunuzović, E.S., Tasić, S.V., Božić, B.R., Džunuzović, J.V., **Dunjić, B.M.**, Jeremić, K.B. Mechanical and thermal properties of UV cured mixtures of linear and hyperbranched urethane acrylates (2012) *Progress in Organic Coatings*, 74 (1), pp. 158-164. (ISSN 0300-9440; IF 2,431)
19. Tomić, M.D., **Dunjić, B.**, Likić, V., Bajat, J., Rogan, J., Djonlagić, J. The use of nanoclay in preparation of epoxy anticorrosive coatings (2014) *Progress in Organic Coatings*, 77 (2), pp. 518-527. (ISSN 0300-9440; IF 2,577)

## **2.1.2 Rad u istaknutom međunarodnom časopisu – M22**

1. Dumont, N., Favre-Réguillon, A., **Dunjic, B.**, Lemaire, M. “Extraction of cesium from an alkaline leaching solution of spent catalysts using an ion-exchange column” *Separation Science and Technology*, 31 (7), 1001-1010. (1996) (ISSN 0149-6395; IF 0,695)
2. **Dunjic, B.**, Gamez, P., Fache, F., Lemaire, M. “Synthesis and characterization of a new chiral polyurea-based catalyst” *Journal of Applied Polymer Science*, 59 (8), 1255-1262. (1996) (ISSN 0021-8995; IF 0,886)
3. Dumont, N., Favre-Réguillon, A., **Dunjic, B.**, Lemaire, M. “Elimination of Vanadium and Arsenic from VKCs Catalysts” *Separation Science and Technology*, 32 (16), 2591-2605. (1997) (ISSN 0149-6395; IF 0,695)
4. Favre-Réguillon, A., **Dunjic, B.**, Dumont, N., Lemaire, M. “Template effect in caesium selective phenolic resins” *Journal of Inclusion Phenomena in Macrocyclic Chemistry*, 32 (4), 477-484. (1998) (ISSN 0923-0750; IF 0,685)
5. Favre-Réguillon, A., **Dunjic, B.**, Lemaire, M., Chomel, R. “Synthesis and evaluation of resorcinol-based ion-exchange resins for the selective removal of cesium” *Solvent Extraction and Ion Exchange*, 19 (1), 181-191. (2001) (ISSN 0736-6299; IF 0,984)
6. Favre-Réguillon, A., **Dunjic, B.**, Dumont, N., Lemaire, M. “Design of ion-exchange resins selective of caesium. Synergistic effect of macrocycle in phenolic resins” *Separation Science and Technology*, 36 (3), 367-379. (2001) (ISSN 0149-6395; IF 0,862)
7. Tasic, S., Bozic, B., **Dunjic, B.** “Synthesis of new hyperbranched urethane-acrylates and their evaluation in UV-curable coatings” *Progress in Organic Coatings*, 51 (4), pp. 321-328. (2004) (ISSN 0300-9440; IF 1,214)
8. Simić, S., **Dunjić, B.**, Tasić, S., Božić, B., Jovanović, D., Popović, I. “Synthesis and characterization of interpenetrating polymer networks with hyperbranched polymers through thermal-UV dual curing” *Progress in Organic Coatings*, 63 (1), 43-48. (2008) (ISSN 0300-9440; IF 1,375)
9. **Dunjic, B.**, Tasic, S., Bozic, B., Aleksandrovic-Bondzic, V., Nikolic, M.S., Djonlagic, J. Rheological properties of hydroxyl-terminated and end-capped aliphatic hyperbranched polyesters (2015) *Journal of Applied Polymer Science*, 132 (7), .(ISSN 0021-8995, IF 1,640)

### **2.1.3 Rad u međunarodnom časopisu – M23**

1. N. Spassky, M.O. Sepulchre, M. Sepulchre, **B. Dunjić**, J. Djonlagić, "Synthesis of stereoregular polyesters by polycondensation of alkine dicarboxylates with  $\alpha,\omega$ -dihalogeno aliphatic compounds". *J. Serb. Chem. Soc.*, **57**, 285-298. (1993) (ISSN 0352-5139; IF )
2. J. Djonlagić, **B. Dunjić**, M. Sepulchre, M.O. Sepulchre, N. Spassky, "Synthesis and rheological study of some maleic acid and fumaric acid stereoregular polyesters. 9. Rheological study of cured configurationally pure unsaturated polyesters", *J. Serb. Chem. Soc.*, **57**, 299-309 (1993) (ISSN 0352-5139; IF )
3. S. Jovanović, K. Jeremić, R. Jovanović, J. Djonlagić, **B. Dunjić**, "Thermoplastic Starch", *J. Serb. Chem. Soc.*, **62**, 623-629. (1997) (ISSN 0352-5139; IF )
4. K. Jeremić, **B. Dunjić**, J. Djonlagić, S. Jovanović, "Blends of thermoplastic starch and some thermoplastic polymers", *J. Serb. Chem. Soc.*, **63** 753-762. (1998) (ISSN 0352-5139; IF nema)
5. S. Markovic, J. Djonlagic, J. Zakrzevska, **B. Dunjic**, "Study of the structure of phenol-formaldehyde novolac resins by NMR spectroscopy and gel-permeation chromatography", *J. Serb. Chem. Soc.*, **64** 177-189. (1999) (ISSN 0352-5139; IF )
6. **B. Dunjic**, J. Djonlagic, S. Vukasinovic, M. Sepulchre, M.O. Sepulchre, N. Spassky, "A rheokinetic study of crosslinking of  $\alpha,\omega$  - dihydroxyoligo(alkylene maleate)s with a triisocyanate", *J. Serb. Chem. Soc.*, **68** ,147-162 (2003) (ISSN 0352-5139; IF 0,474)
7. Džunuzović, E., Tasić, S., Božić, B., Babić, **D.**, **Dunjić**, B. "Dynamical mechanical analysis of photocrosslinked hyperbranched urethane acrylates", *J. Serb. Chem. Soc.*, **69** ,441-453 (2004) (ISSN 0352-5139; IF 0,474)

### **2.1.4 Rad u međunarodnom časopisu van SCI liste**

1. J. Djonlagić, **B. Dunjić**, J.A. Jovanović, "A Rheological Study of Behaviour of Polymer Bitumen Blends", *Erdöl & Kohle, Erdgas, Petrochemie*, **112**, 509-511 (1996) (ISSN 0179-3187; IF - nema)
2. **Dunjic, B.**, Tasic, S., Božić, B. "Hyperbranched urethane-acrylates" European Coatings Journal, (6), 36-41. (2004) (ISSN 0930-3847; IF - nema)

### **Zbornici međunarodnih naučnih skupova (M30)**

### **2.1.5 Predavanje po pozivu sa medunarodnog skupa štampano u izvodu –M32**

1. New Hyperbranched Urethane Acrylates , "Materials for the future: what a chemist can contribute" 4th October 2011, Camerino, Italija.

### **2.1.6 Saopštenje sa međunarodnog skupa štampano u celini – M33**

1. J. Djonlagić, **B. Dunjić**, M.S. Jaćović, M.O. Sepulchre, M. Sepulchre, N. Spassky, "Synthesis and characterization of some random, alternating and multi-blok unsaturated copolyesters", III European Polymer Federation Symposium on Polymeric Materials, Sorento, Italia, oktobar, 1990.

2. J.A. Jovanović, J. Djonlagić, **B. Dunjić**, "A Rheological Study of Behaviour of Polymer Bitumen Blends", 5th Eurobitume Congress, June 1993, Stockholm.
3. **B. Dunjić**, P. Gamez, F. Fache, M. Lemaire, "Sinteza i karakterizacija novih hiralnih katalizatora na bazi poliuree", XII Jugoslovenski simpozijum o hemiji i tehnologiji makromolekula, Herceg-Novi, 24-27. septembra 1996.
4. **B. Dunjic**, A. Favre-Reguillon, O. Duclaux, M. Lemaire, "Synthèse et évaluation de polymères ionoselectifs", SFC, Section Chimie Organique Journés d'Automne, Lyon (France), Septembre 1993.
5. P. Gamez, **B. Dunjic**, F. Fache, M Lemaire, "Substitution allylique catalysée par le Pd : utilisation de ligands chiraux polymérisés"; SFC-Lyon 1994 (France), 26-30 Septembre 1994.
6. A. Favre-Réguillon, **B. Dunjic**, N. Dumont, M. Lemaire, "Immobilisation de macrocycles sur polymères", Congres de la Societe Francaise de Chimie, SFC 1994 Lyon (France), 26-30 septembre 1994.
7. J. Djonlagić, V. Aleksandrović, **B. Dunjić**, R. Jovanović, "Sinteza i karakterizacija termoplastičnih elastomera kopoliestarskog tipa", 3. Naučno-stručno savetovanje sa međunarodnim učešćem, Beograd, 22-23 septembar, 1997.
8. Branislav Bozic, Srba Tasic, Radomir Matovic, Radomir N. Saicic, **Branko Dunjic** "New Hyperbranched Urethane-Acrylates" ACS Symposium series, Vol. 916, Washington DC, 201-214. (2005) (ISSN 0097-6156;), New Polymeric materials, Capri, 22-24. septembra 2003

## 2.1.7 Saopštenje sa međunarodnog skupa štampano u izvodu – M34

1. J. Djonlagić, **B. Dunjić**, M.S. Jaćović, M. Sepulchre, M.O. Sepulchre, N. Spassky, "Sinteza i karakterizacija statističkih, naizmeničnih i multi-blok stereoregularnih, kopoliestara", X Jugoslovenski simpozijum o hemiji i tehnologiji makromolekula, Vrnjačka Banja, maj, 1989,
2. P. Gamez, **B. Dunjic**, F. Fache, M. Lemaire, "Pd-Catalyzed enantioselective allylic substitution, hydride transfer reduction of acetophenone with a chiral polymer as ligand", *POC'94 Venice (Italy)*, June 19-23, 1994.
3. P. Gamez, **B. Dunjic**, F. Fache, M. Lemaire, "Pseudo C<sub>2</sub> poly(amides) and poly(ureas) as chiral ligands in asymmetric catalysis", *BOSS 5* Namur (Belgium), July 11-15, 1994,
4. P. Gamez, **B. Dunjic**, F. Fache, M. Lemaire, "Pseudo C<sub>2</sub> poly(amides) and poly(ureas) as inductive supports in a Meerwein-Ponndorf-Verley type reduction", *European Japanese Symposium*, Rennes (France), September 14-16, 1994.
5. A. Favre-Réguillon, **B. Dunjic**, N. Dumont, M. Lemaire, "Polyurethane-bounded crown ethers. Synthesis and evaluation", *POC'94 Venice (Italy)*, June 19-23, 1994.
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7. A. Favre-Réguillon, **B. Dunjic**, N. Dumont, M. Lemaire, "New Crown Ether-Based Ionoselective Materials", *BOSS 5* Namur (Belgium), July 11-15, 1994.
8. P. Gamez, **B. Dunjic**, F. Fache, C. Pinel, M. Lemaire, "Hydride Transfer Reduction of Ketones in Homogeneous Phase and in Heterogeneous Phase with Template Effect", *Sipsy's Symposium on Asymmetric Catalysis*, Paris (France), June 22-23, 1995.
9. P. Gamez, **B. Dunjic**, F. Fache, M. Lemaire, "Enantioselective Pd-catalyzed Allylic Alkylation in Homogeneous and in Heterogeneous Phase", *Sipsy's Symposium on Asymmetric Catalysis*, Paris (France), June 22-23, 1995.

10. R. Dobrosavljević, S. Jovanović, J. Đonlagić, **B. Dunjić**, B., J. Budinski, "Poliuretan-polimetil(metakrilat) interpenetrirajuće polimerne mreže", *XII Jugoslovenski simpozijum o hemiji i tehnologiji makromolekula, Herceg-Novi*, 24-27. septembra 1996.
11. **B. Dunjić**, A. Favre-Réguillon, N. Dumont, M. Lemaire, "Sinteza i osobine novih jonoselektivnih polimera na bazi poluretana", *XII Jugoslovenski simpozijum o hemiji i tehnologiji makromolekula, Herceg-Novi*, 24-27. septembra 1996.
12. **B. Dunjić**, J. Đonlagić, M. Sepulchre, M. O. Sepulchre, N. Spassky, "Sinteza stereoregularnih teleheličnih poliestara sa završnim hidroksilnim grupama", *XII Jugoslovenski simpozijum o hemiji i tehnologiji makromolekula, Herceg-Novi*, 24-27. septembra 1996.
13. S. Marković, **B. Dunjić**, J. Đonlagić, "Reokinetika umrežavanja fenol-formaldehidnih smola", *XII Jugoslovenski simpozijum o hemiji i tehnologiji makromolekula, Herceg-Novi*, 24-27. septembra 1996.
14. A. Zlatanic, **B. Dunjic**, J. Djonlogic "Rheologocal Study of Crosslinking Acrylate-terminated Unsaturated Ppolyesters", 1st International Conference of the Chemical Societies of the South-East European Countries, June 1-4, 1998, Halkidiki Greece
15. **B. Dunjic**, J. Djonlogic, S. Vukasinovic, M. Sepulchre, M.O. Sepulchre, N. Spassky, "Kinetic Study of Crosslinking Hydroxy-terminated poly(alkylmaleate)s with Triisocyanate", 1st International Conference of the Chemical Societies of the South-East European Countries, June 1-4, 1998, Halkidiki Greece
16. J. Djonlagić, A. Zlatanić, **B. Dunjić**, Synthesis and Characterization of Acrylate-Functionalized Unsaturated Polyesters, IUPAC 39<sup>th</sup> Microsymposium, Advances in polymerization methods: Controlled Synthesis of Functionalized Polymers, Prague, 12-15 July, 1999.
17. V. Aleksandrović, B. Božić, J. Djonlagić, **B. Dunjić**, "Reološko ponašanje alifatskih hiperrazgranatih poliestara", XIII Jugoslovenski simpozijum o hemiji i tehnologiji makromolekula", JU Makro 2001, Zlatibor, 26-2 juni, 2001, Zbornik radova 148.
18. S. Tasić, V. Aleksandrović, J. Djonlagić, **B. Dunjić**, "Uticaj strukture poliestara na dinamičko mehanička svojstva poliestar-melaminskih premaza", XIII Jugoslovenski simpozijum o hemiji i tehnologiji makromolekula", JU Makro 2001, Zlatibor, 26-2 juni, 2001, Zbornik radova 148.
19. **Branko Dunjić**, Branislav Božić, Srba Tasić "Hyperbranched urethane acrylates containing xanthate groups" European Polymer Congress, EPF 2013, Pisa, Jun 16-21, 2013 European Polymer Congress, Book of Abstracts O2-27
20. M. D. Tomić, **B. Dunjić**, V. Likić, J. Djonlagić, Epoxy resin-organoclay nanocomposites for anticorrosion coatings, European Polymer Congress EPF-13, Pisa, June 16–21, 2013, Book of Abstracts, p. 44., P3-39, EPF
21. M. Tomić, V. Likić, **B. Dunjić**, J. Đonlagić, Anticorrosive coatings based on epoxy/organoclay nanocomposites, ICOSECS 8, Belgrade, 18–21 July, 2013, Book of Abstracts, p.182, Serbian Chemical Society, ISBN: 978-86-7132-053-5.
22. M. Tomić, V. Likić, **B. Dunjić**, J. Djonlagić, Anticorrosive epoxy/clay nanocomposites and nanocoatings, Thirteenth Young Researchers' Conference, Belgrade, 10–12. december, 2014, Book of Abstracts, p.25, ISBN: 978-86-80321-30-1
23. Bojana Vukadinovic, Ivanka Popovic Mirjana Kijevcanin, Milos Vlajic, Dejan Stankovic, Zoran Bajic and **Branko Dunjic** „Cleaner Production Assessment - Improvement of Energy and Resource Efficiency of Thermal Power Plants in Serbia, 17th European Roundtable on Sustainable Consumption and Production, 14.-16. October 2014, Portorož, Slovenia, Book of Abstracts, p. 30

24. **Branko Dunjic**, Rodrigo LOZANO, Bojana VUKADINOVIC and Vojislavka SATRIC Seven years of Resource Efficient and Cleaner Production in Serbia: Lessons Learned and Way Forward, 17th European Roundtable on Sustainable Consumption and Production, 14.-16. October 2014, Portorož, Slovenia, Book of Abstracts, p. 80

### Časopisi nacionalnog značaja (M50)

#### 2.1.8 Rad u vodećem časopisu nacionalnog značaja – M51

1. J. Djonlagić, **B. Dunjić**, J.A. Jovanović, "Rheological Properties of Polymer Bitumen Blends", *Plast. i Guma*, **16** (2) 58-65 (1996).
2. **B. Dunjić**, M. Lemaire, "Sinteza funkcionalizovanih polimera i njihova primena u asimetričnoj katalizi", *Hem. Ind.*, **52** (11) 446-449 (1998).
3. **B. Dunjić**, M. Lemaire, "Sinteza heterogenih asimetričnih katalizatora katalizatora metodom "molekulskog otiska", *Hem. Ind.*, **53** (11) 367-371 (1999).
4. S. Marković, **B. Dunjić**, A. Zlatanić, J. Djonlagić, "Reološko izučavanje umrežavanja fenol-formaldehidnih smola", *Hem. Ind.*, **53** (11) 344-349 (1999).
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7. S. Tasić, B. Božić, **B. Dunjić**, "Hiperrazgranati uretan-akrilati", *Hem. Ind.*, **58**, (11), 505-513, (2004).

### Zbornici skupova nacionalnog značaja (M60)

#### 2.1.9 Saopštenja sa skupa nacionalnog značaja štampano u celini – M63

1. S. Marković, J. Djonlagić, **B. Dunjić**, J. Zakrzewska, "Analiza novolačnih smola  $^{13}\text{C}$  NMR spektroskopijom i gel-propusnom hromatografijom", Jugoslovenski kongres inženjera plastičara i gumara YU-POLIMERI '98, Jagodina, 5-8 maj, 1998.
2. K. Jeremić, **B. Dunjić**, J. Djonlagić, S.M. Jovanović, "Svojstva blendi sa sintetičkim polimerima", Jugoslovenski kongres inženjera plastičara i gumara YU-POLIMERI '98, Jagodina, 5-8 maj, 1998.

#### 2.1.10 Naučni radovi saopšteni na skupu nacionalnog značaja štampani u izvodu – M64

1. M. D. Tomić, **B. Dunjić**, V. Likić, J. Rogan, N. Rajić, J. Djonlagić, Mechanical and thermal properties of epoxy-nanoclay nanocomposites, 50<sup>th</sup> Meeting of the Serbian Chemical Society, Belgrade, 14–15.june, 2012, Book of Abstracts, p.134, Serbian Chemical Society, ISBN 978-86-7132-049-8
2. M. Tomić, **B. Dunjić**, V. Likić, J. Djonlagić, Preparation and properties of anticorrosive epoxy/clay nanocomposites, 51<sup>st</sup> Meeting of the Serbian Chemical Society, Niš, 5–7. june, 2014, Book of Abstracts, p.85, Serbian Chemical Society, ISBN: 978-86-7132-054-2
3. J. Djonlagić, **B. Dunjić**, M.S. Jaćović, M. Sepulchre, M.O. Sepulchre, N. Spassky, "Sinteza i karakterizacija statističkih, naizmeničnih i multi-blok stereoregularnih kopoliestara",

X Jugoslovenski simpozijum o hemiji i tehnologiji makromolekula, Vrnjačka Banja, maj, 1989.

4. M.S. Jaćović, **B. Dunjić**, J. Djonlagić, "Nezasićena poliestarska vlakna", XI Jugoslovenski simpozijum o hemiji i tehnologiji, makromolekula, Novi Sad, oktobar 1991, Izvodi radova, 163.
5. J. Djonlagić, **B. Dunjić**, M.S. Jaćović, M. Sepulchre, M.O. Sepulchre, N. Spassky, "Reološko ponašanje umreženih stereoregularnih nezasićenih poliestara", XXXV Savetovanje SHD, januar 1993. Beograd
6. R. M. Dobrosavljević, S. Jovanović, J. Djonlagić, **B. Dunjić**, J. Budinski, "Poliuretan-poli(metil metakrilat) interpenetrirajuće polimerne mreže", XII jugoslovenski simpozijum o hemiji i tehnologiji makromolekula, Yu Makro 96, Herceg Novi, 24-27 septembar, 1996, Zbornik radova i izvoda 151.
7. **B. Dunjić**, J. Djonlagić, M. Sepulchre, M.O. Sepulchre, N. Spassky, "Sinteza stereoregularnih teleheličnih nezasićenih poliestara sa završnim hidroksilnim grupama", XII jugoslovenski simpozijum o hemiji i tehnologiji makromolekula, Yu Makro 96, Herceg Novi, 24-27 septembar, 1996, Zbornik radova i izvoda 153.
8. S. Marković, **B. Dunjić**, J. Djonlagić, "Reokinetika umrežavanja fenol-formaldehidnih smola", XII jugoslovenski simpozijum o hemiji i tehnologiji makromolekula, Yu Makro 96, Herceg Novi, 24-27 septembar, 1996, Zbornik radova i izvoda, 187.
9. J. Djonlagić, **B. Dunjić**, A. Zlatanić, "Sinteza i karakterizacija nezasićenih i termoplastičnih poliestara", Jubilarni naučni skup Sto godina Srpskog hemijskog društva 1897-1997, Beograd, 25 i 26 septembar 1997.
10. V. Aleksandrović, **B. Dunjić**, J. Djonlagić, "Ispitivanje uslova sinteze segmentiranih kopoliestara", Savremene tehnologije i privrednih razvoj, III Simpozijum, Leskovac 23 i 24 oktobar, 1998.

### **2.1.11 Odbranjen magistarski rad – M72**

1. B. Dunjić, „Reološka svojstva stereoregularnih nezasićenih poliestara”, Tehnološko-metalurški fakultet, Univerzitet u Beogradu (1991)

### **2.1.12 Odbranjena doktorska disertacija - M71**

1. B. Dunjić, "Sinteza funkcionalizovanih polimera i njihova primena u asimetričnoj katalizi i separaciji jona", Tehnološko-metalurški fakultet, Univerzitet u Beogradu (1997)

### **2.1.13 Nagrade i priznanja**

1. Dr Branko Dunjić je 1999. godine dobio Medalju za pregalaštvo i uspeh u nauci koju Srpsko hemijsko društvo dodeljuje mladim naučnim radnicima

### **2.1.14 Učestvovanje/rokovođenje projektima**

Dr Dunjić je do 2015. godine učestvovao i rukovodio sledećim projektima:

- Promoting the adaptation and adoption of RECP (resource efficient and cleaner production) in Serbia through the cleaner production centre (CPC) – phase II” project UE/SRB/11/001, 2007-2015. (rukovodilac dr Branko Dunjić)
- Low Carbon Production Project Implementation, PO 3000018505, UNIDO, 2013.(rukovodilac dr Branko Dunjić)

- Preparation of environmentally sound management and final disposal of PCBs project, PO 3000019986, UNIDO, 2014 (rukovodilac dr Branko Dunjić)
- Promotion and implementation of Chemical Leasing business models in industry, UE/SRB/11/001, UNIDO, 2007-2015 (rukovodilac dr Branko Dunjić)
- „Sinteza i karakterizacija novih funkcionalnih polimera i polimernih nanokompozita”, projekat osnovnih istraživanja MPNTR 172062, 2011-2019 (učesnik)

## **2.2 SPISAK OBJAVLJENIH RADOVA NAKON POSLEDNJEG IZBORA U ZVANJE VIŠI NAUČNI SARADNIK**

### **Monografije međunarodnog značaja (M10)**

#### **2.2.1 Poglavlje u istaknutoj monografiji međunarodnog značaja – M13**

1. Marinović, S., Popović, I., **Dunjić, B.**, „Micro- and Nanostructured IPNs based on Thermosetting Resins“ u *Micro- and Nano-Structured Interpenetrating Polymer Networks: From Design to Applications*, (editors: Prof. Dr. Sabu Thomas Dr. Daniel Grande Dr. Uroš Cvelbar Dr. K.V.S.N. Raju Dr. Ramanuj Narayan Dr. Selvin P. Thomas H. Akhinapp) John Wiley & Sons, Inc USA, Chapter 4 (2016) 109-126. ISBN: ISBN: 9781118138175

### **Radovi časopisima međunarodnog značaja (M20)**

#### **2.2.2 Rad u međunarodnom časopisu izuzetnih vrednosti – M21a**

1. Tomić, M., **Dunjić, B.**, Nikolić, M.S., Trifković, K., Stanković, N., Pavlović, V.B., Bajat, J., Djonlagić, J. “Polyamidoamine as a clay modifier and curing agent in preparation of epoxy nanocomposites” *Progress in Organic Coatings*, 131 311-321 (2019) (ISSN 0300-9440; IF 4,469)
2. Vukadinović, B., Popović, I., **Dunjić, B.**, Jovović, A., Vlajić, M., Stanković, D., Bajić, Z., Kijevčanin, M. “Correlation between eco-efficiency measures and resource and impact decoupling for thermal power plants in Serbia” *Journal of Cleaner Production* 138, 264-274. (2016) (ISSN 0959-6526, IF 5,715)

#### **2.2.3 Rad u vrhunskom međunarodnom časopisu – M21:**

1. Tomić, M., **Dunjić, B.**, Nikolić, M.S., Maletaškić, J., Pavlović, V.B., Bajat, J., Djonlagić, J. “Dispersion efficiency of montmorillonites in epoxy nanocomposites using solution intercalation and direct mixing methods” *Applied Clay Science* 154, 52-63 (2018) (ISSN: 0169-1317, IF 3,890)

#### **2.2.4 Rad u istaknutom međunarodnom časopisu – M22**

1. Tomić, M.D., **Dunjić, B.**, Bajat, J.B., Likić, V., Rogan, J., Djonlagić, J. “Anticorrosive epoxy/clay nanocomposite coatings: rheological and protective properties” *Journal of Coatings Technology and Research* 13 (3) (2016) (ISSN 1547-0091, IF 1,557)
2. Godiya, C.B., Marcantoni, E., **Dunjić, B.**, Tomić, M., Nikolić, M.S., Maletaškić, J., Djonlagić, J. „Effect of organoclay modifier structure on the viscoelastic and thermal properties of poly(methyl methacrylate)/organoclay nanocomposites” *Polymer Bulletin*, (2020) (ISSN: 0170-0839; IF 2,014)

## **2.2.5 Rad u u međunarodnom časopisu van SCI liste**

1. Schwager, P., **Dunjić, B.**, Kaltenegger, I. "Success and failure of the Chemical Leasing model in addressing sustainability challenges: Evidence from practice" Current Opinion in Green and Sustainable Chemistry 8, 14-17 (2017) (ISSN:2452-2236, IF – nema)
2. Assenova, M., Georgiev, Z., **Dunjić, B.** "Application of Resource Efficient and Cleaner Production Approach in the Accommodation Sector of the Balkan Region", European Journal of Sustainable Development 5, 432-442 (2016) (ISSN: 2239-5938; IF-nema)

## **Zbornici medjunarodnih naučnih skupova (M30)**

### **2.2.6 Saopštenje sa međunarodnog skupa štampano u izvodu – M34**

1. Miloš Tomić, **Branko Dunjić**, Marija S. Nikolić, Jasna Djonlagić Epoxy/Clay Nanocomposites with Improved Corrosion Stability and Mechanical Properties, European Polymer federation Congress, Lyon, France, 2017
2. **Branko Dunjić**, Miloš Tomić, Marija S. Nikolić, Jasna Djonlagić „The effect of clay modification on the properties of epoxy nanocomposites“ European Polymer Congress EPF, Hersonissos, Greece, June 9-14, 2019, Book of Abstracts p. 188

## **Zbornici skupova nacionalnog značaja (M60)**

### **2.2.7 Naučni radovi saopšteni na skupu nacionalnog značaja štampani u izvodu – M64**

1. M. Tomić, **B. Dunjić**, M. Nikolić, J. Bajat, V. Mišković-Stanković, J. Đonlagić, „Koroziona stabilnost i mehanička svojstva nanokompozita epoksidna smola/glina”, 53. Savetovanje srpskog hemijskog društva, Kragujevac, 10.-11. jun, 2016, 38.
2. M. Tomić, **B. Dunjić**, M. S. Nikolić, J. Đonlagić, „Epoksidni nanokompoziti na bazi gline modifikovane poli(amidoaminom)”, 55. Savetovanje srpskog hemijskog društva, Novi Sad, 8.-9. jun, 2018, 74.

## **2.3. PET NAJZNAČAJNIJIH NAUČNIH OSTVARENJA OD PRETHODNOG IZBORA U ZVANJE**

- Marinović, S., Popović, I., **Dunjić, B.** „Micro- and Nanostructured IPNs based on Thermosetting Resins“ u Micro- and Nano-Structured Interpenetrating Polymer Networks: From Design to Applications, (editors: Prof. Dr. Sabu Thomas Dr. Daniel Grande Dr. Uroš Cvelbar Dr. K.V.S.N. Raju Dr. Ramanuj Narayan Dr. Selvin P. Thomas H. Akhinapp) John Wiley & Sons, Inc USA, Chapter 4 (2016) 109-126. ISBN: ISBN: 9781118138175
- Tomić, M., **Dunjić, B.**, Nikolić, M.S., Trifković, K., Stanković, N., Pavlović, V.B., Bajat, J., Djonlagić, J. “Polyamidoamine as a clay modifier and curing agent in preparation of epoxy nanocomposites” Progress in Organic Coatings, 131 311-321 (2019) (ISSN 0300-9440; IF 2,955)
- Vukadinović, B., Popović, I., **Dunjić, B.**, Jovović, A., Vlajić, M., Stanković, D., Bajić, Z., Kijevčanin, M. “Correlation between eco-efficiency measures and resource and impact decoupling for thermal power plants in Serbia” Journal of Cleaner Production 138, 264-274. (2016) (ISSN 0959-6526, IF 5,715)

- Tomić, M.D., **Dunjić, B.**, Bajat, J.B., Likić, V., Rogan, J., Djonlagić, J. "Anticorrosive epoxy/clay nanocomposite coatings: rheological and protective properties" Journal of Coatings Technology and Research13 (3) (2016) (ISSN 1547-0091, IF 1,557)
- Tomić, M., **Dunjić, B.**, Nikolić, M.S., Maletaškić, J., Pavlović, V.B., Bajat, J., Djonlagić, J. "Dispersion efficiency of montmorillonites in epoxy nanocomposites using solution intercalation and direct mixing methods" Applied Clay Science 154, 52-63 (2018) (ISSN: 0169-1317, IF 3,641)

## **2.4 ANALIZA PUBLIKOVANIH RADOVA KOJI KANDIDATA KVALIFIKUJU ZA IZBOR U ZVANJE VIŠI NAUČNI SARADNIK**

Naučno-istraživački rad dr Branka Dunjića **posle poslednjeg izbora** u zvanje po tematici mogu se svrstati u tri grupe:

- Izučavanje primene UV-očvršćavajućih premaza
- Izučavanje sinteze, karakterizacije i primene nano-kompozita
- Sirovinski efikasnija i čistija proizvodnja i upravljanje hemikalijama

U radu 2.2.1.-1 opisano je ispitivanje mogućnosti upotrebe akrilnih hiperrazgranatih poliestara (HBP) kao UV očvršćavajuće komponente u primeni premaza sa dvostrukim očvršćavanjem u automobilskoj industriji. Dvostruko očvršćavanje je jedan od mogućih načina za brzo stvrdnjavanje premaza otpornih na ogrebotine za upotrebu u premazima za prvu ugradnju i za auto-reparaciju. Sistemi dvostrukog očvršćavanja, nakon stvrdnjavanja, predstavljaju interpenetrirajuće mreže (IPN-ove).

Rad 2.2.2.-2 istražuje i predstavlja potencijale za smanjenje emisije i poboljšanje efikasnosti u termoelektranama. Analiza potencijala tehnološkog unapređenja i uštede resursa i energije, kao i smanjenja emisije izvršena je u termoelektrani TENT A, Srbija, koja posluje u okviru Elektroprivrede Srbije. Procena rada termoelektrane podržana je eksperimentalno izmerenim podacima (pritisci i temperature vode, temperature i pritisci pare, pritisak kondenzacije, protok vode, protok vode za dolivanje, protok pare, sastav uglja, emisije itd.), određivanjem faktora emisije i korišćenje podataka dobijenih tokom balansiranja jedinica i simulacije performansi sistema. Analizom dve jedinice pokazalo se da se nominalna snaga može povećati za 60 MWe, povećanjem bruto efikasnosti jedinice za 0,4% i smanjenjem potrošnje uglja, vode i električne energije.

Radovi 2.2.2.-1, 2.2.3.-1 i 2.2.4.-1 bave se problematikom nanokompozita na bazi epoksid i glina kao nanopunioca. U radu 2.2.2.-1 pripremljeni su nanokompoziti epoksid/nanoglina na bazi predpolimera diglicidiletra bisfenola A i multifunkcionalnog poliamidoamina metodom interkalacije rastvora. Poliamidomamin je korišćen i kao modifikator gline (0,5 mas.%) i kao umreživač. Postignuta je interkalirana/eksfolirana struktura što je potvrđeno SEM i TEM analizama. Postignuta su značajn poboljšanja mehaničkih svojstava filmova (jačina pri kidanju i izduženje pri kidanju) sa ovako modifikovanom glinom. Utvrđeno je da poboljšana disperzija nanopunioca značajno poboljšava barijerna svojstva (propustljivost vodene pare), kao i antikorozivna svojstva. Rad 2.2.3.-1 se bavi disperzijom montmorilonita (Mt) u epoksidnim nanokompozitima (CPN) na bazi diglicidil etra bisfenola A (DGEBA) i poliamidoaminskog sredstva za umrežavanje,

koristeći bubrenje organo-montmorilonita (metoda interkalacije u rastvoru). Ispitivani su efekti polarnosti i sadržaja modifikatora na ponašanje bubrenja organogline u korelaciji sa strukturom (optička mikroskopija, WAXD, SEM), reološkim i mehaničkim svojstvima (DMA) nanokompozita sa 1 mas.% Mt. Mt tretirani funkcionalizovanim kvaternarnim i posebno primarnim (HDA + -Mt) alkilamonijumovim jonima, pri opterećenjima blizu kritičnog, dobro bubre u razređivačima i daju ravnomernu disperziju u epoksidnoj matrici. Kompatibilnost organskih glina sa razređivačem je opisana izračunavanjem rastvorljivosti i Flori-Haginsovih parametara interakcije. U radu 2.2.4.-1 epoksidni nanonokompoziti (NC) sa 1–10 mas.% nano-gline Cloisite 30B (C30B) pripremljeni su metodom rastvora uz pomoć ultrazvuka i ispitani je uticaj količine dodate nano-gline na reološka, mehanička i antikoroziona svojstva pripremljenih NC. Izvlačenjem, presekom i mehaničkim ispitivanjima očvrslih NC otkriveno je da su uzorci sa 1–3 mas.% C30B pokazali nešto nižu adheziju, fleksibilnost, otpornost na udarce i tvrdoću klatna u poređenju sa očvrsłom epoksidnom smolom koja se koristi kao referenca, dok epoksidni prajmer i završni premaz izrađeni od NC-a sa 1–3 mas.% C30B generalno održavaju visoke mehaničke i dobre adhezijske osobine. Dvoslojni sistemi premaza, tj. prajmeri na bazi NC i završni premazi, imali su veću stabilnost na koroziju u komori za raspršivanje soli u poređenju sa nemodifikovanim sistemom, zbog barijernog efekta nanoglina.

U radu 2.2.4.-2 opisana je priprema i karakterizacija nanokompozita (NC) poli (metil metakrilat) (PMMA)/glina. NC su pripremljeni suspenzionom polimerizacijom metil metakrilata u prisustvu dve različite organogline (Cloisite 30B, Cloisite 15A) sa sadržajem gline u rasponu od 0,5 do 5 mas.%. Rezultati reološkog ispitivanja rastopa, skenirajuće elektronske mikroskopije (SEM) i UV/Vis spektroskopije potvrđili su veći stepen disperzije gline u NC sa Cloisite 30B. U poređenju sa čistim PMMA, svi ovi NC pokazuju porast temperature ostakljivanja i poboljšanu termičku stabilnost. Rezultati dobijeni dinamičko-mehaničkom analizom pokazali su da je modul sačuvane energije NC bio veći ugradnjom gline u matricu PMMA, povećavajući se kako se količina gline povećavala i da su njihove mehaničke performanse značajno poboljšane.

Objavljeni radovi dr Branka Dunjića **pre izbora u zvanje** po tematici mogu se svrstati u sedam grupa:

Prvu grupu predstavljaju radovi čija tematika obuhvata sintezu i karakterizaciju stereoregularnih poliestara i drugih polikondenzacionih proizvoda.

U radovima 2.1.1-1 i 2.1.3-1 prikazani su rezultati izučavanja različitih postupaka sinteze statističkih, multi-blok i alternirajućih nezasićenih kopoliestara maleinske, fumarne i ftalne kiseline koristeći reakciju neravnotežne niskotemperaturne polikondenzacije između 1,4-dibromderivata i kalijumovih soli odgovarajućih kiselina u 1-metil-2-pirolidonu. Konfiguracijska čistoća dobijenih polimera i raspored različitih ostataka duž osnovnih lanaca je potvrđena NMR-analizom, a prikazan je i njihov uticaj na prelazne temperature i na druga fizičko-hemijska svojstva dobijenih homopoliestara i kopoliestara. U radu 2.1.1-11. je prikazana sinteza  $\alpha,\omega$ -dihidroksilnih stereoregularnih polimaleata. Korišćena je metoda neravnotežne polikondenzacije kalijumovih soli maleinske kiseline i dibromoderivata  $\text{Br}(\text{CH}_2)_n\text{Br}$  ( $n=4,6$  i 8). Regulacija molarnih masa i uvođenje završnih hidroksilnih grupa postignuti su korišćenjem monofunkcionalnog monomera 2-brometanola. U radu 2.1.1-2. prikazana je sinteza i izrada prvih nezasićenih alifatskih poliestarskih vlakana na bazi fumarne kiseline i kopoliestara fumarne i tereftalne kiseline. Vlakna dobijena od kopoliestara fumarne i tereftalne kiseline pokazala su bolja mehanička svojstva i više temperaturetopljenja u odnosu na polifumarate. Detaljno su obradena ispitivanja uslova izvlačenja i

istezanja vlakana koja omogućavaju dobijanje vlakana visokih modula. U radu 2.1.3-5. je prikazana analiza sastava i strukture različitih novolačnih fenol-formaldehidnih smola pomoću kvantitativne  $^{13}\text{C}$  NMR spektroskopije i gel-propsne hromatografije. Analizirane su novolačne smole sa nasumičnim rasporedom metilenskih mostova u orto i para položajima, kao i novolačne smole sa visokim sadržajem metilenskih mostova u o-o položaju. Dobijen je potpuniji uvid u hemijsku strukturu u pogledu sastava, broja slobodnih C atoma u para i orto položaju, distribuciju izomera, stepen polimerizovanja, kao i širinu raspodele molarnih masa i stepen grananja.

Drugu grupu čine radovi iz oblasti reokinetike odnosno izučavanja reakcije umrežavanja termoočvršćavajućih polimera, kao i svojstava umreženih proizvoda pomoću dinamičko mehaničke analize.

U radu 2.1.1-13. analiziran je uticaj prisustva dvostrukih veza na krajevima lanaca kao i cis-trans konfiguracije dvostrukih veza duž lanaca na kinetiku kopolimerizacije nezasićenih poliestara i stirena. Praćena je promena dinamičkih reoloških parametara. Formiranje umrežene strukture opisano je fenomenološkom jednačinom drugog reda uzimajući u obzir efekat samoubrzanja. U radu 2.1.1-14. je prikazana reakcija umrežavanja novolačnih fenol-formaldehidnih smola sa heksametilentetraaminom (HETA). Reakcija umrežavanja fenolnih smola opisana je fenomenološkom jednačinom trećeg reda, koja uzima u obzir efekat samoubrzavanja, a koji se javlja ne samo kao posledica hemijske reakcije formiranja umrežene strukture već i separacije faza. Pokazano je da konstanta brzine reakcije umrežavanja k sledi Arenijusovu zavisnost, a da takođe zavisi od sastava fenolnih smola kao i od njihovog fizičkog tretiranja. U radu 2.1.3-6. Dinamičko-mehaničkom analizom i FTIR spektroskopijom praćene su reakcije umrežavanja tri serije  $\alpha,\omega$ -dihidroksipropil(alkilen maleata) trofunkcionalnim izocijanatima. Pokazano je da brzina reakcije umrežavanja zavisi od sadržaja funkcionalnih grupa, tj. od molarne mase poliestarskog prepolimera, i od dužine alifatske sekvene u osnovnom motivu ili pokretljivosti segmenta. Brzina umrežavanja opada u nizu: poli(oktametilen maleat) > poli(heksametilen maleat) > poli(butilen maleat). U radu 2.1.1-12. analiziran je uticaj prisustva dvostrukih veza na krajevima lanaca kao i cis-trans konfiguracije dvostrukih veza duž lanaca na viskoelastična svojstva umreženih nezasićenih poliestara. Rezultati mehaničke dinamičke spektroskopije prikazani su kao zbirne krive modula sačuvane energije  $G'$  i modula izgubljene energije  $G''$  na referentnoj temperaturi, koristeći princip jednakosti uticaja vremena i temperature. Parametri WLF jednačine dati su za temperature iznad temperature ostakljivanja. Gustina umreženosti,  $n_c$ , odredjena iz platoa ravnotežnog modula sačuvane energije  $G'_e$ , je veća u odnosu na dobijenu iz ogleda bubreњa što ukazuje na postojanje doprinosa fizičkog umreženja odnosno prepletaja. U radu 2.1.3-2. je prikazano izučavanje viskoelastičnih svojstava umreženih konfiguracijski čistih nezasićenih poliestara na bazi ftalne, maleinske ili fumarne kiseline. Određivan je uticaj cis-trans konfiguracije dvostrukih veza kao i njihovog sadržaja u osnovnim lancima na temperaturu ostakljivanja i na reološka svojstva umreženih poliestara. Pokazano je da se temperature ostakljivanja pomjeraju ka višim temperaturama sa porastom stepena nezasićenosti, a pri istom stepenu nezasićenosti trans izomeri daju znatno više vrednosti od svojih cis izomera.

Treću grupu radova čine radovi koji se bave izučavanjem reološkog ponašanja termoplastičnih elastomera, bitumena i skroba.

U radu pod 2.1.4-1. je prikazan uticaj elastomera, kao što su SBS i SBR i njihovih smeša, na strukturu i reološka svojstva blendi duvanog bitumena. Za karakterisanje polimer-modifikovanih bitumena pored uobičajenih standardizovanih ispitivanja korišćena je i dinamička mehanička analiza. Pokazano je da i mali dodatak polimera od 3% znatno smanjuje osetljivost polimer-modifikovanih bitumena na temperaturu i povećava modul sačuvane energije naročito u oblasti visokih frekvencija. U radovima 2.1.3-3. i 2.1.3-4. su

prikazane blende termoplastičnog skroba sa nekim termoplastičnim polimerima. Termoplastični skrob je umešan u dvopužnom mikseru sa poli(etilen-co-akrilatnom kiselinom), poli(etilen-co-vinilacetatom) i acetatom celuloze, da bi se poboljšala njegova svojstva. Sadržaj ovih polimera u blendama je bio 5 i 10% masenih. Ispitivan je uticaj tako malih količina termoplastičnog polimera na preradljivost, mehanička svojstva i otpornost na vodu termoplastičnog skroba.

Četvrtu grupu čine radovi iz oblasti sinteze i karakterizacije funkcionalizovanih polimera, koji u lancu sadrže grupe sposobne da ispune ulogu katalizatora (radovi 2.1.1-3, 2.1.1-6, 2.1.2-2, 2.1.1.-5, 2.1.1-10). Za polimere koji mogu da se koriste u asimetričnoj heterogenoj katalizi odabrani su optički aktivni poliamidi i poliuree, kod kojih je ligand sastavni deo osnovnog lanca za razliku od postojećih sistema (umreženi polistireni i poliakrilati) gde su ligandi obično u bočnom lancu. Za poboljšanje selektivnosti poliurea primjenjen je koncept „molekulskog otiska“ (molecular imprinting). Osnova ovog koncepta je da se sinteza umreženog polimera izvodi u prisustvu jednog od željenih proizvoda reakcije. Šupljina u trodimenzionoj mreži polimera oblikuje se prema „otisku“ to jest jednom od enantiomera. Nastala šupljina je sposobna da prilikom kasnije upotrebe „prepozna“ molekul korišćen u toku sinteze. Nanošenjem rodijuma na optički aktivne poliuree i poliamide dobijeni su heterogeni katalizatori koji su testirani u asimetričnoj redukciji C=O veze transferom vodonika. Najbolji rezultati su dobijeni sa katalizatorom na bazi poliuree, gde su se optički prinosi kretali i do 60 %.

Peta grupa radova je iz oblasti istraživanja polimera sa jonoselektivnim svojstvima. Za razliku od komercijalno raspoloživih umreženih polistirena hidrofobnog karaktera odabrani su hidrofilni polietri i poliuretani sa bočnim makrocikličnim ligandima (krunskim etrima) i proverena je njihova selektivnost u separaciji jona. U radovima 2.1.1-4, 2.1.1-7, 2.1.1-9, 2.1.2-3 prikazani su rezultati sinteze poliuretana koji su imali krunske etre kao bočne grupe. Navedeni polimeri dobijeni su poliadicijom diolnih komponenti sa krunkim etrima i diizocijanata. Diolna komponenta bila je ili jedinjenje male molarne mase, sa krunkim etrima različite veličine (broj kiseonika 4-8 u prstenu) u bočnom lancu ili telehelični dihidroksilni polietar dobijen anjonskom polimerizacijom. Njihova jonoselektivna svojstva određena su u kompetitivnoj ekstrakciji katjona alkalnih metala u neutralnoj sredini. Diskutovan je uticaj fleksibilnosti polimernog lanca na jonoselektivna svojstva. Pokazano je da su dobijeni polimeri sa dobrim jonoselektivnim svojstvima, koji su vezivali različite katjone u zavisnosti od veličine prstena i koji bi mogli da se koriste kao punjenja za hromatografske kolone jer poseduju dobra mehanička i jonoselektivna svojstva.

Šestu grupu radova čine radovi koji se bave izučavanjem sinteze, karakterizacije i primene polimera na bazi hiperrazgranatih poliestara (HRP) u premazima. U radovima 2.1.1-15, 2.1.1-16, 2.1.2-7, 2.1.2-8 opisana je sinteza i karakterizacija UV-očvršćavajućih premaza koji su pokazivali veliku brzinu umrežavanja, a umreženi film odlična mehanička svojstva. U radu 3-11 prikazano je kako je iskorišćena hiperrazgranata struktura za sintezu materijala sa ksantatnim aktivnim grupama koji su, reakcijom žive polimerizacije uz medijaciju ksantatima (MADIX), omogućili UV očvršćavanje premaza bez dodatka uobičajenih fotoinicijatora i bez inhibicije kiseonikom. U radu 2.1.1-17. opisana je sinteza i karakterizacija interpenetrirajućih mreža (IPN) dobijenih dvojnim umrežavanjem (UV i termalnim) uretan akrilata. IPN su dobijene mešanjem u masenom odnosu 50/50 poliuretanske i poliakrilatne komponente. Po UV očvršćavanju, filmovi su dodatno umrežavani na povišenoj temperaturi reakcijom između izocijanatnih i hidroksilnih grupa. Na ovaj način moguće je dobiti brzo očvršćavajuće premaze otporne na abraziju, pogodne za primenu u automobilskoj industriji. Rad 2.1.1-18 opisuje ispitivanje mehaničkih, reoloških i termičkih svojstava smeša linearnih i hiperrazgranatih uretan-akrilata. Hiperrazgranati poliestri dodatno su modifikovani

esterifikacijom masnim kiselinama sojinog ulja ili izononskom kiselinom. Osnovna ideja je da se ispita kako dodatak hirerazgaranatog polimera linearnom utiče na krajnja svojstva tako dobijenih UV-očvršćavajućih tankih premaza. Pokazano je da se linearni i hiperrazgranati uretan-akrilati dobro mešaju, što dovodi do dobijanja homogenih mreža jako dobrih mehaničkih i termičkih svojstava.

U sedmu grupu spada rad 2.1.1-19, u kome su ispitivana su mehanička, antikoroziona i reološka svojstva epoksidnih premaza dobijenih od nano-kompozita. Nano-kompoziti su pripremljeni umešavanjem komercijalne gline Cloisite 30B, postupkom umešavanja iz suspenzije. Tako pripremljeni nano-kompoziti karakterisani su metodom rendgenske difrakcije (WAXD) i pokazano je da dolazi do eksfolijacije gline. Epoksi nano-kompoziti su tada upotrebljeni u komercijalnoj recepturi dvoslojnog epoksidnog sistema i premazi ispitani svim uobičajenim metodama koje se koriste u industriji boja i lakova, uključujući i test u slanoj komori. U isto vreme, čisti epoksidni nano-kompoziti testirani su ogledima uvijanja i tako određeni moduli sačuvane ( $G'$ ) i izgubljene energije ( $G''$ ). Rezultati su pokazali da dodatak ispod 5 % nanogline povećava antikoroziona svojstva komercijalnih premaza i da predstavlja dobro rešenje za dobijanje premaza koji se mogu koristiti u agresivnim sredinama.

## 2.5. CITIRANOST NAUČNIH RADOVA

Naučni radovi dr Branka Dunjića su citirani 870 puta, odnosno 744 puta (bez autocitata svih autora, izvor SCOPUS na dan 02.12.2020.)

Citirani su sledeći radovi:

Tomić, M., **Dunjić, B.**, Nikolić, M.S., Trifković, K., Stanković, N., Pavlović, V.B., Bajat, J., Djonlagić, J. Polyamidoamine as a clay modifier and curing agent in preparation of epoxy nanocomposites, (2019) Progress in Organic Coatings, 131, pp. 311-321.

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## KVALITATIVNA OCENA NAUČNIH REZULTATA

### 3. KVALITET NAUČNIH REZULTATA

#### 3.1 Naučni nivo, značaj i primenljivost rezultata

Naučno interesovanje dr Branka Dunjića može se po tematici svrstati u oblasti nauke o polimerima i obuhvata sintezu polimera reakcijama stupnjevitih polimerizacija, reokinetiku, odnosno izučavanje reakcije umrežavanja termoočvršćavajućih polimera analizom reoloških parametara, zatim sinteza i karakterizacija funkcionalizovanih polimera, hiperrazgranatih poliestara i nanokompozita sa puniocima prirodnog porekla. Od 2007., dr Dunjić istražuje i u oblasti sirovinski efikasnije i čistije proizvodnje i održivoj razvoju.

U periodu od 2016. do 2020. godine naučno-istraživački i stručni rad dr Branka Dunjića se može podeliti u tri kategorije:

- Izučavanje sinteze, karakterizacije i primene nano-kompozita u epoksidnim premazima za antikorozionu zaštitu
- Izučavanje reološkog ponašanja modifikovanih hiperrazgranatih polimera
- Sirovinski efikasnija i čistija proizvodnja i upravljanje hemikalijama

Nakon izbora u prethodno naučno zvanje – viši naučni saradnik, dr Branko Dunjić je objavio 8 bibliografskih jedinica i to: jedno poglavlje u istaknutoj monografiji međunarodnog značaja (M13), dva rada u međunarodnom časopisu izuzetnih vrednosti (M21a), jedan rad u vrhunskim međunarodnim časopisima (M21), dva rada u istaknutim međunarodnim časopisima (M22) i dva rada u međunarodnim časopisima van SCI liste (M23). Na međunarodnim (M34) i nacionalnim (M64) naučnim skupovima prezentovao je po dva saopštenja štampana u izvodu.

Učestvovao je u realizaciji više naučno-istraživačkih projekta, a postignuti rezultati daju značajan doprinos razvoju nauke o polimerima u našoj zemlji, a posebno u oblasti hemije sintetskih polimera za premaze.

#### 3.2. Uticajnost, citiranost i parametri kvaliteta časopisa

U svom dosadašnjem naučno-istraživačkom radu, dr Branko Dunjić je publikovao 51 naučni rad i to 40 u međunarodnim časopisima, 4 rada u međunarodnim časopisima van SCI liste i 7 u domaćim naučnim časopisima, a 8 radova je saopštio na međunarodnim i 2 na domaćim naučnim skupovima, koji su štampani u celini. Na domaćim i međunarodnim naučnim skupovima saopštio je još 38 radova, koji su štampani u izvodu.

Od toga, jedan rad je iz kategorije M13, dva iz kategorije M21a (IF=4,469 i 5,715) oba posle izbora, 20 rada u kategoriji M21 (1 posle izbora, IF od 0,992 do 3,890) i 11 radova iz kategorije M22 (od toga 2 posle izbora, IF od 0,685 do 2,014).

Naučni radovi dr Branka Dunjića su citirani 870 puta, odnosno 744 puta (bez autocitata svih autora, izvor izvor SCOPUS na dan 02.12.2020.) dok je vrednost h-indeksa 17. Prosečan broj autora po radu za ukupno navedenu bibliografiju iznosi 4,7.

Objavljeni radovi u časopisima međunarodnog značaja su u periodu od 2016. do 2020. godine citirani 251 put, bez autocitata svih autora (Izvor SCOPUS na dan 16.11.2020.). Učestvovao je u realizaciji više naučno-istraživačkih projekta, a postignuti rezultati daju značajan doprinos razvoju nauke o polimerima u našoj zemlji, a posebno u oblasti hemije sintetskih funkcionalizovanih i hiperrazgranatih polimera.

Radovi kandidata su višestruko citirani u uticajnim časopisima M21a kategorije: Chemical Reviews (IF=52,760), Progress in Polymer Science (IF=29,063), Advanced Materials (IF=27,398), Angewandte Chemie (International Edition) (IF=12,59), Chemical Engineering Journal (IF=10,562), Journal of the American Chemical Society (IF=14,612), Journal of Cleaner Production (IF=7,491), Macromolecules (IF=5,918), Progress in Organic Coatings (IF=4,469).

### **3.3. Ocena samostalnosti kandidata**

Dr Branko Dunjić pokazuje visoku samostalnost u svom naučno-istraživačkom radu. On samostalno osmišljava eksperimente, njihovu realizaciju i tumačenje rezultata. Rezultate dobijene u tako osmišljenim eksperimentima objavljuje u najpoznatijim međunarodnim časopisima. Kao direktor Centra za čistiju proizvodnju rukovodi složenim projektima upravljujući timovima sa više od 20 eksperata različitih specijalnosti i iz različitih zemalja. Na istom radnom mestu uspostavio je veze sa mnogim naučno-istraživačkim organizacijama u Srbiji i svetu. U okviru projekta „Zelena hemija“ omogućio je povezivanje istraživača sa Univerziteta u Beogradu (naročito Hemijskog fakulteta) sa istraživačima sa Yale University, SAD i McGill University, Kanada. Dr Branko Dunjić je posle izbora recenzirao radeve za Progress in Organic Coatings (IF=4,469) i Cellulose (IF=4,210). Takođe, Dr Dunjić je područni urednik za polimere u Journal of the Serbian Chemical Society.

### **3.4. Angažovanost u formiranju naučnih kadrova**

Kandidat je učestvovao u osmišljavanju i izradi jedne doktorske disertacije „Uticaj hemijske modifikacije glina na strukturu i svojstva njihovih epoksidnih nanokompozita“ Miloša Tomića. Bio je član komisije za odbranu navedene doktorske disertacije.

Kandidat, Dr Dunjić je učestvovao u radu grupe na Hemiji makromolekula kroz projekat Ministarstva za nauku „Sinteza i karakterizacija novih funkcionalnih polimera i polimernih nanokompozita“ (projekat osnovnih istraživanja MPNTR 172062, 2011-2019), posebno rukovodeći radom mlađih saradnika. Posredno je i pomogao učešće mlađih istraživača na kongresima Evropske federacije za polimere u Pizi, Italija, Drezdenu, Nemačka i Lion, Francuska. Dr Dunjić je predsednik Sekcije za hemiju i tehnologiju makromolekula Srpskog hemijskog društva poslednjih 4 godine.

### **3.5. Normiranje broja poena prema broju koautora**

Prema kriterijumima Pravilnika o postupku i načinu vrednovanja i kvantitativnom iskazivanju naučno-istraživačkih rezultata, normiranju podležu dva rada kategorije M21a (rad 2.2.2-1 i 2.2.2-2), što je uzeto u obzir pri kvantitativnom prikazu naučno-istraživačkog rada kandidata.

### **3.6. Rukovodenje projektima, podprojektima i projektnim zadacima**

Od 2007. godine dr Dunjić je direktor Centra za čistiju proizvodnju koji radi u okviru Tehnološko-metalurskog fakulteta Univerziteta u Beogradu. U okviru delatnosti Centra, koji je nastao kao rezultat projekta UNIDO (Organizacija UN za industrijski razvoj), dr Dunjić je rukovodio više međunarodnih projekata:

- Hemijski lizing: projekat, finansiran od strane UNIDO, Vlada Austrije i Nemačke a usmeren na održivo korišćenje hemikalija
- Eliminacija olova u bojama, finansiran od GEF, u saradnji sa Agencijom za životnu sredinu SAD (US EPA) i Programom za životnu sredinu Ujedinjenih nacija (UNEP).
- Guidance development and case study documentation of green chemistry and technologies, PO 3000062754, UNIDO I GEF, od 2018-2020
- Inclusive Low Carbon Production, PO 3000041049; UNIDO, od 2016 (rukovodilac)

## **4. OSTALI POKAZATELJI USPEHA U NAUČNOM RADU**

### **4.1. Nagrade i priznanja za naučni rad dodeljen od strane relevantnih naučnih institucija i društava**

Dr Branko Dunjić je 1999. godine dobio Medalju za pregalaštvo i uspeh u nauci koju Srpsko hemijsko društvo dodeljuje mladim naučnim radnicima.

### **4.2. Članstvo u naučnom društvu**

Dr Branko Dunjić je član Srpskog hemijskog društva. Od 2009. do 2011. godine je bio sekretar Srpskog hemijskog društva, a od januara 2020. godine je područnu urednik za polimere časopisa Srpskog hemijskog društva (Journal od the Serbian Chemical Society).

### **4.3. Recenzije naučnih radova**

U proteklih 5 godina dr Branko Dunjić je recenzirao 8 radova za sledeće rasopise:

- Progress in Organic Coatings - 4 puta (PROC-D-20-00173; POC\_2019\_1426R1; POC\_2019\_1426; POC\_2017\_1014)
- Cellulose -1 put (CELS-D-19-0008)
- Journal of the Serbian Chemical Society – 3 puta (#7317; #5861; #3304)

## 5. KVANTITATIVNA OCENA NAUČNIH REZULTATA

Sumarni prikaz dosadašnje naučnoistraživačke aktivnosti dr Branka Dunjića dat je u Tabeli 1.

Tabela 1. Pregled ukupnih koeficijenata naučne kompetentnosti

Naziv grupe	Vrsta rezultata	Oznaka rezultata	Vred. koef.	Br. Radova		Σ	
				Ukupno	Od poslednjeg izbora	Ukupno	Od poslednjeg izbora
Monografije, monografske studije, tematski zbornici, leksikografske i kartografske publikacije međunarodnog značaja	Poglavlje u knjizi međunarodnog značaja	M13	7	1	1	7	7
Radovi objavljeni u naučnim časopisima međunarodnog značaja	Rad u vrhunskom međunarodnom časopisu izuzetnih vrednosti	M21a	10	2	2	16,6	16,6*
	Rad u vrhunskom međunarodnom časopisu	M21	8	20	1	160	8
	Rad u istaknutom međunarodnom časopisu	M22	5	11	2	55	10
	Rad objavljen u međunarodnom časopisu	M23	3	7	0	21	0
Zbornici međunarodnih naučnih skupova	Predavanje po pozivu sa međunarodnog skupa stampano u izvodu	M32	1,5	1	0	1,5	0
	Saopštenje sa međunarodnog skupa stampano u celini	M33	1	8	0	8	0
	Saopštenje sa međunarodnog skupa stampano u celini	M34	0,5	26	2	13	1
Radovi u časopisima nacionalnog značaja	Rad u vrhunskom časopisu nacionalnog značaja	M51	2	7	0	14	0
Zbornici nacionalnih naučnih skupova	Saopštenje sa skupa nacionalnog značaja stampano u celini	M63	0,5	2	0	1	0
	Saopštenje sa skupa nacionalnog značaja stampano u izvodu	M64	0,2	12	2	2,4	0,4
<b>Ukupno</b>						<b>299,5</b>	<b>43</b>

\* Normirana su dva rada kategorije M21a (8,3 poena umesto 10)

Minimalni kavantitativni zahtevi za izbor u zvanje viši naučni saradnik za prirodno-matematičke i medicinske nake. Za reizbor u zvanje, kandidat je obavezan da u periodu od prethodnog izbora ostvari najmanje ***polovinu od kvantitativnog minimuma*** naučno-istraživačkih rezultata potrebnih za izbor u zvanje viši naučni saradnik.

Diferencijalni uslov - od prvog izbora u prethodno zvanje do izbora u zvanje	Potrebito je da kandidat ima najmanje XX poena, koji treba da pripadaju sledećim kategorijama:		
		Neophodno XX*=	Ostvareno
<b>Viši naučni saradnik</b>	Ukupno	25	<b>43</b>
Obavezni (1)	M10+M20+M31+M32+M33 +M41+M42+M90	20	<b>41,6</b>
Obavezni (2)	M11+M12+M21+M22+ M23	15	<b>34,6</b>

\*polovina minimalnog kvantitativnog uslova za izbor u višeg naučnog saradnika prema članu 35 Pravilnika

## ZAKLJUČAK

Dr. Branko Dunjić je vrlo uspešan naučni radnik. U svom dosadašnjem naučno-istraživačkom radu, dr Branko Dunjić je publikovao 51 naučni rad i to 40 u međunarodnim časopisima, 4 rada u međunarodnim časopisima van SCI liste i 7 u domaćim naučnim časopisima. Od toga, 1 rad je iz kategorije M13 i to posle prethodnog izbora, 2 iz kategorije M21a, oba posle izbora, 20 radova u kategoriji M21 (1 posle izbora) i 11 radova iz kategorije M22 (od toga 2 posle izbora). Na domaćim i međunarodnim naučnim skupovima saopštio je 10 radova koji su štampani u celini i 38 radova, koji su štampani u izvodu. Citiranost radova prema Scopus bazi podataka (na dan 02.12.2020.) iznosi ukupno 870, odnosno 744 bez autocitata, dok je Hiršov indeks (h-indeks) 17 sa autocitatima, a bez autocitata 16.

Učestvovao je u realizaciji više naučno-istraživačkih projekata, a postignuti rezultati daju značajan doprinos razvoju nauke o polimerima u našoj zemlji, a posebno u oblasti hemije sintetskih funkcionalizovanih i hiperrazgranatih polimera za primenu u premazima. Od 2007. godine direktor je Centra za čistiju proizvodnju gde učestvuje u međunarodnim projektima posvećenim održivom korišćenju sirovina, vode i energije.

Na osnovu svega izloženog se vidi da je dr Branko Dunjić pokazao da poseduje izuzetno interesovanje i sposobnost za naučno-istraživački rad, o čemu svedoče objavljeni radovi i indeks citiranosti. Članovi Komisije smatraju da kandidat dr Branko Dunjić ispunjava sve uslove za sticanje naučnog zvanja VIŠI NAUČNI SARADNIK u oblasti Prirodno-matematičkih nauka u skladu sa Pravilnikom o postupku i načinu vrednovanja i kvantitativnom iskazivanju naučno-istraživačkih rezultata istraživača ("Sl. glasnik RS" br. 24/2016,

21/2017 i 38/2017). Stoga, Komisija sa zadovoljstvom predlaže Nastavno-naučnom veću Tehnološko-metalurškog fakulteta, Univerziteta u Beogradu da ovaj izveštaj prihvati i isti prosledi Ministarstvu prosvete, nauke i tehnološkog razvoja Republike Srbije na konačno usvajanje.

Beograd, 4.decembar 2020. godine

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