

OSOBNJE INFORMACIJE

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Datum rođenja: 14. 12. 1974.

Mjesto rođenja: Sanski Most, BiH

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ZAPOSLENJE

Prirodno-matematički fakultet Univerziteta u Sarajevu

Odsjek za hemiju, Katedra za opštu i anorgansku hemiju

📍 Zmaja od Bosne 35, 71 000 Sarajevo, Bosna i Hercegovina
Kabinet: 336/III

Vanredni profesor za oblasti: Opšta hemija i Anorganska hemija

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RADNO ISKUSTVO

06. 05. 2019. – danas

Vanredni profesor za oblasti *Opšta hemija* i *Anorganska hemija* na Odsjeku za hemiju Prirodno-matematičkog fakulteta Univerziteta u Sarajevu

05. 09. 2014. – 05. 05. 2019.

Docent za predmete: "Uvod u laboratorijski rad" i "Izabrana poglavlja iz anorganske hemije" na Odsjeku za hemiju Prirodno-matematičkog fakulteta Univerziteta u Sarajevu.

24. 04. 2008. – 04. 09. 2014.

Viši asistent za oblast *Opšta hemija* i *Anorganska hemija* na Odsjeku za hemiju Prirodno-matematičkog fakulteta Univerziteta u Sarajevu.

01.6. 2003. – 03. 04. 2008.

Asistent za oblast *Opšta hemija* i *Anorganska hemija* na Odsjeku za hemiju Prirodno-matematičkog fakulteta Univerziteta u Sarajevu.

Iskustvo u nastavi

Od izbora u zvanju vanredni profesor realizirala nastavu iz predmeta: *Uvod u laboratorijski rad, Kompleksna jedinjenja u okolišu, Primijenjena anorganska hemija, Izabrana poglavlja iz anorganske hemije, Opšta hemija za fizičare, Opšta hemija (Akademija likovnih umjetnosti), Senzori za kontrolu polutanata, Savremene teme u hemiji.*

Od izbora u zvanju docent za predmete „Uvod u laboratorijski rad“ i „Izabrana poglavlja iz anorganske hemije“ realizirala nastavu na pomenutim predmetima. U zvanju docent realizirala laboratorijske vježbe na I ciklusu studija iz predmeta: *Opšta i anorganska hemija* (za studente biologije), *Opšta hemija II, Anorganske sinteze*. Ak. 2016/2017. god. realizirala laboratorijske vježbe na II ciklusu studija (nastavnički smjer) iz predmeta: *Metodologija naučnog i stručnog rada, Metodika poučavanja i učenja hemije, Viši kurs iz demonstracionog praktikuma i Učenje otkrivanjem u hemiji.*

U periodu od 2003. godine, do danas, kao asistent i viši asistent realizirala praktičnu nastavu na Prirodno-matematičkom fakultetu iz predmeta:

Opšta hemija, Anorganska hemija, Stehiometrija, Opšta hemija I, Opšta hemija II, Uvod u laboratorijski rad, Opšta hemija za fizičare, Anorganska hemija I, Anorganska hemija II, Anorganske sinteze, Mehanizmi anorganskih reakcija, Viši anorganski praktikum, Izabrana poglavlja iz anorganske hemije.

U dopunskom radnom angažmanu učestvovala u izvođenju laboratorijskih vježbi iz hemije na drugim fakultetima Univerziteta u Sarajevu i to na: Mašinskom fakultetu (*Hemija, Hemija drveta i pomoćnih materijala* od 2005. do 2010.), Poljoprivrednom fakultetu (*Hemija*, ak. 2004/05. god.), Akademiji likovnih umjetnosti (*Osnovi prirodnih nauka*; ak. 2006/07.) i Fakultetu zdravstvenih studija (*Biohemija* u periodu 2012. – 2019.), *Opšta, anorganska i organska hemija* od 2017. do 2021).

OBRAZOVANJE

21. 03. 2014. **Doktor hemijskih nauka**, Prirodno-matematički fakultet, Sarajevo.
Doktorska disertacija: „*Sinteza i karakterizacija novih kompleksa Ru(III) sa O, N-donorskim ligandima*“ urađena na Katedri za opštu i anorgansku hemiju PMF-a u Sarajevu pod mentorstvom prof. dr. Emire Kahrović
09. 06. 2006. *Magistra rerum naturalium*. Rad naslova „*Some metal oxides as mediator for the amperometric determination of hydrogen peroxide*“ urađen na Katedri za opštu i anorgansku hemiju PMF-a u Sarajevu i KFU u Grazu pod mentorstvom doc. dr. Emira Turkušića i prof. dr. Kurta Kalchera.
- 2006 Karl-Franzens Univerzitet, Graz, Austrija
- 2003 – 2005 Postdiplomski studij, Prirodno-matematički fakultet, Sarajevo
- 1997 – 2001 *Diplomirani inženjer hemije*, Prirodno-matematički fakultet, Sarajevo
- 1999 – 2002 *Profesor hemije*, Prirodno-matematički fakultet, Sarajevo
- 1996 – 1997 *Medicinska sestra-tehničar*, Medicinska škola Bihać
- 1996 – 1997 *Fizikalni tehničar*, Gimnazija Sanski Most
- 1994 – 1996 Berufsausbildungsschule Hamburg (Praxis Dr. Bauer – Dr. Diederichs-Holthusen)
- 1989 – 1992 RO Srednjoškolski centar OOOOUR Gimnazija Sanski Most

OSOBNJE VJEŠTINE

Maternji jezik Bosanski jezik

| Ostali jezici | RAZUMJEVANJE | | GOVOR | | PISANJE |
|----------------|--------------|---------|---------------------|--------------------|---------|
| | Slušanje | Čitanje | Govorna interakcija | Govorna produkcija | |
| Njemački jezik | C2 | C2 | C2 | C2 | C1 |
| Engleski jezik | B1 | B1 | B1 | B1 | B1 |
| Turski jezik | A2 | A2 | A2 | A2 | A2 |

Stupnjevi: A1/2: Početnik - B1/2: Samostalni korisnik - C1/2 Iskusni korisnik
Zajednički europski referentni okvir za jezike

DODATNE INFORMACIJE

Usavršavanja

Studijski boravci na Karl-Franzens Univerzitetu (Graz, Austrija): maj, juni 2006.; februar, mart i decembar 2005.; juni, juli 2004.; juli i septembar 2003. „Some metal oxides as mediators for sensors and biosensors“(Project: Development of new sensors and biosensors; Projekti FMON-a i MONKS-a, WUS Austria – scholarship).

Učešća na stručnim seminarima

- Čista hromatografija, RESTEK, Sarajevo, 14. 02. 2017. god.
- Responsible Research and Innovation Tools Training, Sarajevo, 17. 11. 2016. god.
- SHIMADZU TOC – najbrži put do sukladnosti s EU direktivom o vodama, Sarajevo, 25. 05. 2016. god.
- Rješenje za moderni, Vaš laboratorij, ALPHA CHROM, Sarajevo, 17. 09. 2015. god.
- Reforma visokog obrazovanja – Implementacija bolonjskog procesa na Univerzitetu u Sarajevu, Sarajevo, 23. i 24. februar 2007. god.
- MICROSCIENCE WORKSHOP u saradnji sa UNESCO-IUPAC-IOCD-IFSE (voditelj seminara prof. dr. Alexadre Pokrovsky) 20. i 21. mart 2006. god.
- RAZVIJANJE SVIJEŠTI O BOLONJSKOM PROCESU U BiH – Integracija u evropsko područje visokog obrazovanja, 6 – 10 juni, Hotel „Grand“ Sarajevo.
- Improvement of Teaching Quality in South East Europe, 23. Februar – 2. Mart 2003, Sarajevo.

Učešće u projektima

| | |
|--|--|
| <i>Naziv projekta, voditelj projekta, godina</i> | ECOBIAŠ Development of master curricula in ecological and aquatic bioassessment for Western Balkans; prof. dr. Samir Đug, 2021 <i>U domaćim istraživačkim projektima učestvovala u svojstvu saradnika</i> |
| <i>Naziv projekta, voditelj projekta, godina</i> | Procjena zdravstvenog rizika na osnovu sadržaja štetnih supstanci hemijski analizirane drvene biomase (pelet i briket) dostupne na bosansko-hercegovačkom tržištu; doc. dr. Mirha Pazalja, 2019. |
| <i>Naziv projekta, voditelj projekta, godina</i> | Sinteza, karakterizacija i antitumorne osobine novih kompleksa rutenija sa O, N i S – donorskim ligandima; prof. dr. Nevzeta Ljubijankić; 2016. |
| <i>Naziv projekta, voditelj projekta, godina</i> | Novi kompleksni spojevi rutenija i kobalta: sinteza, reakcija sa proteinima i DNA kao pretpostavka za antitumorno djelovanje; prof. dr. Emira Kahrović; 2007. |
| <i>Naziv projekta, voditelj projekta, godina</i> | Istraživanje novih jedinjenja kao potencijalnih anticancera i razvoj novih biosenzora; prof. dr. Emira Kahrović; 2003. |
| <i>Naziv projekta, voditelj projekta, godina</i> | Razvoj novih metalnih kompleksa kao antitumornih agenasa i novi biosenzori; prof. dr. Emira Kahrović; 2003. |

Učešće na konferencijama

| | |
|-----------------|--|
| Juni-juli 2022. | 4 th International Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina, Sarajevo. |
| oktobar 2018. | 3 rd International Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina, Sarajevo. |
| juni 2017. | Peti naučno-stručni skup sa međunarodnim učešćem "5. juni - Svjetski dan zaštite okoliša" Bihać, BiH, 29. i 30. Juni 2017. |
| oktobar 2016. | 2 nd International Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina, Sarajevo. |

- oktobar 2014. 1st Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina with International Participation, Sarajevo, Bosnia and Herzegovina.
- septembar 2013. *International Turkish Congress on Molecular Spectroscopy*, Istanbul, Turkey.
- juli 2009. *14th International Conference on Biological Inorganic Chemistry*, Nagoya, Japan.
- juli 2006. *37th International Conference on Coordination Chemistry*, 13-18th July, Cape Town, South Africa.
- juli 2006. *13th Young Investigators Seminar On Analytical Chemistry*, Zagreb, Croatia.
- juli 2005. *12th Young investigators` Seminar on Analytical Chemistry* July 5 – July 10, Sarajevo, Bosnia and Herzegovina.
- juni 2004. *11th Young investigators` Seminar on Analytical Chemistry*, Karl-Franzens University, Graz, Austria.

Članstva

- Član Društva kemičara i tehnologa Kantona Sarajevo
- Predsjednik Organizacionog odbora i član Naučnog odbora 4. Kongresa hemičara i tehnologa Bosne i Hercegovine sa međunarodnim učešćem (30. juni – 2. juli 2022. god.)
- Član Organizacionog odbora i Naučnog odbora 3. Kongresa hemičara i tehnologa Bosne i Hercegovine sa međunarodnim učešćem (19-21. oktobar 2018. god.)
- Član Organizacionog odbora 2. Kongresa hemičara i tehnologa Bosne i Hercegovine sa međunarodnim učešćem (21-23. oktobar 2016. god.)

Recenzije

Recenzent rukopisa pod naslovom „STEHOMETRIJA, Zbirka zadataka sa rješenjima“ autora doc. dr. Mirhe Pazalja. (Odluka Vijeća Farmaceutskog fakulteta Sarajevo broj 0101-2273/20 od 08. 06. 2020).

Recenzent rukopisa pod naslovom „KEMIJSKO RAČUNANJE“ autora doc. dr. Josipa Jurkovića (Odluka Izdavačkog savjeta Poljoprivredno-prehrambenog fakulteta Sarajevu broj 01-1-827/19 od 01. 04. 2019).

BIBLIOGRAFIJA

Udžbenici



Nevzeta Ljubijankić, **Sabina Begić**, Irnesa Osmanković

Praktikum iz opšte hemije

Univerzitet u Sarajevu, Prirodno-matematički fakultet, 2022;
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Koautor poglavlja u knjizi

Waryo, T.T., **Begić, S.**, Turkušić, E., Vytřas, K. and Kalcher, K. (2005) Sensing in Electroanalysis. U: Karel Vytřas and Kurt Kalcher (eds.), *Metal Oxide-Modified Carbon Amperometric H₂O₂ - Transducers and Oxide-Biosensors*. University of Pardubice, Pardubice, Czech Republik, ISBN: 80-7194-831-4, pp. 145-191.

Naučni radovi u časopisima

1. Šehović, E., Memić, M., Sulejmanović, J., Hameed, M., **Begić, S.**, Ljubijankić, N., ... & Sher, F. (2022). Thermodynamic valorisation of lignocellulosic biomass green sorbents for toxic pollutants removal. *Chemosphere*, 307, 135737.
2. Sulejmanović, J., Memić, M., Šehović, E., Omanović, R., **Begić, S.**, Pazalja, M., Ajanović,

- A., Azhar, O., Sher, F. (2022) Synthesis of green nano sorbents for simultaneous preconcentration and recovery of heavy metals from water. *Chemosphere*, 296/22/133971. DOI: 10.1016/j.chemosphere.2022.133971.
3. Pazalja, M., Salihović, M., Sulejmanović, J., Smajović, A., **Begić, S.**, Spirtović-Halilović, S-H., Sher, F. (2021) SCIENTIFIC REPORTS, 11 (1), 17952; DOI: 10.1038/s41598-021-97305-4.
 4. Sulejmanović, J., Kovač, N., Memić, M., Šabanović, E., **Begić, S.**, Sher, F. (2021) Selective removal of lead ions from aqueous solutions using SiO₂-MoO₃: Isotherm, kinetics and thermodynamic studies. *Case Studies in Chemical and Environmental Engineering*, 3, art. no. 100083. DOI: 10.1016/j.cscee.2021.100083.
 5. Suljević, D., Handžić, N., Fočak, M. Lasić, I., Sipović, F., Sulejmanović, J., **Begić, S.**, Alijagić, A. (2020) Lead Exposure Influences Serum Biomarkers, Hepatocyte Survival, Bone Marrow Hematopoiesis, and the Reproductive Cycle in Japanese Quails. *Biol Trace Elem Res*. DOI: 10.1007/s12011-020-02272-y.
 6. **Begić, S.**, Ljubijankić, N., Gojak-Salimović, S. and E. Osmić (2019) Novel complexes of ruthenium(III) with Schiff bases and indazole – synthesis and characterization. *Rasayan J. Chem.*, 12(1) 294-299. DOI: 10.31788/RJC.2019.1215112.
 7. Sulejmanović, J., Šabanović, E., **Begić, S.** and Memić, M. (2019) Molybdenum(VI) oxide-modified silica gel as a novel sorbent for the simultaneous solid-phase extraction of eight metals with determination by flame atomic absorption spectrometry. *Analytical Letters*, accepted for publication. DOI: 10.1080/00032719.2018.1481418.
 8. Abdić, Š., Memić, M., Šabanović, E., Sulejmanović, J. and **Begić, S.** (2018) Adsorptive removal of eight heavy metals from aqueous solution by unmodified and modified agricultural waste: tangerine peel. *International Journal of Environmental Science and Technology*, 1-8. DOI: 10.1007/s13762-018-1645-7.
 9. Ljubijankić, N., **Begić, S.**, Ljubović-Dedeić, A., Stanković, M., Salimović-Bešić, I., Jadranin, M., Bencun, B. and Ljubijankić, S. (2018) Antimicrobial and genotoxic activity of novel ruthenium(III) complex with *N*-phenyl-5-nitrosalicylideneimine. *Rasayan J. Chem.*, 11(4): 1511-1518. DOI: 10.31788/RJC.2018.1145021.
 10. Ljubijankić, N., Stanković, M., Tešević, V., Grgurić-Šipka, S., Jadranin, M., **Begić, S.** and Šabanović, E. (2018) Cytokinesis block micronucleus assay in human lymphocytes after exposure to Ru(III) thiosemicarbazone complexes *in vitro*. *Rasayan J. Chem.*, 11(2): 647-652. DOI: 10.7324/RJC.2018.1123004.
 11. Ljubijankić, N., Tešević, V., Grgurić-Šipka, S., Jadranin, M., **Begić, S.**, Buljubašić, L., Markotić, E. and Ljubijankić, S. (2016) Synthesis and characterization of Ru(III) complexes with thiosemicarbazide-based ligands. *Bulletin of the Chemists and Technologists of Bosnia and Herzegovina*, 47, 1-6.
 12. **Begić, S.** and Ljubijankić, N. (2016) Synthesis and Characterization of Neutral Ru(III) Complexes Containing Schiff Bases and *N*-donor Heterocyclic Ligands. *Bulletin of the Chemists and Technologists of Bosnia and Herzegovina*, 47, 27-32.
 13. **Begić-Hairlahović, S.**, Kahrović, E. and Turkušić, E. (2014) Synthesis, Characterization and Interaction with CT DNA of Novel Cationic Complex Ru(III) with Indazole and Schiff Base Derived from 5-Chlorosalicylaldehyde. *Bulletin of the Chemists and Technologists of Bosnia and Herzegovina* 43 (2014) 15-20.
 14. Turkušić, E., **Begić, S.**, Kahrović, E. and Kalcher, K. (2011) Amperometric Determination of Glucose with FeO and Glucose Oxidase Bulk-Modified Screen-Printed Carbon Ink Biosensor. *HealthMED*, 5/5, 1117-1122.

15. Turkušić, E., **Begić, S.** Kahrović, E. and Kalcher, K. (2011) Amperometric Determination of hydrogen peroxide with FeO Bulk-Modified Screen-Printed Carbon Ink Sensor. *HealthMED*, 5/4, 949-955.
16. Kahrović, E., Dehari, S., Dehari, D., Reci, H., **Begić, S.** and Ljubijankić, N. (2010) Synthesis and characterization of new Ru (III) complexes with monobasic (NO) and dibasic (ONO) Schiff bases derived from salicylaldehydes. *TECHNICS TECHNOLOGIES EDUCATION MANAGEMENT-TTEM*, 5/4, 799- 803.
17. Waryo, T.T. , **Begić, S.**, Turkušić, E., Vytřas, K. and Kalcher, K. (2005) Fe₃O₄-Modified Thick Film Carbon-Based Amperometric Oxidase-Biosensor. *Sci. Pap. Univ. Pardubice, Ser. A*,11, 265–279.
18. Turkušić, E., Kalcher, J., Kahrović, E., Beyene, N.W., Moderegger, H., Sofić, E., **Begić, S.** and Kalcher, K. (2005) Amperometric Determination of Bonded-Glucose With a Manganese Dioxide and Glucose Oxidase Double Bulk-Modified Screen Printed Electrode Using Flow Injection Analysis. *Talanta*, 65, 559-564.

Cjeloviti radovi u zbornicima
međunarodnih skupova –
proceedings

1. Waryo, T., Kotzian, P., **Begić, S.**, Bradizlova, P., Beyene, N., Baker, P., Kgarebe, B. Turkusić, E., Iwuoha, E., Vytras, K. and Kalcher, K. (2009) Amperometric Hydrogen Peroxide Sensors with Multivalent Metal Oxide-Modified Electrodes for Biomedical Analysis. 13th INTERNATIONAL CONFERENCE ON BIOMEDICAL ENGINEERING, ICBME 2008, Chwee Teck Lim, James C.H. Goh (Eds.), *IFMBE Proceedings* 23/2, 829-833.

Stručni radovi

1. Kazlagić, A., Ljubijankić, S., Kadić, S., Begić, S., **Ljubijankić, N.** (2019) Properties and Ecotoxicology of Phosphorus. *Book of proceedings 6th International Scientific Conference „June 5th – World Environment Day“*, ISSN 2566-4530, p. 416-424.
2. Kadić, S., **Ljubijankić, N.**, Begić, S., Kazlagić, N., Ljubijankić, S. (2019) Ecology in elementary school. *Book of proceedings 6th International Scientific Conference „June 5th – World Environment Day“*, ISSN 2566-4530, p.356-364.
3. Ljubijankić, N., Cipurković, A., **Begić, S.**, Horozić, E. i Ljubijankić, S. (2018) Osobine i ekotoksikologija kadmija. U *Zbornik radova Peti naučno-stručni skup sa međunarodnim učešćem "5. juni - Svjetski dan zaštite okoliša" 29. i 30. Juni 2017*, Bihać, BiH, Univerzitet u Bihaću, Biotehnički fakultet, ISSN 2566-4530, str. 48-55.
4. **Begić, S.**, Ljubijankić, N. (2018) Zbrinjavanje hemijskog otpada u studentskim laboratorijama. U *Zbornik radova Peti naučno-stručni skup sa međunarodnim učešćem "5. juni - Svjetski dan zaštite okoliša" 29. i 30. Juni 2017*, Bihać, BiH, Univerzitet u Bihaću, Biotehnički fakultet, ISSN 2566-4530, str. 105-112.

Naučni radovi na konferencijama

1. Ljubijankić, N., **Begić, S.**, Ibragić, S. (2022) Antioxidant Activity of Ru(III) Complexes and Their Ligands Derived from Salicylaldehyde and Halogenated Anilines, 4th International Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina, Sarajevo, BiH 30.06-02.07, Book of Abstracts, p. 47.
2. Krečo, A., **Begić, S.**, Nuić, I., Mrdić, M. (2022) Possibilities of STEAM Integration in Canton Sarajevo Primary School Chemistry Teaching 4th International Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina, Sarajevo, BiH 30.06-02.07, Book of Abstracts, p. 93.
3. Masleša, A., Sulejmanović, J., Šehović, E., **Begić, S.**, Sher, F. and Selović, A. (2022) Biosorption removal study of Methylene blue dye from aqueous solution on a Citrus limon peel, 4th International Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina, Sarajevo, BiH 30.06-02.07, Book of Abstracts, p.104.

4. Sulejmanović, J., Zrno, A., Omanović, R., Topčagić, A., **Begić, S.** and Jurković, J. **(2022)** Novel approach for effective removal of methylene blue dye from water using grapefruit peel as a potential biosorbent, 4th International Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina, Sarajevo, BiH 30.06-02.07, Book of Abstracts, p.105.
5. Trožić-Borovac, S., Bijedić, A., Škrijelj, R., **Begić, S.**, Imamović, B. **(2022)** Correlation of Saprobic Index and Selected Chemical Factors in the Rivers Ljuta and Buna, , 4th International Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina, Sarajevo, BiH 30.06-02.07, Book of Abstracts, p.117.
6. Sher F., Sulejmanović J., **Begić S.**, Ziani I., Smječanin N., Karadža A., Šehović E., Omanović R., Nuhanović M. **(2022)** Electrocoagulation coupled with oxidation as an effective approach for industrial wastewater treatment, 4th International Congress of Chemists and Chemical Engineers of Bosnia and Herzegovina, Sarajevo, BiH, 30.06-02.07, Book of Abstracts, PP-ENC-23, p.123.
7. Pazalja M., Salihović M., Sulejmanović J., **Begić S.**, Musić E. **(2021)**. Analysis of Heavy Metals in Ashes of Wood Biomass. VII International Congress "Engineering, Environment and Materials in Process Industry". 17 – 19 March, Jahorina, Bosnia and Herzegovina.
8. Pazalja M., Salihović M., Babić H., Špirtović-Halilović S., **Begić S.** **(2019)** Spectrophotometric determination of total carbohydrates in natural juices. 4th Congress of pharmacists of Bosnia and Herzegovina with international participation Sarajevo 10.10-13.10.2019.
9. Pazalja, M., Salihović, M., Sulejmanović, J., Memić, M., **Begić, S.** **(2019)** Determination of the content of heavy metals in pellet and pellet ash by FAAS technique. *VI International scientific-professional symposium* "Environmental resources, sustainable development and food production" – OPORPH 2019, 14-15 November 2019, Tuzla, Bosnia and Herzegovina: Book of Abstracts, p. 35.
10. Salihović, M., Pazalja, M., Roca, S., Špirtović-Halilović, S., Veljović, E., Šapčanin, A., **Begić, S.** **(2019)** Density functional theory: 1H-NMR and 13C-NMR spectra of some Schiff bases. *VI International scientific-professional symposium* "Environmental resources, sustainable development and food production" – OPORPH 2019, 14-15 November 2019, Tuzla, Bosnia and Herzegovina: Book of Abstracts, p. 36.
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