AN OVERVIEW OF THE SCIENTIFIC RESEARCH WORK AT THE DEPARTMENT OF CHEMISTRY OF THE FACULTY OF SCIENCES AND MATHEMATICS IN NIŠ BASED ON THE DEFENDED MASTER’S AND PhD THeses (1971-2017)

UDC 378.096 : 542

Ružica Nikolić, Danijela Kostić

Faculty of Sciences and Mathematics, University of Niš, Niš, Serbia

Abstract. This paper presents an overview of the scientific research work carried out at the Department of Chemistry of the Faculty of Sciences and Mathematics of the University of Niš. The scientific research work was realized in the form of masters and PhD theses, as well as within the projects funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia. In the field of chemistry, a total of 110 masters’ theses and 105 doctoral dissertations were defended during the period 1971-2017. Thirty-nine PhD theses are the result of the PhD program introduced 2006. The Chemistry Department gave a significant contribution in the field of education and science by educating a large number of high-quality masters and PhD students some of which have found positions at the Chemistry Department of the Faculty of Sciences and Mathematics in Niš and other Serbian and foreign scientific institutions.

Key words: Chemistry Department, master’s theses, PhD theses

1. INTRODUCTION

The Faculty of Philosophy in Niš was founded in 1971 and included a chemistry program within its seven basic study programs. Once the Faculty of Science and Mathematics was founded in 1999, it was developed into the current Department of Chemistry.

With an increase in the number of staff and an improved living standard of the society, in addition to the educational and pedagogical activities of the Department, various
scientific research work activities began to take place. They were realized through the work on and defenses of masters and PhD theses, and as a part of various scientific research projects.

Graduate studies at the department began in 1978, and upon completion of the program, students were awarded the academic title of MSc - master’s degree in chemistry. These degrees were offered in the following study programs: Inorganic Chemistry, Organic Chemistry and Biochemistry, Analytic and Physical Chemistry, Industrial Chemistry and Chemistry Education, based on a mentoring system. To date, 110 candidates have been awarded a master’s degree in chemistry.

Since 2006, a three-year PhD program has been introduced with 8 exams which all are picked from a list of accredited courses and 6 types of research curricula. The work on PhD theses is carried out under the guidance of a mentor selected from a pre-determined list, and dissertations are defended upon the publication of two papers in international journals ranked as M20 and one paper in the journal published by the University of Niš. According to Rule Book of the Ministry of Education, Science and Technological Development international journals are classified into four categories:

- An excellent international journal, which is among 10% of the journals on the list for the appropriate discipline ranked by the impact factor value (M21a);
- A top international journal, which is among 30% in its field (M21);
- A prominent international journal, which is between 30 and 60% in its field (M22);
- International Journal, which is a scientific journal on the list, but it is not classified in the first 60% (M23).

Since 2011, the defended PhD theses are available on the faculty website in electronic form. Upon completion of the doctoral studies program, a candidate is awarded a PhD in natural science-chemistry. Until the end of 2017, 105 PhD theses have been defended, 39 of which have been defended since 2006.

2. AN OVERVIEW OF THE DEFENDED MASTER’S THESSES

The master’s thesis program was first offered to students in 1978. The first thesis was defended in 1981, and the last one in 2010. A total of 110 theses have been defended. Among these theses, 64 were defended at the Faculty of Philosophy from 1978 to 1999, and the rest were defended at the Faculty of Science and Mathematics from 2000 to 2010.

A total of 17 theses were defended in the field of inorganic chemistry (Table 1). In these theses No. 2, 4, 6-10 and 12-16 geochemical analyses of samples of various geological origin were performed. These theses were done under the supervision of Prof. Pavle Premović, who was the head of several scientific research projects in the field of geochemistry.
**Table 1 Master’s theses in inorganic chemistry**

| No | Author            | Title                                                                                     | Mentor         | Year |
|----|-------------------|-------------------------------------------------------------------------------------------|----------------|------|
| 1  | Jelica Perović   | Evaporation of molybdenum in a stream of HCl and O\textsubscript{2} as a method for the concentration of impurities and spectrochemical determination | S. Rajić       | 1981 |
| 2  | Mira Pavlović     | Vanadium in Aleksinac shale                                                               | P. Premović    | 1984 |
| 3  | Dragan Zlatanović | Theoretical and thermodynamic analysis of chemical reactions in the system molybdenum sulphide-sodium chloride at elevated temperatures | S. Rajić       | 1985 |
| 4  | Gordana Kitanović | Polymorphic paramagnetic structures in algal muds                                       | P. Premović    | 1985 |
| 5  | Vilina Cirić      | Organo radicals in red blood of late Precambrian                                          | S. Rajić       | 1985 |
| 6  | Zora Grahotav     | Uran in Aleksinac core                                                                    | P. Premović    | 1986 |
| 7  | Ljubiša Jovanović | Paramagnetic polyaromatic structures in the Precambrian kerogen                           | P. Premović    | 1991 |
| 8  | Nikola Nikolić    | Physico-chemical conditions of sedimentation of Cretaceous-Tertiary boundary sediments in Denmark | P. Premović    | 1993 |
| 9  | Branislav Suhartović | Geomineral transformation of kerogen derived from the sulfur-rich asphaltene          | P. Premović    | 1994 |
| 10 | Goran Nikolić     | Identification of ortho-benzo-semiquinone radicals in the urine of smokers by electron spin resonance | P. Premović    | 1995 |
| 11 | Miroslav Premović | Physico-chemical analyses of organic geopolymer: Fourier-ova transformation infrared spectroscopy | G. Miletic     | 1998 |
| 12 | Ivan Tonsa        | Incorporation of porphyrins into asphaltenes and kerogens                                | P. Premović    | 1999 |
| 13 | Jorgovank Bojić   | Oxgen kerogenization of asphaltenes from bituminous rocks                                | P. Premović    | 1999 |
| 14 | Dragan Đorđević   | Geochemical investigation of vanadyl porphyrins in geopolymers                            | P. Premović    | 2003 |
| 15 | Bratislav Todorović | Geomineral analysis of the boundary layer of the Cretaceous-Tertiary Caravaca (Spain)  | P. Premović    | 2003 |
| 16 | Dejan Dulanović   | Geochemical studies of vanadium in kielinite clay                                        | P. Premović    | 2004 |
| 17 | Žarko Mitić       | Synthesis, physicochemical and pharmacological studies of Cu(II) complexes with polysaccharides | R. Nikolić     | 2005 |
A total of 29 theses were defended in the field of analytical chemistry (Table 2). New analytical methods were developed and existing methods were applied in the analysis of various ions and molecules in model systems and on real samples. This is related to the projects funded by the Ministry of Science and Technological Development of the Republic of Serbia, which were implemented in the periods 1996-2000, 2000-2005, 2005-2010 at the Department of Chemistry, within which equipment of capital value and the necessary funds for the realization of experiments were purchased.

Table 2 Master’s theses in analytical and physical chemistry

| No | Author          | Title                                                                 | Mentor   | Year |
|----|-----------------|-----------------------------------------------------------------------|----------|------|
| 1  | Dragan Lazarević | Mineral vode Niške banje (istorijski pregled geohemijskih istraživanja) | S. Rajić | 1986 |
| 2  | Anja Jokić      | Ispitivanje i mogućnosti primene H₂/Pd i D₂/Pd elektrode pri potencijometrijskim određivanjima kiselina u tetrahidrofuramu kao rastvaraču | R. Igov  | 1990 |
| 3  | Sofija Rančić   | Analiza tragova Pb(II), Zn(II) i Cu(II) u pijacoj vodi primenom kinetičke spektrofotometrijske i AAS metode | R. Igov  | 1991 |
| 4  | Sneţana Mitić   | Kinetičko određivanje tragova Mn(II), Cu(II) i Fe(III) u mineralnim vodama | R. Igov  | 1991 |
| 5  | Milena Miljković| Spektrofotometrijsko određivanje koncentracije reaktivnih boja u tehnološkim rastvorima na obojenim tekstilnim materijalima | T. Pecev | 1991 |
| 6  | Ranko Simonović | Nove homogeno-katalitičke reakcije za analizu tragova Fe(III), Zn(II) i Cu(II) katalitičkom oksidacijom 4-hidroksikumarina kalijum-permanganatom u kiseloj sredini | R. Igov  | 1991 |
| 7  | Dragan Dimitrijević | Spektrohemijska karakterizacija organo-fosfornih bojnih otvora tipa "V" | R. Igov  | 1992 |
| 8  | Miodrag Ristić  | Određivanje komponenta smeće (Ni, Pb, Cu i Zn) u otpadnim vodama hromatografskim razdvajanjem i spektrofotometrijskim određivanjem | P. Premović | 1993 |
| #  | Author          | Title                                                                                           | Page |
|----|----------------|------------------------------------------------------------------------------------------------|------|
| 9  | Dragana Noro   | Kinetic determination of trace amounts of Fe(III), Co(II) and Mn(II) by catalytic oxidation of | 195  |
|    |                | the coumarin and some derivatives of coumarin with potassium permanganate in acid medium       |      |
| 10 | Svetlana Rašić | AES analiza difuzionsih procesa u sendvič strukturama omskog kontakta                           | 199  |
| 11 | Anita Todorovski| Preparation and characterization of geometric isomers of (ethylendiamine-N,N,N',triacetate- N'3-propionate) chromate(II) complexes | 1995 |
| 12 | Valentina Živanović | Sodium pyrogallol-5-sulfonate as indicator substance for the determination of traces of As(III), Ni(II) and phosphate in the solution | 1996 |
| 13 | Aleksandar Igov | New homogeneous catalytic reactions for the analysis of traces of La(III), Ti(III) and Mn(II) in solution | 1996 |
| 14 | Danijela Nasković | Investigation of the Fe(III), Mo(VI) complexes with sulfonated products of pyrogallol and resorcinol | 1997 |
| 15 | Danijela Kostić | Kinetic determination of vitamin C, B6 and B1 in pharmaceutical compositions                    | 1998 |
| 16 | Vesna Stankov-Jovanović | New kinetic methods for the analysis of traces of La(III), Ti(III) and Pb(II) in solution     | 1998 |
| 17 | Violeta Mitić  | New kinetic methods for the analysis of traces of Sb(III), Sn(II), Pb(II) and Al(III) in solution | 1998 |
| 18 | Tatjana Andelković | Characterization of terrestrial humic acid isolated by the modified method                   | 2000 |
| 19 | Slavica Sunarić | Investigation of the reaction AsO₄³⁻, H₂AsO₄⁻ and SeO₄³⁻ with oxalic acid                      | 2001 |
| 20 | Irena Vidović  | Contribution to the determination of Pb(II) by atomic absorption spectrophotometry method based on lead hydride generation | 2001 |
| No. | Name                        | Title                                                                 | Author          | Year |
|-----|-----------------------------|-----------------------------------------------------------------------|-----------------|------|
| 21  | Jasmina Mitić              | The survey of underground waters quality in the city of Niš            | M. Purenović    | 2001 |
| 22  | Aleksandra Pavlović        | Kinetic determination of amino acids: histidine, arginine, and lysine  | S. Mitić         | 2002 |
| 23  | Emilija Pecev-Marinković   | The use of food colour PONCEAU 4R as indicator substance in quantitative chemical analysis | Z. Grahovac     | 2004 |
| 24  | Dragan Marinković          | Investigation of organochlorine insecticides and polychlorinated biphenyls in some drinking waters by chromatographic methods | B. Radovanović  | 2004 |
| 25  | Danijela Bojić             | Investigation of reduction of nitrate of exogenous origin in the human oral cavity | J. Perović      | 2005 |
| 26  | Ružica Mitić               | The use of 4-hydroxycoumarin for the determination of traces of Mn(II), Mo(VI), V(V), and Th(IV) ions in solution | S. Mitić         | 2006 |
| 27  | Branka Petković            | Quantitative determination of traces of Au(III), W(VI), Zr(IV), and Mo(VI) ions in solution | T. Pecev        | 2007 |
| 28  | Dragan Stanković           | The impact of chemical species of particular macro and microelements of geothermal water on physical and chemical properties of Bujanovac spa peloids | M. Purenović    | 2010 |
| 29  | Miroslav Milenković        | Determination of digoxin in the pharmaceutical compositions            | R. Palić        | 2010 |
Seven theses were defended in the field of industrial chemistry and environmental chemistry (Table 3). Most of the research on the theses was advised by Prof. Milovan Purenović who also led a few research projects at the Chemistry Department, which dealt with the synthesis of new composite materials and their application in water treatment.

**Table 3 Master’s theses in industrial chemistry**

| No | Author                  | Title                                                                 | Mentor          | Year |
|----|-------------------------|----------------------------------------------------------------------|-----------------|------|
| 1  | Novica Stanković        | Ispitivanje obojenosti poliestarskih i mikropoliestarskih vlakana disperznim serilen bojama refleksionom spektrofotometrijom | M. Purenović   | 1993 |
| 2  | Aleksandar Bojić        | Ispitivanje fizičko-hemijskih pojava pri heterogenoj spontanoj elektrokatalizi u vodenim rastvorima nekih organskih i neorganskih jedinjenja primenom čvrstog katalizatora na bazi mikrolegranog aluminijuma | M. Purenović   | 1997 |
| 3  | Draga Mitić Stojanović | Uticaj nekih dodataka i termohemijske obrade na strukturu i fizičko-hemijske osobine u sistemu SiO₂·H₂O | M. Purenović   | 2000 |
| 4  | Aleksandra Zarubica     | Korelacija metričke i antikorozione karakterizacije organskih premaza u zaštiti metala | M. Miljković    | 2000 |
| 5  | Vesna Cvetković         | Elektrohemijsko ponašanje H₂O u prisustvu nekih katalitičkih materija, dodataka i primesa u jonskom, koloidnom i gasovitom stanju | M. Purenović   | 2005 |
| 6  | Violeta Rakić           | Electrochemical behavior of H₂O in the presence of some catalytic materials, additives and impurities in ionic, colloidal and gaseous states | M. Miljković    | 2007 |
| 7  | Aleksandar Veselinović  | Indeksacija i spektroskospska identifikacija prehrambenih boja u životnim namirnicama | M. Miljković    | 2009 |
|    |                         | Photolysis of humic acids in an aqueous medium                        | A. Bojić       |      |
In the field of chemistry education, 10 theses were defended (Table 4). Most of the theses were done under the supervision of Prof. Miloje Rakočević.

**Table 4** Master’s theses in chemistry education

| No | Author          | Title                                                                 | Mentor       | Year |
|----|----------------|----------------------------------------------------------------------|--------------|------|
| 1  | Vesna Andrejić | Istraživanje esencijalnosti proteinarnih aminokiselina                | M. Rakočević | 1995 |
| 2  | Svetlana Spasić-Vukadinović | Bimarna simetrija proteinarnih aminokiselina u molekulu citohroma C | M. Rakočević | 1995 |
| 3  | Rifat Hadrović | Periodičnost u sistemima organskih molekula kao naučni i nastavni problem | M. Rakočević | 1999 |
| 4  | Vladan Đurić    | Klasifikacija proteinarnih aminokiselina u relaciji sa pozicijom nukleotidnih baza u kodonima | M. Rakočević | 1999 |
| 5  | Vanja Manitašević | Naučni i nastavni aspekti klasifikacije proteinarnih aminokiselina u četiri stereo-chemički tipa | M. Rakočević | 2000 |
| 6  | Predrag Jelenković | Naučni i nastavni aspekti proučavanja strukture aminokiselina           | M. Rakočević | 2001 |
| 7  | Vesna Živković | Korozija metala - naučni, nastavni i ekološki aspekti                | M. Rakočević | 2002 |
| 8  | Mirjana Jovanović | Uticaj posebnog didaktičkog materijala na uspeh u nastavi hemije       | M. Rakočević | 2003 |
| 9  | Jelena Franeta | Hemija životne sredine kao nastavna tema u srednjoškolskoj nastavi     | J. Perović   | 2006 |
| 10 | Aleksandra Gošnić | Korelacija tradicionalne i kompjuterski podržane interaktivne nastavne metode u obradi nastavne teme protein | D. Kostić    | 2009 |
Most of the master’s theses were defended in the field of organic chemistry and biochemistry (Table 5), which is in accordance with world trends in the development of chemistry. The work mostly dealt with the analysis of essential oils and extracts from herbs from the territory of Serbia, also included the synthesis of biologically active substances, and with several papers from the field of organic polymers. The greatest number of master's theses (23 in total) were done under the directions of Prof. Radoslav Palić, who was the head of several projects which were carried out at the Chemistry Department in the period from 1982 to 2012.

### Table 5 Master’s theses in organic chemistry and biochemistry

| No | Author          | Title                                                                 | Mentor              | Year |
|----|----------------|----------------------------------------------------------------------|---------------------|------|
| 1  | Milan Nikolić  | Ispitivanje kardiotoničnih glikozida iz biljke *Adonis vernalis* L. | S. Laišić           | 1986 |
| 2  | Marina Mitić   | Određivanje diferencijalnih proteinjskih klarensa kod bubrežnih boleznika | J. Ursić Janković   | 1987 |
| 3  | Nataša Krstić  | Ispitivanje serumskih proteina zamoraca inficiranih sporama gluje *Aspergillus flavus* | J. Ursić Janković   | 1988 |
| 4  | Mirjana Abramović | Uticaj nekih lekova na elektroforetsko ponašanje serumskih proteina | J. Ursić Janković   | 1988 |
| 5  | Vesna Jovičić  | Ispitivanje serumskih i lipoproteina lipida zamorčića inficiranih sporama gluje *Aspergillus flavus* | J. Ursić Janković   | 1988 |
| 6  | Olga Jovanović | Selektivne transformacije i sinteze u hemiju ugljenih hidrat | D. Glišin           | 1989 |
| 7  | Gordana Stojanović | Sinteza D-dezozamina i njegovog 2-O-metil derivata | D. Glišin           | 1990 |
| 8  | Slobodan Andelović | Ispitivanje reacije sinteze furfuriliden i tetrahidrofurfuril hormona u odgovarajućim spiroketalnim jedinjenjima | S. Laijišić         | 1990 |
| 9  | Nebojša Simić  | Analiza etarskog ulja iz iglica munike (*Pinus heldreichii* Chris), (*Pinus peuce* Griseb) i belog bora (*Pinus sylvestris* L.) | R. Palić            | 1991 |
| 10 | Perica Pešić   | Ispitivanje etarskog ulja i masnih kiselina *Salvia sclarea* L. | R. Palić            | 1992 |
| # | Autori | Naslov | Sezona/rančno jelo | Prvenstvena sostava | Izvor, God. |
|---|--------|--------|------------------|--------------------|-------------|
| 11 | Dragojub Miladinović | Ispitivanje korelacije izolovanog kolhicina iz Colchicum autumnale L. (mmrazovac) sa sadržajem mikroelementa Mn(II), Zn(II), Cu(II) i Ni(II) u zemljistištu i njihova distribucija u biljci | | B. Radovanović | 1992 |
| 12 | Slavica Ilić | Hemisjsko ispitivanje biljnih pigmenta i njihove mikrobiološke aktivnosti iz cveta Melilotus officinalis L. | | S. Miletić | 1992 |
| 13 | Suzana Samardžija | Utičaj aktivnih belih punila na kinetiku procesa vulkanizacije i fizičko-mehanička svojstva elastomernih vulkanizata | | B. Radovanović | 1992 |
| 14 | Branislav Gudžić | Hemisjsko ispitivanje biljnih pigmenta i njihove mikrobiološke aktivnosti iz cveta Hypericum perforatum L. | | R. Palić | 1993 |
| 15 | Gordana Jovanović | Utičaj različitih aditiva na svojstva gume iz etilen-propilendiena kaučuka i sistema vezivnih sredstava na jačinu guma-metal veza | | B. Radovanović | 1993 |
| 16 | Ljiljana Sokolić | Sinteza novih heterocikličnih jedinjenja na bazi 3-cijano-4-hlorkumarina | | R. Palić | 1993 |
| 17 | Nada Nikolić | Transformacije glikoalkaloida Solanum tuberosum L. do solanida | | R. Palić | 1993 |
| 18 | Dušanka Savić | Hemisjsko ispitivanje etarskog ulja, alkana i masnih kiselina Satureja adomovicii Šilić i Satureja fukarekii Šilić | | R. Palić | 1993 |
| 19 | Novica Ristić | Hemisjsko ispitivanje etarskog ulja, masnih kiselina i alkana Micromeria thymifolia (Scop.) Fritsch. i Micromeria albanica (Gritsb. ex. k. Maly) Šilić | | R. Palić | 1994 |
| 20 | Ivan Ivanov | Izolovanje i karakterizacija produkata katalitičke polimerizacije 1,3-dihidroksibenzena | | J. Ursić Janković | 1995 |
| No. | Author                  | Title                                                                 | Year |
|-----|-------------------------|----------------------------------------------------------------------|------|
| 21  | Goran Petrović          | Investigation of the effect of the molecular structure of some isatin Schiff bases on the effectiveness of the inhibition of corrosion of iron | 1995 |
| 22  | Vesna Milanović         | Chemical analysis of anthocyanins from flower petals of *Malva sylvestris* L. (Malvaceae), *Delphinium consolida* L. (Ranunculaceae), *Papaver rhoeas* L. (Papaveraceae), *Rosa centifolia* L. (Rosaceae) | 1995 |
| 23  | Marina Marković         | The composition of seed oils of *Oenothera biennis* L. and *Cucurbita pepo* L., and germ oil of *Triticum vulgare* L. | 1995 |
| 24  | Agim Šabani             | Synthesis of novel heterocyclic compounds condensed and cyclized in positions 3 and 4 of the coumarin ring | 1996 |
| 25  | Zilha Krijažtorac        | Determination of the activity and the specific activity of total and prostatic acid phosphatase in the serum of diseased with prostate adenoma using different substrate concentrations | 1996 |
| 26  | Vojislav Jovanović      | Influence of type and mass fraction of char on the density of crosslinking and the activation energy of crosslinking of vulcanisate of acrylonitrile-butadiene India rubber | 1997 |
| 27  | Jasmina Velčković       | Fatty acids and alkanes of *Achillea lingulata* L., *Achillea crithmifolia* L., and *Achillea nobilis* L. | 1999 |
| 28  | Radmila Pavlović         | Production of nitrogen monoxide and L-arginine metabolism in the early period after mild lung injury in rabbits | 1999 |
| 29  | Slađana Alagić          | Investigation of essential oil and extracts of domestic types of species *Nicotiana tabacum* L. | 2000 |
| 30  | Tanja Nasković          | Chemical and microbiological study of *Achillea crithmifolia* W.K., *Achillea lingulata* W.K. et K., and *Achillea nobilis* L. | 2000 |
| 31  | Ivan Palić               | Chemical and microbiological study of *Micromeria albanica* and *Micromeria cristata* | 2001 |
| #  | Ime i Prezime       | Naslov | Autori                                      | Godina |
|----|---------------------|--------|---------------------------------------------|--------|
| 32 | Jasmina Mitrović    | Hemisjo ispitivanje biljne vrste Artemisia lobelli All. | R. Palić 2001 |
| 33 | Tatjana Jovanović   | Hemisjo i mikrobiološko ispitivanje odabranih biljnih vrsta roda Acinos Miller | R. Palić 2002 |
| 34 | Olivera Marinovici | Ispitivanje masnih kiselina i alkan iz biljnih vrsta Hypericum perforatum, Hypericum maculatum i Hypericum olympicum | R. Palić 2003 |
| 35 | Vesna Ranković      | Kvalitet rakja lozovača hibridnih sorti grožđa Lucia i Mediana | R. Palić 2005 |
| 36 | Niko Radulović      | Sekundarni metaboliti biljnih vrsta Achillea clavennae L. i Achillea holosericea Sibth. et Sm. | G. Stojanović 2005 |
| 37 | Jelena Lazarević    | Sekundarni metaboliti biljne vrste Stachys milani Petrović | R. Palić 2005 |
| 38 | Predrag Sibinović   | Ispitivanje stabilnosti ciprofloksacina u gotovim farmaceutskim oblicima | R. Palić 2005 |
| 39 | Biljana Dekić       | Sintegra, struktura i mikrobiološka aktivnost heterocikličkih dibenz[a,h]antracena i Sintegra, struktura i mikrobiološka aktivnost heterocikličkih dibenz[a,h]antracena i | R. Palić 2006 |
| 40 | Vidoslav Dekić      | Sintegra, struktura i mikrobiološka aktivnost kondenzovanih derivata kumarina | R. Palić 2006 |
| 41 | Polina Blagojević   | Hemijski sastav i mikrobiološka aktivnost etariskih ulja biljnih vrsta Artemisia absinthium L. i Artemisia vulgaris L. | G. Stojanović 2007 |
| 42 | Branimirka Vasić    | Sintegra, rendgenska struktura analiza, antimikrobiološka aktivnost 4-supstituisanih kumarina | R. Palić 2007 |
| 43 | Milan Dedić         | Isparljivi sekundarni metaboliti steno-endemične biljne vrste Aquilegia pancicii Degen | R. Palić 2008 |
| 44 | Aleksandra Dordević | Identifikacija isparljivih konstituenata cvetova biljnih vrsta Prunus domestica L. i Prunus padus L. | R. Palić 2008 |
An Overview of the Scientific Research Work at the Chemistry Department

The distribution of master's theses in a certain scientific field is presented in Fig. 1. Most of the theses were defended in the field of organic chemistry, then in the field of analytical chemistry, inorganic chemistry, chemistry education, and industrial chemistry. In terms of subject matter, these theses are correlated with the scientific research projects realized in the aforementioned period, while the advisors were all staff members of the Chemistry Department. The greatest number of the theses was defended under the guidance of Professors Radosav Palić and Pavle Premović (25 and 14, respectively), who spent more than thirty years working in the field of chemistry.

A total of 110 master’s theses were defended. Of them, in the period from 1978 to 1999, 64 masters’ theses were defended at the Faculty of Philosophy, and from 2000 to 2010 the rest of the theses were defended at the Faculty of Science and Mathematics. The number of defended theses in five-year periods since the master program was first launched until 2010 is presented in Fig. 2. The number of defended theses was initially small. The master’s study program was attended by the teaching assistants working both at the Chemistry Department and at other related Departments and Universities. Following 1990, due to the overall economic and political situation in the country, there was a rapid increase in interest in the master’s degree program. The original master’s program, as it has existed from the beginning, was terminated in 2005, with the passing of the Law on Higher Education.

Many of the students awarded an MSc in chemistry continued their education at the Chemistry Department, so that most of them went on to earn their PhD. Dozen of students who earned their MSc at the Chemistry Department also found work at the other Faculties of the University of Niš, as well as at the University of Priština (nowadays seated in Kosovska Mitrovica). A number of students who earned their MSc at the Chemistry Department continued their education by attending various PhD programs abroad.
Fig. 1 The distribution of masters’ theses among different chemistry fields

Fig. 2 A chronological overview of the number of defended master’s theses

3. AN OVERVIEW OF THE DEFENDED PHD THeses

The first PhD thesis in the field of chemistry was defended at the Faculty of Philosophy in 1984. In the period from 1972 to 2017 a total of 105 PhD theses were defended.

In the field of inorganic chemistry, a total of 16 PhD theses were defended (Table 6). Theses supervised by Prof. Pavle Premović dealt with the geochemical analysis of samples of various geochemical origins and were done within the following two projects implemented at the Chair of Inorganic Chemistry:
1. “Balances in complex environments” within the subproject "Study of the nature, structure, and origin of chemical species in natural environments (1995-2000)”, funded by the Ministry of Science and Technological Development of the Republic of Serbia, project leader Prof. Pavle Premović;

2. “Physicochemical characterization of heavy metals in structures of synthetic minerals of clay, natural minerals of clay and clay of industrial and ecological significance from the area of wider Serbia (2000-2005)”, funded by the Ministry of Science and Technological Development of the Republic of Serbia, project leader Prof. Pavle Premović.

The remaining PhD theses were from the field of coordination chemistry and bioelements supervised by Prof. Ružica Nikolić.

**Table 6 PhD theses in the field of inorganic chemistry**

| No | Author          | Title                                                                 | Mentor      | Year |
|----|-----------------|-----------------------------------------------------------------------|-------------|------|
| 1  | Ružica Nikolić | Geohemisjska analiza Cu, Ag i Au u nekim geološkim uzorcima iz Srbije | P. Premović | 1992 |
| 2  | Jakov Stamenković | Pokretljivost jona u polimernima akrilne kiseline | K. Zumbov   | 1993 |
| 3  | Ljubiša Jovanović | Termalna stabilnost vanadil porfirinskih jedinjenja u sedimentnim stenama | P. Premović | 1996 |
| 4  | Nikola Nikolić | Vanadijum i fizičko-hemijski uslovi sedimentacije | P. Premović | 1999 |
| 5  | Biljana Kaličanin | Ugrađivanje i izluživanje jona Cu, Zn, Pb i Cd u dentalnim protetičkim materijalima, model protetičkim materijalima i prirodnim zubima | R. Nikolić   | 2004 |
| 6  | Dragana Đorđević | Termalna stabilnost vanadil porfirina u sedimentnim kerogenima | P. Premović | 2009 |
| 7  | Bratislav Todorović | Geohemisjska analiza graničnog sloja krede i tercijara Fish Clay (riblja glina) sa lokaliteta Hojenup (Stevns Klint, Danska) Ni, Co i Zn u crnom laporcu | P. Premović | 2009 |
| 8  | Žarko Mitić | Sintez a i spektar strukturne korelacije kompleksa nekih biometala sa dekstranom i pululanom | M. Cakić   | 2009 |
| 9  | Maja Stanković | Uporedna geohemisjska ispitivanja smektila vulkanskog porekla iz Arizone (SAD) i smektila graničnih sedimenata kreda-paleogene iz Danske | P. Premović | 2010 |
In the field of analytical and physical chemistry, a total of 25 doctoral dissertations were defended (Table 7). Ten of them were supervised by Prof. Snežana Mitić. Until the 2000s most of the work in the field of analytical chemistry was based on the development of a kinetic spectrophotometric method for determination of various elements, pesticides, and drugs in model and real samples, while in recent years the application of other methods (like HPLC and ICP-QES) has started. Most of the research was realized within the projects implemented by teachers and researchers from this Department:

1. “Development of new methods for determining low concentrations of substances in real samples (1995-2000)”, funded by the Ministry of Science and Technological Development of the Republic of Serbia;
2. “Development of new analytical methods for analysis of elements in samples of natural and artificial origin in aquatic and non-aquatic environments (1995-2000)”, funded by the Ministry of Science and Technological Development of the Republic of Serbia;
3. “Development of new and improvement of existing analytical methods for monitoring the quality of industrial products and the environment (2000-2005)”, funded by the Ministry of Science and Technological Development of the Republic of Serbia, project leader Prof. Snežana Mitić;
4. “Development and application of methods for monitoring the quality of industrial products and the environment (2006-2010)”, funded by the Ministry of Science and Environment Protection of the Republic of Serbia, project leader Prof. Snežana Mitić.

**Table 7 PhD theses in the field of analytical and physical chemistry**

| No | Author                | Title                                                                 | Mentor     | Year |
|----|-----------------------|----------------------------------------------------------------------|------------|------|
| 1  | Gordana Miletić       | Nove kinetičke metode za analizu tragova nekih jona u rastvoru        | R. Igov    | 1984 |
|    |                       | New kinetic methods for the analysis of traces of some ions in solution |            |      |
| 2  | Todor Pecev          | Prilog homogeno-katalitičkim reakcijama za analizu tragova elemenata u rastvoru | R. Igov    | 1984 |
|    |                       | Contribution to homogeneous catalytic reactions for the analysis of traces of elements in solution |            |      |
| 3  | Snežana Mitić        | Određivanje tragova Cu(II), Fe(III), Cr(VI), Mn(II), Cd(II), Pd(II) i I- jona u rastvoru primenom kinetičke metode analIZE | R. Igov    | 1994 |
|    |                       | Determination of traces of Cu (II), Fe (III), Cr (VI), Mn (II), Cd (II), Pd (II) and I- ions in the solution using the kinetic method of analysis |            |      |
| 4  | Ranko Simonović      | Nove kinetičke metode hemijske analize za određivanje tragova V(III), Rh(III), Fe(III), In(III) i Al(III) u rastvoru | R. Igov    | 1996 |
|    |                       | New kinetic methods for the determination of traces of V (III), Rh (III), Fe (III), In (III) and Al (III) in solution |            |      |
| 5  | Zora Grahovac        | Ispitivanje produkata spontane reakcije 1,3-dihidroksibenzena u koncentrovanoj perhlornoj kiselini | M. Obradović | 1997 |
|    |                       | Investigation of the products of the spontaneous reaction of 1,3-dihydroxybenzene in concentrated perchloric acid |            |      |
| 6  | Goran Nikolić        | Ispitivanje uticaja neorganskih soli na ekstrakciju različitih fenola iz vodenih rastvora i bioloških uzoraka | J. Perović  | 2002 |
|    |                       | Investigation of the effect of inorganic salts on the extraction of different phenols from aqueous solutions and biological samples |            |      |
| 7  | Valentina Živanović  | Određivanje tragova aktivnih materija nekih pesticida kinetičkim metodama analIZE | S. Mitić   | 2003 |
|    |                       | Determination of traces of pesticides by kinetic methods of analysis |            |      |
| 8  | Tatjana Andelković    | Utjecaj kiseoničnih funkcionalnih grupa huminskih kiselina na njihove kiselinsko bazne i kompleksirajuće osobine | J. Perović  | 2006 |
|    |                       | Oxygen-containing functional groups of humic acid related to its acid-base and complexometric properties |            |      |
| 9  | Slavica Sunarić       | Određivanje aminoglikozidnih i tetracyklinskih antibiotika na osnovu njegove degradacije H₂O₂ u prisustvu Cu(II) | S. Mitić   | 2007 |
|    |                       | Determination of aminoglycoside and tetracycline antibiotics on the basis of their degradation with H₂O₂ in the presence of Cu (II) |            |      |
| 10 | Aleksandra Pavlović   | Kinetičko određivanje nekih analgetika i sedativa                        | S. Mitić   | 2009 |
|    |                       | Kinetic determination of some analgesics and sedatives |            |      |
| 11 | Ražica Mitić | Kinetičko određivanje tragova jona u realnim uzorcima | S. Mitić | 2009 |
|----|-------------|----------------------------------------------------|---------|------|
| 12 | Snežana Tošić | Proučavanje sistema: mono i disulfidovani produkti hidrohinona-joni metala | M. Obradović | 2009 |
| 13 | Dragan Milenović | Razvoj i validacija HPLC metoda za određivanje rezidua aktivnih komponenti farmaceutskih preparata | S. Mitić | 2010 |
| 14 | Emilija Pecev-Marinković | Razvoj i primena kinetičkih metoda analize za kvantitativno određivanje pojedinih pesticida | Z. Grahovac | 2011 |
| 15 | Ivana Rašić-Mitić | Kinetičko-spektrofotometrijsko određivanje pojedinih komponenata u farmaceutskim preparatima | G. Miletić | 2011 |
| 16 | Milan Mitić | Kinetička degradacija fenolnih jedinjenja hidroikil radikalima | M. Obradović | 2012 |
| 17 | Dragan Velimirović | Optimizacija, validacija i primena ICP-QES metoda određivanja sadržaja metala u realnim uzorcima | S. Tošić | 2013 |
| 18 | Milan Stojkovic | Antioksidativna aktivnost, fenolni i mineralni sastav biljnih vrsta Geranium macrorrhizum L., Allium ursinum L., Stachys germanica L. i Primula veris L. | S. Mitić | 2014 |
| 19 | Budimir Ilić | Hemometrijska analiza rezultata hemijskih i bioloških istraživanja farmakološki značajnih biljaka | D. Miladinović | 2014 |
| 20 | Branka Stojanović | Hemijski sastav i antioksidativna aktivnost metanolnih i acetonskih ekstrakata pulpe i kore domaćih vrsta voća sa područja Jugoistočne Srbije | S. Mitić | 2015 |
| 21 | Saša Randelović | Bioakumulacija metala u odabranim vrstama voća i lekovitih biljaka | S. Mitić, D. Kostić | 2015 |
| 22 | Dušan Paunović | Hemijski sastav i antioksidativna aktivnost piva i sirovina za proizvodnju piva. Kinetika ekstrakcije | S. Mitić | 2015 |
| 23 | Jovana Kristić | Mineralni i polifenolni profil zelenog, crnog, biljnih i voćnih filter čajeva i njihov antioksidativni kapacitet | A. Pavlović | 2017 |
In the field of organic chemistry and biochemistry, a total of 41 PhD theses were defended (Table 8). Before 2000, most of the theses dealt with organic synthesis, e.g. synthesis of carbohydrates and carbohydrate-based derivatives, and biochemistry, e.g. investigation of serum proteins, while after 2000 the research interest was mainly in the field of chemistry of natural products. The work mainly focused on the analysis of essential oils and the extracts from the herbs found on the territory of Serbia.

**Table 8 PhD theses in the field of organic chemistry and biochemistry**

| No | Author                  | Title                                                                 | Mentor          | Year |
|----|-------------------------|----------------------------------------------------------------------|-----------------|------|
| 1  | Đorđe Glišin            | Selective reactions in the chemistry of hexopyranosides, stereoselective synthesis of D-desosamine | M. Petković     | 1986 |
| 2  | Milan Nikolić           | Isolation and investigation of bioactive compounds from the plant *Chelidonium majus* L. (Rusa) | R. Palić        | 1993 |
| 3  | Marina Mitić-Zlatanović | The influence of biogeochemical factors on some markers of early dysfunction of kidney cells | P. Premović     | 1995 |
| 4  | Gordana Stojanović      | The synthesis of lactam derivatives of gamma-lactone as potential fungicidal and antibacterial agents | R. Palić        | 1997 |
| 5  | Mirjana Abramović       | Histochemical examination of the affinity of elastic tissues towards organic dyes in comparison with conventional methods | S. Petrović     | 1998 |
| 6  | Nataša Trutić           | The activation of genes in the liver of rats exposed to partial hepectectomy and high doses of radiation | J. Ursić Janković | 1999 |
| 7  | Nebojša Simić           | Chemical and microbiological study of domestic species of the genus *Achillea* L. | R. Palić        | 2000 |
| #  | Author(s) | Title | Year |
|----|-----------|-------|------|
| 1  | Danijela Kostić | Ispitivanje oksidacionog uticaja sele na i prirodnih polifenol na u feroperoksidnim model sistemima | 2002 |
| 2  | Mirjana Vukićević | Acilovanje ferocena | 2003 |
| 3  | Andrija Šmelcerović | Izolovanje i određivanje strukture sekundarnih metabolita iz morskog aktinomiceta B1758 | 2003 |
| 4  | Dušanka Kitić | Hemijisko i mikrobiološko ispitivanje biljnih vrsta roda Calamintha miller | 2003 |
| 5  | Branislav Gudčić | Hemijsko i mikrobiološko ispitivanje etarskog ulja Hypericum perforatum L., Hypericum olympicum L. i Hypericum maculatum GRANTZ | 2003 |
| 6  | Gordana Marković | Umreženi materijali na bazi hidrosulfonovanog polietilenskog kaučuka | 2004 |
| 7  | Sladana Alagić | Sastav ekstrakta selekcionisanih hibrida duvana tipa Jaka, Prilep i Otija | 2005 |
| 8  | Niko Radulović | Novi azaphiloni, steroidi i terfenili iz gljiva Creosphaeria sassafras, Hypoxylon multiforme i Thelephora terrestris | 2006 |
| 9  | Sandra Konstantinović | Sinteza, struktura i antimikrobna aktivnost koordinacionih jedinjenja izatina Schiff-ovih baza | 2007 |
| 10 | Vesna Milovanović | Sekundarni metaboliti biljnih vrsta roda Equisetum | 2007 |
| 11 | Novica Ristić | Hemijisko, mikrobiološko i antioksidativno ispitivanje sekundarnih metabolita odabranih biljnih vrsta roda Stachys Lindley | 2007 |
| 12 | Ivan Palić | Hemijeska analiza i mikrobiološka aktivnost ekstrakata odabranih biljnih vrsta roda Micromeria Bentham | 2009 |
| 13 | Olga Jovanović | Primena dekonvolucije masenog skena u identifikaciji konstituenata etarskih ulja | 2009 |
| Page | Author/Title | Description | Year |
|------|-------------|-------------|------|
| 21   | Tatjana Golubović | Sekundarni metaboliti odabranih biljnih vrsta roda *Acinos Miller* | R. Palić 2010 |
|      |             | Secondary metabolites of selected plant species from the genus *Acinos Miller* | |
| 22   | Biljana Dekić | Sinteza antibakterijskih i antifungalnih 4-arylarnino-3-nitrokumarina | R. Palić 2010 |
|      |             | Synthesis of antibacterial and antifungal 4-arylarnino-3-nitrokumarins | |
| 23   | Polina Blagojević | Novi pristup poredenju složenih smela isparljivih jedinjenja prirodnog porekla: veza procentualnog sastava i prinosa etarskog ulja, odnosno sastava i usrednjenog masenog skena ukupnog jonskog hromatograma | N. Radulović 2010 |
|      |             | A new approach to the comparison of complex volatile mixtures of natural origin: a correlation between the essential oil yield and chemical composition, and percentage composition and the average mass scan of the total ion chromatogram | |
| 24   | Predrag Sibinović | Optimizacija formulacije i stabilnost tableta karvedilola | R. Palić 2011 |
|      |             | Formulation optimization and stability of carvedilol tablets | |
| 25   | Milan Dekić | Fitohemijsko ispitivanje odabranih biljnih vrsta familija Geraniaceae i Brassicaceae | N. Radulović 2011 |
|      |             | Phytochemical study of selected taxa belonging to Geraniaceae and Brassicaceae plant families | |
| 26   | Jelena Lazarević | Homotaksonomski značaj konstituenata etarskih ulja, hemometrijski pristup | R. Palić 2011 |
|      |             | Chemotaxonomic validation of volatile secondary metabolites - chemometric approach | |
| 27   | Aleksandra Đorđević | Hemijski sastav i antimikrobna aktivnost etarskih ulja odabranih biljnih vrsta roda *Hypericum L.* | R. Palić 2011 |
|      |             | Chemical composition and antimicrobial activity of essential oils of selected plant species of the genus *Hypericum L.* | |
| 28   | Vidoslav Dekić | Potpuna asignacija *1H* - i *13C*-NMR spektara i kristolografska analiza novih 4-arylarnino- i 4-alkilarnino-3-nitrokumarina | N. Radulović 2011 |
|      |             | Complete assignment of *1H* - and *13C*-NMR spectra and crystallographic analysis of the new 4-arylarnino- and 4-alkylarnino-3-nitrokumarins | |
| 29   | Goran Petrović | Kompleksi β-ciklodekstrina i modifikovanih β-ciklodekstrina sa pesticidima i etarskim uljima | G. Stojanović 2011 |
|      |             | Complexes of β-cyclodextrin and modified β-cyclodextrin with pesticides and essential oils | |
| 30   | Katarina Vučić-Petricić | Određivanje aminoglikozidnih antibiotika i njihovih nečistoća primenom tečne hromatografije sa maseno-spectrofotometrijom | N. Radulović 2012 |
|      |             | Determination of aminoglycoside antibiotics and their impurities by liquid chromatography-tandem mass spectrophotometry | |
| 31   | Nevenka Cakić | Alkaloidi, fenilpropanoidi, steroidi i terpenoidi iz odabranih biljnih vrsta familije Apioaceae | N. Radulović 2012 |
|      |             | Alkaloids, phenylpropanoids, steroids, and terpenoids from selected Apiaceae species | |
| 32   | Jasmina Veličković | Hemijska analiza i antioksidativna aktivnost ekstrakata odabranih biljnih vrsta bogatih fenolnim jedinjenjima | D. Kostić 2014 |
|      |             | Chemical analysis of the antioxidant activity of extracts of selected plant species rich in phenolic compounds | |
| Broj | Autor | Naslov | Autor Vladica | Godina |
|------|-------|--------|---------------|--------|
| 33   | Jelena Mladenović | Ekstrakti povrća *Allium porrum* L., *Daucus carota* L., *Capsicum annuum* L. i *Lycopersicon esculentum* Mill.: hemijski sastav, antioksidaciono, antimikrobno i antikancerogeno delovanje i njihova primena | B. Radovanović | 2014 |
| 34   | Danica Dimitrijević | Analiza hemijskog sastava i antioksidativne aktivnosti ekstrakata duda (Morus spp., Moraceae) | D. Kostić | 2014 |
| 35   | Marija Genčić | Izolovanje, sinteza i biološka aktivnost sekundarnih metabolita odabranih biljnih vrsta **Lycopus** (Lamiaceae) i **Inula** (Asteraceae) | N. Radulović | 2015 |
| 36   | Ana Miltojević | Sekundarni metaboliti biljne vrste **Choisya Ternata** Kunt (Rutaceae): Izolovanje, sinteza, spektarna karakterizacija i biološka aktivnost | N. Radulović | 2016 |
| 37   | Marko Andelković | Optimizacija ekstrakcije i krakaterizacije fenolnih jedinjenja i bio ulja iz sorti Vranac i Merlo (**Vitis vinifera** L.) i njihova potencijalna primena | B. Radovanović | 2016 |
| 38   | Ljiljana Jelenković | Uticaj odabranih monoterpena na aktivnost dijagnostički značajnih enzima u kontrolnom humanom serumu *in vitro* | V. Stankov Jovanović, I. Palić | 2016 |
| 39   | Snežana Jovanović | Sekundarni metaboliti predstavnika roda **Sedum** L. (Crassulaceae) centralnog Balkanskog poluostrva i njihov hemotaksonomijski značaj | G. Stojanović | 2016 |
| 40   | Ana Mileković Andelković | Ekstrakcija, karakterizacija, biološka aktivnost, biološka aktivnost i potencijalna primena fenolnih jedinjenja iz plodova i lišća biljnih vrsta familija Rosaceae, Cornaceae i Grossulariaceae | B. Radovanović | 2017 |
| 41   | Marko Mladenović | Kombinatorne biblioteke odabranih prirodnih i sintetskih biološki aktivnih estara | N. Radulović | 2017 |
In the period from 2002 to the present, the following projects were implemented at the Chair of Organic Chemistry and Biochemistry:

1. “Investigation of chemical composition and bioactivity of secondary metabolites of plants species from genera Achillea, Acinos, Artemisia and Calamintha (2002-2005)”, funded by the Ministry of Science and Environment Protection of the Republic of Serbia, project leader Prof. Radoslav Palić;
2. “Secondary metabolites: biological and antioxidant Activity (2006-2010)”, funded by the Ministry of Science and Environment Protection of the Republic of Serbia, project leader Prof. Radoslav Palić;
3. “Natural products of plants and lichen: isolation, identification, biological activity and application (2011-2017)”, funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia, project leader Prof. Gordana Stojanović;
4. “Combination libraries of heterogeneous catalysts, natural products, modified natural products, and their analogs: a pathway to new biologically active agents (2011-2017)”, funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia, project leader Prof. Niko Radulović.

Within these projects, modern capital equipment (GC-MS, GC-MS/MS, NMR, HPLC, UV-Vis, etc.) was purchased and funds were provided for the realization of most of the PhD theses.

In the field of industrial chemistry and environmental protection, a total of 20 PhD theses were defended, that mainly dealt with the synthesis of composite materials for the removal of harmful elements and molecules from natural and industrial waters, development and optimization of oxidation processes for degradation of organic pollutants in water, as well as with biodiesel production. Since 2002, PhD theses at the Chair of Applied and Industrial chemistry were mostly realized within the following projects:

1. “Innovation, monitoring, and reconstruction of a technical-technological system for refinement of alkali, cyanide and acidic wastewaters, which contain Cr, Ni, Cu, Zn, Sn and Cd (2002-2005)”, funded by Ministry of Science and Technological Development of the Republic of Serbia, project leader Prof. Milovan Purenović;
2. “Improvement of chemical-technological processes and system reconstruction in electronic tubes manufacture– MHT6725 (2005-2008)” , by Ministry of Science and Technological Development of the Republic of Serbia, project leader Prof. Milovan Purenović;
3. “Development and characterization of novel biosorbent for natural and wastewater treatment (2011-2017)”, funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia, project leader Prof. Aleksandar Bojić.

Alongside the funds for the realization of PhD theses, within these projects, modern equipment of capital value was purchased as well. Beside national projects, teachers and researchers from our Chemistry Department also participated in the implementation of several international projects.
### Table 9 PhD theses in the field of applied and industrial chemistry

| No | Author          | Title                                                                 | Mentor       | Year |
|----|-----------------|----------------------------------------------------------------------|--------------|------|
| 1  | Jelica Perović | Doprinos proučavanju mehanizama hladnog zaptivanja anodno oksidovanog aluminijuma | P. Premović  | 1992 |
| 2  | Milena Miljković | Uticaj organskih i neorganjskih kiselina na obojenost i mehanizam bojenja poliestarskih vlakana disperzionim bojama | T. Pecev     | 1994 |
| 3  | Dragan Zlatanović | Doprinos proučavanja procesa oksidacije sulfida nekih prelaznih metala u prisustvu natrijum-hlorida u sistemu "čvrsto-gas-čvrsto" | M. Purenović | 1999 |
| 4  | Radosav Marković | Uticaj gasne korozije i strukturnih promena na mehaničke karakteristike nekih visokolegiranih čelika | M. Purenović  | 2000 |
| 5  | Aleksandar Bojić | Proučavanje mehaničkog delovanja kompozicija na bazi elektrohemijski aktivnog mikrolegiranog Al na mikroorganizme u vodenoj sredini | M. Purenović  | 2002 |
| 6  | Novica Stanković | Uticaj koloidnog SiO₂ i primes na fiziko-hemijske procese stvaranja kamena u geotermalnim vodama | M. Purenović  | 2010 |
| 7  | Marjan Randelović | Interakcija elektrohemijski aktivnih, mikrolegiranih i strukturovom modifikovanih kompozita na bazi aluminjskata matrice sa jonskim i koloidnim vrstama pojedinih štetnih sastojaka u sintetičkim vodama | M. Purenović  | 2012 |
| 8  | Milan Momčilović | Kinetički i raviotežni parametri adsorpcijnih procesa pri uklanjanju pojedinih štetnih katranskih sastojaka iz vodenih rastvora aktivnim uglevimidobijenih hemijski-termičkom obradom srž ploda divljeg kestena i šišarke crnog bora | M. Purenović  | 2012 |
| 9  | Jelena Đorđević | Membranska ekstakcija pesticida - primena za kvantitativnu analizu u prirodnim vodama i njihovo uklanjanje iz industrijskih voda | M. Purenović  | 2012 |
| No. | Name               | Title                                                                                                               | Authors | Year |
|-----|--------------------|---------------------------------------------------------------------------------------------------------------------|---------|------|
| 10  | Dragana-Mitić      | Uklanjanje teških metala iz vode biosorbetom na bazi *Lagenaria vulgaris*                                             | A. Bojić | 2012 |
| 11  | Kostić             | The interaction between M(II) ions of transition metals with O-donor binding sites of humic acids and humic-like ligands | T. Andelković | 2013 |
| 12  | Mitić              | Degradacija organskih polutanata u vodi unapređenim oksidacionim procesima: optimizacija parametara procesa i analiza degradacionih proizvoda | A. Bojić | 2013 |
| 13  | Kostić             | Sinteta i karakterizacija ksantovanih biosorbenata i njihova primena za uklanjanje katjonskih polutanata iz vodenih rastvora | A. Bojić | 2014 |
| 14  | Zagovac            | Struktura karakterizacija CaMnO₃ nanoprahova dopiranih itrijumom i teorijsko modelovanje stabilnosti Perovskitske strukture | A. Zarubica | 2014 |
| 15  | Ljupković          | Sinteta biodizela na aktiviranom katalizatoru na bazi CaO: optimizacija procesnih parametara i efekti korišćenja biodizela | A. Zarubica | 2014 |
| 16  | Rakitić             | The investigation of pH effects on the structure, color and spectral characteristics of cyanidin and cyanidin 3-O-β-glucopyranoside and the examination of their interactions with lipid membrane membranes | M. Miljković | 2015 |
| 17  | Petrović            | Sinteta i karakterizacija anoda na bazi tankih slojeva bismut-oksida i njihova primena za elektrohemijsku oksidativnu degradaciju sintetičkih boja u vodi | A. Bojić | 2015 |
| 18  | Radović            | The use of homogeneous and heterogeneous advanced oxidation processes for degradation of textile anthraquinone dye | A. Bojić | 2015 |
| 19  | Vasić               | Optimizacija i fotokatalitička primena nanostrukturanog TiO₂ | A. Zarubica | 2017 |
| 20  | Stajković           | Sulfatim i fosfatim modifikovani ZrO₂ kao katalizator u izabranim industrijski značajnim petrohemijskim procesima | A. Zarubica | 2017 |
In the field of chemistry education, a total of three PhD theses were defended (Table 10). Only few teachers were engaged in the chemical education research. All the PhD theses were realized under the supervision of Prof. Miloce Rakocevic. Research projects in the field of chemistry education were not financed by the Republic of Serbia at our faculty.

| No | Author            | Title                                                                 | Mentor          | Year |
|----|-------------------|----------------------------------------------------------------------|-----------------|------|
| 1  | Dragan Lazarevic  | Periodicitet svojstava atomskih konstituenata proteinskih aminokiselin | M. Rakocevic     | 1995 |
|    |                   | The periodicity of properties of atomic constituents of protein amino acids |                 |      |
| 2  | Anja Jokic        | Specifičnost pozicija bioelemenata u periodnom sistemu D. I. Mendelejeva | M. Rakocevic     | 1997 |
|    |                   | Specificity of bioelements position in the periodic table of D. I. Mendeleev |                 |      |
| 3  | Slavoljub Dukic   | Naučni i nastavni aspekti trodimenzionalnosti periodičnog sistema hemijskih elemenata | M. Rakocevic     | 2002 |
|    |                   | Scientific and educational aspects of three-dimensional periodic system of chemical elements |                 |      |

A classification of PhD theses based on the field of study is shown in Fig. 3. Again the greatest number of PhD theses was defended in the field of organic chemistry and biochemistry, then in the fields of analytical, inorganic and industrial chemistry. Under the guidance of Professors who spent more than 30 years working at our Department, Radoslav Palić and Pavle Premovic, a total of 14 and 8 PhD theses were defended, respectively.

![Fig. 3 The distribution of PhD theses among different chemistry fields](image)
An Overview of the Scientific Research Work at the Chemistry Department

A number of defended PhD theses, from 1981 to 2017, during five-year periods, is shown in Fig. 4. The first PhD thesis was defended in 1984. In the period from 1972 to 1999 at the Faculty of Philosophy, a total of 20 PhD theses were defended, while the remaining 85 were defended at the Faculty of Science and Mathematics in the period from 2000 to 2017. During the 2006/2007 school year, the first generation of students was enrolled in the three-year PhD program. Of the overall number of PhD theses, 39 were defended by students attending the new PhD program.

What greatly contributed to the increase in the number of defended PhD theses, especially after 2010, was the activity of the Ministry of Education, Science and Technological Development of the Republic of Serbia which financed an increasing number of projects headed by researchers from the Chemistry Department. Within them, new capital equipment was procured which improved the quality of the research results and the effectiveness of the work, in addition to improved availability of the scientific information, especially following the introduction of the Kobson service, which allowed online access to research data starting from 2000. Many PhD students were included in the projects as researchers during the completion of their dissertations.

4. CONCLUSION

The first chemistry study program began in 1971 at the Faculty of Philosophy and continued at the Chemistry Department of the Faculty of Science and Mathematics in Niš. In its long history, it gained reputation built by its high-quality undergraduate and graduate students, and by publishing of research papers in renowned scientific journals.

In the field of chemistry, a total of 110 master’s and 105 PhD theses were defended during the period 1971-2017. Thirty-nine PhD theses are the result of PhD program introduced 2006. Regarding the field of scientific research, the most widely disseminated are the master’s and PhD theses with researched topics in organic chemistry, with more than 40%, then the work in analytical and physical chemistry, industrial chemistry and
inorganic chemistry. There is a correlation in the presence of master’s and PhD theses in certain fields of science, most probably because most of the students attending the master’s program continued their work in the same field. The subject matter of work was mostly related to that of scientific research projects which were realized at the time.

The Chemistry Department gave a significant contribution in the field of education and science educating a large number of high-quality master’s and PhD students who have found positions at the Chemistry Department of the Faculty of Science and Mathematics in Niš and other Serbian and foreign scientific institutions.

REFERENCES
Zajećaranović G., 1996. Filozofski fakultet u Nišu 1971-1996, Izdavačka jedinica Univerziteta u Nišu, Niš.
http://wpresspmf.pmf.ni.ac.rs/?page_id=1470
http://tempns1.junis.ni.ac.rs:7778/docr_web/plsql/doc_pretraga.pocetak
http://eteze.ni.ac.rs/

PREGLED NAUČNO-ISTRAŽIVAČKOG RADA NA DEPARTMANU ZA HEMIJU PRIRODNO-MATHEMATIČKOG FAKULTETA U NIŠU NA OSNOVU ODBRANJENIH MAGISTARSKIH TEZA I DOKTORSKIH DISETACIJA (1971-2017)

U radu je prikazan naučno-istraživački rad na Depratmanu za hemiju Prirodno-matematičkog fakulteta Univerziteta u Nišu. Naučno-istraživački rad realizovan je u obliku magistarskih teza i doktorskih disertacija, kao i raznih projekata koje finansira Ministarstvo prosvete, nauke i tehnološkog razvoja Republike Srbije. U oblasti hemije, u periodu od 1971. do 2017. godine odbranjeno je ukupno 110 magistarskih teza i 105 doktorskih disertacija. Trideset i devet doktorskih disertacija je rezultat doktorskog programa koji je akreditovan 2006. godine. Departman za hemiju je dao značajan doprinos u oblasti obrazovanja i nauke. Obrazovan je veliki broj kvalitetnih magistara hemije i doktora hemijskih nauka, a neki od njih su zaposleni na Prirodno-matematičkom fakultetu u Nišu i drugim srpskim i inostranim naučnim institucijama.

Ključne reči: Departman za hemiju, magistarske teze, doktorske disertacije