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Chair of Applied and Environmental Chemistry

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ABSTRACT

Chair of the Applied and Environmental Chemistry was established in 1995 on the initiative of Prof. Dr. Milovan Purenović, who has been in the position of Head of the Chair since its establishment until his retirement in 2011. Prof. Dr. Aleksandar Bojić is currently Head of the Chair. Since its establishment until now, professors and associates of the Chair of Applied and Environmental Chemistry have been dedicated to the applied research, within the framework of innovative and development projects, which were realized through cooperation with industry. Also, a significant contribution has been made in the field of environmental protection, especially in the treatment of drinking and wastewater. Several operational technologies have been developed, some of them are protected by patents of the Intellectual Property Office of the Republic of Serbia. The Chair of Applied and Environmental Chemistry consists of four full professors, one associate professor, and one assistant professor.

Innovation and development projects implemented so far:

1. **Innovation project: I.3.1231, Ministry of Science of the Republic of Serbia,**
   Project title: "Development and application of catalytic reactor system for decomposition and purification of waste paints in fabric processing technology of textile factory NITEX-Niš" (1996).
2. **Innovation project: I.3.1791, "EI - Printed Circuits" - Ministry of Science of the Republic of Serbia**

Project name: " The new process of copper separation, decomposition of ammonia and other harmful substances from waste electrolytes of base ammonia complexes of copper and acid copper(I)- and copper(II)-chloride" (1997).

3. **Research and development project, Municipality of Niš**

   Project title: "Contribution to the groundwater quality in the City of Niš region", JKP Gradski vodovod- "NAISSUS-NIŠ" (1998-1999).

4. **Research and development project, "Tigar"Ltd. Pirot**

   Project title: "Contribution to the investigation of physical and chemical processes during the processing of rubber compounds by the extrusion process"(2001).

5. **Innovation project, Municipality of Medveđa**

   Project title: "Innovation of Industrial and Sewerage Water Treatment Plant Medveđa" (2001).

6. **Innovation project, "Limske hidroelektrane" Nova Varoš**

   Project title: "Solving corrosion protection problem of the internal part of pipeline in the Bistrica hydroelectric power plant"(2001).

7. **Development project: MHT 0279 - Ministry of Science of the Republic of Serbia**

   Project title: "Innovation, monitoring and reconstruction of technological systems for the purification of alkaline, cyanide and acidic wastewaters containing Cr, Ni, Cu, Zn, Sn and Cd"(2001-2004).

8. **Innovation project-JKP Gradska toplana-Niš**

   Project title: "A new procedure for the protection of boilers, hot water and heat exchangers from corrosion and scale by corrosion inhibitor protection and modifier"(2003).

9. **Innovation project: I.EE401-1007V, Ministry of Science of the Republic of Serbia**

   Project title: "High energy efficiency of boilers and heat exchangers in power plants, achieved by removing existing calcite and corrosion products and preventing calcite formation by dosing original modifiers and inhibitors in boiler water and district heating" (2005).

10. **The project of the existing process improvement: MHT 6725**

    Project title: "Improvement of chemical and technological processes and reconstruction of existing systems in the production of audio electronic tubes"(2005-2008).

11. **Innovation project: IP 8027 of the Ministry of Science of the Republic of Serbia**

    Project title: "New universal compact technology for the purification of wastewaters, municipal and drinking waters from harmful substances using novel electrochemically and chemically activated and micro alloyed materials" (2006).

12. Development project TR19031 of the Ministry of Science of the Republic of Serbia

Project title: “Development of electrochemically active micro alloyed and structurally modified composite materials” (2008-2011).

13. Innovation project no. 01501-12 Ministry of Environment-Fund for Environmental Protection

Project title: “Operational technology for decontamination of asbestos and asbestos dust with instructions for dismantling and cleaning of the machine part of the plant Fiaz-Ferode in Prokuplje” (2009-2010).

14. Innovation project no. 501-12/10-01 Ministry of Environment-Fund for Environmental Protection

Science popularization programme

Project title: "Human environment under the loupe of chemistry"; Project funding: Center for the Promotion of Science of the Republic of Serbia, 2011.

Accredited Program of Permanent Professional Development-Title: "Chemistry of gases in teaching, nature and industry"; Project duration: 2009/2010 and 2010/2011.

Accredited Program of Continuing Professional Development-Title: "Planet Earth: Minerals, Rocks, Ores-from the origin to Minerals"; Project duration: 2010-2011.

Bilateral collaboration between the University of Niš and the University Pierre and Marie Curie in Paris; Duration: 2008-2013.

Partnership for education and community development (PECD)-Niš; Title: "Development of the Chemical and Ecological Center of the City of Niš"; Project duration: 2009/2010.

Partnership for education and community development (PECD)-Niš; Title: "Eco monitoring of Niš 2011-2012"; Project duration: 2011/2012.

Promotion and popularization of science programme; Title: "Mass spectrometry, basics and applications"; Project duration: 2010.

International Meeting “Mass Spectrometry school”; Title: "Mass Spectrometry School"; Duration of the project: 10 schools from 2008 to 2018.

Teaching projects

511044-Tempus-1-2010-1-UK-Tempus-JPCR UoG "Modernization of Post-Graduate Studies in Chemistry and Chemistry Related Programs" 2010-2013.
44482-TEMPUS-1-2013-1-IT-TEMPUS-JPHES "Blending academic and entrepreneurial knowledge in technology enhanced learning" BAEKTEL 2013-2016.
573885-EPP-1-2016-1-RS-EPPKA2-CBHE-JP "ICT Networking for Overcoming Technical and Social Barriers in Instrumental Analytical Chemistry Education (NETCHEM)" 2016-2019.

Current projects

Development and characterization of new biosorbent for purification of natural and wastewaters, TR34008.
Period: 2011-2018, researchers on the project: 16
The names of the researchers engaged on the project are:

Name and surname	**Academic title**
Aleksandar Lj. Bojić	Full professor
Aleksandra R. Zarubica	Full professor
Danijela V. Bojić	Scientific Associate
Jelena Z. Mitrović	Assistant professor
Miljana D. Radović	Scientific Associate
Marjan S. Ranđelović	Associate professor
Radomir B. Ljupković	Scientific Associate
Miloš M. Kostić	Scientific Associate
Milica M. Petrović	Scientific Associate
Nena D. Velinov	Research Associate
Slobodan M. Najdanović	Research Associate

Dr Aleksandar Bojić, full professor, Head of the Chair

Teaching contributions:

Fundamentals of industrial chemistry

Corrosion and corrosion protection of metals

Industrial chemistry I

Chemistry of waters and wastewaters

Advanced water treatment processes

Remediation technologies

Publications:

University textbooks: 2

Published scientific papers: 54

Selected publications:

1. Bojic, A., Bojic, D., &Andjelkovic, T. (2009). Removal of Cu^{2+} and Zn^{2+} from model wastewaters by spontaneous reduction-coagulation process in flow conditions. Journal of Hazardous Materials,168, 813-819.
2. Milenković, D., Bojić, A., &Veljković, V. (2013). Ultrasound-assisted adsorption of 4-dodecylbenzene sulfonate from aqueous solutions by corn cob activated carbon. UltrasonicsSonochemistry, 20(3), 955–962.
3. Mitrović, J., Radović, M., Anđelković, T., Bojić, D., &Bojić A. (2014). Identification of intermediates and ecotoxicity assessment during the UV/H_2O_2 oxidation of azo dye Reactive Orange 16. Journal of Environmental Science and Health, Part A, 49, 491-502.

International collaborations:

- „1st Summer SchoolThe Mass Spectrometry Opens on the Environment and the Life“, University „Pierre and Marie Curie”–Paris (2008);

- Postdoctoral fellow at Pierre and Marie Curie-Paris, Senior research project: "Mass spectrometry analysis of UV/H_2O_2 process degradation products of organic matter in water", 3 months: "City of Paris", France (2009);
- "Mass spectrometry practical course in the environmental analysis of persistent organic pollutants", University „Pierre and Marie Curie"–Paris, Funding: Ministry of Foreign Affairs of France (2010);
- "Mass spectrometry practical course in the environmental analysis of pesticides and textile dyes and their degradation products in water" at University „Pierre and Marie Curie"–Paris, Ministry of Foreign Affairs of France (2011);
- Bilateral collaboration: CNRSR. France and Ministry of Science Serbia (2011-2012);
- "Environmental Chemistry and Engineering", Michigan State University (USA) held at the Faculty of Occupational Safety (2004).

Journal editorial boards membership:

Member of editorial board in the journal „Water SA".

Review activities:

- Analytical Methods,
- Arabian Journal of Chemistry,
- BioResource,
- Chemical Engineering & Technology,
- Chemical Industry and Chemical Engineering Quarterly,
- Desalination,
- Desalination and Water Treatment
- Environmental Engineering and Management Journal,
- Facta Universitatis,
- Hemijska industrija,
- Journal of Applied Electrochemistry,
- Journal of Chemical & Engineering Data,
- Journal of Hazardous Materials,
- Water SA.

Dr Milena Miljković, full professor

Teaching contributions:

Food additives

Chemistry teaching methodology 1

Industrial chemistry 2

Chemistry of textile materials and industrial dyes

Surface active agents

Chemistry of dyes

Colormetrics

Research contributions:

Determination of reactive dye concentration in technological solutions and on dyed textile materials by UV/VIS spectrophotometry; 2) catalytic degradation of dyes in textile industry wastewaters; 3) analysis of the color of composite materials in dental prosthetics; 4) determination of the concentration of food colors and additives; 5) application of reflection spectrophotometry in the textile industry; 6) color metrics by CIELAB system; 7) chemical-textile technology.

Currently engaged on the project: Development of new and the improvement of already existing technological procedures to produce technical textile materials (TR 34020), Ministry of Education, Science and Technological Development, Republic of Serbia. Antioxidative and antiapoptic effect of the extract of bilberry (*Vaccinium myrtillus* L.): *in vivo* and *in vitro* experimental investigation-bilateral project (ev.no. proj. 651-03-1251/2012-09/15).

Publications:

University textbooks: 3

Published scientific papers: 21

Selected publications:

1. Miljkovic, M., Djordjevic, D. M., Miljkovic, V. M., Stamenkovic, M., &Stepanovic, J. M. (2014). The influence of pH adjusted with different acids on the dyeability of polyester fabric. Polish Journal of Chemical Technology, 16 (4), 1-5.
2. Miljkovic, M. N., Purenovic M. M., Stamenkovic M., & Petrovic M. (2012). Determination of two reactive dyes concentration in dyed cotton fabric. Hemijska Industrija, 66 (2), 243-251.
3. Miljkovic, M. N., Purenovic, M. M., Djordjevic, D. M., &Petrovic, M. (2011). Influence of different acids for adjusting the dyebath pH value on the dyeability of polyester knitwear dyed with Disperse Yellow 23. Hemijska Industrija, 65 (3), 257-261.

Dr Tatjana Anđelković, full professor

Teaching contributions:

Fundamentals of environmental chemistry

Hemodynamics of pollutants

Environmental chemistry

Pollutants and pollution control

Active learning in chemistry

The hemisphere of water and soil

Chemistry of gases

Research contributions:

Environmental Pollutants Detection; Soil analysis; Soil organic matter; Properties, isolation and characterisation of aquatic and terrestrial humic substances as well as their complexing properties, environmental analysis of water, soil and air; chemistry teaching methodologies.

Publications:

University textbooks: 3

Published scientific papers: 24

Selected publications:

1. Bojic, A. L., Bojic, D. V., & Andjelkovic, T. D. (2009). Removal of Cu^{2+} and Zn^{2+} from model wastewaters by spontaneous reduction-coagulation process in flow conditions. Journal of Hazardous Materials, 168 (2-3), 813-819.
2. Kocic, G., Pavlovic, R., Nikolic, G., Veljkovic, A., Panseri, S., Chiesa, L.M., Andjelkovic, T., Jevtovic Stoimenov, T., Sokolovic, D., Cvetkovic, T., Stojanovic, S., Kocic, H., & Nikolic R. (2014). Effect of commercial or depurinized milk on rat liver growth-regulatory kinases, nuclear factor-kappa B, and endonuclease in experimental hyperuricemia: Comparison with allopurinol therapy. Journal of Dairy Science, 97 (7), 4029-4042.
3. Andjelkovic, T., Perovic, J., Purenovic, M., Blagojevic, S., Nikolic, R., Andjelkovic, D., & Bojic, A. (2006). Spectroscopic and potentiometric studies on derivatized natural humic acid. Analytical Sciences, 22 (12), 1553-1558.
4. Milojković, D. S., Anđelković, D. H., Kocić, G. M., & Anđelković, T. D. (2015). Evaluation of method for phthalate extraction from milk related to milk fat content**.** Journal of the Serbian Chemical Society, 80 (8), 983-996.
5. Kostić, I. S., Anđelković, T. D., Anđelković, D. H., Cvetković, T. P., & Pavlović, D. D. (2016). Determination of di(2-ethylhexyl) phthalate in plastic medical devices. Hemijska industrija, 70(2), 159-164.

International collaborations:

Scholarship of French Government at the University Pierre and Marie Curie, Paris, France-Institut Parisien de Chimie Moléculaire and Laboratory L.C.H. Paris period: 14 - 29 January 2009; 6 - 11 April 2009; 6 - 24 February 2010; 8 - 26 December 2014.

Training at UPMC Pierre and Marie Curie University, Paris, France-Institut Parisien de Chimie Moléculaire in the Field of Mass Spectrometry, as project leader, CNRS/Pavle Savić, "Heavy metals geochemical modelling and speciation in groundwater and soil using soft ionization mass spectrometry" (22.11.-29.11.2011 and: 12.11 - 08.12.2012).

Several short study visits for cooperation and training at the University of Greenwich, Brno University of Technology, RWTH Aachen University, University of Nova Gorica, in the period 2010-2013 within the framework of the project 511044-TEMPUS-1-2010-1-UK-TEMPUS-JPCR, "Modernization of Post-Graduate Studies in Chemistry and Chemistry Related Programs", TEMPUS MCHEM.

Within the project 573885-EPP-1-2016-1-RS-EPPKA2-CBHE-JP, ERASMUS + NETCHEM, "ICT Networking for Overcoming Technical and Social Barriers in Instrumental Analytical Chemistry Education" several short stays for collaboration and training at the University of Greenwich, Brno, Tirana, Sorbonne University in the period 2016-2018.

Organizer and participant of 10 mass spectrometry schools “Mass Spectrometry School - The Mass Spectrometry in Environmental Pollutants Detection, Niš”, organized by Faculty of Science and Mathematics, Niš and the University Pierre and Marie Curie, Paris (France).

Postdoctoral training:

Scholarship of the Ministry of Science and Technological Development for young researchers at the Postdoctoral Training in 2011. Project title: "Oxidative metabolites of DEHP as urinary biomarkers of human exposure to phthalates from milk and milk products". Project duration: 4 months (June-September 2011). Institution in which postdoctoral training was realized: The University Pierre and Marie Curie, Paris.

Review activities:

- Water Practice and Technology
- Water Science and Technology: Water Supply
- Analytical Letters
- Journal of the Serbian Chemical Society

Awards:

Award of the Serbian Chemical Society for graduated students in 1993/94.

Dr Aleksandra Zarubica, full professor

Teaching contributions:

Fundamentals in materials engineering

Industrial chemistry

Active learning in chemistry

Materials chemistry and engineering

Green chemistry

Chemistry of surface processes

Nanostructural materials

Publications:

University textbooks: 3

Published scientific papers: 58

Selected publications:

Prekajski, M., Zarubica, A., Babić, B., Jokić, B., Pantić, J., Luković, J., & Matović, B. (2016). Synthesis and characterization of Cr^{3+} doped TiO_2 nanometric powders. Ceramics International, 42, 1862-1869.

Babic, B., Zarubica, A., Minovic-Arsic, T., Pantic, J., Jokic, B., Abazovic, N., & Matovic, B. (2016). Iron doped anatase for application in photocatalysis. Journal of the European Ceramic Society, 36(12), 2991-2996.

Zarubica, A., Vasic, M., Antonijevic, M., Randjelovic, M., Momcilovic, M., Krstic, J, & Nedeljkovic, J. (2014). Design and photocatalytic ability of ordered mesoporous TiO_2 thin films, Materials Research Bulletin, 57, 146-151.

Vukoje, I., Tomašević-Ilić, T., Zarubica, A., Dimitrijević, S., Budimir, M., Vranješ, M., Šaponjić, Z., & Nedeljković, J. (2014). Silver film on nanocrystalline TiO_2 support: Photocatalytic and antimicrobial ability. Materials Research Bulletin, 60, 824-829.

Randjelovic, M., Purenovic, M., Matovic, B., Zarubica, A., Momcilovic, M., & Purenovic, J. (2014). Structural, textural and adsorption characteristics of bentonite-based composite. Microporous and Mesoporous Materials, 195, 67-74.

Momcilovic, M., Randjelovic, M., Zarubica, A., Onjia, A., Kokunesoski, M., & Matovic, B. (2013). SBA-15 templated mesoporous carbons for 2,4-dichlorophenoxyacetic acid removal. Chemical Engineering Journal, 220, 276-283.

Randjelovic, M., Purenovic, M., Zarubica, A., Purenovic, J., Matovic, B., & Momcilovic, M. (2012). Synthesis of composite by application of mixed Fe, Mg (hydr)oxides coatings onto bentonite - A use for the removal of Pb(II) from water. Journal of Hazardous Materials, 199-200, 367-374.

Randjelovic, M., Purenovic, M., Zarubica, A., Purenovic, J., Mladenovic, I., & Nikolic, G. (2011). Alumosilicate ceramics based composite microalloyed by Sn: An interaction with ionic and colloidal forms of Mn in synthetic water. Desalination, 279 (1-3), 353-358.

Momcilovic, M., Purenovic, M., Bojic, A., Zarubica, A., & Randjelovic, M. (2011). Removal of lead (II) ions from aqueous solutions by adsorption onto pine cone activated carbon. Desalination, 276 (1-3), 53-59.

Vujicic, Dj., Comic, D., Zarubica, A., Micic, R., & Boskovic, G. (2010). KineticsofbiodieselsynthesisfromsunfloweroiloverCaOheterogeneouscatalyst. Fuel, 89 (8), 2054-2061.

Review activities:

1. Chemical Engineering Journal
2. Applied Surface Science
3. Renewable Energy
4. Reaction Kinetics and Catalysis Letters
5. Reaction Kinetics, Mechanisms and Catalysis
6. Chemical Industry and Chemical Engineering Quarterly
7. Macedonian Journal of Chemistry and Chemical Engineering
8. Processing and Application of Ceramics
9. Advanced Technologies
10. Facta Universitatis: Series-Physics, Chemistry and Technology.

Awards:

Award for the best graduated students in Study Group of Chemistry at the Faculty of Philosophy in Niš in 1994/1995.

Annual Award of the Serbian Chemical Society in 1999, for the remarkable success achieved during the academic studies.

Funding by the Government of Belgium and the Spanish Society for Analytical Chemistry for participation and presentation of scientific results at the conference "Euroanalysis XIV" (2007).

Postdoctoral training:

The postdoctoral training at the University of Technical Sciences in Berlin, Germany (from July to October 2010). Training was funded by the DAAD Foundation (A/10/05029; Section: 324).

She has been awarded by a post-doctoral degree scholarship under the EC EC BASILEUS program for 10 months at Università La Sapienza, Rome, Italy (2010). She did not use the scholarship because she was engaged and funded through DAAD Foundation in the same year.

International collaboration:

Participant of the course "Environmental Chemistry and Engineering" Michigan State University (USA) held at the Faculty of Occupational Safety (2004).

Several short study visits at the Technical Sciences University in Turin (Italy), the Technical Sciences in Coventry (United Kingdom) and Aristotle University in Thessaloniki (Greece) within the project JP 510985-2010, "Improvement of Students' Internship in Serbia", TEMPUS ISIS, period: 2011-2013, EU.

Within the project 511044-TEMPUS-1-2010-1-UK-TEMPUS-JPCR, the "Modernization of Post-Graduate Studies in Chemistry and Chemistry Related Programs", TEMPUS MCHEM, was on short study stay/training at the Faculty of Chemistry/Pharmacy, the University of Greenwich (United Kingdom).

Dr Marjan Ranđelović, associate professor

Teaching contributions:

Colloid and surface chemistry

Environmental monitoring

Industrial processes

Chemistry of surface processes

Nanostructural materials

Advanced water treatment processes

Research contributions:

Materials science, Chemical reactions in solids and on their surfaces, Functional composite materials, Electrocatalysis, Colloid chemistry, Water treatment.

Publications:

University textbooks: 1

Published scientific papers: 33

Selected publications:

1. Ranđelović, M., Purenović, M., Zarubica, A., Purenović, J., Mladenović, I., Nikolić, G. (2011). Alumosilicate ceramics based composite microalloyed by Sn: An interaction with ionic and colloidal forms of Mn in synthetic water. Desalination, 279 (1-3), 353-358.
2. Ranđelović, M., Purenović, M., Zarubica, A., Purenović, J., Matović, B., & Momčilović, M. (2012). Synthesis of composite by application of mixed Fe, Mg (hydr)oxides coatings onto bentonite - a use for the removal of Pb(II) from water. Journal of Hazardous Materials, 199-200, 367-374.

3. Ranđelović, M., Purenović, M., Matović, B., Zarubica, A., Momčilović, M., Purenović, J. (2014). Structural, textural and adsorption characteristics of bentonite-based composite. Microporous and Mesoporous Materials, 195, 67-74.
4. Ranđelović, M., Momčilović, M., Matović, B., Babić, B., & Barek, J. (2015). Cyclic voltammetry as a tool for model testing of catalytic Pt- and Ag-doped carbon microspheres. Journal of Electroanalytical Chemistry, 757, 176–182.
5. Ranđelović, M., Momčilović, M., Nikolić, G., Đorđević, J. (2017). Electrocatalitic behaviour of serpentinite modified carbon paste electrode. Journal of electroanalytical chemistry, 801, 338-344.

International collaboration:

Three short research stays at the Faculty of Chemistry and Mineralogy of the University of Leipzig, Germany (7-28 days).

Short research stay at the Faculty of Chemistry and Chemical Engineering, Babes-Bolyai University, Cluj-Napoca, Romania (7 days).

Short research stay at the Faculty of Natural Sciences and Mathematics, Ss. Cyril and Methodius University, Skopje (5 days).

Short research stays at the UNSW Sydney, Faculty of Science, School of Materials Science and Engineering, Australia (21 days).

Short research stays at the Faculty of Science, Charles University in Prague, Czech Republic (5 days).

Short study stay at the University of Ljubljana, Slovenia (6 days).

Peer review activity:

Microporous and Mesoporous Materials

Journal of Hazardous Materials

Journal of Chemical Engineering

Desalination

Awards:

Special award of the Serbian Chemical Society for 2007 for outstanding success during the academic study of chemistry.

Dr Jelena Mitrović, assistant professor

Teaching contributions:

Fundamentals of industrial chemistry

Environmental monitoring

Water and wastewater treatment technologies

Selected chapters in purification and disinfection of waters

Selected publications:

1. Mitrović, J., Radović, M., Anđelković, T., Bojić, D., & Bojić, A. (2014). Identification of intermediates and ecotoxicity assessment during the UV/H_2O_2 oxidation of azo dye Reactive Orange 16. Journal of Environmental Science and Health, Part A, 49, 491-502.
2. Radović, M. D., Mitrović, J. Z., Bojić, D. V., Antonijević, M. D., Kostić, M. M., Baošić, R. M., & Bojić, A. Lj. (2014). Effects of system parameters and inorganic salts on the photodecolourisation of textile dye Reactive Blue 19 by UV/H_2O_2 process. Water SA, 40(3) 571-578.
3. Mitrović, J., Radović, M., Bojić, D., Anđelković, T., Purenović, M., & Bojić, A. (2012). Decolorization of textile azo dye Reactive Orange 16 with UV/H_2O_2 process. Journal of the Serbian Chemical Society, 77(4), 465 – 481.

International collaboration:

„1st Summer School: The Mass Spectrometry Opens on the Environment and the Life“, the University „Pierre and Marie Curie”–Paris (2008).

Peer review activity:

- Water SA

- Chemical Industry and Chemical Engineering Quarterly
- Environmental Technology
- Water Environment Research

Available equipment in the laboratory for Applied Chemistry:

- AAS Perkin Elmer A300 with graphite cuvette and the system for gaseous hydrides, AAnalyst 300 (Perkin Elmer, USA),
- HPLC, Dionex Ultimate 3000, Thermo Fisher Scientific, MA USA with Diode Array Detector and Dionex Corona Veo Charged Aerosol Detector,
- Ion Trap MS model LCQ DECA (Thermo Finnigan, USA),
- Ion Trap MS model LCQ Advantage (Thermo Finnigan, USA),
- GC-MS model 6890/5973 (Hewlett Packard, USA),
- UV-vis, UV-1800 (Shimadzu, Japan),
- Potentiostat, Amel 510 DC (Materials Mates, Italy) controlled by VoltaScope software package,
- Potentiostat, EmStat Blue (PalmSence, Netherlands),
- Colorometer, MultiDirect, Lovibond-Tintometer (Germany),
- Turbidimeter, Turb 355 IR/T, WTW (Germany),
- Conductometer, sension5, HACH, Colorado (USA),
- Water Purification System, Smart2Pure, Thermo Fisher Scientific (MA USA),
- Vacuum evaporator, RV 10 D, IKA (Germany),
- Recirculating Water Vacuum Pump, JPV, Velp Scientifica (Italy),
- Muffle furnace, Sel-Horn R-3 L (J.P. Selecta s.a., Spain),
- Muffle furnace (Vims elektriks, Serbia),
- Drying oven (Raypa, Spain),
- Incuterm (Raypa, Spain),
- Thermostat, F 12 (Julabo, Germany),
- Air sampler, 4G 2R (ASV Co d.o.o., Serbia),
- Digital bireta, solarus (Hirschman Laborgerate, Germany),
- Power Supply, Model 1786B (BK Precision, USA),
- Digital microscope Motic,
- Heating mantle with controller (Witeg, Germany) – 2x,
- Peristaltic pump, SP 311 (Velp Scientifica, Italy),

- Peristaltic pump, PLP 380 (Dülabo, Germany),
- Ultrasonic bath, Sonic (Vims Elektrik, Serbia),
- Ultrasonic bath, Sonic 4.5 G (Vims Elektrik, Serbia),
- Hot plate, HP-20D (Witeg, Germany),
- Advanced Vortex Mixer, Zx3 (Velp Scientifica, Italy),
- Shaker, KS 130 control (IKA®-Werke, Germany) – 2x,
- Heating Magnetic Stirrer, Aluminum Hot Plate Stirrer, ARE (Velp Scientifica, Italy),
- Overhead Stirrer, Stirrer type PW (Velp Scientifica, Italy),
- Magnetic Stirrer, MULTISTIRRER 6 (Velp Scientifica, Italy),
- Magnetic Stirrer, AGE (Velp Scientifica, Italy) – 2x,
- BOD_5, oxiTOP IS6 (WTW, Germany),
- pH meter with ion-selective electrodes, sension3 (HACH, Colorado, USA),
- pH meter, H260G (HACH, Colorado, USA),
- pH meter, Orion Star A214 (Termo Scientific, USA),
- Analytical scale, ALS 220-4 (KERN, Germany),
- Analytical scale (Sartorius, Serbia),
- Technical scale, 440-33 (KERN, Germany),
- UV reactor
- UV/Vis reactor
- UV meter, solarmeter, model 8.0 UVC (Solartech Inc, USA),
- Infrared Thermometer, No. 201311007089
- Test screening machine, JEL 200 (Germany),
- Laboratory blender, Waring commercial (USA),
- Micropipettes.