Personal information

Ivan Marić

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Sex Male | Date of birth 28/8/1993 | Nationality Croatian

Work Experience

1 April 2024 - now

Research Associate

- **Ruđer Bošković Institute, Division of Materials Chemistry, Radiation Chemistry and Dosimetry Laboratory, Zagreb (Croatia)**
  - Synthesis of composite noble and non-noble metal catalysts on conductive supports
  - Synthesis of magnetic nanoparticles (iron oxides) and Au, Ag nanoparticles
  - Radiolytic snythesis of iron oxide/Au and iron oxide/Ag nanocomposite materials

1 May 2022 – 31 December 2023

Postdoctoral Fellow

- **Ruđer Bošković Institute, Division of Materials Chemistry, Radiation Chemistry and Dosimetry Laboratory, Zagreb (Croatia)**
- **National Institute of Chemistry, Division of Materials Chemistry, Ljubljana (Slovenia), ERC project "Towards Nanostructured Electrocatalysts with Superior Stability"**
  - Synthesis of composite noble and non-noble metal catalysts supported on conductive supports such as titanium oxynitride and various graphene materials for electrocatalytic water splitting.

1 August 2022 – 30 April 2023

Postdoctoral Fellow

- **Ruđer Bošković Institute, Division of Materials Chemistry, Radiation Chemistry and Dosimetry Laboratory, Zagreb (Croatia)**
  - Radiolytic synthesis of composite iron oxide/Au and iron oxide/Ag nanoparticles, microwave synthesis of manganese oxide nanostructures, and investigation of their catalytic properties for the degradation of organic pollutants in aqueous systems
- **University of Ljubljana, Faculty of Health Sciences, Ljubljana (Slovenia)**
  - Preparation of composite PMMA/Au films for dental applications, investigation of their mechanical and surface properties, as well as their antifungal and antibacterial properties

1 August 2018 – 31 July 2022

Assistant

- **Ruđer Bošković Institute, Division of Materials Chemistry, Radiation Chemistry and Dosimetry Laboratory, Zagreb (Croatia), CSF project "The effect of polymers on the radiolytic synthesis of magnetic nanoparticles"**
  - Synthesis of magnetic nanoparticles (iron oxides) and Au, Ag nanoparticles in the presence of various polymers, as well as their nanocomposite hydrogels by γ-irradiation.
  - Characterization of materials with thermal analysis method (DSC), FTIR, UV-Vis and Mössbauer spectroscopy (at room temperature, at low temperatures and in-magnetic field), XRD, DLS and microscopy (SEM, TEM), N_2 gas adsorption, SQUID magnetometry

1 February 2018 – 1 August 2018

Student Researcher

- **Ruđer Bošković Institute, Division of Materials Physics, Laboratory for Molecular Physics and Synthesis of New Materials, Zagreb (Croatia)**
  - Synthesis and characterization of various metal oxides and oxyhydroxides (TiO_2, manganese oxides in different oxidation states, iron oxides)
  - Catalysis experiments of synthesized materials for the degradation of organic dyes,

September 2017 – December 2017

Associate

- **Total Research & Technology, Feluy (Belgium)**
  - Data analysis and descriptive statistics, scientific articles and patents analysis relevant for the energy sector

Education

2018-2022

Ph. D. in Chemistry (13. 5. 2022.)

University of Zagreb, Faculty of Science, Department of Chemistry

- Title of the PhD thesis: "The effect of polymers on the radiolytic synthesis of magnetic iron oxide nanoparticles"
- Mentor: Dr. Tanja Jurkin

2015-2018

M. Sc. Chemistry (21. 2. 2018.)

University of Zagreb, Faculty of Science, Department of Chemistry

- Title of the MSc thesis: "Hydrothermal synthesis and photocatalytic activity of nanocrystalline solid solutions of the TiO2-Fe2O3 system"
- Mentor: Dr. Marijan Gotić and Dr. Goran Štefanić

2012-2015

B. Sc. Chemistry

University of Osijek, Department of Chemistry

- Title of the BSc thesis: "Solution and refinement of crystal structures"
- Mentor: Dr. Berislav Marković

Personal Skills

Job-related skills

- Extensive experience in the use of ionizing irradiation techniques for the synthesis of iron oxide nanoparticles
- Extensive experience in the use of irradiation techniques for the synthesis of nanocomposite polymer hydrogels (Au, Ag and magnetic iron oxide composite polymer gels)
- Extensive experience in the analysis of iron oxides by Mössbauer spectroscopy in different conditions (external magnetic field, low temperature, room temperature)
- Good knowledge of experimental techniques for the synthesis of magnetic iron oxide nanoparticles and Ag, Au, Mn oxides and Ti oxides nanoparticles (gamma-irradiation, hydrothermal synthesis, mechanochemistry, microwave synthesis, high temperature annealing)
- Good knowledge of the synthesis of Pt, Ru, Cu, Co, Pd, Ir metal nanoparticles, as well as the synthesis and modification of properties of titanium oxynitride
- Working knowledge of different instrumental analysis techniques: DSC, XRD, FT-IR, UV-Vis spectroscopy, DLS, electron microscopy, SQUID magnetometry, rheology, gas adsorption
- Working knowledge of surface characterization techniques such as contact angle measurement (tensiometry), profilometry, streaming potential measurement, colorimetry
- Experience in electrochemical measurements of catalytic activity for hydrogen and oxygen evolution reactions
- Experience in testing the SERS activity of nanoparticles on model molecules
- Experience in the testing of catalytic activity of nanoparticles on model systems
- Experience in structural and morphological characterization of liposomes, bacteria, solid solutions, and silicon nanostructures

Digital competences (computer skills)

- Very good knowledge of Microsoft Office suite (Excel, Powerpoint, Word), Origin for general data analysis, crystallographic software (Maud, Match!, Qualx, Olex2, Mercury), Mössbauer spectra fitting software (MossWinn), UV-Vis spectra analysis (Spectragryph) and other.
- Basic knowledge of the Python programming language, and several Python packages such as numpy, pandas, matplotlib.

Mother tongue	Croatian				
Other language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C1	B2	B2	C1
Slovene	B2	B1	A2	A2	A1

Additional information

Research projects

Collaborator on 6 research projects and co-principal investigator of 1 research project:

- Collaborator on Research Project of Croatian Science Foundation "Radiolytically synthesized magnetic nanoparticles for hyperthermia effect on cancer cells" (2023.-2027.). PI: Dr. Tanja Jurkin
- Postdoctoral fellow on ERC project "Towards Nanostructured Electrocatalysts with Superior Stability" (2020. – 2025.). PI: Dr. Nejc Hodnik
- Collaborator on the CRP project of International Atomic Energy Agency „Innovative production of novel biocomposite based on bacterial nanocellulose from biowaste using radiation technology" (2023. – 2028.). PI: Dr. Ivana Tartaro Bujak
- Secondary chief scientific investigator on the CRP project by International Atomic Energy Agency "Face masks recycling with the use of radiation technologies" (2022 – 2026).
- Collaborator on the Installation Research Project of Croatian Science Foundation UIP-2017-05-7337 "The impact of polymers on radiolytic synthesis of magnetic nanoparticles" (2018 – 2023). PI: Dr. Tanja Jurkin
- Collaborator on Croatian-Hungarian bilateral project "Platinum decorated iron tin oxide solid solutions for hydrogen gas sensing" (2021 – 2022). PI: Dr. Marijan Gotić
- Collaborator on Croatian-Slovenial bilateral project "Radiolytic synthesis of magnetic δ-FeOOH@Au nanoparticles designed for biomedical applications" (2020 – 2021). PI: Dr. Tanja Jurkin

Membership in scientific organizations

- Croatian Chemical Society
- European Microscopy Society
- Croatian Radiation Protection Association
- Croatian Society for Electron Microscopy
- Croatian Crystallographic Union

Conferences and training courses

- 35 presentations at international conferences (3 oral and 32 poster presentations)
- Full list of abstracts available at:
  https://www.croris.hr/osobe/profil/34870
  https://www.croris.hr/crosbi/searchByContext/2/34870?VRSTA_RAD=5&VRSTA_RAD=7
- 15 training courses and workshops

Publications and citations

- **21 scientific papers (1st author of 11 papers), 120 citations, h-index = 6**
- 7 papers published in the top 10% of Q1 papers, of which 4 are in top 5% of Q1
  Full list of papers available at:
  https://www.croris.hr/crosbi/searchByContext/2/34870?VRSTA_RAD=4&TIP_RAD=1
  at WoSCC: https://www.webofscience.com/wos/woscc/summary/431dc5be-1790-4932-bcfe-ef49c178991d-c41d473b/relevance/1
  at Scopus: https://www.scopus.com/authid/detail.uri?authorId=57204789378
  at Google Scholar: https://scholar.google.hr/citations?user=fGZWGc8AAAAJ&hl=en&oi=ao

Awards

- Medal of excellence awarded by University of Zagreb, Faculty of Science, Department of Chemistry

- Best student award awarded by University of Osijek, Department of Chemistry
- Ruđer Bošković Institute yearly award for best scientific papers in 2019. (1 paper)
- Ruđer Bošković Institute yearly award for best scientific papers in 2020. (4 papers)
- Department of Chemistry, Institute Ruđer Bošković yearly award for the best paper in the 2nd category (without PhD) in 2020.
- Ruđer Bošković Institute stipend for 1 month stay at IMMM in France (2020.)
- French Embassy and Ruđer Bošković Institute stipend for 1 month stay at IMMM in France (2019.)
- IAEA-iia stipend for the participation at the 19th International Meeting on Radiation Processing and Pre-IMRP Training Course in Strasbourg and Reims in France 2019.

Other

- Reviewer for Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy (IF: 4.098)
- Reviewer for Arabian Journal of Chemistry (IF: 6.0)
- Reviewer for congress Second International Conference on Applications of Radiation Science and Technology (ICARST-2022)
- Assisted in the mentorship of a diploma thesis of MSc Monika Mihaljević "Synthesis of nanocomposite poly(ethylene oxide) hydrogels with Ag nanoparticles by gamma irradiation"

Annexes

List of publications

1. **Marić, Ivan**; Šoltić, Monika; Dražić, Goran; van Spronsen, Matthijs A.; Štefanić, Goran; Ivanda, Mile; Held, Georg; Jurkin, Tanja; Bohinc, Klemen; Gotić, Marijan
Synthesis of Pt decorated manganese oxide (MnO_2/Mn_5O_8) nanorods and their catalytic activity for the reduction of 4-nitrophenol to 4-aminophenol // *Applied surface science* **649** (2024) 159091.
IF = 6,7; Q1; 0 citations (WoSCC), 0 citations (Scopus)

2. **Marić, Ivan**; Dražić, Goran; Radin, Edi; Peter, Robert; Škrabić, Marko; Jurkin, Tanja; Pustak, Anđela; Baran, Nikola; Mikac, Lara; Ivanda; Petravić, Mladen; Štefanić, Goran; Gotić, Marijan
Impact of platinum loading and dispersion on the catalytic activity of Pt/SnO_2 and $Pt/\alpha\text{-}Fe_2O_3$ // *Applied surface science* **607** (2023) 155073
IF = 6,7; Q1; 7 citations (WoSCC), 8 citations (Scopus)

3. Kiš, Marta; Zdolec, Nevijo; Kazazić, Snježana; Vinceković, Marko; Jurić, Slaven; Dobranić, Vesna; Oštarić, Fabijan; **Marić, Ivan**; Mikulec, Nataša
Implementation of Novel Autochthonous Microencapsulated Strains of Lactiplantibacillus plantarum, Lactococcus lactis, and Lamb's Rennet in the Production of Traditional "Paški Sir" Cheese // *Fermentation* **9** (2023) 441
IF = 3,7; Q2; 0 citations (WoSCC), 0 citations (Scopus)

4. **Marić, Ivan**; Gotić, Marijan; Pustak, Anđela; Dražić, Goran; Grenèche, Jean-Marc; Jurkin, Tanja
Magnetic δ-FeOOH/Au nanostructures synthesized using γ-irradiation method and their catalytic activity for the reduction of 4-nitrophenol // *Applied surface science* **611** (2023) 155653
IF = 6,7; Q1; 2 citations (WoSCC), 3 citations (Scopus)

5. **Marić, Ivan**; Zore, Anamarija; Rojko, Franc; Sever Škapin, Andrijana; Štukelj, Roman; Učakar, Aleksander; Vidrih, Rajko; Veselinović, Valentina; Gotić, Marijan; Bohinc, Klemen
Antifungal Effect of Polymethyl Methacrylate Resin Base with Embedded Au Nanoparticles // *Nanomaterials* **13** (14) (2023) 2128
IF = 5,3; Q1; 1 citations (WoSCC), 1 citations (Scopus)

6. Belovari, Mateja; Nestić, Davor; **Marić, Ivan**; Majhen, Dragomira; Cametti, Massimo; Džolić, Zoran
Photophysical characterization and the self-assembly properties of mono- and bis-pyrene derivatives for cell imaging applications // *New journal of chemistry* **46** (47) (2022) 22518 – 22524.
IF = 3,3; Q2; 0 citations (WoSCC), 0 citations (Scopus)

7. Ledinski, Maja; **Marić, Ivan**; Peharec Štefanić, Petra; Ladan, Iva; Caput Mihalić, Katarina; Jurkin, Tanja; Gotić, Marijan; Urlić, Inga
Synthesis and In Vitro Characterization of Ascorbyl Palmitate-Loaded Solid Lipid Nanoparticles // *Polymers* **14** (2022) 1751
IF = 5,0; Q1; 3 citations (WoSCC), 5 citations (Scopus)

8. Bousiakou, Leda G.; Dobson, Peter J.; Jurkin, Tanja; **Marić, Ivan**; Aldossary, Omar; Ivanda, Mile
Optical, structural and semiconducting properties of Mn doped TiO_2 nanoparticles for cosmetic applications. // J*ournal of King Saud University – Science* **34** (3) (2022) 101818.
IF = 3,8; Q2; 10 citations (WoSCC), 12 citations (Scopus)

9. Radin, Edi; Štefanić, Goran; Dražić, Goran; **Marić, Ivan**; Jurkin, Tanja; Pustak, Anđela; Baran, Nikola; Raić, Matea; Gotić, Marijan
Solid-State Dispersions of Platinum in the SnO_2 and Fe_2O_3 Nanomaterials. // *Nanomaterials,* **11** (2021) 3349.
IF = 5,3; Q1; 3 citations (WoSCC), 3 citations (Scopus)

10. Mohaček-Grošev, Vlasta; Brljafa, Sandro; Škrabić, Marko; **Marić, Ivan**; Blažek Bregović, Vesna; Amendola, Vincenzo; Ropret; Polona; Kvaček Blažević, Anita
Glucosamine to gold nanoparticles binding studied using Raman spectroscopy. // *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, **264** (2022) 120326.
IF = 4,4; Q1; 3 citations (WoSCC), 5 citations (Scopus)

11. Mikac, Lara; Sabolić, Nikola; Raić, Matea; **Marić, Ivan**; Jurkin, Tanja; Gotić, Marijan; Škrabić, Marko; Rigo, Istvan, Veres, Miklos; Ivanda, Mile
Synthesis of porous silicon based nanoparticles for applications in surface enhanced Raman spectroscopy. // *Vacuum*, **191** (2021) 110335.
IF = 4,0; Q2; 3 citations (WoSCC), 3 citations (Scopus)

12. Mikac, Lara; Kovačević, Ema; Ukić, Šime; Raić, Matea; Jurkin, Tanja; **Marić, Ivan**; Gotić, Marijan; Ivanda, Mile
Detection of multi-class pesticide residues with surface-enhanced Raman spectroscopy. // *Spectrochimica Acta Part A: Molecular Spectroscopy*, **252** (2021) 119473.
IF = 4,4; Q1; 15 citations (WoSCC), 18 citations (Scopus)

13. **Marić, Ivan**; Šijaković-Vujičić, Nataša; Pustak, Anđela; Gotić, Marijan; Štefanić, Goran; Grenèche, Jean-Marc; Dražić, Goran; Jurkin, Tanja
Rheological, microstructural and thermal properties of magnetic poly(Ethylene oxide)/iron oxide nanocomposite hydrogels synthesized using a one-step gamma-irradiation method. // *Nanomaterials*, **10** (2020) 1823.
IF = 5,3; Q1; 3 citations (WoSCC), 3 citations (Scopus)

14. **Marić, Ivan**; Gotić, Marijan; Štefanić, Goran; Pustak, Anđela; Jurkin, Tanja
γ-irradiation generated ferrous ions affect the formation of magnetite and feroxyhyte. // *Radiation Physics and Chemistry*, **170** (2020) 108648
IF = 2,9; Q1; 5 citations (WoSCC), 6 citations (Scopus)

15. **Marić, Ivan**; Šijaković Vujičić, Nataša; Pustak, Anđela; Gotić, Marijan; Jurkin, Tanja
One-step synthesis of poly(ethylene oxide)/gold nanocomposite hydrogels and suspensions using gamma-irradiation. // *Radiation Physics and Chemistry*, **170** (2020), 108657
IF = 2,9; Q1; 5 citations (WoSCC), 5 citations (Scopus)

16. Raić, Matea; Mikac, Lara; **Marić, Ivan**; Štefanić, Goran; Škrabić, Marko; Gotić, Marijan; Ivanda, Mile
Nanostructured Silicon as Potential Anode Material for Li-Ion Batteries. // *Molecules*, **25** (2020) 891
IF = 4,6; Q2; 14 citations (WoSCC), 14 citations (Scopus)

17. **Marić, Ivan**; Dražić, Goran; Štefanić, Goran; Zadro, Krešo; Gotić, Marijan; Jurkin, Tanja
Characterization of radiolytically synthesized feroxyhyte and oxidized magnetite nanoparticles. // *Materials Characterization*, **159** (2020) 110038
IF = 4,7; Q1; 6 citations (WoSCC), 7 citations (Scopus)

18. Mikac, Lara; **Marić, Ivan**; Štefanić, Goran; Jurkin, Tanja; Ivanda, Mile; Gotić, Marijan
Radiolytic synthesis of manganese oxides and their ability to decolorize methylene blue in aqueous solutions. // *Applied surface science*, **476** (2019), 1086-1095
IF = 6,7; Q1; 9 citations (WoSCC), 10 citations (Scopus)

19. **Marić, Ivan**; Štefanić, Goran; Gotić, Marijan; Jurkin, Tanja
The impact of dextran sulfate on the radiolytic synthesis of magnetic iron oxide nanoparticles. // *Journal of molecular structure*, **1183** (2019) 126-136
IF = 3,8; Q2; 10 citations (WoSCC), 11 citations (Scopus)

20. **Marić, Ivan**; Dražić, Goran; Ivanda, Mile; Jurkin, Tanja; Štefanić, Goran; Gotić, Marijan
Impact of Fe(III) ions on the structural and optical properties of anatase-type solid solutions. // *Journal of molecular structure*, **1179** (2019), 354-365
IF = 3,8; Q2; 4 citations (WoSCC), 4 citations (Scopus)

21. **Marić, Ivan**; Gotić, Marijan; Jurkin, Tanja; Mikac, Lara; Tronc, Élisabeth; Ivanda, Mile
Structural Properties of Iron/Titanium Oxide Nanoparticles Synthesized by Sol-gel Method in the Presence of Poly(ethylene glycol). // *Croatica Chemica Acta*, **91** (2018) 577-588
IF = 0,73; Q4; 2 citations (WoSCC), 2 citations (Scopus)

Scientific visits, training courses and workshops

1. Participation on the Coordinated Research Meeting (RCM) "Recycling of polymer waste for structural and non-structural materials by using ionizing radiation"
International Atomic Energy Agency (IAEA), Vienna, Austria (3. – 9. 4. 2022.)

2. "Virtual Training Course on Applied Radiation Technology as a Tool for Recycling of Polymer Waste" - (online) (16. – 20. 8. 2021.)

3. 6th European Crystallography School - ECS6 (online) (4. – 10. 7. 2021.)

4. Virtual Workshop on Radiation Technology for Industry and Enviroment - (online) (19. – 22. 4. 2021.)

5. **Scientific visit at "Institut des Molecules et Materiaux du Mans", Le Mans, France financed by Ruđer Bošković Institute stipend (31. 10. – 29. 11. 2020.)**

6. Webinar „Dissemination of the Knowledge on Application of Ionizing Radiation for Sterilization of Medical Equipment, Personal Protection Equipment and the other Microbiologically Infected Objects" - (online) (7. 10. 2020.)

7. The European School on Magnetism 2020 – e-ESM 2020 (online) (28. 9.-2. 10. 2020.)

8. Microwave Synthesis Course
Anton Paar, Zagreb, Croatia (28. 1. 2020.)

9. **Scientific visit at "Institut des Molecules et Materiaux du Mans", Le Mans, France financed by French Embassy & Ruđer Boškovićć Institute stipend (13. 10. – 29. 11. 2019.)**

10. Mössbauer spectrometry and nanomaterials workshop
Ruđer Bošković Institute, Zagreb, Croatia (9. – 10. 10. 2019.)

11. 1st LKB MicroCal User Meeting, Zagreb, Croatia (2. – 3. 10. 2019.)

12. IAEA Regional Workshop TC Project RER1019 „Status, Advances and Applications of Ionizing Radiation on Biomedical Materials"
(IAEA project TC 1019), Ruđer Bošković Institute(co-organized with IAEA), Zagreb, Croatia (11. – 14. 6. 2019.)

13. Workshop on Solar Energy Materials
Ruđer Bošković Institute, Zagreb, Croatia (9. – 10. 5. 2019.)

14. Dosimetry Workshop, Strasbourg, France (1. 4. 2019.)

15. Pre-IMRP Course on Radiation Processing for Advanced Materials
Université de Reims-Champagne-Ardenne (organized by iia-IAEA, participation funded by the iia-IAEA grant), Reims, France (27. – 29. 3. 2019.)