

Ivica Cvrtila

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## EMPLOYMENT TRACK AT THE RBI

- 1. 5. 2024. – Postdoctoral student**  
Job position: postdoctoral fellow (viši asistent)
- 3. 10. 2022 – 30. 4. 2024. Postdoctoral student**, funded by Croatian Science Foundation through grant No. IP-2020-02-1419  
Job position: postdoctoral fellow (viši asistent)

## EDUCATION

- 2022 – 2025 Postdoctoral study** at the Ruđer Bošković Institute
- 2022 PhD** in Chemistry, thesis: **Building complexity in chemical systems**
- 2012 – 2016** PhD student in Stratingh Institute, Faculty of Science, University of Groningen; specialization in systems chemistry, dynamic combinatorial chemistry, and HPLC
- 2011 MSc** in Chemistry, thesis: **Crystal structures of phenazine, imidazole and o-phenylenediamine hexacyanoferrates**
- 2009 – 2011** Graduate student in chemistry, specialization in organic and inorganic chemistry at the Department of Chemistry, Faculty of Science University of Zagreb, Croatia
- 2009 BSc** in chemistry, thesis: **Metal sulfides and polysulfides**
- 2006 – 2009** Undergraduate student, Department of Chemistry, Faculty of Science, University of Zagreb, Croatia

## RESEARCH EXPERIENCE

- 2022 – present** Postdoctoral research in Laboratory for synthesis and catalysis in the solid state, on project “Systematics of mechanisms in neat or liquid-assisted solid-state synthesis (SystForSynt)”
- 2012 – 2016** PhD research: **Dynamic combinatorial approach to folding of peptides; Molecular cages based on disulfide and hydrazone chemistry; Photoresponsive dynamic combinatorial libraries based on acyl hydrazones**
- 2008 – 2011** Student research on metal diketonates and organic hexacyanoferrate

salts under supervision of dr. sc. B. Kaitner and dr. sc. V. Stilinović on scientific project „**New organic and coordination compounds – synthesis and structure-property relation**“

#### TEACHING AND SCIENCE POPULARIZATION EXPERIENCE

<b>2025</b>	<b>8th winter school of chemistry (Rijeka):</b> Whence lithium in smartphones? (lecture)
<b>2024</b>	<b>8th summer school of chemistry (Rijeka):</b> Silver in medicine (lecture)
<b>2023</b>	<b>7th summer school of chemistry (Rijeka):</b> Chemistry before life (lecture) <b>3rd summer school of chemistry for students (Rijeka):</b> Systems chemistry (lecture)
<b>2021</b>	<b>4th winter school of chemistry (Rijeka):</b> Chemistry before life (virtual lecture); How to categorize matter (virtual lecture)
<b>2015 – (2019)</b>	<b>Priroda</b> magazine – editorial board member
<b>2015</b>	<b>Organic synthesis for chemistry students</b> (practical course)
<b>2014</b>	<b>Organic synthesis for chemistry students</b> (practical course)
<b>2013</b>	<b>Organic synthesis for pharmacy students</b> (practical course)
<b>2012</b>	<b>Organic synthesis for pharmacy students</b> (practical course)
<b>2008</b>	<b>Summer school of chemistry:</b> Colloidal silver (lecture for general audience) <b>Summer Science Factory:</b> Organic acids (workshop for elementary school pupils; with Filip Topić) Festival Znanosti ( <b>Science festival</b> ), On beryllium poisoning (lecture for general audience)
<b>2006</b>	<b>Summer school of chemistry:</b> Sulfuric water (workshop for high school students)
<b>2006 – present</b>	E-škola kemije ( <b>E-school of chemistry</b> ) - associate

#### AWARDS AND SCHOLARSHIPS

<b>2023</b>	Best postdoctoral presentation on Slovenian-Croatian crystallographic meeting (SCCM 2023)
<b>2011</b>	<b>Rector's prize</b> for work „Supramolecular architecture in crystal structures of hexacyanoferrates of organic bases“
<b>2006 – 2011</b>	Recipient of Zagrebačka županija scholarship for (under)graduate students
<b>2002 – 2006</b>	Recipient of Zagrebačka županija scholarship for high school students

## 2001 – 2006

National meeting and competition of young chemists: Dubrovnik (2001) – 4th place; Rovinj (2002) – 4th place; Supetar (2003); Supetar (2004); Čakovec (2005) 1st place; Rab (2006)

National meeting and competition of young mathematicians (Makarska (2001); Zadar (2002); Kraljevica (2006)

National meeting and competition of young physicists: Novi Vinodolski (2002) – first prize; Mali Lošinj (2004)

**International Chemistry Olympiads:** Taipei, Taiwan (2005) – **bronze medal**; Gyeongsan, South Korea (2006) – **silver medal**

## SKILLS

**Solid-state chemical synthesis** in ball mills with *in situ* Raman monitoring, photomechanical setup for ball mills, solid-state CD spectroscopy

Supramolecular synthesis and crystallization, organic and inorganic synthesis, automated solid-support peptide synthesis, basic analysis (NMR, UV/Vis, FT-IR)

**X-ray** single crystal and powder diffraction; data evaluation, crystal structure solving, and (basic) quantum crystallography (Oxford Diffraction CrysAlis, WinGX, Mercury, Philips X'Pert, MoPro, **Topas**)

Data analysis using **Matlab**

Thermal analysis (TG, DSC)

**HPLC, prep HPLC, UPLC** (Agilent, Waters, Shimadzu)

## LANGUAGES

Native: Croatian

Advanced: English

Basic understanding: German, Dutch

## INTERESTS

Solid-state synthesis, photoswitching, supramolecular synthesis, crystal engineering, molecular receptors, dynamic combinatorial chemistry, complexity in chemistry, out-of-equilibrium phenomena, dissipative systems, prebiotic evolution

Science communication and popularization, pseudoscience depopularization, chemistry education

Reading, writing, puzzles, biology, geology, nature photography, farming, beer brewing

## SCIENTIFIC PAPERS

13. I. Cvrtila, V. Štrukil, M. Alešković, I. Kulscár, T. Mrla, E. Colacino, I. Halasz: Real-Time In Situ Raman Monitoring of Photomechanochemical Reactions, *Chemistry-Methods*, **2025**, e202400089.
12. I. Cvrtila and S. Otto: Emergent Behavior of a Photoswitchable Solute in a Biphasic Solvent System, *Chem. Eur. J.*, **2024**, 30, e202403157.
11. L. Vugrin, I. Cvrtila, H. Geneste, I. Halasz: Investigation of Mechanochemical Thianthrene-Mediated Aryl C–H Functionalization, *Croat. Chem. Acta*, **2024**, 97(2), 1–5.
10. L. Vugrin, I. Cvrtila, M. Juribašić Kulcsár, and I. Halasz: Acid-Base Catalysis in the Mechanochemical Formation of a Reluctant Imine, *Croat. Chem. Acta*, **2022**, 95(4), 141–145.
9. I. Cvrtila and V. Stilinović: Polymorphs of phenazine hexacyanoferrate(II) hydrate: supramolecular isomerism in a 2D hydrogen-bonded network, *Acta Cryst.*, **2021**, B77, 211–218.
8. I. Cvrtila, H. Fanlo-Virgós, G. Monreal Santiago, and S. Otto: Accelerating Hydrazone Exchange by UV Irradiation, *J. Sys. Chem.*, **2020**, 8, 73–81. (*non-indexed journal*)
7. I. Cvrtila and V. Stilinović: New Tricks by Old Anions: Hydrogen Bonded Hexacyanoferrous Anionic Networks, *Cryst. Growth Des.*, **2017**, 17, 6793–6800.
6. I. Cvrtila, H. Fanlo-Virgós, G. Schaeffer, G. Monreal Santiago, and S. Otto: Redox Control over Acyl Hydrazone Photoswitches, *J. Am. Chem. Soc.*, **2017**, 139, 12459–12465.
5. B. M. Matysiak, P. Nowak, I. Cvrtila, C. G. Pappas, B. Liu, D. Komáromy, and S. Otto: Antiparallel dynamic covalent chemistries, *J. Am. Chem. Soc.*, **2017**, 139, 6744–6751.
4. J. Li, I. Cvrtila, M. Colomb-Delsuc, E. Otten, and S. Otto: An “Ingredients” approach to functional self-synthesizing materials: A metal-ion selective, multi-responsive, self-assembled hydrogel, *Chem. Eur. J.*, **2014**, 20, 15709–15714.
3. I. Cvrtila, V. Stilinović, and B. Kaitner: Tuning of coordination geometry via cooperation of inter- and intramolecular hydrogen bonds in bis(benzoylacetato)manganese(II) adducts with pyridine derivatives, *CrystEngComm*, **2013** 15(33), 6585–6593.
2. V. Stilinović, K. Užarević, I. Cvrtila, and B. Kaitner: Bis(morpholine) hydrogen bond pincer - A novel series of heteroleptic Cu(II) coordination compounds as receptors for electron rich guests, *CrystEngComm*, **2012** 14(21), 7493–7501.
1. I. Cvrtila, V. Stilinović, and B. Kaitner: Morpholine adducts of Co, Ni, and Mn benzoylacetates: Isostructurality and C-H...O hydrogen bonding, *Struct. Chem.*, **2012** 23(2), 587–594.

## BOOKS

- S. Čičić, I. Cvrtila, V. Kojić: **Kemija na maturi** – priručnik za pripremu ispita državne mature, ŠK, Zagreb, 2023.
- S. Čičić, I. Cvrtila, V. Kojić: **KEMIJA 4** - zbirka zadataka iz kemije u četvrtom razredu gimnazije, ŠK, Zagreb, 2021.

## POPULAR SCIENCE ARTICLES

- I. Cvrtila: Mučenici znanosti, *Priroda*, **2017**
- I. Cvrtila: Ptica, mačka i otok, *Priroda*, **2016**
- I. Cvrtila: Što je to samoreplikacija?, *Priroda*, **2014** 11 (1039), 50–58.
- I. Cvrtila: Kukci, boje i kristali, *Priroda*, **2014** 6 (1035), 54–58.
- I. Cvrtila: Ni pingvini nisu što su nekad bili, *Priroda*, **2014** 2 (1031), 36–38.
- I. Cvrtila: Nesvjesno uništenje biblijske pošasti, *Priroda*, **2011** 10 (1005), 24–26.
- I. Cvrtila: Kako je golub selac odselio u vječna gnjezdišta, *Priroda*, **2011** 7/8 (1003), 10–15.
- I. Cvrtila: Ljudi koji jedu arsen, *Priroda*, **2010** 9 (993), 36–39.

## SCIENTIFIC MEETINGS

- 2024**                      **International school of crystallography:** 59th course: Powder diffraction: Advancing real materials in the information era (Erice, Italy)  
Synchrotron XRD of DABCO hydrobromide reveals hidden details (poster presentation)
- 2023**                      **Supramolecular Chemistry 2023** (VI. simpozij supramolekulske kemije) (Zagreb, Croatia)  
2-Formylpyridine Blue Out of the Blue (poster presentation)  
**8th Symposium of Chemistry Students (SiSK<sup>8</sup>)** (Zagreb, Croatia)  
Formylpyridine blue (invited lecture)  
**Slovenian-Croatian crystallographic meeting** (SCCM 2023) (Topolšica, Slovenia)  
Chiral crystallization of hippuric acid from carvone (oral presentation)  
**28<sup>th</sup> Croatian Meeting of Chemists and Chemical Engineers (28HSKIKI)** (Rovinj, Croatia)  
2-formylpyridine blue out of the blue (oral presentation)
- 2017**                      **SiSK<sup>4</sup>** (4th Croatian Chemistry Student Symposium) (Zagreb, Croatia)  
Acyl hydrazones, thiols, and disulfides in systems chemistry (invited lecture)
- 2016**                      **Workshop on Supramolecular Systems Chemistry 2016** (Barcelona, Spain)  
Enhancing combinatorial chemistry by photoswitching of acyl hydrazones (oral presentation)
- 2015**                      **Chemical Complexity & Biology Symposium** (Strasbourg, France)  
Acyl hydrazone based dynamic combinatorial libraries responsive to

UV irradiation (poster presentation)

**Workweek 2016** (Eindhoven, The Netherlands)

Acyl hydrazone based dynamic combinatorial libraries responsive to UV irradiation (oral presentation)

**2014**

**CHAINS 2014** (Veldhoven, The Netherlands)

Acyl hydrazone based dynamic combinatorial libraries responsive to visible light (poster presentation)

**FMS Annual Meeting 2014** (Veldhoven, The Netherlands)

Acyl hydrazone based dynamic combinatorial libraries responsive to visible light (poster presentation)

**Functional Peptide and Protein Nanostructures** (Tzuba, Israel)

Exploring the folding of peptides using dynamic covalent chemistry (poster presentation)

**2013**

**Organic Chemistry & Synthesis Study Group Meeting 2013**

(Lunteren, The Netherlands)

Exploring the folding of peptides using dynamic covalent chemistry (poster presentation)

**Joint ReAd/Dynamol Network Meeting / Centre for Systems Chemistry**

**22<sup>nd</sup> Croatian-Slovenian Crystallographic Meeting** (Baška, Croatia)

Gel or crystal? It depends on the cations (oral presentation)

**Winter School in Supramolecular Chemistry** (Bressanone, Italy)

Exploring the folding of peptides using dynamic covalent chemistry (poster presentation)

**2012**

**ERC Grantees Conference** (Strasbourg, France)

Exploring the folding of peptides using dynamic covalent chemistry (poster presentation)

**Organic Chemistry & Synthesis Study Group Meeting 2012**

(Lunteren, The Netherlands)

Exploring the folding of peptides using dynamic covalent chemistry (poster presentation)

**2011**

**22<sup>nd</sup> Croatian Meeting of Chemists and Chemical Engineers** (Zagreb, Croatia)

Phenazine hexacyanoferrate(II) solvates (poster presentation)

**20<sup>th</sup> Croatian-Slovenian Crystallographic Meeting** (Baška, Croatia)

*o*-Phenylenediamine hexacyanoferrates – diversity out of nowhere (oral presentation)

- 2010**                      **19<sup>th</sup> Slovenian-Croatian Crystallographic Meeting** (Strunjan, Slovenia)
- 4,4'-Bipyridinium hexacyanoferrate(II) and (III) hydrates (oral presentation)
- 8<sup>th</sup> Meeting of Young Chemical Engineers** (Zagreb, Croatia)
- Bis(benzoylacetonato)manganese(II) adducts with pyridine derivatives (poster presentation)
- 2009**                      **18<sup>th</sup> Croatian-Slovenian Crystallographic Meeting** (Varaždin, Croatia)
- Bis(benzoylacetonato)bis(morpholine-κ N)manganese(II) morpholine solvate (oral presentation)
- 21<sup>st</sup> Croatian Meeting of Chemists and Chemical Engineers** (Trogir, Croatia)
- Bis(benzoylacetonato)manganese(II) adducts with dimethylsulfoxide and 4-methylpyridine (poster presentation)
- Summer School of Chemistry (poster presentation)