Dr. Brandon Djukic, Ph.D.
Phone: (905) 869-1566
email: brandondjukic@gmail.com

Mailing address:
3335 Binbrook Rd.
Hamilton, ON, CA, L0R 1C0

2018-03-15

Dear 30 Forensic Engineering hiring personnel:

I am writing to you to express my interest in the position:
Senior or Principal Fire Investigator

I have a long standing passion for physical sciences, analysis and technology and have worked hard to reach goals and achievements in these fields. My formal education and work experience is broad, and started by earning a chemical engineering technology diploma. Afterwards, I pursued an undergraduate degree and a Ph.D. in inorganic chemistry. Two post-doctoral fellowships followed, one in physical organic chemistry and the second in solar cell materials research. During this time I've also worked in the chemical industry, initially as a quality assurance technician, and later as a materials scientist leading teams of researchers and coworkers towards project goals and deadlines.

My core skills include research, data analysis, environmental science, chemical instrumentation, and chemical synthesis but I also have experience with project management, team leadership as well as business and technical development. My commercialization endeavors have helped transform academic research into products on the market. I'm competent in providing technical assessments of new technologies and enjoy working with clients, from planning and initiation, executing, and closing the work of a team to achieve project goals.

I have extensive experience in technical communication. This is demonstrated by the 21 peer reviewed research articles I've authored that have been cited 300 times. I'm also the author of 3 patents, numerous standard operating procedures, safety data sheets (MSDS), and other workplace safety documents. I enjoy contributing to a safe workplace and have participated as a joint health and safety committee member. In one example, after examining past incidents I drafted safety documents that eliminated the most common forms of injury at my workplace (hand injuries). I've also given 17 conference presentations to the public on my research achievements. Additionally, I taught chemistry at Brock University, as a teaching assistant/lecturer and lab demonstrator. I believe effective communication is an important skill for achieving project goals and successful client negotiations, but also because it can help to foster a good working relationship between coworkers, improving overall satisfaction and efficiency in the work place.

Thank you for your consideration and I look forward to hearing from you to further discuss this opportunity.

Sincerely,

Dr. Brandon Djukic

B.Sc., Ph.D.

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Brandon Djukic

B.Sc., Ph.D.

Curriculum Vitae

Profile

- Seven years of project management experience.
- Thirteen years of industrial experience related to environmental science.
- Four years of teaching experience.
- Proven track record of delivering high quality products and data analysis.
- Ability to work under strict timelines.
- Excellent problem solving and record keeping abilities.
- High level of attention to detail.
- Committed to improving health and safety in the workplace.
- Ability to generate and follow standard operating procedures.
- Eager to learn and be part of a team.
- Easy going personality, able to work well with others.

Employment

GreenCentre Canada 2014-2018

Product Development Scientist

University of Toronto (Toronto ON, CA) 2011-2014

Postdoctoral Research Associate - Seferos Research Group

Industrial research with Saudi Basic Industries Corporation (SABIC)

McGill University (Montréal, QC, CA) 2010-2011

Postdoctoral Research Associate - Perepichka Research Group

Brock University (St. Catharines, ON, CA) 2005-2010

Teaching Assistant

Lab Demonstrator

Research Associate

Philips Services Corporation (Hamilton and Toronto, ON, CA) 2000-2005

Small Quantities Specialist

Quality Control Technician

Quality Assurance Laboratory Technician

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Education

Brock University (St. Catharines, ON)

Ph.D. (Inorganic Chemistry) 2006-2010

Thesis: Spin Labile Conducting Metallopolymers: A new architecture for hybrid multifunctional materials

B.Sc., Honors (Chemistry) 2003-2006

Thesis: Exploring the reactivity of 3,3'-diaminobipyridine in the synthesis of new ligands and coordination complexes

Mohawk College of Applied arts and Technology (Hamilton, ON) 1999-2002

Chemical Engineering Technology

Awards and Honours

Ontario Post-Doctoral Fellowship	2012
NSERC - Industrial R&D Fellowship	2011
Ontario Graduate Scholarship	2009
Dean of Graduate Studies Excellence Scholarship	2009
Dean of Graduate Studies Entrance Scholarship	2006
Brock University Student Research Assistant Scholarship	2005
Canadian Society for Chemical Technology Medal (CIC)	2002

Leadership and Project Management

1. **Senior research associate** for 12 students from 2006-2014, providing technical training, safety procedures, and guidance to other group members.
2. **Lab demonstrator** for undergraduate general chemistry and organic chemistry labs at Brock University. helping students conduct their experiments in a safe and timely manner.
3. **Tutorial instructor** for a class of 250 general chemistry students at Brock University. I presented tutorial lectures and administered tests. Examining the outcome of this program revealed a 5% increase of the average student grade upon implementation.
4. **Team lead** for an industrial-academic collaboration between the University of Toronto and SABIC. I reviewed analytical data collected for the project from two post-doctoral scientists and then prepared and presented comprehensive reports to SABIC, on a monthly basis for 3 years.
5. **Project manager** for 3 technologies under development at GreenCentre Canada, and technical lead for 6 other technologies.
6. **Financial management**: I was in charge of all purchasing for the Seferos Research Group's international collaboration with SABIC between 2011-2014.

7. **Scientific Collaborations**: Participation in many national or international scientific collaborations with both academic and industrial partners.

Business and Technical Development

1. Technology Assessments

- Literature and intellectual property review
- Industry outreach
- Market assessment
- Technology validation

i. Frampton, M.B.; Simionescu, R.; Dudding, T.; Zelisko, P.M. (2010) J. Mol. Catal. B-Enzym. 66, 105–112. DOI: 10.1016/j.molcatb.2010.04.002.

The enzymatic cleavage of Si–O *bonds: A kinetic analysis of the biocatalyzed hydrolysis of phenyltrimethoxysilane.*

ii. Takebayashi, S.; John, J.M.; Bergens S.H. (2010) J. Am. Chem. Soc. 132 (37), 12832–12834. DOI: 10.1021/ja105783u.

Desymmetrization of meso-Cyclic Imides via Enantioselective Monohydrogenation.

iii. *Kahwaji, S.; Johnson, M.B.; Kheirabadi, A.C.; Groulx, D.; White, M.A.* (2017) Sol. Energy Mater Sol. Cells *167, 109-120.* DOI: 10.1016/j.solmat.2017.03.038.

Fatty acids and related phase change materials for reliable thermal energy storage at moderate temperatures.

2. Research and Commercialization

- Industry consultation
- Adaptation of an invention to suit the needs of the industry
- Development of synthetic pathways, materials and testing parameters
- Validation and scale-up

i. Ralph, C.K.; Bergens, S.H. (2007) Organometallics, 26, 1571-1574. DOI: 10.1021/om070109g.

A Highly Reusable Catalyst for Enantioselective Ketone Hydrogenation. Catalyst−Organic Frameworks by Alternating ROMP Assembly.

ii. Darabi, A.; Glasing, J.; Jessop, P.G.; Cunningham, M.F. (2017) J. Polym. Sci. A, 55, (6), 1059-1066.

Preparation of CO_2-switchable latexes using N-[3-(dimethylamino)propyl]-methacrylamide (DMAPMAm).

3. Innovation Services

- Client consultation
- Statement of work development
- Literature review
- Instrumentation and equipment assembly
- Method development
- Method validation
- Formulation

- Process optimization
- Data analysis and report generation

i. Christensen, M.; Nolting, A.; Shevlin, M.; Weisel, M.; Maligres, P.E.; Lee, J.; Orr, R.K.; Plummer, C.W.; Tudge, M.T.; Campeau, L.-C.; Ruck, R.T. (2016) J. Org. Chem. 81 (3), 824-830. DOI: 10.1021/acs.joc.5b02296

Enantioselective Synthesis of α-Methyl-β-cyclopropyldihydrocinnamates (high throughput experimentation)

ii. Kirk, Donald W.; Graydon, John W.; White, Andrew J. (2012), WO 2012094736 A1

Production of biochar absorbent from anaerobic digestate (hydrogen sulfide removal from natural gas streams).

iii. Magargee, R.J. Ahrens, W.A. Eyde, D.T. Smith B.T. (2006) WO 2006041608 A1

Sodium permanganate ethylene absorption agent (antimicrobial, ethylene and volatile organic compound air filter to prevent food spoilage)

iv. Mochalin, V.N.; Shenderova, O.; Ho, D.; Gogotsi, Y. (2012) Nat. Nanotechnol. 7, 11–23. doi:10.1038/nnano.2011.209.

The properties and applications of nanodiamonds.

4. Custom Synthesis

- Synthesis validation
- Scale-up safety assessment
- Scale-up synthesis
- Quality analysis
- Client consultation
- Product links:

https://www.sigmaaldrich.com/catalog/product/aldrich/799718?lang=en&region=CA

https://www.sigmaaldrich.com/catalog/product/aldrich/746339?lang=en&region=CA

i. Sather, A.C.; Lee, H.G.; De La Rosa, V.Y.; Yang, Y.; Müller, P.; Buchwald, S.L. (2015) J. Am. Chem. Soc. 137, 13433−13438. DOI: 10.1021/jacs.5b09308.

A Fluorinated Ligand Enables Room-Temperature and Regioselective Pd-Catalyzed Fluorination of Aryl Triflates and Bromides

ii. Spasyuk, D.; Smith, S.; Gusev, D.G. (2013) Angew. Chem. Int. Ed. 52, 2538 –2542. DOI: 10.1002/anie.201209218

Replacing Phosphorus with Sulfur for the Efficient Hydrogenation of Esters.

iii. Spasyuk, D., Smith, S. and Gusev, D. G. (2012), Angew. Chem. Int. Ed., 51: 2772–2775. doi:10.1002/anie.201108956

From Esters to Alcohols and Back with Ruthenium and Osmium Catalysts.

Chemical Analysis and Instrumentation Experience

1. Equipment Operation and Data Analysis

- Density Functional Theory (DFT)

- Electrochemistry and spectroelectrochemistry
- Electron spin resonance (ESR) spectroscopy
- Energy-dispersive X-ray spectroscopy (EDS)
- Fluorimetry
- Fourier-transform infrared spectroscopy (FTIR)
- Gas chromatography–mass spectrometry (GC-MS)
- Gas flow rate and capacity measurements/calculations
- Gel permeation chromatography (GPC)
- High/Ultra-performance liquid chromatography-mass spectrometry (HPLC/UPLC-MS)
- High-resolution transmission electron microscopy (HR-TEM)
- Inductively coupled plasma emission spectrometry (ICP)
- Magnetochemistry (MPMS-SQUID)
- Mass Spectrometry
- Nuclear magnetic resonance (NMR) techniques,
- Powder x-ray diffraction (PXRD)
- Single crystal growth and x-ray diffraction, including solving X-ray crystal structures.
- Small angle x-ray scattering (SAXS)
- Ultraviolet–visible spectroscopy (UV-Vis)
- X-ray photoemission spectroscopy (XPS)

2. Analytical Equipment Maintenance

- Analytical balances
- Cryogenic equipment
- Fluorimeter
- Glove boxes
- HPLC-MS
- Optoelectronic equipment
- Schlenk-vacuum lines
- UV-Vis spectrometer

Chemical Synthesis Experience

1. **Organic chemistry:** scale-up synthesis, multi-step, cross coupling (Sonogashira, Suzuki etc.), heterocycle synthesis, cyclization reactions, protecting group chemistry, photo-physics organic systems, working with stable radicals and π-conjugated molecules.
2. **Inorganic chemistry:** glove box/Schlenk techniques, organometallic synthesis, self-assembly, coordination chemistry, bioinorganic chemistry, metathesis and nanoparticle fabrication.
3. **Polymers:** chemical and electrochemical polymerization in aqueous or anhydrous organic solutions, radical polymerization, self-assembly, conjugated organic polymers, and organometallic polymers.
4. **New materials design and characterization:** devising new materials, polymers and precursors; inorganic-organic hybrid materials; materials that contain multiple electronic, optical and magnetic states, organic semiconductors, photovoltaic materials, organic field effect transistors.

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Articles Published in Peer Reviewed Journals

1. Wang, J.; **Djukic, B**.; Cao, J.; Alberola, A.; Razavi,F. S.; Pilkington M. (2007) Inorg. Chem. 46, 8560-8568.

A novel bis tridentate bipyridine carboxamide ligand and its complexation to copper(II): Synthesis, structure, and magnetism.

2. Cheng, H.; **Djukic, B.**; Harrington, L. E.; Britten J. F.; Lemaire, M. T. (2008) Acta Cryst. E64, 719.

N'-(3- Thienylmethylene)pyridine-2-carbohydrazide.

3. **Djukic, B.**; Harrington, L. E.; Britten J. F.; Lemaire, M. T. (2008) Acta Cryst. E64, 463.

5,7-Di-2-pyridyl-2,3- dihydrothieno[3,4-b][1,4]dioxine.

4. **Djukic, B.**; Dube, P. A.; Razavi, F.; Seda, T.; Jenkins, H. A.; Britten, J. F.; Lemaire, M. T. (2009) Inorg. Chem. 48, 699- 707.

Preparation and magnetic properties of iron(3+) spin-crossover complexes bearing a thiophene substituent: Toward multifunctional metallopolymers.

5. O'Sullivan T.J.; **Djukic, B.**; Dube P.A.; Lemaire M.T. (2009) Can. J. Chem. 87, 533-538.

Preparation and properties of thienyl and 2,2-bithienyl substituted cobalt-bis(semiquinone) valence tautomers.

6. **Djukic, B.**; Poddutoori, P. K.; Dube P. A.; Seda T.; Jenkins, H. A.; Lemaire, M. T. (2009) Inorg. Chem. 48, 6109-6116.

Bimetallic iron(3+) spin-crossover complexes containing a 2,2-bithienyl bridging bis-QsalH ligand.

7. **Djukic, B.**; Lemaire, M.T. (2009) Inorg. Chem. 48, 10489–10491.

A hybrid spin-crossover conductor exhibiting unusual variable temperature electrical conductivity.

8. O'Sullivan, T.; **Djukic, B.**; Dube, P. A.; Lemaire, M. T. (2009) Chem. Commun. 1903-1905.

A conducting metallopolymer featuring valence tautomerism.

9. Cheng, H., **Djukic, B.**, Jenkins, H.A., Gorelsky, S. I. Lemaire, M.T. (2010) Can. J. Chem. 88, 954–963.

Iron(II) complexes containing thiophene substituted "bispicen" ligands: Spin-crossover, ligand rearrangements, and ferromagnetic interactions.

10. **Djukic, B.**; Singh, M.; Lemaire M.T. (2010) Syn. Met. 160 825-828.

Unusual formation of spin-crossover polymer microspheres.

11. Adugna, S.; Revunova, K.; **Djukic, B.**; Jenkins, H.A.; Gorelsky, S.I.; Lemaire, M.T. (2010) Inorg. Chem. 49, 10183-10190.

Persistent metal bis(hexafluoroacetylacetonato) complexes featuring a 2,2'bipyridine substituted triarylamminium radical cation.

12. **Djukic, B.**; Seda, T.; Gorelsky, S.I.; Lough, A.J.; Lemaire, M.T. (2011) π- Inorg. Chem. 50, 7334-7343.

Extended and six- coordinate iron(II) complexes: Structures, magnetic properties, and the electrochemical synthesis of a conducting iron(II) metallopolymer.

13. **Djukic, B.**; Perepichka, D.F. (2011) Chem. Commun. 47, 12619-12621.

Non-classical heteroacenes: synthesis and properties of anthra[2,3-c,6,7-c']dithiophene derivatives

14. Dadvand, A.; Moiseev, A.G.; Sawabe, K.; Sun, W.; **Djukic, B.**; Chung, I.; Takenobu, T.; Rosei F.; Perepichka, D.F. (2012) Angew. Chem. Int. Ed. 51, 3837-3841.

Maximizing field-effect mobility and solid-state luminescence in organic semiconductors.

15. **Djukic, B.**; Perepichka, D.F. (2012) Chem. Commun. 48, 6651- 6653.

Unexpected formation of a cyclic vinylene sulfate in the synthesis of ethynyl-substituted acenes.

16. **Djukic, B.**; Jenkins, H. A.; Seda, T.; Lemaire, M. T. (2013) Transit. Metal Chem. 38, 207-212.

Structural and magnetic properties of homoleptic iron(III) complexes containing N-(8-quinolyl)-salicylaldimine $[Fe(Qsal)_2]^+X^-$ {X = I or (Qsal)$FeCl_3$}.

17. Wilson, D.; **Djukic, B.**; Lemaire, M. T. (2013) Transit. Metal Chem. 10.1007/s11243-013-9766-9.

Synthesis of bromine-or aryl-substituted ditopic Schiff base ligands and their bimetallic iron(II) complexes: Electronic and magnetic properties.

18. Gao, D.; **Djukic, B.**; Shi, W.; Bridges, C. R.; Kozycz L. M.; Seferos, D. S. (2013) ACS Appl. Mater. Interfaces. 5, 8038-8043.

Evolution of the Electron Mobility in Polymer Solar Cells with Different Fullerene Acceptors.

19. Jahnke, A.; **Djukic, B.**; McCormick, T.; Lee, Y.; Seferos, D. S. (2013) J. Am. Chem. Soc. 135, 951-954.

Poly(3- alkyltellurophene)s Are Solution-Processable Polyheterocycles.

20. **Djukic, B.**; Lough, A.; Seferos, D. S. (2013) J. Org. Chem. 78, 9340-9344.

A Highly Electron-Deficient Analogue of Aniline, Soluble Oligomers, and Their Redox Properties.

21. Tilley, A.J.; Pensack, R.D.;Lee, T.S.; **Djukic, B.**; Scholes, G.D.; Seferos D.S. (2014) J. Phys. Chem. C 118, 9996−10004.

Ultrafast Triplet Formation in Thionated Perylene Diimides.

Patents

1. Seferos, D. S.; **Djukic, B.**; Tevtia, A. (2014) WO2014164224A1.

Semiconductor Polymers.

2. Seferos, D. S.; **Djukic, B.**; Abdelrahman, A. (2014) WO 2014040055 A3.

Conjugated polymer composition for solar cell and flexible electronics applications.

3. Seferos, D. S.; **Djukic B.**; Abdelrahman, A. (2014) WO2014040057A3.

Process for manufacture of conjugated polymer compositions for solar cell applications.

Public Presentations and Communication Activities

1. Canadian Society for Chemistry (2007). National conference; poster presentation. Lemaire, M.T.*; **Djukic, B.**

Synthesis, characterization and properties of iron(III) spin crossover compounds.

2. Mapping the New Knowledges (2007). Institutional conference; poster presentation. **Djukic, B.**;* Lemaire, M.T.

Candidates for future molecular electronics.

3. 3rd Annual Brock Chemistry Undergraduate Research Day (2007). Institutional conference; poster presentation. O'Sullivan, T.*; **Djukic, B.**; Lemaire, M.T.

Novel valence tautomeric materials.

4. Eastern Canadian Magnetism Meeting (2008). Regional conference; poster presentation. **Djukic, B.**;* Lemaire, M.T.

A spin transition complex incorporated into conjugated metallopolymers.

5. Eastern Canadian Magnetism Meeting (2008). Regional conference; oral presentation. Lemaire, M.T.*; **Djukic, B.**

Thiophene substitution in spin crossover complexes: Toward multifunctional metallopolymers.

6. Canadian Society for Chemistry (2008). National conference; poster presentation. Lemaire, M.T.*; **Djukic, B.**

Thiophene substitution in spin transition complexes: toward multifunctional metallopolymers.

7. Inorganic Discussion Weekend (2008). Regional conference; poster presentation. O'Sullivan, T.; **Djukic, B.***; Lemaire, M. T.

A conducting metallopolymer featuring valence tautomerism.

8. Mapping the New Knowledges (2008). Institutional conference; poster presentation. **Djukic, B.***; Lemaire M. T.

A spin transition incorporated into a conjugated metallopolymer.

9. 4th Annual Brock Chemistry Undergraduate Research Day (2008). Institutional conference; poster presentation. Cheng, H.*; **Djukic, B.**; Lemaire, M.T.

Synthesis of New Thiophene Containing Iron(II) Spin- Transition Complexes.

10. Canadian Society for Chemistry (2009). National conference; oral presentation. **Djukic, B.**; O'Sullivan, T.; Cheng, H.; Dube P. A.; Seda T.; Jenkins, H. A.; Lemaire, M.T.*

Electronic Lability Incorporated within Oligo- and Polythiophene Materials: Hybrid Spin-Crossover or Valence Tautomeric Conductors.

11. Canadian Society for Chemistry (2009). National conference; poster presentation. **Djukic, B.***; Lemaire, M.T.

Exploring interactions between electrical conductivity and magnetic switching in hybrid polythiophene materials.

12. Spin Chemistry Meeting (2009). International conference; poster presentation. **Djukic, B.***; Lemaire, M.T.

Hybrid multifunctional materials: An investigation of synergistic interactions between magnetic spin and electron transport.

13. Inorganic Discussion Weekend (2009) conference: Regional conference; oral presentation. **Djukic, B.***; Lemaire, M.T.

Hybrid Multifunctional Materials: An Investigation of Synergistic Interactions between Magnetic Spin and Electron Transport

14. Eastern Canadian Magnetism Meeting (2010). Regional conference; poster presentation. **Djukic, B.***; Lemaire, M.T.

Exploring interactions between electrical conductivity and magnetic switching in hybrid polythiophene materials.

15. Canadian Society for Chemistry (2010). National conference; poster presentation. **Djukic, B.***; Lemaire M.T.

Conjugated Polymers featuring Adaptable Magnetic Spin.

16. Canadian Society for Chemistry (2011). National conference; poster presentation. **Djukic, B.***; Morrantz, M.; Perepichka, D.F.

Synthesis, Characterization, and Properties of Anthracene Derivatives Bearing Fused Heterocyclic Rings.

17. Future Leaders of Green Chemistry (2013). Institutional conference; poster presentation. **Djukic, B.*** Seferos, D.S.

All polymer solar cells synthesized using direct C-H activation.

18. Canadian Society for Chemistry (2017). National conference; oral presentation. **Djukic, B.***; Pasternak, A.; Thornton, P.; Nepal, P.; Kalapugama, S.; Bergens, S.

Highly Active and Reusable Heterogeneous Catalysts and Their Path to Commercialization.

Standard Operating Procedures and Safety Related Activities

1. GreenCentre Canada joint health and safety committee member

- Root cause analysis of safety incidents
- Provided general safety recommendations to the organization

2. Joint Health and Safety Committee Sign-off Approval

- Calcination of silica-coated glass microparticles
- High pressure reverse osmosis cell operation

3. Standard Operating Procedures Authored

- Hand safety and broken glassware SOP
- HPLC-MS SOP
- Ethers and other peroxide forming chemicals SOP

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- Flash point tester SOP

4. Standard Operating Procedures Reviewed

- General lab rules and safety practices
- Use and operation of gas detectors
- Use and operation of the dissolved oxygen meter

5. Hazard Assessments Authored

- Hydrogen sulfide gas use
- High temperature furnace work
- Scale-up chemical reaction using *t*-butyl lithium to form a benzyne intermediate

6. **Note:** Hand safety was the most prevalent form of injury at GreenCentre Canada, averaging six incidents per year. After implementing the hand safety policy I wrote, the number of incidents occurring was reduced to zero.

References

Available upon request