Philip D. Bulsink B.Sc., M.Sc.

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SUMMARY   Analytical Chemist with a passion for problem-solving and a proven ability to leverage computational tools (R, VBA, Python) to develop novel solutions. Thrives in fast-paced environments, excelling at independent learning and driving innovative research efforts.

EDUCATION

University of Ottawa
Master's Degree   **2015**

- Thesis: "*Rhenium^I Terdentate Compounds: Theoretical and Experimental Investigations*"
- Seminar: "*Recent Advances in NO_x Abatement from Diesel Engine Emissions*"
- Tasks: Synthesis & characterization of ligands and catalysts with novel photochemical properties. In-depth mechanism studies with various computational packages. Developed software in Python to simplify & accelerate work.
- Supervisors: Dr. Tom Woo and Dr. Darrin Richeson

University of Waterloo
Bachelor of Science, Honour's Chemistry, Co-op, Music Minor   **2012**

- Honour's Thesis: "*Solid Sample Analysis by Microplasma Optical Emission Spectroscopy*"

PROFESSIONAL EXPERIENCE

Characterization Laboratory, CanmetENERGY, Natural Resources Canada   Ottawa
Fuels Chemist   **2014 – Present**

- Pioneered advanced analytical methods using FTIR, HPLC, GC-MS, and GCxGC to unlock new insights from solid, liquid, and gaseous samples.
- Cultivated strong client relationships by providing expert analysis recommendations and cost-effective project planning.
- Championed data quality by overseeing all liquid and gaseous sample analysis, personally verifying reported data, and leading ISO17025 internal audits.
- Acted as a scientific liaison at internal and external client and committee meetings, representing the laboratory, department, and Canadian scientific expertise.
- Contributed strategically to research funding proposals, improving experimental campaigns and project success.

University of Ottawa, University of Waterloo   Ontario
Laboratory Teaching Assistant   **September 2011 – May 2014**

- Supervised undergraduate labs in General, Organic, Inorganic, Analytical, and Physical Chemistry, demonstrating techniques, explaining theoretical concepts, and ensuring safe and accurate experiment execution.

CanmetENERGY, Natural Resources Canada   Ottawa
Research Assistant - DeNO$_x$ Group   **May 2010 – August 2011 (12 months total)**

- Investigated novel homogeneous catalysts for the reduction of nitrogen oxides (NOx) in lean-burn diesel engine exhaust.
- Scaled catalyst synthesis processes by 3 orders of magnitude.
- Custom-built instrumentation and software to support studies.

Kinectrics, Inc.   Etobicoke
Analytical Chemist   **September – December 2009**

Characterization Lab, CanmetENERGY, Natural Resources Canada   Ottawa
Analytical Chemist - Characterization Laboratory   **January – April 2009**

HONOURS AND DISTINCTIONS	Excellence in Science - Departmental Achievement Award, Natural Resources Canada	**2023**
	Positive Workplace Impact - Energy Efficiency & Technology Sector Award, Natural Resources Canada	**2022**
	Innovation & Creativity - CanmetENERGY-Ottawa Award, Natural Resources Canada	**2021**
	Dean's Scholarship, University of Ottawa	**2015**
	Dean's Honour Roll, University of Waterloo, University of Ottawa	**2011 − 2014**
	Graduate Student Poster Award, CSC Inorganic Division Poster Symposium, Quebec City	**2013**
	Recognition of Collaboration - Departmental Achievement Award, Natural Resources Canada	**2012**
	Aileen Proudfoot Award, CanmetENERGY, Natural Resources Canada	**2011**
	Outstanding Co-op ranking, University of Waterloo	**2009 − 2012**

SELECTED PUBLICATIONS & PRESENTATIONS

Bulsink, P., Sant-Anna, S., Giddings, T., "Quantification of components without direct calibration by GC-MS/PolyArc®-FID" *American Chemical Society Conference*, **2023**

Bulsink, P., "Results of the IEA Bioenergy Round Robin on the Analysis of Heteroatoms in Biomass Liquefaction Oils" *CanmetENERGY-Ottawa Science Seminar*, **2020**

Bulsink, P., de Miguel Mercader, F,. Sandström, L., Van De Beld, B., Preto, F., Zacher, A., Oasmaa, A., Dahmen, N., Funke, A., Bronson, B. "Results of the International Energy Agency Bioenergy Round Robin on the Analysis of Heteroatoms in Biomass Liquefaction Oils", *Energy & Fuels*, 34, 9, pp. 11123–11133, **2020**. 10.1021/acs.energyfuels.0c02090

Bulsink, P., Al-Ghamdi, A., Joshi, P., Korobkov, I., Woo, T., Richeson, D. "Capturing Re(I) in a neutral N,N,N pincer scaffold and resulting enhanced absorption of visible light", *Dalton Trans.*, 45, pp. 8885–8896, **2016**.10.1039/C6DT00661B

Bulsink, P. "Transforming the Chemistry of Rhenium I: Physical and Theoretical Investigations", *University of Ottawa Thesis*, **2015**. 10.20381/ruor-2762

Stanciulescu, M., Bulsink, P., Caravaggio, G., Nossova, L., Burich, R. "NH3-TPD-MS study of Ce effect on the surface of Mn- or Fe-exchanged zeolites for selective catalytic reduction of NOx by ammonia", *App. Surface Sci.*, 300, pp. 201–207, **2014**. 10.1016/j.apsusc.2014.01.175

Richeson, D., Woo, T., Bulsink, P., Joshi, P., Jurca, T., Korobkov, I. "Expanding the coordination geometry and enhancing the photophysical features of Re (I) with redox non-innocent pincer ligands", *American Chemical Society Conference*, **2014**.

Bulsink, P., Korobkov, I., Woo, T., Richeson, D. "Transforming the chemistry of Re^I to access the Elusive Pincer Geometry", *CSC Inorganic Division Poster Symposium*, **2013**.

Stanciulescu, M., Caravaggio, G., Dobri, A., Moir, J,. Burich, R., Charland, J.-P., Bulsink, P. "Low-temperature selective catalytic reduction of NOx with NH3 over Mn-containing catalysts", *App. Catal. B: Env.*, 123–124, pp. 229–240, **2012**. 10.1016/j.apcatb.2012.04.012

Caravaggio, G., Stanciulescu, M., Burich, R., Scheier, B., Bulsink, P. "Novel Catalysts for NOx Reduction with Reductants Produced In-Situ", *DEER Conference*, **2010**.

ACTIVITIES

f1dataR Package

Author & Maintainer   **2022 – Present**

- Developed and maintain an R package that bridges the gap between R and Formula 1 data, leveraging a Python library
- Ensured seamless data access by maintaining the R–Python interface via the 'reticulate' package
- Responded to user and custodian feedback by addressing CRAN (Comprehensive R Archive Network) demands and handling issues raised on GitHub.

BulsinkBot

Designer & Programmer   **2018 – Present**

- Developed and deployed predictive models for NHL hockey game, season, and playoff outcomes, achieving top-5 ranking in accuracy against professional and amateur models (2019-present).
- Leveraged data analysis to generate daily NHL predictions shared via social media platforms (Twitter, Mastodon, and BlueSky).
- Provided expert NHL predictions for dailyfaceoff.com for two seasons (2021–2022 and 2022–2023).

Emergency Response Team - CanmetENERGY, Natural Resources Canada

Team Member & Incident Commander   **2015 – Present**

- Comprehensively trained in emergency medical and chemical response procedures, including first aid, burn response, trauma/wound care, and HAZMAT operations.
- Acted as backup dispatch, incident commander, and maintained annual SCBA recertification.

AFFILIATIONS   American Chemical Society (ACS), member 2019 – Present