

Helen Engelhardt

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SKILLS

- **Materials Characterization:** X Ray Diffraction, Electron Microscopy (SEM/TEM), Potentiostatic Analysis, Glovebox Protocol, Nanoparticle Synthesis, Battery Design, Electrochemical Cells.
- **Programming:** Python, Java, MATLAB, C, C++, HTML/CSS, Gnuplot, COMSOL.
- **Design:** Solidworks, Blender, Adobe Creative Cloud, Latex, Microsoft Office, Academic Communication.

EXPERIENCE

National Research Council Canada

Jan. 2021 – Apr. 2021

Research Assistant, Battery Anode Materials

Edmonton, AB

- Investigated new anode materials to improve capacity of lithium-ion batteries by 10 times compared to commercial cells, while maintaining cell safety at high temperatures and pressures.
- Formulated model of nucleation and diffusion in lithium-ion batteries using Comsol and MATLAB.
- Performed and analyzed *in situ* x-ray diffraction of lithium-ion battery anodes .
- Collaborated with graduate students to compose and share scientific manuscripts and presentations.

Klinkova Lab, University of Waterloo

Sep. 2019 – present

Research Assistant, Nanomaterials and Electrochemistry

Waterloo, ON

- Initiated project on gold core cage nanoparticle synthesis and self-assembly, which won Outstanding Poster Presentation award at Ryerson University's SOUSCC48.
- Collected and analyzed over 200 data sets from organic electrochemical reduction systems.
- Maximized efficiency of carbon dioxide reduction electrochemical reactor using Comsol simulations.

Waterloo Engineering Society

Sep. 2019 – present

Vice President Finance & Class Representative

Waterloo, ON

- Managed budget for over 100 student-organized events, allocated sponsorship funding to design teams, and oversaw the Engineering swag store, student lounge, and hardware store.
- Conveyed class concerns to professors and student council to ensure an inclusive academic environment.

Waterloo International Genetically Engineered Machine

Jan. 2020 – Nov. 2020

Mathematical Modelling Team Member

Waterloo, ON

- Designed filtration column in Solidworks and Python to remove 99.5% of copper ions from wastewater.

PUBLICATIONS

- F. Li, X Medvedeva, J. Medvedev, E. Khairullina, **H. Engelhardt**, S. Chandrasekar, Y. Guo, J. Jin, A. Lee, H. Thérien-Aubin, A. Ahmed , Y. Pang, A. Klinkova. "Interplay of electrochemical and electrical effects induces structural transformations in electrocatalysts." Manuscript Accepted, *Nature Catalysis* (2021).
- J. Medvedev, X. Medvedeva, **H. Engelhardt**, and A. Klinkova. "Relative activity of metal cathodes towards electroorganic coupling of CO₂ with benzylic halides." *Electrochimica Acta* (2021).
- **H. Engelhardt**, X. Medvedeva, and A. Klinkova. Poster: "Self Assembly of Gold Core Cage Nanoparticles." Poster, SOUSCC48 (2020).

EDUCATION

University of Waterloo

Sep. 2019 – present

Candidate for Bachelor of Applied Science, Nanotechnology Engineering

GPA: 3.8/4.0

INTERESTS

Violin performance, Whitewater Kayaking, Knitting, Environmentalism, Poetry, Sewing.