



UNIVERSITY
OF MANITOBA

Enabling High-Capacity Li-ion and Na-ion Battery Cathodes with Conducting Binders

Fully funded projects available to start January 2020

The laboratory for electrochemically functional materials (Dr. Christian Kuss) at the Department of Chemistry, University of Manitoba is searching for a graduate student to join our ongoing research in conducting Li- and Na-ion battery binders.

About the project

Lithium and sodium ion batteries are based on solid state materials that can reversibly insert and de-insert (intercalate) lithium and sodium ions. Ground-breaking research into these materials has developed the lithium-ion technology that we know today. In this project, you will investigate the properties of new composite electrodes for lithium and sodium ion batteries that employ electronically conducting polymers. This work will involve the synthesis of intercalation materials and conjugated polymers, their comprehensive characterization, and fabrication of test batteries. Focus of the work will lie on the study of 3D structure – performance relationships, using state-of-the-art microscopic tools, such as synchrotron X-ray nano-tomography and operando transmission electron microscopy.

For more information on projects, applications, and the group, please visit our website at <http://kussmaterials.com> or contact Dr. Kuss at christian.kuss@umanitoba.ca.

Requirements

- An undergraduate degree in Chemistry, Chemical Engineering or a related subject
- A G.P.A. of 3.5 or higher (see http://umanitoba.ca/faculties/graduate_studies/admin/569.html and http://umanitoba.ca/faculties/graduate_studies/admissions/equivalencies.html for conversion details)
- Proven English language proficiency (see http://umanitoba.ca/faculties/graduate_studies/admissions/139.html)
- Keen interest in electrochemistry and energy applications
- Scientific curiosity and motivation
- Ability to work in a team as well as independently

Application Procedure:

Applications should be sent to Christian Kuss (christian.kuss@umanitoba.ca) and consist of a cover letter, CV, and copies of your most recent transcripts and English language test certificate. To be fully considered, please submit your application by the deadline of May 15th 2019.

Stipend:

The University of Manitoba Department of Chemistry guarantees an annual stipend of \$ 20,000 for

M.Sc. students for up to two years and of \$ 22,000 for Ph.D. students for up to four years, subject to satisfactory progress in the program and participation in the Teaching Assistantship program. Additional financial support may be available from external awards.

Tuition:

This year's tuition fees for domestic students are about \$5,000 for the first year and about \$800 for subsequent years in the M.Sc. program, and about \$5,000 per year for the first two years, \$800 for subsequent years in the Ph.D. program. International students with sufficiently strong academic record qualify for a tuition relief scholarship that reduces the international fees to the domestic level. Up-to-date information on current tuition fees can be found here:

http://umanitoba.ca/faculties/graduate_studies/admissions/programs/647.html

Learning environment:

At the University of Manitoba, you will have access to brand-new state-of-the-art equipment for battery fabrication, characterization and testing. You will further be trained on high-end characterization tools, available through affiliation with the Manitoba Institute for Materials, including electron microscopies. Part of the characterization work will be carried out at the Canadian Light Source and the Advanced Photon Source, two synchrotron light sources located in Saskatoon and Chicago.

The University of Manitoba has a graduate student population of more than 3'500, out of which nearly 20% are international students. There is loads to do in and around Winnipeg. And with a generous graduate student stipend and among the lowest living expenses in Canada, you'll be able to make use of all the opportunities.

For more information, please visit:

<http://umanitoba.ca>

<http://www.sci.umanitoba.ca/chemistry>

<http://umcgsa.wordpress.com>

<http://www.tourismwinnipeg.com>

<http://www.travelmanitoba.com>