

Chemical Kinetics Modeling of Antioxidant Reactions in
Lubricating Oils
Carleton University

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Job Title	Chemical Kinetics Modeling of Antioxidant Reactions in Lubricating Oils
Department	Mechanical and Aerospace Engineering https://carleton.ca/mae
Institution	Carleton University Ottawa, Ontario
Date Posted	Mar. 4, 2024
Application Deadline	Open Until Filled
Position Start Date	Available Immediately
Job Categories	Post-Doc
Academic Field(s)	Chemical/Petroleum
Job Website	https://carleton.ca/nanomechanics/
Apply By Email	ronmiller@cunet.carleton.ca

Job Description

We are currently seeking to hire a Post-Doctoral Fellow for a term of up to 2 years, to work on a project to model the degradation of lubricants in bearing and engine lubrication environments. Our industrial partner has an interest in developing an in-line oil monitor capable of detecting the remaining useful life of a lubricating oil. This requires an accurate model of the relationship between oil operating conditions and detectable levels of antioxidant degradation by-products.

While it is known that the consumption of antioxidant additives is a key indicator of lubricant degradation, the quantitative relationship between operating conditions, antioxidant by-product concentrations and reaction rates is not fully understood. In this project, we will develop this understanding through a combination of theoretical calculations and experiments. The end goal is an

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“engineering” model of the relationship between oil operating history and by-product formation, which will be validated with the help of the experimental data.

The PDF will work on the development of the chemical kinetics modelling aspects of the project. Using a combination of the known literature, experimentally determined rate parameters and first-principles models, the PDF will test and refine databases of reaction-rate parameters and develop a model of anti-oxidant consumption for a variety of pressure and temperature conditions.

Interested candidates should have a PhD in Chemical Engineering, Chemistry, Mechanical Engineering, or a related discipline and experience with one or more of (1) chemical kinetics modeling, (2) experimental determination of reaction rate constants in condensed-phase (liquid) systems, (3) characterization methods such as HPLC, Raman Spectroscopy and GC-MS, and (4) computational fluid dynamics.

Please submit a CV and the names of three references to Professor Miller to apply.

EEO/AA Policy

We are strongly committed to equity, diversity, and inclusion in the nomination and appointment process.

Carleton University is committed to fostering diversity within its community as a source of excellence, cultural enrichment, and social strength. We welcome those who would contribute to the further diversification of our university including, but not limited to: women and gender minorities; racialized individuals; Indigenous Peoples; persons with disabilities; and persons of any sexual orientation and/or expression. We invite you to review our revitalized Indigenous strategy, [Kinàmàgawin](https://carleton.ca/indigenousinitiatives/cu-files/kinamagawin/) at <https://carleton.ca/indigenousinitiatives/cu-files/kinamagawin/> and visit our [Department of Equity and Inclusive Communities](http://carleton.ca/equity) at <http://carleton.ca/equity> for information about our commitment to leadership in the areas of equity, diversity, and inclusion.

Accessibility is a university strategic priority and applicants selected for an interview who require accommodations are invited to contact Professor Miller as soon as possible to ensure that appropriate arrangements may be made.

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Contact Information

Please reference Academickeys in your cover letter when
applying for or inquiring about this job announcement.

Contact Ron Miller
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