

Postdoctoral Research Fellow – Memorial University

Department: Process Engineering

Job Type: Full time, contract

Duration: 1 year, possible extension

Salary: \$60,000 per annum

Anticipated Starting Date: July 1, 2024

Department Background

The Department of Process Engineering at Memorial University emphasizes the processing and production of petrochemicals, oil, gas, minerals, food, and any other materials used to obtain valuable products through green and sustainable technologies. Research in the department covers the topics of chemical and biochemical conversion of natural resources into useful intermediate industrial chemicals and ultimately end products; green recovery of valuable metals from low-grade ores; contaminant removal from solid fuels, crude oil and natural gas; modeling, simulation and optimal control of complex reactions, separation and integrated reaction-separation processes.

Research Project Overview

The postdoctoral fellow will be engaged in a research project entitled “Characterization and solvent extraction of rare earth elements” funded by the National Sciences and Engineering Research Council of Canada (NSERC) through an Alliance Mission Grant. The project aims to develop a cost-effective solvent extraction separation technology for four magnetic rare earth elements (REEs) namely, Nd, Pr, Dy and Tb, using an integrated method of density functional theory calculation, spectroscopic characterization and experimental validation. The ultimate objective of the research is to build the guiding framework for the development of industrial-scale REE processing plant.

Position Duties and Responsibilities

This is a full-time postdoctoral fellow position in the St John’s campus of Memorial University. The incumbent of this position will, under the direction of Drs. Yan Zhang and Kelly Hawboldt, be responsible for leading the research activities of the characterization and solvent extraction of REEs, including but not limited to the following core responsibilities:

- Coordinating the research activities carried out by different personnel
- Characterization the contents of REEs from different feedstock using WD-XRF, ICP-OES and ICP-MS
- Extractant and diluent screening for the solvent extraction of the Nd, Pr, Dy and Tb from the leaching solutions
- Density functional theory (DFT) simulation to predict the selectivity of the extractant towards the desired magnetic REEs

- Experimental investigations on the solvent extraction of the desired REEs using the best-performance extractant
- Optimization of the operating parameters for the solvent extraction process

Qualifications

- Graduation from an accredited university with a PhD in inorganic chemistry/chemical engineering/mineral processing engineering
- Prior experience in DFT simulation
- Experience with the use or operation of XRF, ICP-OES and ICP-MS
- Knowledge in multi-stage liquid-liquid extraction and solid-liquid extraction
- Knowledge of experimental design and statistical analysis of experimental results
- Excellent communication skills in English
- Proven ability to work independently within a research lab

How to Apply

Prospective applicants interested in pursuing this fellowship opportunity are invited to email Dr. Yan Zhang at yanz@mun.ca with a cover letter, curriculum vitae (including a list of publications), the names of three referees, and evidence of their degree by May 10, 2024.