

Materials Science & Engineering Graduate Seminar

Wednesday, January 22, 2020, 4:10-5:00 p.m., FASB 295

Parker Okabe

PhD candidate in Nuclear Engineering

Gas-Solid Based Chlorination for Purifying Cerium Metal via Volatilization of Actinides and Transition Metals



Mr. Okabe holds a bachelor's degree in Mechanical Engineering from the University of Utah and is currently a PhD candidate in Nuclear Engineering. He works in Dr. Michael Simpson's pyrometallurgy lab.

Haruka Pinegar

PhD candidate in Metallurgical Engineering

Thermal Reduction Treatment of Waste Lithium-Ion Battery Cathode Material by Hydrogen

Waste streams of end-of-life lithium-ion batteries (LIBs) are expected to increase dramatically due to the foreseen rapid growth of LIB market. Recycling of LIBs as a secondary resource is a solution for reducing resource scarcity risks of essential LIB materials (i.e., lithium and cobalt) and mitigation of environmental impacts from LIB production. Meanwhile, present recycling technologies remain under-developed and still have issues such as high operating cost which hinder improvement in recycling capacity.

As a pretreatment of active cathode material to reduce chemical usage in the subsequent leaching process, thermal reduction treatment by hydrogen was investigated. This approach achieved complete reduction of LiCoO_2 into Li_2O and Co , which were separated by magnetic separation and water leaching. Evaporation of the separated leachate precipitated LiOH , which is a preferable cathode precursor to Li_2CO_3 . These studies indicate that the proposed method could reduce chemical usage in LIB recycling, which would reduce operating cost.

Haruka Pinegar graduated from Nagoya University with a bachelor degree in Materials Science and Engineering in 2007, and the University of Utah with her master's degree in Metallurgical Engineering in 2010. After receiving her M.S. degree, she worked for Rio Tinto as a process engineer for four years. Her areas of expertise include design and execution of laboratory-scale experiments, material characterization, data analysis, and process modeling and simulation. She is a Ph.D. candidate in Materials Science and Engineering and expecting graduation in Summer 2020.

