IR-HEATED TOTAL CONSUMPTION SAMPLE INTRODUCTION SYSTEM FOR THE ANALYSIS OF COMPLEX GEOLOGICAL SAMPLES BY INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY. **William Hachey** and Diane Beauchemin. Queen's University, Department of Chemistry, 90 Bader Lane, Kingston, ON K7L 3N6, Canada. (17wrjh@queensu.ca)

The Canadian mineral sector must rely heavily on analytical chemistry when identifying and quantifying minerals. A popular analytical tool used to analyze geological samples is inductively coupled plasma mass spectrometry (ICPMS). This technique can instantaneously measure multiple elements with, depending on the analyte and matrix, a detection limit as low as one part per quadrillion. However, the system has a low sample transport efficiency, and the noise of the nebulization process affects the detection limit. These limitations can be overcome by using an infrared (IR)-heated sample introduction system to pre-evaporate the sample and reduce the droplet size so more enters the ICP while decreasing the noise accompanied by nebulization.[1] This work centers on optimizing an IR-heated total consumption sample introduction system for the analysis of geological samples with complex matrices. The effect of IR heating on sensitivity, detection limit, robustness, and spectroscopic interferences in ICPMS is examined. Additionally, the effect of different spray chamber designs was observed when utilizing IR heating. This research will benefit the analytical services industry by enhancing mineral analysis results while cutting waste disposal costs.

[1] A. Al Hejami, M. J. Burgener, J. Burgener, D. Beauchemin, *J. Anal. At. Spectrom.* 35 (**2020**) 1450-1454.