A METHOD FOR THE DETERMINATION OF ULTRA-TRACE RARE EARTH METALS IN REFRACTORY MATERIAL USING ETV-ICPOES. Sophia Kienast, Yanyang Wang, Diane Beauchemin. Queen’s University, Department of Chemistry, 90 Bader Lane, Kingston, ON K7L 3N6, Canada. (sophia.kienast@queensu.ca)

Electrothermal vaporization coupled to inductively coupled plasma optical emission spectrometry (ETV-ICPOES) was used for the ultra-trace determination of rare earth metals (Ce, Dy, Er, Eu, Gd, Ho, La, Lu, Nd, Pm, Pr, Sc, Sm, Tb, Tm, Y, Yb) in slag. Slag is a by-product of mining; it contains the contents removed during the smelting process and is typically rich in metal oxides and sulphur. Using the ETV technique eliminates the need for sample preparation and greatly improves the efficiency of the measurements. Using Minitab 19 software, and after optimizing the reaction gas (carbon tetrafluoride), carrier gas, and bypass gas flow rates, as well as the pyrolysis temperature, we were able to reliably determine ultra-trace concentrations of the aforementioned rare earth metals in the slag sample. External calibration curves were generated using TILL 1, 2, 3, and 4 as reference materials.