

Potassium isotopic measurements on $^{40}\text{Ar}/^{39}\text{Ar}$ mineral standards
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Final Report

Purpose of the visit

The purpose of this visit was to begin measurements of potassium isotopes by thermal ionization mass spectrometry (TIMS) at the National Aeronautics and Space Administration (NASA) Johnson Space Center (JSC) in Houston, Texas, USA. The measurements are being made at JSC because Dr. Justin Simon of JSC has considerable experience in measuring potassium, an element that very few isotope geochemists regularly measure.

Description of the work carried out during the visit

During the visit, we experimented with loading techniques of potassium solution onto the filament, ideal temperatures and filament currents for obtaining. We then made potassium measurements by TIMS of standard reference materials (SRM) 985 and 999b to determine their relative isotopic compositions. We made significant progress on this front, and measurements will continue over the coming weeks and months.

Description of the main results obtained

The main results obtained are still tentative, as further analyses are required to reduce precision as much as possible. However, sub-permil results were already attained within this visit, which is quite promising. Further work will assess variable fractionation patterns and determine the most appropriate techniques for attaining maximum precision.

Future collaboration with host institution (*if applicable*)

This collaboration will continue for the remainder of the project. I intend to spend an additional two weeks at JSC in November 2012 to make spike and sample measurements.

Projected publications/articles resulting or to result from your grant

We intend to publish results from this visit and measurements to be completed soon as part of a publication assessing the concentration isotopic composition of potassium SRM 999b. These results will subsequently be incorporated into a publication presenting results of the ^{40}K concentration determinations in $^{40}\text{Ar}/^{39}\text{Ar}$ mineral standards.

Other comments (*if any*)