

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 focused this time on measurements of the ^{40}K isotope, rather than the stable isotope $^{39}\text{K}/^{41}\text{K}$ ratios measured previously. This also included the development of ion exchange column chemistry methods for the separation of potassium. By the end of the visit, we had determined the optimal loading and running conditions for making measurements of ^{40}K , free of any interference from ^{40}Ca . Colleagues at NASA will continue with this work now, and intend to make final measurements within the coming month.

Description of the main results obtained

The main results obtained are still tentative, as we only just determined optimal techniques near the end of my visit. However these results are quite promising, and may lead to a more accurate value for ^{40}K abundance in terrestrial samples.

Future collaboration with host institution (*if applicable*)

This collaboration will continue for the remainder of the project. Colleagues at NASA will now work towards making the final measurements required for the larger project, and future collaborations on K isotopic measurements are likely.

Projected publications/articles resulting or to result from your grant

We intend to publish results from this and previous visits and as part of a publication assessing the concentrations and isotopic compositions of potassium in SRM 999b and SRM 985. 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*)