Argon Release Profiles and a Preliminary Ar/Kr ratio from the Genesis Polished Aluminum Collector. A. P. Meshik[1], O. V. Pravdivtseva[1], C. M. Hohenberg[1], J. C. Mabry[1], J. Allton[2], and D. S. Burnett[3]. [1]Washington University, Physics Deparment, St. Louis, MO 63130, am@physics.wustl.edu; [2]Lockheed Martin c/o NASA/JSC; [3]Geology & Planet. Sciences, Caltech.

Introduction: We previously reported helium and neon release profiles obtained using UV-laser stepped-power extraction from Polished Aluminum Collector (PAC) exposed to the solar wind for the entire duration of Genesis mission [1]. These profiles demonstrated clearly that isotopic composition varies with depth in agreement with implantation of constant velocity ions. The Ar depth profile in Bulk Metallic Glass (BMG) obtained using closed-system stepwise etching [2] demonstrated the same trend – $^{36}Ar/^{38}Ar$ ratio decreases with depth, however the data suggested an $^{36}Ar/^{38}Ar$ bulk ratio of 5.3 ± 0.1 but this was, to some extent, compromised by a rather large blank correction (BMG was manufactured in Ar-rich atmosphere). Here we report the attempt to obtain an Ar depth profile in PAC using stepped UV laser rastering, an extraction method we successfully used for Ne depth profiling.

Experimental: We have developed a technique for measuring Ar, Kr, and Xe simultaneously in the same run without cryogenic separation. This is now feasible due to our multicollector Noblesse mass-spectrometer with an electrostatic zoom lens to vary isotope spacing to that of the collectors. The measurements were performed at four steps of the magnetic field with an active zoom so that the isotopes of each gas were focused on all 8 channel-multipliers and the Faraday cup (for ^{40}Ar). Although the PAC was not manufactured in inert atmosphere, it was highly polished by a complex organic compound which led to contamination along with Xe and Kr surface trapping. All of our attempts to make bulk (single raster) measurements failed because of this surface contamination. Therefore we used the stepped UV extraction, developed for He and Ne, to separate surface-correlated contaminants from deeper implanted solar gases, using 8 power steps (from 0.3 to 1.5 mJ) to get rid of the surface contamination and trapped gases, but less than 2% of the solar Ar. 22 subsequent steps (from 1.7 to 8 mJ) degassed all of the implanted solar wind gases.

The ^{40}Ar blank in our system was low for these runs ($< 3 \times 10^{-10}$ ccSTP), resulting in the lowest observed $^{40}Ar/^{36}Ar$ ratios ~1 from solar wind collectors, demonstraing that neither contamination by Utah mud nor system blanks can have appreciable effect on the Ar results we obtained.

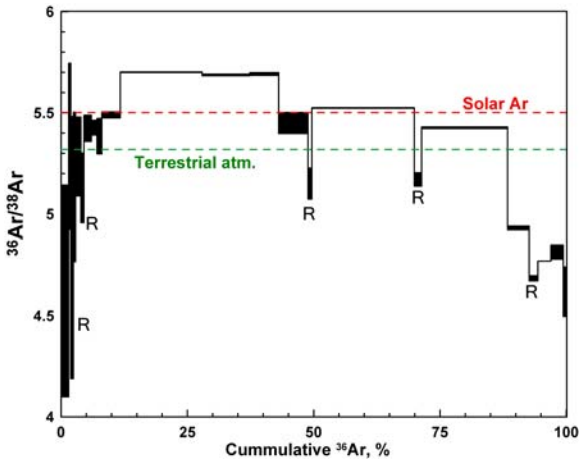

Figure 1. Depth dependant $^{36}Ar/^{38}Ar$ ratio. Weighted average is close to the more precise value of 5.501 we obtained from the AloS collectors [3], and distinct from that of the terrestrial atmosphere. When we used repeat rasters at the same power, the lower amounts of Ar obtained made the terrestrial correction more important. These data, corrected for terrestrial Ar, have lower $^{36}Ar/^{38}Ar$ ratios, suggesting slight over-correction for terrestrial. Although not affecting the results since the quantities are low, it points toward further refinement of atmospheric correction procedures.

Our current effort is to refine these preliminary techniques for better control, and increase the rastered areas so dependable Kr and Xe data can be obtained. This will allow us to obtain good elemental ratios for all the solar wind noble gases, and expand the measured isotopic ratios to include the heavy noble gases.

References: [1] Meshik A. P. et al. (2006) *69th Meteoritical Society Meeting*, Abstract #5083 [2] Grimberg A. et al *LPSC XXXVII*, Abstract #1270 [3] Meshik A. et al. (2007) *Science*, **318,** 433.

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