BORON AND LITHIUM CONTENTS AND ISOTOPIC COMPOSITIONS OF THE LUNAR VOLCANIC GLASSES. B. Parks[1] A.E. Saal[1] M. Chaussidon[2], A. Gurenko[3] & M. Rutherford[1], [1]DEEPS, Brown University, 324 Brook St., Box 1846, Providence, RI, 02912. [2]IPGP, Univ Paris Diderot, UMR 7154 CNRS, F-75005 Paris, France [3]CRPG-CNRS, BP20, 54501 Vandoeuvre les Nancy, Cedex, France

Boron and Lithium are moderately volatile lithophile elements and their abundance, isotopic composition and spatial distribution provide important constraints on models for the thermal and chemical evolution of the Moon's interior. Most of the geochemical inferences about the deepest section of the Moon have been based on studies of the most primitive melts recovered by the Apollo mission, the lunar volcanic glasses. Here, we report new in-situ measurements of Boron and Lithium (B, Li) abundances and isotopic compositions on individual beads of the lunar volcanic glasses from the Apollo 15 and 17 landing sites.

We investigated three main compositional groups of glasses: very low-Ti and low-Ti glasses (sample 15426/27), and high-Ti glasses (sample 74220). Also, we recognized the five compositional subgroups (A, B, C, D and E) of Delano's very-low-Ti glasses **[1]**. The major, trace and highly volatile (H, C, F, S, Cl) elements contents of the lunar volcanic glasses have been previously reported **[2-5]**. The abundances of B and Li and $^{11}B/^{10}B$ and $^{7}Li/^{6}Li$ ratios were measured by SIMS with the Cameca IMS 1280 at CRPG-CNRS, France, employing methods previously developed for chondrules, CAIs, glasses and minerals **[6]**. We performed spot analyses and depth profiles to unravel not only the primitive B, Li isotopic composition of the Moon's interior, but also the processes that affected the B, Li isotopes and contents during and after eruption.

The new data indicate that the cores of lunar volcanic glass bead have $\delta^{11}B$ -6 ± 2‰, similar to the average MORB (-7 ± 1‰ **[7]**) and a surface component with a $\delta^{11}B$ as low as -14‰. The $\delta^{7}Li$ of the glass cores ranges from values similar to those in MORB (+3.5 ± 1‰ **[7]**) to values as heavier as + 10‰, with a surface component with $\delta^{7}Li$ as low as -20‰ and Li concentrations 3 to 8 times higher than the glass interior. In general, Li and B concentrations seem to correlate with F and S contents among the major compositional groups, consistent with their moderately volatile behavior. The best correlation with highly volatile element is exemplified by the low-Ti glasses where H, C, Cl, F, S concentrations positively correlate Li and B contents and inversely correlate with $\delta^{7}Li$. The Li and B concentrations and isotopic variations in the bead cores and surface component of the lunar volcanic glasses, suggest that the Moon's interior has isotopic compositions similar to those of the Earth's upper mantle and that Li and B were partially mobilized as volatile elements, forming part of the gas phase during the processes that generated the lunar glasses.

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