Supplement to Reviews in Mineralogy & Geochemistry Vol. 82
--- Non-Traditional Stable Isotopes --

Chapter 5. Lithium Isotope Geochemistry
Pages 165-218
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Appendix on Li flux contamination

Even a small amount of lithium metaborate flux (for example that used in the preparation of glass disks for XRF analysis) can make its way into sample powders and have large effects on the Li isotope measurements. Most commercially available Li is enriched in ^{7}Li due to extraction of ^{6}Li which, because of its large neutron capture cross section, was used as the trigger in hydrogen bombs. The remaining ^{6}Li-depleted Li is sold commercially. Thus, most examples of sample contamination due to inadvertent addition of Li flux increase the δ^{7}Li of the sample. We relate here an example from our Maryland lab (data are as yet unpublished). A powder of gabbro from the Finger Bay Pluton, Aleutian Islands, came from a laboratory where Li metaborate fluxes were in use. The measured Li concentration and isotopic composition of this powder were 10.7 ppm and +28‰, respectively. Rocks with such a high δ^{7}Li are rare. Consequently, fresh powder from the original rock was prepared at the University of Maryland where Li metaborate fluxes are not used. The Li concentration and δ^{7}Li of the newly prepared powder were 9.6 ppm and +0.7‰. This example demonstrates that addition of a very small amount of Li flux, which increased the Li concentration by 1 ppm or ~10% (since the uncertainty of measurement for Li concentration is 10%, the increase is within the uncertainty of measurement), can significantly alter the Li isotopic composition of a sample.