



Lithium isotopic variation in volcanic rocks from the northern Icelandic rift zone

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Li isotopes are powerful tracers of different mantle sources, including recycled crustal material. Samples from Theistareykir and Krafla (northern Icelandic rift zone) have been analysed to test the variability of sources in Icelandic volcanic rocks. The studied samples cover a range from primitive olivine-tholeiites to highly evolved rhyolites.

Volcanic rocks from Theistareykir and Krafla are known to have variable Sr, Nd, Hf and Pb isotopic compositions and delta ^{18}O values, and we have previously shown that they also have a large range of delta ^7Li values (-0.8 to 6.3‰). The samples are fresh, so the previously analysed isotopic ratios and the new delta ^7Li data are assumed to represent magmatic values. The range of delta ^7Li observed in the basalts from the Theistareykir and Krafla regions should therefore reflect the variations in the composition of Icelandic mantle.

Since Li is unlikely to fractionate in high-temperature processes, the observed variability in delta ^7Li most likely represents an earlier incorporation of crustal material into the mantle, but the variations may also reflect different sources of parental magma.

It is expected that hydrothermal alteration will have a significant effect on the Li isotopic composition of volcanic rocks. The effects of alteration and its implications for the interpretation of Li isotopic data in volcanic rocks from the Krafla and Theistareykir regions will be further explored in this project using samples of different facies collected from two boreholes (Krafla and Reykjanes Peninsula). The data will be presented along with new Pb isotopic data from the studied volcanic rocks.