

$^{40}\text{Ar}/^{39}\text{Ar}$ dating of pegmatite segregations in late Quaternary Icelandic basalts

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Obtaining accurate and precise ages for late Quaternary basaltic eruptions by the $^{40}\text{Ar}/^{39}\text{Ar}$ method is analytically challenging because of the difficulty posed by the measurement of very small amounts of $^{40}\text{Ar}^*$. This is particularly true of Icelandic basalts, which are generally highly depleted in K along with other incompatible elements. An improved chronology for the Icelandic lava succession, however, would provide important information on secular variations in mantle melting at a mid-ocean ridge-centered hotspot, rift relocations, and the timing of reversals of the magnetic field with implications for the calibration of the Geological Time Scale.

Here we explore the possibility of $^{40}\text{Ar}/^{39}\text{Ar}$ dating of incompatible-element enriched pegmatite segregations that are commonly developed in low viscosity Icelandic pahoehoe lava flows. Inflated frontal lobes to these flows attain thicknesses of up to 15 m and it is here where both vertical and horizontal pegmatite segregations may form by processes described in Sigmarsson *et al.* [1]. We are in the process of characterizing the mineralogy of the pegmatite segregations found in a number of Icelandic Holocene basaltic shield lava flows on the Reykjanes Peninsula, using both a benchtop micro-XRF and a SEM. Initial work has revealed the presence of small alkali feldspar crystals (< 100 microns) in the pegmatite segregations, which may possibly be amenable to $^{40}\text{Ar}/^{39}\text{Ar}$ dating. We will present preliminary $^{40}\text{Ar}/^{39}\text{Ar}$ results on one of the segregations and evaluate the potential usefulness of our approach in contributing to an improved chronology for Icelandic basaltic volcanism.

[1] O. Sigmarsson *et al.* (2009) *IAVCEI* **2**, 85-104.