



## **A furnace extraction system for $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology of young basalts**

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Although laser extraction systems are commonly used in  $^{40}\text{Ar}/^{39}\text{Ar}$  geochronology for dating small amounts of sample, classical resistance furnace systems still have some important advantages: e.g. furnace systems have superior temperature homogeneity throughout the sample and furnace systems can be designed for larger amounts of sample, when compared to laser heating systems. Here we describe a new furnace extraction system linked to a HIDEN triple filter quadrupole mass spectrometer that is capable of measuring the  $^{40}\text{Ar}/^{39}\text{Ar}$  age of samples in an age range to well below 100 ka. The resistance furnace is a high capacity design fitted with a 30 mm diameter Mo sample tube and liner. Up to 23 samples can be loaded in an all-metal revolving sample holder that is separated from the furnace by an in-line valve. Sample purification is achieved with a metal cold trap as a first step and up to three stages of gettering in a dedicated purification section. Furthermore two getter tubes are fitted on the mass spectrometer housing. The mass spectrometer is a 9 mm filter rod triple filter instrument fitted with an open electron bombardment source and a dual Faraday - Channeltron pulse counting electron multiplier collector. Peak separation between  $m/e:40$  and  $m/e:39$  is excellent, and peak tops have a stable reproducible shape, allowing up to 7 readings to be taken at 0.05 mass unit intervals. An initial project on samples from Etna volcano in Sicily demonstrates that results are of comparable quality as samples measured with a more conventional  $\text{CO}_2$  laser - sector noble gas mass spectrometer system.