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### **published in**

Goldschmidt 2021  
2021

### **DOI (link to publisher)**

[10.7185/gold2021.7215](https://doi.org/10.7185/gold2021.7215)

### **document version**

Publisher's PDF, also known as Version of record

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### **citation for published version (APA)**

Luciani, N., Nikogosyan, I., de Hoog, J. C. M., Davies, G. R., & Koornneef, J. (2021). Boron Isotopes in Italian melt inclusions. In *Goldschmidt 2021: [Abstracts]* <https://doi.org/10.7185/gold2021.7215>

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## Boron Isotopes in Italian melt inclusions

NATASCIA LUCIANI<sup>1</sup>, IGOR K. NIKOGOSIAN<sup>1</sup>, JAN DE HOOG<sup>2</sup>, GARETH R DAVIES<sup>1</sup> AND JANNE M. KOORNNEEF<sup>1</sup>

<sup>1</sup>Vrije Universiteit

<sup>2</sup>The University of Edinburgh

Presenting Author: [n.luciani@vu.nl](mailto:n.luciani@vu.nl)

The composition of  $\delta^{11}\text{B}$  can be used to study the cycling of volatile elements within Earth's interior. Due to its incompatibility and high mobility in aqueous fluids boron provides a powerful tool to better understand fluid-related crustal recycling processes in subduction zones. Across-arc profiles in arc lavas show that the concentration of B decreases with increasing slab depth and decreasing amount of slab-derived fluids. The two stable isotopes  $^{10}\text{B}$  and  $^{11}\text{B}$  fractionate in the fluids, leading the heavier  $^{11}\text{B}$  to concentrate in the fluid itself [1].

Melt inclusions (MIs) in high-forsterite olivine potentially preserve primary mantle-derived elemental concentrations and isotopic signatures and can record the B isotopic composition of the surrounding melt at the time of trapping. The complex Italian post-collisional subduction setting represents an excellent natural laboratory to study subduction recycling. The magmatic products vary from potassic and ultrapotassic along the Tyrrhenian side in the north to calc-alkaline and Na-alkaline in the south. This diversity reflects the changing geodynamic setting and related major crustal recycling creating a heterogeneous mantle source along the subduction zone. Olivine-hosted MIs from across Italy reveal that primary melts tap this heterogeneous mantle including subducted oceanic and continental components that were introduced during the Alpine, and/or Adriatic and Ionian subduction phases [2-4].

We present boron isotope compositions in 100 selected melt inclusions from a wide range of Italian lavas. The MIs are characterised for major and trace elements and include primary melts representing the different end-members for each of the magmatic Italian provinces as well as within single magmatic series. We will focus on the relation between major- and trace elements and boron isotope compositions to reveal the diversity of subduction-derived metasomatic agents in the Italian mantle that are the sources of the variable K-rich and Na-Ca alkaline melts.

[1] De Hoog & Savov (2018). *Boron Isotopes*, 217-247.

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[3] Nikogosian et al. (2016). *EPSL*, 449, 12-19.

[4] Koornneef et al. (2019). *Nature communications*, 10(1), 1-10.