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ABSTRACT BOOK

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Tracing sediment recycling into the mantle: application of Molybdenum isotopes to ultrapotassic Italian rocks

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In the last decades the study of non-traditional stable isotopes has provided new means to decipher the contribution of recycled materials in subduction zones and the nature of their transport (i.e., fluids vs. melts).

Molybdenum stable isotopes, thanks to their redox-sensitive behaviour, have been shown to fractionate in superficial environments entailing the formation of reservoirs with very different isotopic compositions. Although the geochemical behaviour of Mo is still not completely understood, it has been suggested that Mo is substantially incompatible during mantle melting although a number of accessory phases (i.e., rutile and sulphides), do retain Mo and can play a role in governing its fate.

It is well accepted that the geochemical and isotopic budget of the subduction-related magmas is strongly dependent on both the nature and composition of the recycled material and the residual mineralogy of the melting process. The coupling between the budget of Mo and traditional trace elements in subduction-related magmas can thus provide useful information on the occurrence of specific residual phases reflecting the composition of the recycled material.

The Italian potassic and ultrapotassic igneous rocks of the Tuscan magmatic province and Mount Vesuvius (Roman magmatic province) show extremely variable and well distinct geochemical and radiogenic isotopic signatures, which are referred to the involvement of different sediment-dominated subduction components in their mantle source. These rocks, thus, represent a unique opportunity to test Mo isotopes as a new tool to tackle the role of different subduction-related components during mantle metasomatism.

In this study we present $\delta^{98/95}$Mo and Mo content on these magmatic rocks along with a selection of sedimentary composites as *proxy* of the recycled material. The isotopic signature of these rocks reveals the occurrence of a sort of Italian baseline, with $\delta^{98/95}$Mo heavier than other subducted-related magmas measured so far. The absolute Mo content, although significantly different between the two magmatic provinces, is depleted compared to other incompatible trace elements.

The data are discussed aiming to evaluate if the observed differences are due to i) original difference in the down-going sediments, ii) fractionation during sediment subduction and melting in response to different phase stabilisation, and iii) elemental or isotope fractionation *en route* to the surface.