

***Nitrogen contents and nitrogen isotope
fractionation in subduction zones***

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Subduction zones are sites of material transfer between Earth's external (i.e. crust, atmosphere, oceans) and internal (i.e. mantle) reservoirs and therefore exert a fundamental control on the distribution of elements within the Earth. Nitrogen has unique features among volatile elements due to its distinct isotopic composition, which makes it a useful tracer of material exchange between Earth's reservoirs. Nevertheless, its abundance of interior Earth is still not well constrained. Estimations indicated that the proportion of nitrogen recycled to the surface at arcs is only about 20% of the amount entering subduction zones. The remaining nitrogen is thought to be further subducted into the mantle.

The aim of this study is to investigate the partition coefficient of nitrogen, and its isotopic fractionation, between potential N-bearing minerals present within a subduction zone and the melts or fluids that may be formed upon the release of volatiles. The influence of the oxygen fugacity on the behaviour of nitrogen is also being investigated via melting/dehydration experiments.

Preliminary results from this study provided a benchmark for the maximum amount of N expected to be carried along the subduction zone to the Earth's interior.