

## High temperature stable nickel isotope fractionation in planetary materials

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Investigation of terrestrial stable nickel (Ni) isotope fractionation is a relatively new field of study and has been used to investigate biological [1]; oceanic [2]; and other low temperature and surface processes and materials [3]–[5].

Studies of high temperature systems have provided early indications of Ni isotopic fractionation in the mantle [6] and this study explores this in more detail.

We use the double spike technique to analyse Ni isotopic compositions in geological samples with MC-ICP-MS after [7]. Samples are purified using a three-column ion exchange chemistry developed from [7].

We present Ni isotopic compositions for a range of high temperature terrestrial lithologies from USA (Kilbourne Hole, New Mexico), Cameroon, Tanzania, and selected other geological settings. We find evidence for Ni isotopic fractionation associated with small degree mantle melting in Cameroon Line nephelinites from the volcano Etinde; and with metasomatism in some spinel lherzolites and harzburgites from Kilbourne Hole.

[1] Cameron *et al.* (2009) *Proc. Natl. Acad. Sci. U. S. A.* **106**, 27, 10944–10948. [2] Cameron & Vance (2014) *Geochim. Cosmochim. Acta* **128**, 195–211. [3] Porter *et al.* (2014) *Chem. Geol.* **387**, 12–21. [4] Ratié *et al.* (2015) *Chem. Geol.* **402**, 68–76. [5] Estrade *et al.* (2015) *EPSL* **423**, 24–35. [6] Gall *et al.* (2017) *Geochim. Cosmochim. Acta* **199**, 196–209. [7] Gall *et al.* (2012) *J. Anal. At. Spectrom.* **27**, 1, 137–145.