Goldschmidt 2022 Abstract
https://doi.org/10.46427/gold2022.11423

Mineral-whole rock isotope fidelity? A comparative study of Hf-Nd-O from high Ba-Sr granites.

EMILIE BRUAND[1], CRAIG STOREY[2], MIKE FOWLER[2], BRUNO DHUIME[3] AND RÉGIS DOUCELANCE[4]

[1]Laboratoire Magmas et Volcans
[2]University of Portsmouth
[3]CNRS-UMR5243, Géosciences Montpellier, Université de Montpellier
[4]Laboratoire Magmas et Volcans, Université Clermont-Auvergne
Presenting Author: emilie.bruand@uca.fr

Crustal evolution is currently governed by plate tectonics and it has been shown that between the Archean and the Phanerozoic major changes in subduction styles occured. Among others, the chemistry of different plutonic rocks through time and the understanding of their petrogeneses have helped to define different stages in the evolution of plate tectonics. An important change around 2.7 Ga led to the formation of magmas within a metasomatized mantle: the sanukitoids. This diachronous event is interpreted as the result of the evolution from a shallow to a steep subduction style. Similar rocks are generated in the modern Earth, for example the Caledonian (Palaeozoic) high Ba-Sr plutons in northern Scotland [1].

In this contribution, we aim to study this Caledonian sanukitoid-like suite and test the reliability of several isotopic systems within the abundant accessory minerals. Whole rock chemistry (including radiogenic and stable isotopes) is well constrained. We now present a multi-isotope study of three accessory minerals (titanite, zircon and apatite). New Sm-Nd in-situ isotopes in titanite and apatite and Hf in zircon results are discussed in the light of oxygen isotopes previously published on the same samples for all phases [2]. These data are then compared to previous WR data obtained on the same samples[3], [4].

[1] M. Fowler & H. Rollinson (2012) *Geology* 40, 1079–1082.

[2] E. Bruand et al. (2019) *Geochim. Cosmochim. Acta* 255, 144–162.

[3] M. Fowler et al. (2001) *J. Geol. Soc. London.*, 158, 521–534.

[4] M. Fowler et al. (2008) *Lithos* 105, 129–148.