

F, Cl, S concentrations and Pb isotopes in melt inclusions from São Miguel, Azores

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São Miguel is the largest easternmost island of the Azores archipelago in the northern Atlantic and possibly one of the oldest surface manifestation of the Azores hotspot (up to 4 Ma^{1, 2}). Pb isotope measurements by SIMS (Cameca IMS 1280) in olivine-hosted melt inclusions from São Miguel confirm the high ²⁰⁷Pb/²⁰⁴Pb and high ²⁰⁸Pb/²⁰⁴Pb for a given ²⁰⁶Pb/²⁰⁴Pb of their host lavas. The Pb isotope variations in the melt inclusions show a mixture between only two endmembers, a central group-like mantle component, similar to that beneath Graciosa and Faial and a radiogenic endmember and, the Nordeste component. F, S and Cl concentrations measured in the same São Miguel melt inclusions represent parental abundance unmodified by crustal assimilation, and they allow us to refine the volatile element composition of both components. The melt inclusions have F, S and Cl concentrations ranging from 637±98 to 1399±10, 311±34 to 2115±56 and 335±7 to 966±43ppm, respectively.

Compared to F/Nd ratios measured in global OIBs, São Miguel melt inclusions have relatively high F/Nd (18 to 27) that are comparable, although more variable, to that of EMII melt inclusions (Samoa) and lower than F/Nd of HIMU melt inclusions (Mangaia; 20 to 41). São Miguel melt inclusions have an intermediate F/Nd = 23.1±3.4 identical within error to the canonical mantle value of 21±5. We find a global negative correlation between F/Nd and ²⁰⁷Pb/²⁰⁶Pb of melt inclusions from melt inclusions in global OIB.

Pb-isotope compositions correlate positively with S concentrations which is tentatively interpreted as due to small sulfide blebs ponding at the bottom of the crust that could have been entrained by the magma.

[1] Abdel-Monem et al., 1975, *Lithos*, 8, 247-254.

[2] Moore, 1990, *Bull. Volc.*, 52, 602-614.