



## Melt inclusion study of the most recent basanites from El Hierro and Lanzarote, Canary Islands

Alejandra Gomez-Ulla (1,3), Olgeir Sigmarsson (1,2), Maria Jose Huertas (3), and Eumenio Ancochea (3)

(1) Laboratoire Magmas et Volcans, Blaise Pascal University, Clermont-Ferrand, France

(a.gomez-ulla@opgc.univ-bpclermont.fr, O.Sigmarsson@opgc.univ-bpclermont.fr), (3) University Complutense of Madrid, Geochemistry and Petrology, Madrid, Spain (algome01@ucm.es, huertas@geo.ucm.es, eancochea@geo.ucm.es), (2) University of Iceland, Reykjavik, Iceland (olgeir@hi.is)

The latest eruptions of both Lanzarote (one of the oldest and easternmost of the Canary Island archipelago) and El Hierro (the youngest and westernmost) produced basanite lavas. Major, volatile and trace element concentrations of melt inclusion (MI) hosted in olivine for both eruptions have been analysed. The basanites display primitive mantle normalized trace element spectra suggesting a magma source largely composed of recycled oceanic crust. In addition, beneath Lanzarote an interaction with a carbonatitic fluid phase or metasome would explain eccentric Ba/U and other trace element ratios. Contribution of carbonatitic component would readily account for extremely volatile-rich (Cl, F, S) MI from Lanzarote (Cl=1577-2500 ppm) whereas the maximum for El Hierro is 1080 ppm. The submarine character of the 2011-12 eruption off El Hierro appears to have affected the degassing behavior, whereas estimated sulfur emission to the atmosphere during the historical Lanzarote eruptions are amongst the highest observed so far. An estimated magma volume ( $V_{DRE}$ ) of 0.02 km<sup>3</sup> yields atmospheric mass loading of 0.2 Mt SO<sub>2</sub> from the 1824 Lanzarote eruption. Scaling the volume of the 1824 Lanzarote eruption to that of the previous Timanfaya eruption (1730-6; 5 km<sup>3</sup>) results in estimated 12 Mt SO<sub>2</sub>, an atmospheric mass loading only outnumbered by the historical Laki and Eldgjá eruptions in Iceland. The significantly greater volatile budget of basanites from Lanzarote compared to El Hierro is thus controlled by more fertile source composition closer to the African continent.