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ABSTRACT BOOK

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CURATORI DEL VOLUME

Fabio Massimo Petti, Bernardo Carmina, Rosolino Cirrincione, Carmelo Monaco.

The Geochemistry of the melilite-bearing lavas of the Nyiragongo volcanic complex (D.R. Congo)

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The extremely active Mount Nyiragongo, located in the Virunga Volcanic Province on the edge of the Tanzanian craton, is formed by highly silica undersaturated, feldspar-free, melilite-bearing rocks (olivine melilitites and melilite-leucite nephelinites); nepheline is more abundant than leucite. The Nyiragongo primitive rocks are characterized by high contents of MgO (>8 wt.%), CaO (>12 wt.%) and Sr (>2000 ppm) and low Zr/Nb (2.1). The REE patterns show high La/Yb_n (42), no negative anomalies in Eu, and the mantle normalized diagrams display troughs at K and Pb. The $^{87}Sr/^{86}Sr$ (0.70447 - 0.70469), $^{143}Nd/^{144}Nd$ (0.51272), $^{206}Pb/^{204}Pb$ (19.413 - 19.751), $^{207}Pb^{204}Pb$ (15.663 - 15.749) $^{208}Pb/^{204}Pb$ (39.629 - 39.814) isotope compositions has also been determined. A volatile (H_2O, CO_2, S, Cl and F) and incompatible element-rich lithosperic source is proposed also from the evaluation of the isotopic compositions of the lavas, far removed from that of astenosferic or plume mantle, and expected in metasomatized cratonic/pericratonic areas throughout the African plate. Melting was favoured by the rifted tectonic regime and by the decreasing of melting temperature caused by fluid-rich sources. Melilitites and nephelinites are silicate melts generated by CO_2-rich sources, and occur preferentially at the propagation tip and on the flanks of the rifts which impinge on a craton that appears to be at an ntermediate stage of destabilization (e.g., Chakrabarti et al., 2009; Foley et al., 2012; Foley and Fischer, 2017).

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