Nature of enriched mantle components beneath the Oku Volcanic Group (OVG) along the Cameroon Volcanic Line (CVL), west Africa

A.N.E. ASAAH[1]* , T. YOKOYAMA[1], F.T. AKA[2], T. USUI[1], T. KURITANI[3], M.J. WIRMVEM[4] AND T. OHBA[4]

[1]Tokyo Institute of Tecchnology, Tokyo, 152-8551, Japan (*correspondence: asaahel@yahoo.com)
[2]IRGM, P.O. Box 4110, Yaounde, Cameroon
[3]Osaka City University, Osaka 558-8585
[4]Tokai University, Hiratsuka, 259-1211, Japan

On the basis of radiogenic isotope systematics of ocean island basalts, (OIBs), distinct mantle reservoirs such as depleted mantle (DM), high-μ (HIMU), focus zone (FOZO) and enriched mantle (EM) have been identified during the last decades[1,2]. This approach is now commonly applied to continental intra-plate volcanic settings. The nature of the mantle involved in the petrogenesis of CVL lavas is still poorly constrained. In this study, we use combined trace elements and Sr-Nd-Pb isotope evidence to characterize the mantle involved in the generation of OVG lavas.

Twenty six rock samples collected from OVG were analyzed for major elements (XRF), trace elements (ICP-MS) and Sr-Nd-Pb isotopes (TIMS). The samples are basanite, basalts and trachybasalts with Mg# ranging from 43–62. Primitive mantle normalized multi-element diagrams for these samples show relative enrichment of LILE, LREE and depletion in HREE, akin to OIBs. Trace element ratios such as Th/Pb, Ba/Nb, K/La, Ce/Pb, do not show significant contribution of the continental crust. Sr-Nd-Pb isotopes show the following ranges: $^{87}Sr/^{86}S$ = 0.70318-0.70357; $^{143}Nd/^{144}Nd$ = 0.512821-0.52907; $^{206,207,208}Pb/^{204}Pb$ = 19.33-19.99, 15.60-15.76672, & 39.02-39.85 respectively. Sr-Nd-Pb isotope systematics indicate the involvement of 3 mantle end members (DM-FOZO-EMI) in the petrogenesis of OVG lavas. The source of EM1 is likely a metasomatized subcontinental lithospheric mantle (SCLM).

[1] Stracke *et al* (2005). *G*^{3},6, Q05007, [2] Willbold and Stracke (2010) *Chem. Geol*, **276**,188-197