

EVIDENCE OF TWO MAGMATIC LIQUIDS IN THE PETROGENESIS OF THE GUENFALABO RING-COMPLEX (GRC), CAMEROON VOLCANIC LINE (CVL), CAMEROON

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RESUMO: The GRC, a rare example of a complete series is amongst the over 60 massifs along the CVL, a sinistral mega-shear zone of tension gashes, N300E trending, in the African plate. The anorogenic massifs have been emplaced along the CVL from the Cretaceous to recent times. Two rock suites have been determined in the GRC:- microgabbro-diorite-syenite-granite suite with associated ankaramites and basalts.- peralkaline syenites and granites with associated peralkaline kaersutite-bearing trachytes and pantellerites. The ankaramites are olivine-phyric (25%), Fo85-88, have 50-52% clinopyroxene (salite), 5% plagioclase (An55-36) and 7% Fe-Ti oxides. The kaersutite xenocrysts in the trachytes have mantle-derived signatures: TiO₂>4%, MgO8%, high Mg# =0.70, higher than that of the host trachyte, the Ti content is 0.63 c.p.f.u. and Al=2, characteristic of kaersutites of HP and HT origin: 13-23 kbar, 1100-1220o C. Trace element modeling shows that the GRC rocks were generated from a basaltic magma from about 3% PM of garnet lherzolite (5-8% Grt) at a melt segregation depth of about 100km. A first magmatic pulse through differentiation by FC gave the ankaramites and alkali basalts and the microgabbro-diorite-syenite-granite suite. The ankaramites and basalts have: Zr=225-253, Nb=98-111, Y=33-56, typical of HIMU-OIB and plume-related magmas. (La/Yb)_N=9-20 indicate REE fractionation. Elemental ratios as La/Nb=0.49-0.81, Nb/Y=1.00-2.04 suggest a minor intervention of crustal contamination. The (La/Sm)_N=2-3.5 and LREE enrichment corroborate the contribution of a subcontinental lithospheric mantle (SCLM). Subsequently, a probable modal metasomatic event accompanied by infiltration of volatiles might have occurred in the magmatic chamber, provoking the precipitation of kaersutite. This is evidenced by the presence of kaersutite xenocrysts in the peralkaline trachytes, Mg# =0.70 of the kaersutite, far higher than for the host trachyte (0.14), late-stage distinct enrichment in Rb, K, Zr, Nb, LREE, a sharp increase in the PI (peralkaline index) accompanying Zr enrichment, hydrous veinlets of calcite in the ankaramite outcrop, (Ce/Yb)_N= 7-15, Fe-Ti enrichment signaturred by the presence of ferropseudobrookite-ilmenite-ulvospinel in the syenites and ilmenite in the pantellerite. The calcite veinlets in the ankaramites signature a minor CO₂ involvement. Another pulse ejected the kaersutite-bearing magma from the chamber and during its ascent experienced crustal contamination producing a kaersutite-bearing peralkaline magma, trachytic, which gave the trachytes and pantellerites on one hand and the syenites and granites on the other hand. The kaersutite xenocrysts in the trachytes were certainly entrained from the metasomatized basaltic magma. The Rb/Ba > 1 in the trachytes (2.44, 26.7), pantellerite (6.33), granites (0.63-1.8) portray a role of AFC. Trace element constraints do not show a FC link from the basaltic rocks to the trachytes and pantellerites. REE spectras and TE spidergrams are concordant for each rock suite.

PALAVRAS-CHAVE: CAMEROON VOLCANIC LINE; GUEFALABO RING-COMPLEX; TWO MAGMATIC LIQUIDS.