Geochemical characterisation of the Pan-African granitoïds of the Badiangseu area in Central Cameroon

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The magmatic complex of the Badiangseu area is part of the central Domain of the North Equatorial fold belt, which crops out within the Central Cameroon Shear zone (CCSZ).

This complex comprises four groups of plutonic rocks: (i) monzodiorites and quartz monzodiorites, (ii) tonalites to granodiorites, (iii) quartz-monzonites and (iv) granites.

The rocks are peraluminous (granites) to metaluminous, high-K, and calc-alkaline to shoshonitic, with mineralogical and geochemical characteristics of I-type granitoids. Granites and granodiorites present high ferrous affinity contrary to monzodiorite and quartz monzodiorite which are medium magnesium. The plutonic rocks are characterised by high Sr, moderate ∑REE concentrations and low Ni and Cr contents. They also display chondrite–normalised REE patterns characterised by variable high LREE enrichment, a moderate to minor HREE, with moderate negative Eu anomalies (Eu_N/Eu^*_N:0.66-0.93) for quartz-monzonites and monzo-diorites; and significant negative Eu anomalies for granites (Eu_N/Eu^*_N:0.30-0.70). Trace element distribution patterns show that all these rocks are distinctively depleted in Th, Nb, Ba, Ti and Ta relative to other trace elements and are enriched in LILE compared to HFSE. Each plutonic group shows a distinct evolutionary trends and do not seem to be related. This agrees with field and microstructural observations, which suggest different emplacement ages with respect to deformation.

The plutonic rocks of Badiangseu area resemble other Neoproterozoic high-K calc-alkaline syntectonic plutons in western Cameroon. They also display strong similarities with high-K calc-alkaline plutons of the Pernambuco shear zone in NE Brazil.

Hybrid-type metal biogeochemistry in the South Atlantic: A full-depth zonal ocean section of total dissolved and labile Cobalt, and comparison to iron and manganese vertical structure

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This study presents the first high-resolution full-depth zonal section of total dissolved and labile cobalt from a cruise transecting the South Atlantic Ocean along approximately 11˚S. The micronutritive role of cobalt may affect community structure in different regions of the oceans with changes in chemical speciation distribution, a compelling reason to include cobalt in the trace element analyses planned for the GEOTRACES Program. This section reveals an advective source of total dissolved and labile cobalt from the African coast near Namibia that is likely due to the Benguela Current interacting with reducing shelf sediments. High concentrations of cobalt were also observed within the oxygen minimum zone that extends across much of the South Atlantic basin, which suggests that redox cycling of cobalt is occuring in the water column. Nutrient-like vertical structure for cobalt and iron was observed in the surface waters across the majority of the basin due to biological utilization, and the expected hybrid-type trend is observed at depth, with scavenging below the nutricline for cobalt, and iron. Iron and cobalt profiles reveal a subsurface maxima between 50 and 100m, likely due to remineralization. Manganese shows typical maxima in the surface waters, scavenging with depth, and a small secondary maxima around 600m. The differences among total dissolved cobalt, iron, and manganese vertical profiles imply distinctions among their biogeochemical behaviors.