Goldschmidt 2023 Abstract
https://doi.org/10.7185/gold2023.15213

Oceanic-plateau ultramafic lavas and arc-related intrusives in two contrasting ultramafic complexes from the Paleoproterozoic Guiana Shield

RENOESHA NAIPAL[1,2], SALOMON B. KROONENBERG[2,3], LEO M. KRIEGSMAN[1,4] AND PAUL R. D. MASON[1]

[1]Utrecht University
[2]Anton de Kom University of Suriname
[3]Delft University of Technology
[4]Naturalis Biodiversity Center

Presenting Author: r.naipal@uu.nl

Greenstone belts are important archives of crustal growth through the Archean and into the Paleoproterozoic. The Rhyacian greenstone belts of South America and West Africa are a late stage of greenstone formation in which evidence for subduction is prevalent and ultramafic magmatic rocks are relatively scarce. The significance of these greenstone belts in global models for crustal growth remains unclear. Here we studied two ultramafic complexes with contrasting characteristics from the Paleoproterozoic basement of the Guiana Shield in Suriname. The Bemau Ultramafic Complex (BUC) forms part of the Marowijne Greenstone Belt of NE Suriname and is closely associated with partly pillowed Paramaka Formation metabasalts which is the base of the volcanosedimentary sequence of the greenstone belt. The Borgia Hill Chromite Complex (BHCC) forms an isolated greenstone enclave in granitoid terrain in central Suriname. The ultramafic rocks in both complexes show differences in their origin based on their petrology and geochemistry. The BUC consists of ultramafic schists, mainly talc-tremolite-chlorite-carbonate schists, with textures indicative of a volcanic origin, intruded by cumulates with partly serpentinized dunites, wehrlites, clinopyroxenites and gabbros. The main spinel-group mineral is magnetite, mostly of secondary origin. The BHCC consists of serpentinized dunites with chromite, orthopyroxenite, and altered cumulates with talc-tremolite-chlorite and tremolite- anthophyllite assemblages. The BUC schists show flat primitive mantle-normalized REE patterns. Their geochemistry is consistent with an oceanic plateau origin and they can be classified as komatiitic rocks. The BUC cumulates show REE patterns with a mild negative slope and are strongly enriched in LREE and LILE relative to the primitive mantle. Calculation of liquids in equilibrium with clinopyroxene (diopside), show that the parental melt had an arc signature. The BHCC shows more enriched and variable REE values. The Nb/Th vs Zr/Nb ratios [1] suggest an arc-related affinity for the cumulates from both the BUC and the BHCC. Our results demonstrate a complex relationship between relatively late stages of komatiitic magmatism and subduction in the Rhyacian.

[1] Condie, K. C. (2003). *Incompatible element ratios in oceanic basalts and komatiites: Tracking deep mantle sources and continental growth rates with time.* Geochem. Geophys. Geosyst. 4 (1), 1005.