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# LA-ICP-MS U–Pb Zircon Geochronology of Nkout Banded Iron Formations and associated rocks, Northwestern Congo Craton, Southern Cameroon

**DR. LYSIANE CHRISTELLE KOUAYEP TCHOUNDI, PHD**[1] AND SYLVESTRE GANNO[2]

[1]University of Yaoundé I
[2]University of Yaoundé I (Cameroon)

**LA-ICP-MS U–Pb Zircon Geochronology of Nkout Banded Iron Formations and associated rocks, Northwestern Congo Craton, Southern Cameroon**

**Lysiane Christelle Kouayep Tchoundi[1], Sylvestre Ganno[1]**

*[1]Department of Earth Sciences, Faculty of Science, University of Yaoundé I, P.O. Box 812 Yaoundé-Cameroon,*

**Corresponding author: lysianekouayep@gmail.com*

The Nkout area, located in southern Cameroon, is part of the Mbalam-Sangmelima greenstone belt within the Ntem Complex. This study aims to determine the origin, environment and depositional ages of the banded iron formations (BIFs) and associated rocks in the Nkout iron deposit through petrographic, geochemistry and geochronological analyses. The basement of the study area comprises metamorphic rocks, mainly magnetite BIFs and interlayered mica schists, which have undergone amphibolite-facies metamorphism. The BIFs exhibit the characteristics of pure chemical precipitates, with enrichment in heavy rare earth elements, positive anomalies in La, Gd, Y and superchondritic Y/Ho ratios similar to seawater. These BIFs formed by mixing of seawater (99.99%) and hydrothermal fluids (0.1%) in a suboxic to anoxic environment. The positive Eu anomalies suggest their affinity with Algoma-type BIFs. The micaschists originate from ferruginous sands derived from an Archean felsic source and deposited in a continental island arc setting. U-Pb dating of detrital zircons yields a maximum depositional age (MDA) of 2814 ± 14 Ma, indicating that the Nkout BIFs are likely the oldest in the Ntem Complex. The Nkout micaschist shows an MDA of 2829 ± 72 Ma. The Nkout amphibolites, part of the same metavolcano-sedimentary sequence, have been dated at 2862 ± 10 Ma. Based on these results, the depositional age of the Nkout BIFs and associated micaschists is bracketed between 2862 and 2814 Ma. Additionally, the Nkout micaschists record a Paleoproterozoic metamorphic event at 2038 ± 62 Ma, attributed to the Eburnean orogeny. This represents the first documentation of such an imprint in the Ntem Complex. The event is associated with the collision and assembly of the Congo and São Francisco cratons, contributing to the formation of the core of the Columbia/Nuna supercontinent between 2100 Ma and 2000 Ma.

**Keywords**: BIFs; Associated rocks; MDA; Hydrothermal fluids; Eburnean orogenic cycle; Nkout iron deposit.

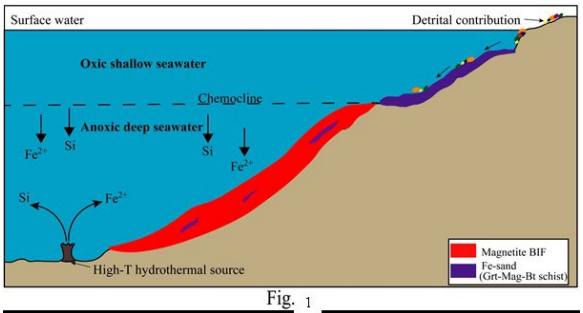


Fig. 1

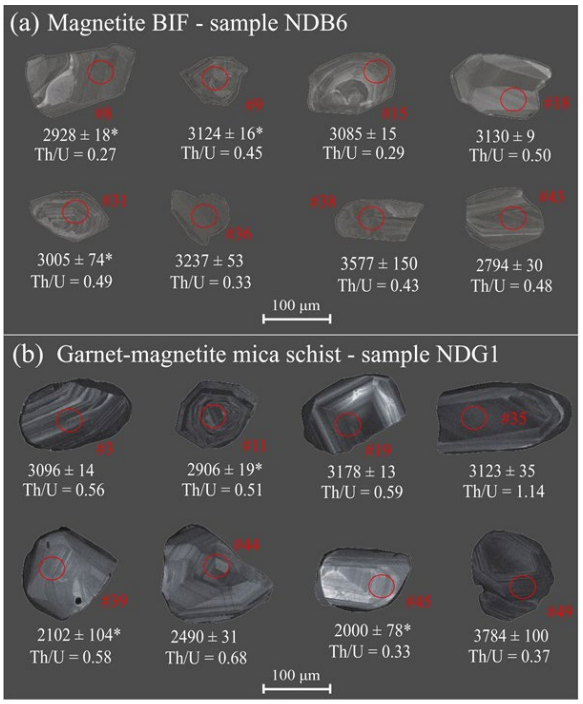


Fig. 2