

REVIEWER'S REPORT

Manuscript No.: IJAR- 58782

Title: PETROGRAPHY AND GEOCHEMISTRY OF GUIGLO GNEISSES, CÔTE D'IVOIRE,

Recommendation:

Accept after minor revision

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality			✓	
Clarity			✓	
Significance	✓			

Reviewer's ID: Bilquees Hamza

Detailed Reviewer's Report

General Overview

The manuscript presents a detailed petrographic, mineralogical, and whole-rock geochemical investigation of two distinct Palaeoproterozoic gneissic lithotypes (the NZO-1 migmatitic gneiss and the GUI-1 amphibole augen gneiss) exposed along the N'zo River in the Guiglo region of southwestern Côte d'Ivoire. The study aims to constrain their petrogenetic histories, metamorphic conditions, deformation trends, and broader geodynamic significance within the West African Craton.

The strengths of the study include an integrated analytical workflow combining field structural measurements, electron microprobe mineral chemistry, and whole-rock major/trace element analyses (XRF/ICP-MS). The geochemical data successfully document a dual magmatic character: high-K tholeiitic trondhjemites (NZO-1) alongside medium-K calc-alkaline tonalites/monzodiorites (GUI-1), both exhibiting characteristic subduction-related signatures (LILE enrichment, negative Nb-Ta-Ti anomalies). The structural and mineralogical evidence effectively supports a model of peak amphibolite-facies metamorphism and sinistral transpressional shearing during the Eburnean orogeny, followed by greenschist-facies retrogression.

While the paper is well-structured and scientifically sound, minor revisions are required prior to publication. These primarily involve fixing minor citation discrepancies in the text, improving caption/labeling consistency in the figures and tables, and refining a few minor technical details.

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Detailed Recommendations for Improvement

- **Citation and Reference Alignment:** In Section 4.2.1, the text cites Middlemost [17] for the TAS diagram, Barker [15] for classification, and Barker/Arth [16, 18] across lines 218–230. However, the reference list shows Sun & McDonough as [15], Koffi (PhD thesis) as [16], Middlemost as [17], and Barker as [18]. The citation indices in the text for geochemical classification diagrams must be carefully re-audited and matched exactly to the corresponding items in the reference list.
- **Table and Figure Quality Control:** In Table 1, the TiO₂ content for GUI-1 is reported as 0.74% in the main narrative (line 224) but needs to be cross-checked with the listed oxide total. In Figure 6b, the legend/axis labeling contains minor typos (e.g., "ARK3/Chondrite" and fragmented x-axis element labels). The authors should clean up the graphic labels for Figure 6a and 6b to ensure publication-quality resolution and legible element labels.
- **Clarification of Metamorphic P-T Estimates:** In Section 5.1, the P-T conditions for amphibolite-facies metamorphism are given as 550–650 °C at 4–6 kbar for NZO-1 and 600–700 °C for GUI-1. Please explicitly state in the methodology or text whether these estimates are derived from specific geothermobarometric mineral exchange models (e.g., hornblende-plagioclase thermometry) or established regional metamorphic facies constraints.
- **Geochronological Contextualization:** Although the authors rightly acknowledge that U-Pb zircon geochronology is needed for future work (Section 6), providing a slightly deeper comparison with existing radiometric ages of adjacent Birimian/SASCA domain orthogneisses (e.g., 2.80 Ga vs 2.10 Ga units) would provide stronger temporal context for the proposed crustal reworking model.
- **Minor Textual Edits:** Correct minor typographical spacing issues in the narrative, such as the repeated phrase "to review to review" in similar regional context descriptions or broken line references in the results section.

Recommendation to the Editor

Decision: Accept with Minor Revision

Comments to the Editor:

I recommend that the manuscript "*Petrography and Geochemistry of Guiglo Gneisses, Côte d'Ivoire*" be accepted for publication following **minor revisions**.

The paper addresses an understudied geographical sector of the Man domain in the West African Craton and provides valuable, high-quality analytical data (electron microprobe and whole-rock geochemistry). The interpretation of subduction-related magmatism and Eburnean transpressional reworking is well-supported by the evidence.

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The required revisions are straightforward and non-fundamental: re-aligning reference numbering between the text and reference list, polishing figure labels in the geochemical plots, and clarifying the basis for the metamorphic P-T estimates. These adjustments can be made quickly without requiring a second full review cycle.