

## **Petrogenesis of the Neoproterozoic Rocks of Megele Area, Asosa, Western Ethiopia**

**Authors :** Temesgen Oljira, Olugbenga Akindeji Okunlola, Akinade Shadrach Olatunji, Dereje Ayalew, Bekele Ayele Bedada

**Abstract :** The Western Ethiopian Shield (WES) is underlain by volcano-sedimentary terranes, gneissic terranes, and ophiolitic rocks intruded by different granitoid bodies. For the past few years, Neoproterozoic rocks of the Megele area in the western part of the WES have been explored. Understanding the geology of the area and assessing the mineralized area's economic potential requires petrological, geochemical, and geological characterization of the Neoproterozoic granitoids and associated metavolcanic rocks. Thus, the geological, geochemical, and petrogenetic features of Neoproterozoic granitoids and associated metavolcanic rocks were elucidated using a combination of field mapping, petrological, and geochemical study. The Megele area is part of a low-grade volcano-sedimentary zone that has been intruded by mafic (dolerite dyke) and granitoid intrusions (granodiorite, diorite, granite gneiss). The granodiorite, associated diorite, and granite gneiss are calc-alkaline, peraluminous to slightly metaluminous, S-type granitoids formed in volcanic arc subduction (VAG) to syn-collisional (syn-COLD) tectonic setting by fractionation of LREE-enriched, HREE-depleted basaltic magma with considerable crustal input. While the metabasalt is sub-alkaline (tholeiitic), metaluminous bodies are generated at the mid-oceanic ridge tectonic setting by partially melting HREE-depleted and LREE-enriched basaltic magma. The reworking of sediment-loaded crustal blocks at depth in a subduction zone resulted in the production of S-type granitoids. This basaltic magma was supplied from an LREE-enriched, HREE-depleted mantle.

**Keywords :** fractional crystallization, geochemistry, Megele, petrogenesis, s-type granite

**Conference Title :** ICMDPT 2022 : International Conference on Mineral Deposits and Plate Tectonics

**Conference Location :** Kuala Lumpur, Malaysia

**Conference Dates :** August 30-31, 2022