

Geologic age of the central African Proterozoic metamorphic rocks in South Sudan

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This study aims to report geochemistry features and geochronology of metamorphic rocks distributed in Jebel Mountain of the Juba Area of South Sudan.

In this study we carried out major element analysis (SSD-1, SSD-2; N4.840556, E31.552778) and also performed SHRIMP U-Pb age dating of the zircons from sample SSD-2.

In the study area, mela-gneiss (SSD-1) was intruded by leuco-gneiss(SSD-2). Their major element compositions plotted on QAP diagram show these samples which are SSD-1 and SSD-2 belong to quartz-monzodiorite and tonalite field, respectively. In the AMF diagram, the samples correspond to the calc alkalic rock series. And also sample SSD-1 is characterized by intermediate that has 60.84 SiO₂ (wt%) but sample SSD-2 has 77.1 SiO₂ (wt%) that featured acidic rock.

Analyses of zircon rim from SSD-2 yield a predominant 206Pb/238U age population of Neoproterozoic (ca. 580 Ma). Th/U ratio less than 0.1 indicate that this area experienced a regional metamorphism during the Neoproterozoic. In spite of 1 point, the zircon core yield 207Pb/206Pb age of Archean (ca. 2590 Ma) that represents intrusive age of leuco-othogneiss.

According to these data, sample SSD-1 and SSD-2 were originally igneous rocks corresponded to calc alkalic series. The leuco-gneiss (SSD-2) intruded mela-gneiss (SSD-1) in Archean (Ca. 2590 Ma) and then they were metamorphosed during the last stage of global scale collision forming Gondwana supercontinent at ca. 580 Ma.

References

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