

The Expression of the Multistage Evolution of the Pegmatitic Magma in the Licungo Pegmatite Field, Zambézia, Mozambique

Marcelino Moiana

Museu Nacional de Geologia, Mozambique

The Licungo Pegmatite Field (LPF) is a cluster of pegmatite lenses aligned along NNE-SSW, NNW-SSE and WNW-ESE regional fractures. This field is hosted in Mesoproterozoic terranes, represented by orthogneisses, paragneisses interlayered with carbonate rocks and amphibolites. Their microscope observation reveals widespread sericitization of Ca-plagioclase in orthogneisses. Besides quartz and pethite (>90%), the pegmatites are composed of accessory beryl, garnet, monazite and columbite-tantalite. In the backscattered electrons image, the garnet is concentrically zoned, showing: i) a **core zone** dominated by the spessartine component associated with albite, zircon and rutile, being the later enriched in Nb, Th and U, common in magmas of alkaline affinity; ii) an **intermediate zone** with relatively high content of grossular component, resulting probably for contamination by paragneisses or representing influx of Ca, into LPF, released during plagioclase sericitization; and iii) an **outer zone** with progressive increase in Mn/Fe ratio towards the outermost margin, representing the crystal growth by fractionation. The filling of columbite-tantalite fractures by U-Ca-microlite supports the suggested contamination hypothesis. In the other hand, the monazite composition clusters in three populations: i) **population 1** shows the highest contents of light rare earth elements (LREE), high P and low Si, corresponding probably to the formation of early stage monazite; ii) **population 2** shows the highest Sm, Gd and U content resulting from the referred contamination and iii) **population 3** shows the highest Si, Th and the lowest LREE corresponding, probably, to the fractionation towards the formation of thorite, found associated with monazite. The above paragenesis and chemical data distribution suggest multistage evolution of the pegmatitic magma.

Key-words: Licungo Pegmatite Field, Mozambique, zone, garnet, columbite-tantalite, monazite.

Biography:

Marcelino Moiana obtained a PhD in geology in 2016 and MSc in geology in 2008 at University of Minho, Portugal. He is now working on research on internal structure and paragenesis of pegmatites located in northern and Central Mozambique. He is also engaged in the research of geosites, followed by a proposal of relevant ones to be declared Geological Heritage by the national entities.