

Petrography and Geochemistry of Pegmatite and Leucogranite of the Ntega-Marangara Area, Burundi, in Relation to Rare Metals Mineralisation

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The Ntega-Marangara area, part of the Kanyaru supergroup, Western Domain (WD) of the Karagwe Ankole Belt (KAB), hosts numerous pegmatite veins related to the leucogranite. This investigation aims to characterise the granitoids, their alteration products, and rare metals mineralisation potentials. Quartz, plagioclase, microcline, albite, and muscovite are the essential minerals in both the pegmatite and leucogranite. The Σ REE values of the pegmatite and leucogranite are 147 and 102 ppm, respectively. The greisenised pegmatite with Rb, Cs, Ta, Li, Nb, and Sn of 5,940, 1015, >2500, 130, 1,595, and 671 ppm, respectively, are higher than the corresponding values of 636, 62, 32, 74, 58, and 110 ppm of the kaolinized pegmatites. This enrichment classifies them as lithium-caesium-tantalum (LCT) pegmatite. The mean K/Rb, K/Cs, and Nb/Ta in the leucogranites are 106.86, 2819.24, and 4.30; pegmatite is 35.33, 469.47, and 3.1; and greisen 14.05, 82.2, and 0.64, respectively, which suggest that greisenisation due to metasomatic reactions of late hydrothermal activity could have increased the potential for rare metals mineralisation of the altered pegmatite. Pegmatite of the Ntega-Marangara area is enriched in LREEs relative to HREEs, with a K/Rb ratio <100, indicating a high level of fractionation and mineralisation in Ta-Nb, Sn, and Li, in contrast to the leucogranite that is less fractionated and barren.