A Study on Geology and Geochemistry of Pegmatites in Relation to Niobium-Tantalum and Tin Mineralisation, Gitarama and Gatumba Areas,Rwanda

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Gitarama area in south and Gatumba area in west are of interest in Karagwe Ankole Belt (KAB) for the study of pegmatites. Previous works on pegmatites are not enough for focused exploration and mining. Therefore, further studies were carried out. Petrography, Geochemistry and X-Ray Diffraction techniques were used for pegmatite description. Quartz, Plagioclase feldspars and Muscovites are identified. Albite ($An_{0.1-0.8}$; $Ab_{98.7-99.6}$ and $Or_{0.3-0.5}$) is found as the major plagioclase feldspars mineral. Whole rock geochemical compositions of pegmatites show the average values for major oxides (in wt %) of SiO_2 (~67.9) , Al_2O_3 (~14), CaO (~3), K_2O (~3.4), Na_2O (~3.85), and trace element of Rb (~721.7 ppm), Cs (~ 7.6ppm), W (~ 2211ppm) Nb (~164.8 ppm), Ta (~ 122.01ppm), Sn (~ 1522ppm) and Li (~ 1082.2ppm). The pegmatites are found Lithium-Cesium-Tantalum (LCT) pegmatite family and Muscovite-Rare element pegmatites, metaluminous to the peraluminous suite of post-collisional stage. Pegmatites contain ferrocolumbite/ferrotantalite ($Fe\text{-}Nb_2O_6/Fe\text{-}Ta_2O_6$) and cassiterite ($SnO_2$), which is induced by precipitation reactions during the circulation of magmatic hydrothermal fluid. The weathered pegmatite from Gatumba area shows dominant minerals such as the muscovite and kaolinite, which both indicate the occurring processes of muscovitisation and kaolinisation. Pegmatite from Gatumba area is found mineralised, contrarily the pegmatite samples from Gitarama area are regarded barren.