

Paper Number: 5482

Preliminary results on the petrogenesis and metallogenesis of Archaean rare-metal granitic pegmatites along the southern margin of the Zimbabwe craton

Chagondah G.S.¹ and Hofmann A.¹

¹Department of Geology, University of Johannesburg, South Africa; geolochagondah@yahoo.com

The Archaean Zimbabwe craton is endowed with granitic pegmatites associated with granitoid suites of different ages. Palaeo-/Mesoarchaeal plutons are characterized by tonalite-trondhjemite-granodiorite (TTG), whilst end of Neoarchaeal granitoids comprise granodioritic-monzogranitic compositions. TTGs include the pre-/syn-tectonic Chingezi, Sesombi and Wedza suites (c. 2.98-2.67 Ga, [1]) while potassic granites form the syn-/post-tectonic Chilimanzi Suite (c. 2.6-2.58 Ga, [1], [2]). Equivalents of Chilimanzi suite granites intruded tectonic contacts along the northern and southern margin of the Zimbabwe craton and are respectively known as the Mudzi and Razi Suites ([2], [3]). All the granite suites are intrusive into Upper Bulawayan greenstones and cross cut the supracrustal sequences [1].

Along the southern margin of the Zimbabwe craton rare-metal mineralization is spatially and temporarily associated with Chilimanzi suite plutons. Mineralization is hosted along the Mweza-Buhwa and Masvingo greenstone belts corridor in complex type granitic pegmatites envisaged to be derived from igneous differentiation of parental K-rich granitoids. Residual melts enriched in high field strength elements and incompatible elements are envisaged to have leaked and crystallized in favourable structures such as faults, shear zones and zones of extension in country rocks. A major rare-metal pegmatite suite hosted along the southern margin of the Zimbabwe craton include Li, Cs, Ta, Be and Nb in the world-class Bikita and Sandawana fields.

This paper describes preliminary results of ongoing work on the petrogenesis and metallogenesis of rare-metal pegmatites in various geological environments along the southern margin of the Zimbabwe craton. Based on field relations the following observations have been made: (1) Pegmatites occur in various geological environments including meta-volcanics, meta-sediments and granite-gneisses. (2) Pegmatites hosted in meta-volcanics of greenschist-amphibolite facies grade environment are the most productive with respect to rare-metal mineralization, whereas the granite-gneiss hosted dykes are considered least productive. (3) At Sandawana pegmatite field, the dykes appear to be conformable to regional foliation and are deformed together with country rocks with elevated mineralization associated with fold closures. (4) At Bikita pegmatite field, the dykes are discordant to regional fabric and (5) there is a suite of mineralization associated with each zone of the pegmatite dykes.

References:

[1] Wilson JF et al. (1995) In: *Early Precambrian Processes*. Geol Soc Lond Spec Publ 95: 113-114

[2] Frei R et al. (1999) *S Afr J Geol* 102: 55-63

[3] Barton CM et al. (1991) *The Geology of the Country around Rushinga and Nyamapanda*. Geol Surv Zim Bull 92

