

**CHARACTERISATION OF THE SUBCONTINENTAL LITHOSPHERIC MANTLE BENEATH THE TANZANIA CRATON BASED ON GARNET XENOCRYSTS**

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Kimberlites from Mwadui, Singida, Nyangwale and Galamba have been emplaced within the northern part of the Tanzania Craton in Archean granitic basement. No mantle xenoliths, but single garnet grains and garnet megacrysts were found in the four visited/sampled kimberlite pipes. These garnets have been studied using major-, trace- and rare earth element compositions in order to obtain information on the underlying upper mantle.

According to the classification scheme of GRÜTTER et al. (2004) the garnets can be distinguished into five different groups (Fig. 1): low-Cr megacrysts (G1), eclogitic garnets (G3), pyroxenitic garnets (G4), lherzolitic garnets (G9) and harzburgitic garnets (G10). Some garnets within group G4 and G10 can be strongly associated with diamonds (G4D and G10D). The different originated garnets reflect a less depleted to depleted mantle (variations in Ti, Zr and Y) that is influenced by metasomatic mantle processes (e.g. melt-type- and phlogopite-type metasomatism). Eclogitic garnets have a low MgO and Cr<sub>2</sub>O<sub>3</sub> content and are interpreted to be derived from subducted oceanic crust. These garnets may be related to 2 Ga old eclogites from the Usagaran belt, to the south east of the Tanzania Craton.

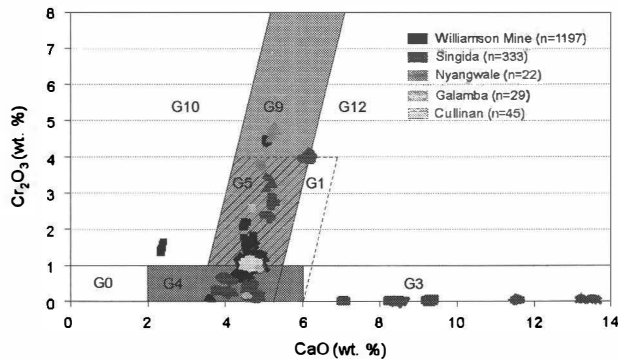


Figure 1. Cr<sub>2</sub>O<sub>3</sub> vs. CaO diagram. G-number nomenclature after GRÜTTER et al. (2004): G0= unclassified, G1= low-Cr megacrysts (dashed parallelogram), G3= eclogitic, G4 and G5= pyroxenitic, G9= lherzolitic, G10= harzburgitic, G12= wehrlitic. n= number of analyses.

GRÜTTER, H.S., GURNEY, J.J., MENZIES, A.H., WINTER, F. (2004): *Lithos*, 77, 841-857.