

Re-Os dating of sulfide inclusions in Cr-pyropes from the Upper Muna kimberlites

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Archean cratons are underlain by highly depleted subcontinental lithospheric mantle (SCLM). However, there are extensive evidences that Archean SCLM has been extensively refertilized by metasomatic processes, with the addition of Fe, Ca, and Al to depleted protoliths. The distribution of sub-calcic Cr-rich garnets in the SCLM beneath the Siberian craton suggests (1) sub-calcic garnets and diamonds are metasomatic phases in the cratonic SCLM; (2) the distribution of both phases is laterally heterogeneous on relatively small scales and related to ancient structural controls [1].

Re-Os isotopic compositions of twenty six sulfide inclusions in lherzolitic Cr-pyropes from Upper Muna kimberlites have been determined by laser ablation MC-ICPMS. Most analysed sulfides (~92%) have very low Re/Os ratios (<0.07), and their Re-depletion ages (T_{RD}) form three major peaks: 3.4-2.8, 2.2-1.8 and 1.4-1.2 Ga (± 0.03 Ga, mean 2s analytical uncertainty). One sulfide give the oldest T_{RD} age at 4 Ga.

Our data suggest that refertilization of the highly depleted SCLM and the introduction of Cr-pyrope garnet occurred in several episodes. The oldest age of ca 4 Ga indicate on the beginning of the formation of the depleted SCLM of the Siberian Craton in Hadean time [2].

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[1] Malkovets et al. (2007) *Geology* 35, 339–342.

[2] Griffin et al. (2014) *Lithos* 189, 2–15.