



Variations of the SCLM structures and geochemical features of the peridotites in different mantle terranes beneath Siberian craton.

I.V. Ashchepkov (1), N.V. Vladykin (2), S.S. Kuligin (1), A.P. Smelov (3), T. Ntaflou (4), S.I. Kostrovitsky (1), M.I. Lelyukh (5), A.Ya. Rotman (5), V.P. Afanasiev (1), N.S. Tychkov (1), E.V. Malygina (1), Yu.I. Ovchinnikov (1), S.V. Palessky (1), I.V. Nikolaeva (1), O.S. Khmelnikova (1), and E.N. Nigmatulina (1)

(1) Institute of Geology and Mineralogy, Geodynamics, Novosibirsk, Russia (igor.ashchepkov@igm.nsc.ru, +7 (383) 333-27-92), (2) Institute of Geochemistry SD RAS, Irkutsk, Russia, (3) Institute of Geology of Diamond and Noble Metals SD RAS, Yakutsk, Russia, (4) Vienna University, A-1090 Vienna, Austria, (5) Alrosa Stock Company, Mirny, Russia

The kimberlite fields cross several (7) tectonic terranes compiling Siberian craton. According tectonic data (Rosen et al., 2006) they are locating within the Paleoproterozoic Accretion Zone which have ~1.8 ma age corresponds to the peak of the Re/Os dates (Ionov et al., 2011; Malkovets et al., 2011) and dating in other isotopic systems (Rosen et al., 2006).

The lithospheric mantle beneath seven different tectonic terrains in Siberia is characterized by TRE geochemistry and major elements of peridotitic clinopyroxenes. The mantle in Magan terrain contains more fertile peridotite in the South (Mir pipe) than in North (Alakite) which are metasomatized by subduction-related (LILE Sr-enriched) melts producing Phl and Cpx about 500-800 Ma ago. Daldyn terrain is essentially harburgitic in the west (abyssal peridotite) but in the east is more differentiated to fertile and depleted varieties and more oxidized in Upper Muna (East Daldyn terrain). The Markha terrain (Nakyn) contains depleted but partly refertilized harzburgites, subducted pelitic material and abundant eclogites. Circum-Anabar mantle is ultradepleted in the lower part but in the upper regions it has been fertilized by fluid-rich melts very enriched in incompatible elements.

The SCLM in Magan terrane near Mir pipe contains in upper part fertile and hydrous metasomatic peridotites and eclogite lens in middle part (40 kbas). More depleted lens starts from 50 kbar beneath Mir pipe. But SCLM of Internationalnaya pipe show large amount of eclogites and hybrid peridotite material at the same depth.

In SCLM beneath Nakyn the more continuous thick peridotite sections contain abundant various eclogites and Garnet bearing Fe-rich micaceous rocks (metapellites in protolith) (Spetcius et al., 2004). The general granulite-gneiss siliceous character of terrane coincides with the rather fertile mantle type. In the Markha terrane the SCLM is essentially metasomatic and contains essentially depleted lenses near Aykhal and Yubileinaya lin. They together may represent the peridotites similar to those from the subduction front and probably upper part. They also show sharp peaks in U, enrichment in Sr, Ba, Rb etc (Chen, Zeng 2007) The peridotites of the Archean times exposed in ophiolite series commonly have very flat uniform trace element spider diagrams (Furnes et al., 2009).

Mantle in lower part of Hapschan terrane which is an accretion complex is extremely depleted in Al and Ca the lower part but the dunites are more Fe-rich than common Mariana like mantle. But the upper part here corresponds to the peridotites which are highly metasomatized with fluid enriched melts.

The SCLM in Berikite granite-greenstone terrane like Markha again contains mildly depleted associations and abundant eclogites of hybrid origin (Taylor et al., 2003) near 40 kbar boundary. This boundary probably is not transparent for the eclogites in high temperature conditions. This may be one of the reasons of the division of the lithospheric mantle into two parts and the origin of the pyroxenitic lens. Mantle peridotites here have features of the high degree oceanic type depletion like in Daldyn region (Ashchepkov et al., 2012).