



New model of the mantle lithosphere beneath Kuoyka kimberlite field Yakutia.

Igor Ashchepkov (1), Sergey Kostrovitsky (2), Yury Ovchinnikov (1), Nikolai Tychkov (1), Olga Khmelnikova (1), and Stanislav Palessky (1)

(1) Institute of Geology and Mineralogy SD RAS, Koptyug ave 3, Novosibirsk, Russia, (2) Institute of Geochemistry SB RAS, Favorskogo 1a, Irkutsk, Russia

New data for the 11 pipes from Kuoyka field show that high Cr₂O₃ garnets to 10- 12% as well as high Cr chromites (to 64%Cr₂O₃) are found in several more pipes Zaozernaya, Seraya, Slyudyanka, Vodoraselnaya, Titan, Lusya in addition to Djanga pipe. All garnets belong to lherzolite field and not less than 1/3 are TiO₂ rich. The TiO₂ rich chromites are dominating in the Cr- rich population. Metasomatic Cr₂O₃- rich (to 6%) ilmenites are in the MgO and TiO₂- part of the variation diagrams. The Cr- diopside variations show high variations of Fe and Na content to 4 % suggesting the hybridic origin similar to the Cr- pyroxeneis from Obnazhennaya pyroxenites (Taylor et al ., 2003). Omphicites (to 7 % Na₂O) are rare. Cr-amphiboles (pargasites and hornblendes) are common in the upper part of the SCLM as well as in the Anabar and Kharamai region.

Reconstructions of the mantle sections show the deep lithospheric roots beneath the Zosernaya pipe (7.5 GPa) traced by the PT conditions for Opx, Cpx, Gar, Cr and Ilm. SCLM is divided into 4 sections and Ilm trace tow intervals in lower and upper part from 4 GPa. The HT branch is sporadically found from 7 GPa to the Moho. In other pipes ilmenite and garnet PT estimates are more common in the lower part of mantle section while the Cpx trace mainly middle part of SCLM similar to the Obnazhennaya pipe. It seems that kimberlites captured mainly the walls of feeders traced by Cr- low garnets and ilmenites in the lower part of SCLM while peridotitic mantle column was captured starting from the middle part of SCLM. The NS transsect of the Kuoyka field show more fertile mantle sections in the NNW part of the field.

The TRE determined for the minerals from Kuoyka field show rather rounded patterns for REE of garnets with high variations in HREE part and small elevation in LREE . The depleted compositions reveal the inflection in Eu TRE spidergrams well as relatively small Sr minima. Many of them show Ta peak, relatively small Pb elevation and Th trough. The asymmetric bell like patterns of the clinopyroxenes with the humps from SM to Pr also show HREE variations due to the difference in Ga/Cpx ratio peridotites. The spidergram show Zr -Hf minima deeper for Zr and Pb troughs. The left incompatible parts show flattened but very different levels.

The REE spidergrams of the pyropeites reveal notable REE content to from 0.1 to 10C1 difference in LREE levels with the division to tetrads which show higher LREE than HREE . The spider grams show Hf minima but small elevation in Nb , Ta and Hf. RBRF grant 11-05- 00060a.