

Unique amphibole-rich mantle beneath the Leningrad kimberlite pipe, West Ukukit field, NE Yakutia

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In subcratonic mantle beneath Leningrad pipe, West Ukukit field, Yakutia garnet thermobarometry (Ashchepkov, 2017a) give division to 7 horizons (paleosubduction slabs). Cr-bearing amphiboles are changing from Cr- hornblendes to pargasites, edinites, K-richterites with increasing pressure determined with new version of amphibole thermobarometer (Ashchepkov, 2017b). They are divided in to 9 groups according to major trace elements and amphibole thermobarometry tracing all branches of the garnet geotherm from 0.8 to to 7.5 GPa The Cr pargasitic hornblendes of Fe or- types are covering the 2.5-0.8 GPa interval. The Cr pargasites refer to 40mw/m2 geotherm in middle SCLM from 2.5 to 4GPa. The edinites are found from 4 to 6 GPa also give LT and HT branches. The richterites of 3 types tracing different PT branches from convective to LT are found in 6 to 7.5 GPa interval. The eclogites compile dense branch in the middle part of mantle column with the highly inclined P-Fe# trend.

Pargasitic hornblendes with inclined concave REE patterns and Eu, HFSE troughs show Ba, U, Th peaks. The high- T varieties (Gr2a) have less inclined LREE , La (10/C1). Pargasites 3a and 3b have straight line REE and bell like - La to Sm patterns. The Gr3b with Eu minima show $La_n \sim 140/C1$. Zr-Hf troughs The Gr3b have HFSE maxima high Ba low U. The Gr3c minima in HFSE , high Rb , low, Th U. Edinites Gr4 –Gr5, Gr 6 show slightly inclined REE pattern $(Gd/Yb)_n \sim 70 -50$. The samples from Gr5 reveal rotation of the La-Sm and inclination from the negative to flat. The richterites Gr 7-9 in the LAB show the highly inclined and enriched TRE patterns with high LILE, Sr, Rb and troughs in Nb, Pb. The Na- rich have Rb, Ba, variable Th peaks and essentially lower REEE with the MREE depressions (created in harzburgites).. Clinopyroxenes show Th, U, Sr peaks related to carbonatites.

The amphibole-rich mantle was formed at the margin of the craton where subduction – related Na and K (silica-rich) fluids percolated through mantle with abundant eclogites causing amphibolization in several stages

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