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Ilmenite -metasomatism in the lithospheric mantle beneath the Sytykan pipe and Alakite region and its influence on the diamond potential.

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Compositions of the minerals from >100 peridotite xenoliths found in Sytykan kimberlite pipes were used to compare the results of the TP reconstructions using heavy concentrate from the pipe (>400 grains). Garnets from meatsomatic xenolith are rich in harzburgite and pyroxenite varieties comparing those from concentrate. Clinopyroxenes show the wide range of composition from Na-Cr rich metasomatic to depleted and Fe – rich varieties.

Clinopyroxenens from the 60-40kbar interval show typical Fe- enrichment in the basement and broad compositional scattering at the 55-45 interval but upper 40 kbars they are referring mainly to Fe-enriched varieties. Garnets thermobarometry reveal the layering compiled from 6units having in the basements sub –Ca garnets. Garnets are relatively rare in the middle parts of the section from 40to 25 kbar, Fe content of garnets rises to upper and lower part of the section . Cr- spinels mainly refer to the lower part of the mantle column the ulvospinel content is rise to 40 kbar – pyroxenite lens, they are more heated then Ti less varieties.

Ilmenites from metasomatic xenoliths and contacts of peridotites and megacrystalline veins are tracing the Cr- rich branches with 5-4% and ∼2% Cr2O3, while Cr- low varieties represent the fractionations within the large magmatic bodies in the lower pert of the mantle columns. According to Ilm (Ahshchepkov, Vishnyakova,2005) and

Cpx (Ashchepkov, 2001) thermobarometry the Cr-low Ilm associations are referred to the basement of magmatic column.

Reconstructed TP conditions for the concentrate show that primary kmberlite melts producing Cr-low ilmenites were fractionated only lower 50 kbar. Upper the megacrysts were crystallized from contaminated melt portions derived from the top of magamtic system. It was enriched by water and produced the Phl- Ilmenite metasomatism which has the same magmatic source and the degree of the contamination increased with the decreasing pressure up to 40kbar. Ilmenites from the veins and veinlets are heated to 40-45mv/m2 geotherm. Upper 40-30 kbar only scattered vein phlogopite metasomatism accompanied the crystallization of last melt portions. Trace elements for ilmenites show that second portion of the metasomatic melts was accompanied by the fusion in garnet bearing source with the high $La/Yb_n > 15$ while the primary ilmenites reveal flattened REE patterns.

The Clinopyroxenes TRE compositions demonstrate Ta-Nb and less Hf-Zr depletion and in general correspond to the modal of decreasing of melting degree and increasing of Ol modal composition with the depth in mantle column. Garnets demonstrate quite different TRE and REE patterns from S type to rounded flat or straight line REE but more often LREE enriched and with different HFSE depletion and small U minima.

Ilmenite metasomatism developed in two stages is referred to the primary protokimberlite melts and those mixed with the low degree hydrous anatectic melts, but both are heating the mantle column.

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