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# Evolution of the mantle sections beneath the kimberlite pipes example of Yakutia.

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The PTX diagrams for the separate phases in Sytykanskaya (Ashchepkov et al., 2016) Dalnyaya (Ashchepkov et al., 2017), pipes shows that the PK show the relatively simple P-X trends and geotherms and shows more contrast and simple layering. The PK contain most abundant material from the root of the magma generation they are dunitic veins as the magma feeders represented by the megacrysts.
New results for the Aykhal, Zarya and Komsomolskaya pipes in Alake field and Zarnitsa and Udachnaya pipes in Daldyn field show that evolution is accompanied by the developing of metasomatites and branching and veining of the wall rock peridotites .
In Aykhal pipe in PK the Gar- dunites prevail, the xenoliths from the dark ABK “Rebus” contain Cr-Ti - rich garnets and ilmenites, more abundant compared with the grey carbonited breccia Nearly the same features were found for Yubileinaya pipe.
The example of Komsomolskya pipes show that the ABK contain more eclogitic xenolith than PK. The developing of the magma channel shown in satellite Chukukskaya and Structurnaya pipe was followed by the separation of some parts of the magmatic feeders and crystallization of abundant Gar megacrysts near o the walls blocking the peridotites from the magma feeder. This drastically decrease diamond grade of pipes. Such blocking seems to be the common features for the latest breccias.
In Zarnitsa pipe, the dark PK and ABK also contain fresh xenoliths but not only dunites but also sheared and metasomatic varieties and eclogites.
Most of dark ABK in Yakutia contain the intergrowth of ilmenites with brown Ti- Cpx showing joint evolution trends.
The late breccia contains completely altered peridotite xenoliths mainly of dunite- harzburgite type.
The comparison of the trace elements of the coexisting minerals in megacryst show that they were derived from the protokimberlites but are not in complete equilibrium as well as other megacrystalline phases. Ilmenites show inflections of the trace element patterns of most Ilmenites but more regular for the Cpx and Garnets revealing the sub parallel patterns elevating LREE with the rising TRE. But commonly these are not continuous sequances because they developed in the pulsing moving systems like beneath Zarnitsa. The minerals from the feeders like dunites also show the inflected or S-type REE patterns. From the earlier to later phases the TRE compositions became more evolved reflecting the evolution of protokimberlites. The wall rocks also often show the interaction with the more evolved melts and sometimes “cut” spectrums due to the dissolution some phases and repeated melting events
So we could suggest the joint evolution of the mantle column protokimberlites and megacrysts composition and type of kimberlites with the diamond grade. The mantle lithospheric base captured by the PK. The developing and rising protokimbelrites was followed by the crystallization of the diamonds in the gradient in $FO_2$ zone in wall rocks due to reductions of C -bearing fluids and carbonatites (> 1 QMF) on peridotites ((< -2 -5 QMF). The most intensive reactions are near the graphite – diamond boundary where protokimberlites are breaking and where most framesites are forming.
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