



Using deep seated minerals from new kimberlite field in Guinea for mantle reconstructions.

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New kimberlite field in Guinea 100 km SW from Bubudu contains large Dyke and placers in Lao river. Deep seated minerals from kimberlite concentrate and diamondiferous placers were compared to reconstruct the mantle sequences and to determine the possible sources of diamonds in the river. Two river placers in Lao and Bobeko differ in minerals. The kimberlite of the large dyke strengthening in several km quite differ from the Druzhba pipe (Bunudu) containing mainly ilmenite and rare pyropes. This is similar to Bobeko placer despite on the 100 distance. Dyke is rich in peridotites and coarse grained garnet pyroxenite xenoliths.

Using monomineral thermobarometry for Cpx (Nimis, Taylor, 2000; Ashchepkov, 2000) and garnet (Ashchepkov, Vishnyakova, 2004) and Sp (Ashchepkov, Vishnyakova, 2005) the mantle structure was determined beneath this region. Dyke clinopyroxenes (large Cr-Diopside and small low Cr-varieties both reflect the compositions of deep layers ~60 kbars and are rather cold ~1100-1200°C). Hot material corresponds to more rich in garnet peridotites. The upper part of mantle column is close to 35 mV/m² geotherm and in 60-50 kbar – is composed from the garnet peridotites while 40-50 kbar interval is more rich in spinels give colder TP estimates. Those corresponding to 40 kbar pyroxenite lens and upper Sp-Gar part and in the lithosphere basement reveal more HT conditions.

Garnets from all the localities are close lying mainly within the Iherzolite field to 10% Cr₂O₃ with deviation to harzburgites a 6% Cr₂O₃ what is typical for Dyke garnets.

Chromites from Dyke are Ti – low while Bobeko and especially Lao chromites define the ulvospinel enrichment. Diopsides differing from the Kaapvaal deep clinopyroxenites and drops on the Fe- Ti-Na-Al enrichment trend.

Ilmenites from three localities – define close trend reflecting the crystallization of megacrystalline cumulates in pre-eruption feeding system. The Dyke ilmenites are mainly from the deep part of the mantle section while the other are splitting on the deep and shallow parts. Babeko and Druzhba are similar in ilmenite variations while Lao and some Druzhba ilmenites are Mn – rich and less in Cr possibly reflecting the pass of the protokimberlite magma through the eclogite material.

Geochemistry. Most of Cr clinopyroxenes are typical for Ga- bearing peridotites with concave upward REE patterns. They are also are rich in Nb – Ba- U and extremely depleted in Zr . Zircon is abundant in concentrates what corresponds to large scale H₂O bearing metasomatism. Garnets are LREE-rich with MREE hamper typical for pyroxenites.

The mantle columns in this kimberlite field in Guinea abundant in eclogites with the high scale matasomatism and heating corresponding to the creation of ulvospinel trend was favorable for the growth of diamonds

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