



## Concentrates and mantle xenocrysts from the Lao river Guinea and reconstructions of the mantle structure

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The discovery of the kimberlite dykes in Guinea in the basin of the Lao river means finding of the new diamondiferous kimberlite field in the West Africa. It is locating 100 km SW from Bubudu and contains large dykes and placers in Lao river.

The kimberlite concentrate and diamondiferous placers are containing pyropes, chromites, Ilmenites and Cr diosides and low Cr- pyroxenes.

Two river placers in Lao and Bobeko and newly discovered dyke slightly differ in compositions of minerals. mainly in representatives of the minerals though their compositional trends are in general similar. The concentrates from and Druzhba pipe (Bunudu) contains mainly ilmenite and more are pyropes.

Garnets from all localities are close and belong mainly to the Iherzolite field to 10 wt%Cr<sub>2</sub>O<sub>3</sub>. But the dyke contains essential amount of harzburgitic garnets starting from 2 %wt Cr<sub>2</sub>O<sub>3</sub> and they became prevailing from 6 wt %Cr<sub>2</sub>O<sub>3</sub>. There are also megacrystic low – Cr pyropes in dyke concentrate.

Dyke is rich in peridotites and coarse grained garnet pyroxenite xenoliths which are ranging from the low Cr –to Cr –diopside type

Chromites from Dyke are Ti – low but are often Al rich. While chromites from Bobeko and especially Lao placers define the Cr- rich trend from 60 to 40 wt%Cr<sub>2</sub>O<sub>3</sub> and demonstrate the deviation to ulvospinel trends with increasing of Al<sub>2</sub>O<sub>3</sub> . Cr - Diopsides clinopyroxenites trace the Fe- Ti-Na-Al enrichment trend.

Ilmenites from three localities – define close trends splitting to the two intervals 60-40 wt% TiO<sub>2</sub> and 33-27 TiO<sub>2</sub> which are enriched in Cr<sub>2</sub>O<sub>3</sub> to 5wt% reflecting the crystallization of megacrystalline association at the lithosphere base and Ilm metasomatic vein stockwork near the Moho in pre-eruption feeding system. The Dyke ilmenites are Mg rich and mainly are captured from the deep part of the mantle section. Babeko and Druzhba localities are similar variations of ilmenite trends. Some ilmenites from Lao and Druzhba are Mn – rich and are less in Cr possibly reflecting the interaction protokimberlite magma with subducted material.

The calculated PTXFO<sub>2</sub> diagrams with monomineral methods (Ashchepkov et al ., 2010 -2014) the layered structure and presence of thick pyroxenite enriched lens in the middle part of mantle section which also contain harzburgite associations. He interval 4.5-5.5 GPa contains the Chromite bearing peridotites together with Ga-harburghites. Cr- low pyroxenites probably are associated with the ilmenites while some of them are more Fe rich and reflects the de –eclogitization. The typical deformed peridotite association were not detected but heating for the garnets is found along the magma feeder traced by ilmenites.

The TRE geochemistry show that 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 suggesting probably the preceding depletion with the H<sub>2</sub>O rich melts . Zircon is abundant in concentrates what corresponds to large scale H<sub>2</sub>O bearing metasomatism. Garnets demonstrates semi round HREE – high patterns with MREE hump typical for pyroxenites and small LREE- enrichment.

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