First data on new kimberlite field of the South-Eastern Guinea

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New kimberlite field called "Massadu field" has been found in 2005-2006 in the South-Eastern Guinea to the south of Matsenta city near Massadu village within concession area of SOREM Company. 16 kimberlite bodies in the form of dikes have been discovered by Russian geologists in 2005-2006 using only mineralogical method.

Massadu field occurs within Man craton just as other kimberlite fields of Guinea, Liberia, Sierra Leone and Mali. Archaean granite gneisses are kimberlite bearing rocks. By analogy with other kimberlite fields of this region (Skinner et al., 2004), the age of Massadu field kimberlites is supposed to be 140-145 Ma.

Dike is a basic form for Massadu field kimberlite bodies. Dikes are oriented E-N-E corresponding to K-4 trend (S. Haggerty), which is related to the development of the rift, split Gondwana in Mesozoic era. The main kimberlite controlling zone is aligned with Sierra Leone in W-S-W direction. In E-N-E direction it is oriented to Bunudu kimberlite field 90 km from Massadu field. The dike bearing zone is 600 m wide and 11 km in extension. It runs along Tovabo and Bobiko river valleys in line with K-4 trend direction.

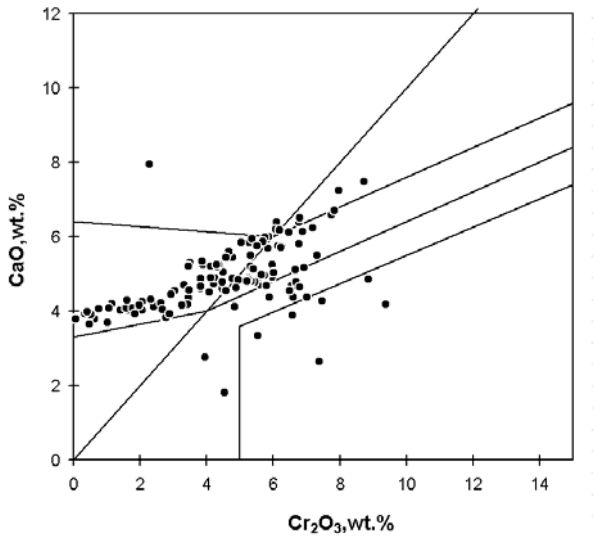

Fig.1 Dike Zuburumou, garnets

Dikes are overlapped by alluvium or laterite of 2-12 m thick. Dikes are closely spaced but differ in mineralogy. Majority of dikes are about 1 m in thickness but dike N1 is 4 m thick in the strip site, Bobiko-1 dike thickness is about 7 m in the place of discovery. Kimberlites of all dikes in the strip site are extremely weathered to a depth of 2-4 m (some are probably weathered strongly) and represent clay with kimberlite relic structure and indicator minerals. Indicator minerals, especially pyropes, also show evidence of chemical weathering. Owing to strong weathering, petrographic study of kimberlites has not been carried out yet. Xenoliths of host rocks are nearly absent and rounded xenoliths of low crust rocks with garnets are available. Mantle xenoliths are not found yet. Dikes can be of compound structure and include kimberlite of 2-3 intrusion phases differing in structure and mineralogy. Autoliths of one kimberlite variety in the other could be found.

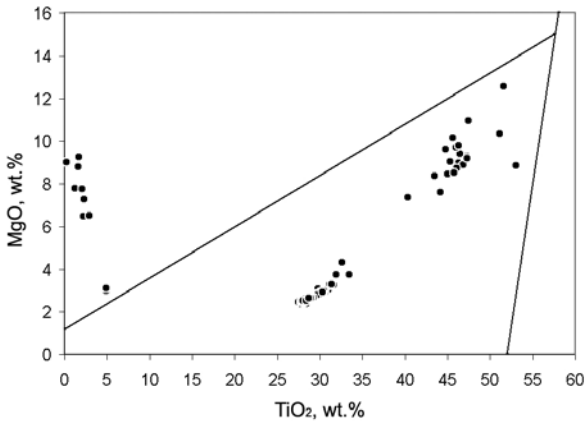

Fig.2 Dike Zuburumou, picroilmenites

The content of indicator minerals in majority of kimberlite bodies is rather high and reaches 10-12 kg/t, but this is probably due to kimberlite weathering and its volume decrease with retention of indicator minerals amount. Pyrope, ilmenite, chromite and mica are the main deep-seated minerals. Chemical composition of pyropes is common with diamond bearing kimberlites (fig 1). Ilmenite is of zonal structure: central part has high iron and manganese content, the outer zone is common with widespread in kimberlites manganese-rich picroilmenite (fig. 2). All chromespinelides are of the same type and unusual in

composition. Their morphology corresponds to mantle chromespinelides but composition demonstrates high titanium and iron role at variable chrome and low aluminum content (fig. 3).

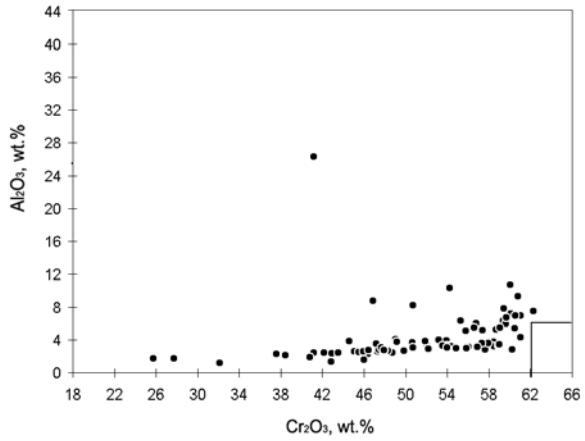

Fig. 3 Dike Zuburumou, chromites

Octahedrons diamonds with polycentric structure of faces are typical for the region. Nearly all diamonds are colorless and exhibit extraordinary glance. 50-70% of diamonds extracted from the placer over kimberlites are of gem quality. The diamond content in placer is not high and reaches 0,1 car/m3. This is mainly caused by minor size of erosive shear of kimberlites – 60-80m. This fact is supported by our analysis of sedimentogenesis from the moment of kimberlite intrusion at this territory. We suppose that more than kilometer erosive shear, suggested by M.Skinner (Skinner et al., 2004) for Man craton reasoning from the dike form of kimberlite bodies, is unreal. In this case very rich placers should be found in this region.

Thus one more diamondiferous kimberlite field with diamonds of gem quality has been found in the South-East of Guinea.

References

Skinner, E.M.W., Apter, D.B., Morelli, C., Smithson, N.K. Kimberlites of the Man craton, West Africa.// Lithos, 2004, 76, p. 233-259.