

Diamondiferous trend of the kimberlites in the Lunda region (Angola)

Zinchenko, V.¹, Felix J.T.², Francisco J.³

^{1, 2, 3} CATOCA Mining Project (SM CATOCA), felix@catoca.com

The first study of the relation between the diamond content of kimberlites and composition of the pyropes in NE of Angola, region Lunda (tectonic corridor Lucapa), was established by N. Sobolev and co-authors. These researchers determined the increase in the diamond content, proportionate to the growth of contents in kimberlite pyropes of chromium oxide – Cr_2O_3 [1].

We received the new data on the chemical composition of 630 grains of pyrop from kimberlites Kamafuka, Kamuanzanza, Txiuzo, Catoca and Luele, which let to clarify the trend of diamond content of the kimberlite pipes of this region. The diagram on Fig. 1 shows the dependence «the contents of diamonds, Ct/T – the contents of Cr_2O_3 , %», determined by the contents of pyropes from these kimberlites. The exponential character of this function is determined by the maximum definitions of Cr_2O_3 substance in kimberlite pyropes. This data ascertains the found out earlier trend of diamond content, the direction of which is shown by the arrow on Fig. 2.

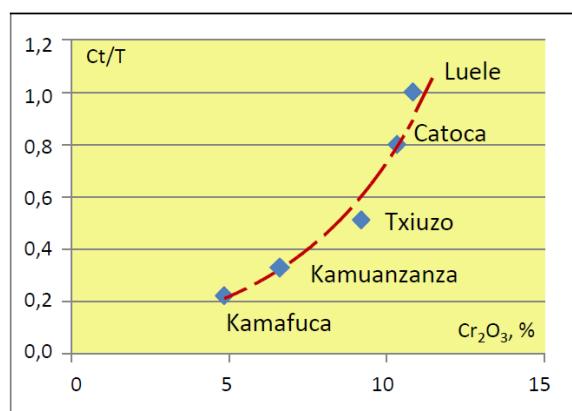


Figure 1: Dependence «content, Ct/T – Cr_2O_3 , %» in kimberlite pyropes of region Lunda [1, 5]

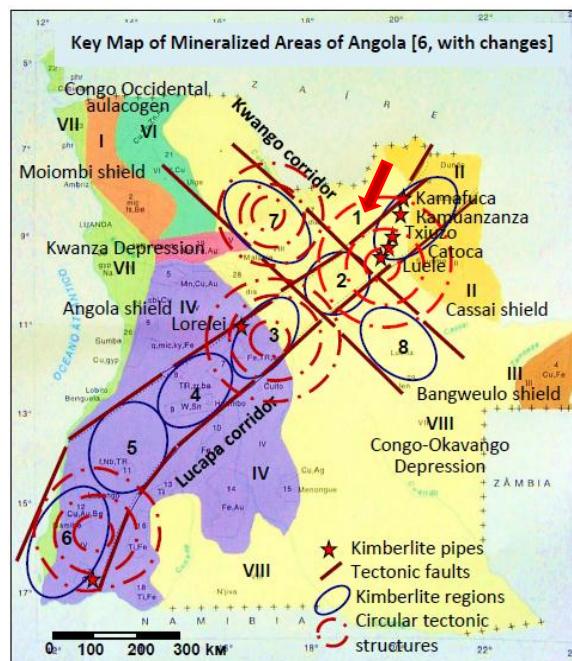


Figure 2: Diamondiferous trend of Lunda region (growth pipes potential – arrow) [2, 3, 5, 6]

The laying-out of the kimberlite pipes of Lunda region is under control of the massive circular structure of Saurimo (1) diameter 200 km, the growth of which is related to the mantel plume activation under Cassai Archean shield (II) in Early Cretaceous epoch [2, 3, 5, 6] (Fig. 2). In direction from NE to SW the average content of the diamonds in kimberlites increases 5 times – from 0,22 Ct/T (Kamafuka) to 1,10 Ct/T (Luele) (Fig. 1) [5].

Similar structures found in other kimberlite regions of Kukumbi (2), Kwanza (3), Cunene (6) and Kwango (7), in the center of which is also possible to detect highly diamondiferous kimberlite pipes, which can be localized based on the study of kimberlite pyropes Cr_2O_3 trend in these areas (Fig. 2).

References:

- [1] Sobolev N et al. (1990) Doklady Earth Sciences 315 (5): 1225-1229
- [2] Serokurov Y et al. (2004) Ores and Metals 5:5-8
- [3] Zinchenko V et al. (2015) *Diamantes dos kimberlitos do Nordeste de Angola* V.1: IMETRO-RENOME Publishers: 1-134
- [4] Nikitina I et al. (2014) Precambrian Research 249: 13-32
- [5] Zinchenko V (2015) *Diamond deposits from kimberlites of NE Angola* DR. Abstract: SPbU – RENOME Publishers: 1-34
- [6] Araujo A et al. (1998) *Mapa dos recursos minerais de Angola*: MGM – IGEO Publishers