

Kimberlite magmatism of the Ukraine.

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Finds of diamond and its genetic accessories in terrigenous complex of rocks made it possible to forecast regions of a probable manifestation of kimberlite magmatism at the territory of the Ukraine. The scientific forecast has been confirmed by a zone of joint of Priazovski (Near-Azov) mass with Donbass and polymictic breccias with fragments of kimberlites at the territory of the North Volyn in 70's.

During further prospecting work, already within the limits of the Priazovski mass three kimberlite pipes and dyke, conjugated with one of pipes, bedding in granitoids of Pre-Cambrian basement, have been discovered.

The Petrovskoe kimberlite body, with dimensions 280x150 m, is traced to the depth of 30 - 60 m and is underlied by sandy-carbonaceous rocks of Nikolaev suite in Middle Devonian. In connection with the fact, that during prospecting work incurred canals have not been established, it was supposed that kimberlite body had been broken away from its roots by geodynamical processes.

Kimberlites are characterized by porphyreous structure with two generations of olivine phenocrysts, size of which reaches 5 - 7 mm, and by rather high (up to some %) content of chloritized phlogopite. The groundmass is fine-grained and intensively carbonatized. The typical accessory minerals are chromespinels and pyrope. The peculiarity of kimberlites is sharp prevalence of chrome-spinels both over pyrope and another heavy minerals. According results of microprobe determinations the chrome content in chrome-spinels does not exceed 57 mass%. Among pyropes rose-violet varieties with chrome content up to 7,3 mass% prevail.

From pipe bodies, within the limits of Priazovski mass the Nadiya pipe with irregular-oval shape, with dimensions of 60 x 30 m, was found the first; the second one was the Yuzhnaya pipe, with complex amoeba-like shape, with dimensions of 150-300m; the third one was the Novolaspinskaya pipe, with an oval shape and dimensions of 40 - 100m. Dyke is conjugated with the Novopavlovskaya pipe and is traced on 300m in the west-south-western direction with general dip to south-south-east under the angle 70-80°. Tentative thickness of the dyke is 10-15 m.

Kimberlites break sub-alkaline granitoids of Middle Proterozoic eastern-Priazovski complex and they are overlapped only by Quaternary loams with thickness from 0,5 m in the central part of the first pipe to 8 - 11 m on the other kimberlite bodies. By their age, kimberlites belong to Fransian of Upper Devonian.

Rocks of pipes and dykes are composed by xenotuff breccias, eruptive breccia and massive kimberlites of porphyritic structure. In separate cases rather considerable contents of autoliths are observed. In all mentioned bodies large laths of chloritized and vermiculitized mica-phlogopite are developed.

Rocks have typical porphyric structure. Phenocrysts are represented by aggregates of epigenetic minerals on olivine grains with subidiomorphic and oval contours and on tabular grains of light coloured mica.

Size of phenocrysts is from 1 to 10 mm. Quantitatively they constitute up to 30 - 40% of a rock volume, with phlogopite and olivine ratio 1:3. As a whole, rocks are intensively serpentinitous, carbonatized and, in sections, saponitized. In upper horizons of all bodies kimberlites are decomposed up to clay-like, amorphous masses. The characteristic feature of considered kimberlites, in contradistinction to kimberlites of the Petrovskoe body, is sharp prevalence of picroilmenite in heavy fractions of rock, which often forms nodules with size of 4-5 cm. Many picroilmenite segregations have original granulated structure. Microprobe study of granules showed zonal change of their composition, with this, external zones are sharply enriched with manganese, and internal zones - with magnesium.

Diamond was not established in kimberlites by their preliminary sampling.

Finds of kimberlite fragments and pyrope eclogites in polymictic breccias of the Northern Volyn' are of the particular interest.

Breccias are confined to Kukhotkovolskaya and Serkhovskaya fault zones, subparallel, at the distance about 20 km, and are stretched in a latitudinal direction. By structural-textural features and by chemical composition three types of kimberlites are distinctly distinguished: magnophyric, finely-phyric and distinctly-phyric with high content of fine-dispersed ore matter, represented by magnetite.

In composition of kimberlites and breccias, containing them, all typical diamond accessories were established, including high-chrome pyropes with knorringite components up to 27%.

It should be noted the existence of accessory minerals aureoles in sedimentary rocks on areas, adjacent to breccia manifestations. In the base of Cenomanian deposits large (up to 3 - 4 mm) grains of pyropes and picroilmenites with surfaces typical of original kimberlites, and corresponding to diamond facies of a rock by composition. Thus, existence of original kimberlite bodies in a considered region does not give rise to doubts. A delay with their discovery is practically connected with lack of financing of corresponding work.

As a whole, there are all reasons to assert, that at the territory of the Ukraine kimberlite magmatism, including its diamondiferous facies, has been widely manifested itself.