

# INDICATOR MINERALS OF KIMBERLITIC MAGMATITES IN THE SEDIMENTARY COVER OF THE SIBERIAN PLATFORM

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Indicator minerals of kimberlitic magmatites or minerals - sputniks of diamond ( MSD ) are known in the different age deposits of the Phanerozoic cover of the Siberian platform and are wide- spread in the river alluvium.

The most ancient deposits with MSD of the known composition are the Lower Cambrian conglomerates of the Kesyusa and Tyuser suites in the Lower Lena and Olenyok . Pyropes of lherzolite paragenesis predominate among MSD in this level. The content of titaniferous ferrichrome- spinelides and picroilmenites is less. The presence of armalcolite is the characteristic feature of the Lower Cambrian level of MSD localization.

The Early Carboniferous ( theTurnaisian ) level of the MSD spreading is traced in Kyutyungda graben, on the Kharaulakh and Ebelyakh uplifts as well as in the Viluy sineclise. The chromic pyropes predominate everywhere except the Ebelyakh uplift. About 4-8% of the diamond association present among chromic pyropes in the Kyutyungda graben. Single grains of phlogopite and picroilmenite present also.

The picroilmenites, often abundant in chrome, predominate in the Turnaisian quartz conglomerates of the Ebelyakh uplift. The second mineral of MSD is Ti-ferrichrome-spinelide. The presence of chrome-spinelides, rich in chrome and titanium, is common there. Such varieties are typical for lamproites. Pyropes present there in the lesser quantity, have a wide spectrum of the composition and contain single grains of diamond paragenesis. The study of the Turnaisian deposits in the North of the Siberian platform shows that the potentially diamondiferous magmatites were wide-spread there and were being washed-out in the Early Carboniferous time.

The North part of Kharaulakh anticlinorium and the Suntar uplift can be marked as a new area of kimberlite magmatite localization. The Ebelyakh uplift can be considered as an area of diamondiferous magmatites of non- kimberlitic formation.

The Middle-Upper Carboniferous sediments are wide-spread on the territory of Aikhal and Malo-Botuobya districts. Different subdivisions of these sediments are MSD's primary or secondary collectors. In Aikhal district MSD are concentrated in the deposits of the Konyok and the Aikhal suites. In Malo-Botuobya district they are concentrated in the deposits of the Lapchan and the Botuobya suites. In the Lapchan suite pyropes predominate over picroilmenites, but in the Botuobya suite it is quite opposite. Constant presence of ferrimagnetic picroilmenites rich in chrome ( average content 3,5%  $\text{Cr}_2\text{O}_3$  ) is common for Malo- Botuobya area and next to the North territory. The content of the ferrimagnetic picroilmenites reaches there 15% of the heavy fraction weight. The hurricane concentration of pyropes and chrome-spinelides of the diamond association are fixed on separate sites. MSD had presented in the weathering crust before these minerals were deposited in the Middle-Upper Carboniferous rocks. The MSD transfer was insignificant from the primary sources.

Pyropes of Malo-Botuobya area are more various in the Early Permian deposits. There is an evidence that this level formed both at the expence of the wash-out of the

underlying rocks and of the kimberlitic pipes. In the South parts of the Olenyok and Ebelyakh uplifts MSD are marked in the macromeric sediments of the Early Permian. The study shows that the Early Permian sediments of different territories are distinguished both by the MSD content and by the spectra of these compositions. It is obvious that the conditions for the MSD concentration arose only in the local sites near to feeding sources. Middle-chromic pyropes and low-chromic picroilmenites are fixed in the Later Permian deposits ( the Boruloy suite ) of Malo-Botuobya area.

Only the Carnian level of the Triassic levels is well expressed and studied. It is traced along all the N.-E. rim of the Siberian platform. The Indian, the Ladinian and the Norian levels have insignificant development. Only ferrichrome-spinelides, rich in titanium, are fixed in the Indian sediments of the Boor river. In the Ladinian deposits Ti-ferri-chrome-spinelides, low-chrome picroilmenites and pyropes are present. The Norian level of the MSD concentration is marked on the Laptev coast, where Ti-ferrichrome-spinelides and picroilmenites with no chrome are found. The Carnian conglomerates consist of : 60% pebbles of the weathered magmatic rocks, pyropes of the lherzolite and dunite-harzburgite paragenesis. Chrome-spinelides among which titanium-ferrichrome varieties predominate are there in less quantity. It is characteristic that the concentrations of pyropes and grains of diamond paragenesis in them are timed only to the Carnian foot and they get depleted upwards the cut. Picroilmenites in the Carnian level are met only on the Lena right bank. The study of the Carnian deposits shows that there were a lot feeding sources on the wide territory of their spreading.

The Jurassic intermediate collectors of diamond and its sputniks are marked on the four levels: the Hettangian, the Pliensbachian, the Callovian and the Lower Volhzsky. The Hettangian diamondiferous and MSD'ferous deposits are spread in the South part of Malo-Botuobya district and have a variable thickness, small lenses and seams, bad sorting of material and reflect the composition of the fed kimberlitic bodies. On the greater part of the Lena-Anabar interfluvium the Jurassic cut begins with the Pliensbachian conglomerates, which contain pyropes, picroilmenites and chrome-spinelides, opaque minerals in summary predominating over pyropes. The grains of diamond paragenesis are found among pyropes on the Ebelyakh-Chimara and the Muna-Chimidican watersheds. The diamond association is absent everywhere among chrome-spinelides. In picroilmenites the low-titanium varieties predominate.

The Callovian basal conglomerates in the Prylana region contain: pyropes of lherzolite and eclogite paragenesis; high-magnesian picroilmenites with the content of  $\text{Cr}_2\text{O}_3$  to 3,9% ; chrome-picrotites with single grains of the diamond association. The good safety of the significant number of the MSD in these sediments allows to conclude that the greatest part of them got into the deposits from the primary but not from the secondary sources.

The Lower Volhzsky conglomerates stretched along the Pryverkhoyan basin and contain pyropes of lherzolite and eclogite paragenesis with no the diamond association. Locally they are accompanied by low-chrome non-titanium spinelides.

The Cretaceous deposits in the N.-E. of the Siberian platform are present by unfavourable facies for the accumulation of the diamondiferous material. In the relic sediments of the Ebelyakh drainage-basin the wide range of the picroilmenites and single grains of the titanium-chrome-spinelides are marked. It is obvious in the Cretaceous time the MSD could be accumulated only in the narrow-local depressions near to the sources.

The Neogene ( the Neogene - Early Quarternary ) level is fixed in the Prylena region, on the Udzah uplift, on the Markha left bank ( the Kononchan - Ikke - Teryut-Tomakh watershed). In the Markha drainage-basin MSD are presented only with the pyropes containing 8-10% of the diamond paragenesis grains. In the Udzah uplift the deposits of this age contain picroilmenites of the wide spectrum composition and high-titanium ferrichrome-spinelides. Such MSD are wide-spread in the Middle-Upper Quarternary sediments of the North part of the Anabar - Olenyok interfluve as well as on the Neogene level of the Udzah uplift.

The wide-spreading of the monotonous MSD association ( Ti-ferrichrome-spinelides and picroilmenites of various compositions with the absolute absence of pyropes ) testifies to the non-kimberlitic genesis of this association. The alkali-picrites which have the wide-spreading within the given territory can be its sources. These picrites contain similar spinelides and picroilmenites in their composition.