INDICATOR MINERALS OF CL-25 KIMBERLITE PIPE, SLAVE CRATON, NORTH-WEST TERRITORIES, CANADA.

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CL-25 kimberlite pipe was discovered in September of 1994 in the territory of the Slave Craton, North West Territories of Canada. This pipe represents a new kimberlite cluster located approximately 100 km to the South from the well known Lac de Gras kimberlite field and related with regional fault zone of south-west - north-east direction containing a number of doleritic dykes sharply reflected in the magnetic field and subparallel to the MacDonald s fault zone which delimits the Slave Craton to the South-East.

CL-25 pipe is composed by intensively altered kimberlite breccia which is highly enriched with xenogenic material represented mainly by different types of metamorphic and magmatic rocks of the crystalline shield. High amount of xenogenic and contaminated material in this breccia is reflected in chemical composition of this rock which is significantly different if compare with composition of classic kimberlite: SiO_2=44.3-45.5wt.%; TiO_2=0.93-1.82wt.%; Al_2O_3=7.17-8.46wt.%; Fe as Fe_2O_3=6.40 9.47wt.%; MnO=0.11-0.13wt.%; MgO=17.6-21.4wt.%; CaO=1.79-3.12wt.5; Na_2O=0.04-0.48wt.%; K_2O=86-2.25wt.%; P_2O_5=0.19-0.22wt.%; LOI=11.5-15.0.

Analysis of specially selected material of this breccia without the visible fragments of xenogenic matter shows some differences in composition if compare with data presented above and more similar to the kimberlite composition: SiO_2=39.5wt.%; TiO_2=1.02wt.%; Al_2O_3=4.44wt.%; Fe_2O_3=6.23wt.%; MnO=0.12wt.%; MgO=23.9wt.%; CaO=5.16wt.%; Na_2O=0.02wt.%; K_2O=1.19wt.%; P_2O_5=0.27wt.%; LOI=18.22.

Very interesting composition has the rock of the dyke which was drilled in the body of CL-25 pipe: SiO_2=5.01wt.%; TiO_2=1.47wt.%; Al_2O_3=2.74wt.%; Fe_2O_3=4.08wt.%; MnO=0.20wt.%; MgO=0.21.9wt.%; CaO=24.9wt.%; Na_2O<0.01wt.%; K_2O=0.12wt.%; P_2O_5=0.21wt.%; LOI=39.3wt.%. This altered rock has not visible xenogenic material.

We have studied in detail the composition of garnets, picroilmenites, chromespinels and clinopyroxenes from the CL-25 kimberlite pipe. Garnets are represented by: a) chrome-pyropes of different parageneses; b) garnets from disintegrated rocks of crust; c) garnets of different types of eclogites. Cr-pyropes include: predominate pyropes of lherzolite paragenesis (Cr_2O_3=0.2-13.3wt.%, CaO=3.5-7.8wt.%); subcalcic Cr-pyrope related with 1) harzburgite paragenesis (Cr_2O_3=3.6-14.2wt.%, CaO=2.8-5.7wt.% and very low admixtures of Ti, Na and andradite molecule), 2) metasomatized and Na-enriched lherzolite paragenesis (relatively high admixtures of Na_2O - up to 0.18wt.%, TiO_2 - up to 0.61wt.% and

significant content of Fe^{3+} in crystallochemical formula - up to 0.3 on 12 atoms of O).

Pyropes of wherlite paragenesis have higher content of CaO (up to 12wt.%) than lherzolite ones. There is also relatively high propotion of pyropes of megacrystal suite: FeO=9.5-13.7wt.%; TiO_2=0.4-1.1wt.%; Na_2O=0.06-0.17wt.%; Cr_2O_3=0.2-1.9wt.%.

Eclogite garnets have variable Mg#(32-73), CaO=6.2-16.9wt.%; Na_2O=0.01-0.18wt.%.

Ilmenites are represented by picroilmenites with wide ranges in content of MgO (3.4-12.4wt.%); TiO_2 (29.4-52.6wt.%); Cr_2O_3 (0.3-6.3wt.%) and hematite molecula (7-31 mol%). Al_2O_3 content range is typical for kimberlite picroilmenites: 0.3-0.9wt.%.

Chromespinels have wide intervals in content of Cr_2O_3 (23.1-63.4wt.%); Al_2O_3 (0.3-32.4wt.%; TiO_2 (0.01-4.1wt.%); MgO (5.2-18.2wt.%). There is relatively high proportion of chromites with low MgO content (5.2-9.5wt.% and high content of magnetite molecula (19-37 mol%.

Clinopyroxenes in the CL-25 pipe are typical chromediopsides having 1.1-3.2wt.% Cr_2O_3, 1.3-2.7 wt.% Na_2O and low Al^{IV}. We have not found any subcalcic clinopyroxene among 23 grains analyzed.

Thus the peculiarities of the CL-25 pipe indicator minerals composition as well as features of structures and composition of breccia of this pipe suggest that CL-25 pipe belongs to the kimberlite affinity. Its melts have sampled relatively thick cross section of lithosphere beginning from levels corresponded to the depth of the diamond stability field.