

INCLUSIONS OF PLUTONIC MINERALS IN DIAMONDS FROM KIMBERLITE ROCKS OF THE NORTHERN EAST-EUROPEAN PLATFORM.

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According to data of visual diagnosis it has been revealed, that diamonds with plutonic minerals inclusions from kimberlite pipes of the East-European platform (EEP) amount to 0,6 - 2% from the whole quantity of crystals. Inclusions of olivine and coesite are observed in diamonds of all pipes the most often; the quantity of inclusions of chrome-spinellid is also increased, garnets and pyroxenes occur more seldom.

The most minerals-inclusions are characteristic of a crystallographic cut as polyhedrons, that imparted them a rounded shape.

Inclusions have been analysed with X-ray scanning spectral microanalyser "Kamebax-Microbeam", Cameca (acceleration voltage 15 kW, 15mA).

Minerals of ultrabasic paragenesis. The composition of chromous garnet, chrome-spinellid, olivine, clinopyroxene and orthopyroxene have been studied.

Among five analysed grains of chromous garnet four grains belong to high-chromous knorringite-bearing variety, in which the content of Cr_2O_3 ranges from 10 to 13%, CaO - from 2,4 to 5,4%, ferruginousness of garnets is low and ranges from 11,9 to 15,3%. Besides recorded pyropes, garnet with low content of Cr_2O_3 - 3% and CaO - 2,9% and low ferruginousness ($f \approx 12\%$) has been established.

As for known chrome-spinellid - inclusions, once more analysed 14 grains are characteristic of low ferruginousness from 23 to 38 and of high chromousness from 83 to 90%. Their content of Cr_2O_3 ranges from 64 to 90%, moreover, in about half of chromites the amount of Cr_2O_3 is higher, than 67%, that in inclusions of chromites from Yakutiya diamonds occurs very seldom and it is a regional typomorphic feature. The content of TiO_2 in chrome-spinellids ranges from hundredth parts of percent to 0,26%.

All five analysed olivine grains have similar composition and are characteristic of low ferruginousness of 6,6 to 7,9%.

Impurity of Cr_2O_3 was found in three olivine inclusions, moreover, in olivine, in its turn, was included in chrome-spinellid, the content of Cr_2O_3 is extremely high -0,45%. In two olivines the impurity of NiO is registered.

The aggregate of chrome-diopside and enstatite, found in one of diamonds, is of essential interest. Chrome-diopside is characteristic of increased magnesia content $\text{Ca}/\text{Ca}+\text{Mg} = 43,2$, that in paragenesis with enstatite affirms high temperature of equilibrium.

Inclusion of chromous pyroxene, having emerald-green colour, is characteristic of increased content of Cr_2O_3 - 7,8% simultaneously with anomalously high Na_2O - 5,9%. Combination of chrome and sodium in clinopyroxenes leads to arising of rare component NaCr_2O_6 - ureyite, which in pure state occurs only in meteorites. The content 8% of Cr_2O_3 corresponds to 15% of ureyite component. Pyroxenes with such composition as inclusions in diamonds have not been fixed earlier.

Eclogitic paragenesis. From minerals of a given paragenesis garnet, clinopyroxene and coesite have been analysed.

Garnet (11 analyses) is represented by pyrope-almandine variety, which ferruginousness is 42 - 55%. The content of Ca-component is 20 - 32%, and in two samples value of Ca-component is particularly high -37 and 39%, respectively. In two diamonds, together with orange-coloured garnets, colourless inclusions of coesite were distinguished and analysed.

The compositions of two omphacite inclusions are identical. Their content of jadeitic mineral is high (about 50%), impurity of K_2O is 0,80%. According to peculiarities of chemical composition they belong to the most rich in jadeite pyroxenes, known among inclusions in diamonds. Both by content of jadeite component and content of impurity K_2O , the studied pyroxenes approach pyroxenes from diamonds of Argail lamproitic pipe in the Western Australia.

Thus, the cited data show, that on a level with typomorphic features, common for a given complex of minerals of all regions, inclusions in diamonds of EEP are characterized by a series of regional features.