STRUCTURE AND PECULIARITIES OF FORMATION THE KUMDYKOLSKOYE DEPOSIT.

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Discovery of diamond deposit in the metamorphic complex of the Kokchetav crystalline massif in northern Kazkhstan widen our views on formation diamonds in nature. For reliable substantiation of theoretic and practical conclusions on diamondbeariness metamorphic rocks in other regions it is demanded realization of complex researches on known objects. At present time the Kumdykolskoye deposit of technic diamonds is most studied object of new genetic type. It allow to use its in the capacity of standard object. Many questions concerning of mineralogical, petrological and petrohemical peculiarities diamondiferous rocks were wide published in scientific literature (Sobolev et al., 1989, 1990; Ekimova et al., 1992; Lavrova, 1991). To a lesser degree attention was paid to structure aspects diamondbearing metamorphic complexes. We consider these questions on example of the Kumdykolskoye microdiamond deposit.

The Kumdykolskoye deposit and series diamond manifestations are located within metamorphic rocks of the Zerendinskaya Series of the Kokchetav massif (Northern Kazakhstan). These rocks compose massif basement.

The ore-bearing formations within the deposit are deformed into north-easterly striking linear folds. The deposit is located in the side of a north-westly tilted fold, steeply dipping southeastwards. Host rocks, referring to the kumdykolskaya suite, are represented by interbedded garnet-biotite, biotite-quartz and biotite-tourmaline-quartz gneisses, which contain calciphyre seams, and tectonic lenses of eclogites and garnet-pyroxene rocks.

The main diamond concentrations are in the ore zone singled out within the deposit. Beyond the zone's boundaries, diamonds in rocks are sparsed sporadically. The ore zone is traced along the NE-SW strike for more then 1000 m. It is about 200 m wide on northeastern flank and about 50 m - on sourth-western flank. On the north-west, the ore zone boundary coincides with marginal part of a garnet-bearing leucocratic granite body. On the sourth-east, it is cofined by migmatites.

The high extent of dislocation, appearing as a result of repeated tectonic deformations together with the development of metasomatic processes, are characteristic features of the ore zone.

North-easterly striking tectonic dislocations, reflecting the ore-zone location at the fault of the same trend, are major elements of the ore-zone's structure. A linear structure of the Kumdykolskoye deposit is good displayed on plan and vertical sections (Petchnikov et al., 1993). They show up as linear stripes of aposubstrate hydrothermal metasomatites. Some sites of blastomylonites and kataclasites which are found within these stripes, seem to be the markers of tectonic joints. These dislocations are demonstrated to form a single zone of deformations, involving some lenses and blocks of slightly deformed rocks.

In tectonic plan ore-zone present the dextral strike-slip shear

zone that includes the high-strain rocks. A specific regularity is marked for the diamonds distribution within the ore zone. Some linearly extended high-concentration zones are singled out, separated by the depleted or diamondfree sites. The latter appear as slightly dislocated lenses and blocks of unchanged metamorphic rocks and injection granites. Linear high-concentration anomalies, following a north-easterly striking system of dislocations, occur all over the explored part of the deposit.

Studies performed at the reference cross-sections oriented across diamond-enriched zones within the most widely developed gneiss substrate showed that diamond-free and diamond-depleted garnet-biotite gneisses are almost free of graphite. As the diamond-enriched zones are approached, the rocks demonstrate changes in their composition. Diamond-enriched apogneiss metasomatites show up as stripe rocks with blastomylonite and blastokataclasite structures. These structures characterize the deep levels of the strike-slip deformation zones.

The studies on isotopic composition of diamond and accompanying graphite carbon from different types of rocks indicate that it varies in each rock group. Diamond is enriched in ^{13}C isotope relative to graphite. Isotopic composition of diamond and graphite carbon shows variation from one group to another. Diamond and graphite of pyroxene-carbonaceous rocks appear to be heavier in isotopic composition than those of apogneiss metasomatites. On the average the difference $\delta^{13}C$ is 5.0 % (Petchnikov, 1993)

The enrichment of graphite and diamond of carbonaceous rocks in carbon's heavy isotope might be simply and strongly explained by the isotope fractionation from the rocks carbonate during the crystallization of these minerals, provided it took place in situ.

So, analysis of the geological structure theKumdykolskoye deposit show that diamondbeariness was laid on adjacent country metamorphic rocks. The results of carbon isotopic fractionation in the deposit's graphite and diamond agree well the date on synthesis of diamond and graphite from the gaseous phase.

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