ABOUT THE GENESIS OF THE LAMPROD DIES AND THE COMPOSITION OF THE EARTH'S CRUSH IN THE KOYTOSH MINING AREA

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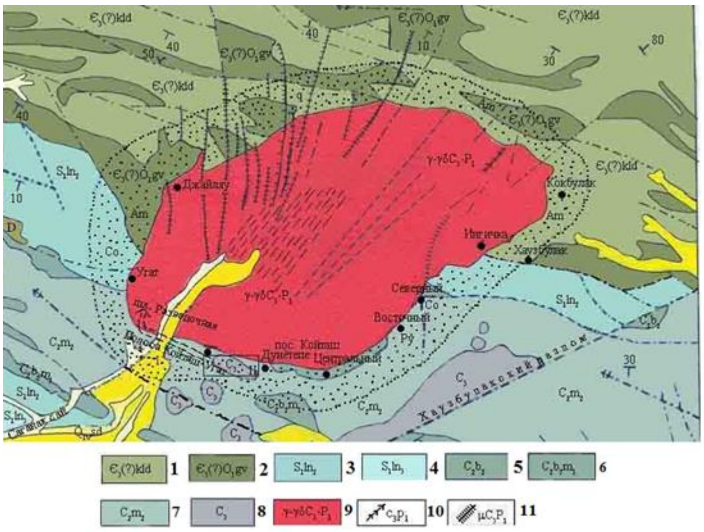
Annotation: *The article provides an analysis of the genesis and composition of the earth's crust based on geophysical and petrological data in the Koytash ore field on the southern slopes of the Nurata Nurata. Data on surface levels and nomenclature of K1, K2 and Mokho surfaces of the ore area determined on the basis of Karabekaul-Koytash GSZ profiles are proven by petrological evidence. It has been concluded that the occurrence of more gabbroid xenoliths and less pyroxenite additions in the composition of the most common dyke in the ore field indicates that the dyke was formed in the lower part of the crust, around the Moho boundary zone.*

Key words: *Dyke genesis, ore field, geophysical and petrological data, gabbroid xenoliths, Moho boundary zone.*

It is known that basic dykes are very common in the Koytash mining area, which in the west and north of the mine area break the Koytash intrusive rocks and Cambrian Ordovician siltstone and chalk suite deposits (Fig. 1).



1st kaltadavan suite (Ê3(?)kld). Quartz-mica shales and mica-quartz siltstones, siltstones and sandstones; 2nd limestone suite (Ê3(?)-O1gv), quartz-chlorite-sericite, sericite-quartz-argillite shales in the lower part of limestones. Limestone siltstone shales. Limestone siltstones and sandstones; 3.4 - S1ln2-S1ln3. Stratification of quartz-sericite shales, siltstones, sandstones, limestones, siliceous rocks; 5-8 - C2b2. Limestones, C2m1. Argillitic limestones, C2m2. Siltstones, sandstones, siltstones with limestone, argillites, C3. Conglomerates, sandstones, argillites; 9-Koytash granodiorites; 10-Spessartites (C3-P1); 11-melanocratic diorite-porphyrites (S3-R1).

Figure 1. Schematic geological map of Koytash mining area
(E.V. Chukarov et al., 1968, with amendments by M.B. Ashirov, 2008). M.1:100000.

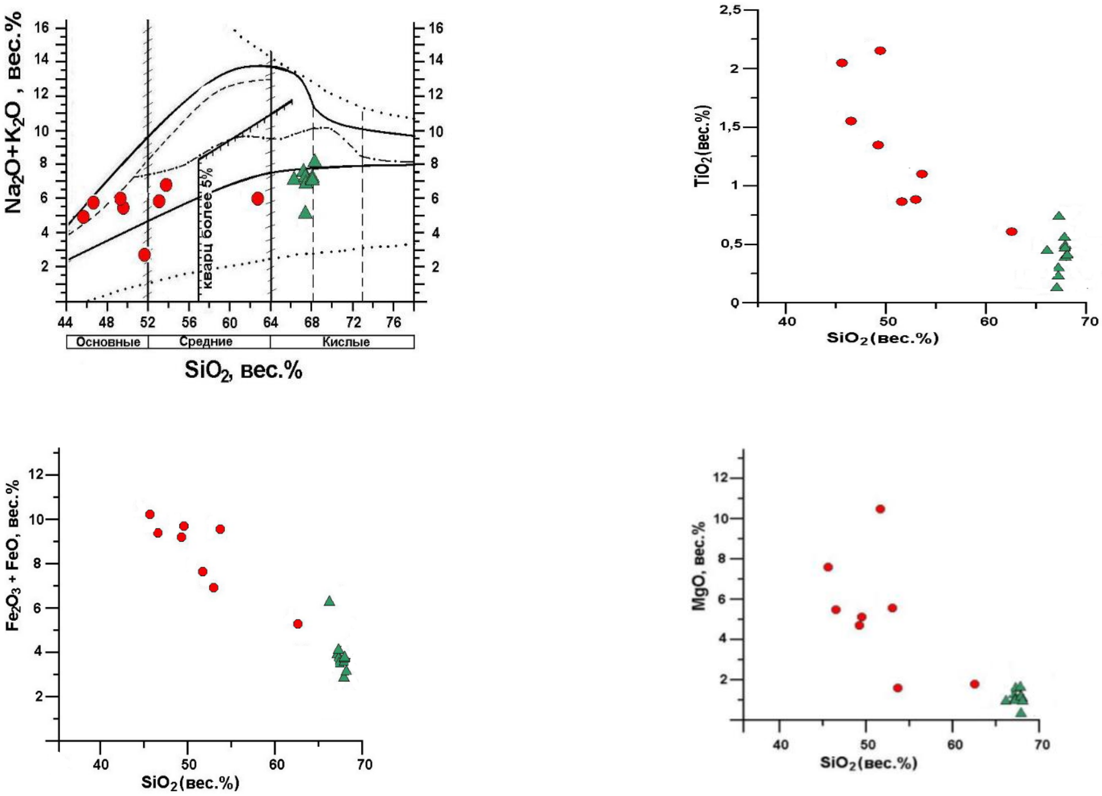
The composition of the dykes mainly consists of diorite-porphyrite and spessartites. In the scientific works of A. M. Musaev, these rocks were called andesibasalt (1984, 1985, 1990). To date, the composition of these dykes is being studied at the microprobe at the Institute of Geology and Geophysics named after H. M. Abdullaev. Preliminary studies show that their structure is very complex, in some places it is a lamprophyric structure, and in others it is close to a diabase, porphyry, even ophitic structure. Very common, amphiboles are close in composition to kersutite-barkewickite, but they are very close in composition both in the main mass and in porphyry inclusions. In this context, it is more abstract to call them xenocrysts.

In this article, the chemical composition of dykes and intrusive rocks was analyzed in diagnostic diagrams, and geophysical and petrological information about the composition of the earth's crust was presented.

As can be seen from the diagram of O.A. Bogatikov et al. [2], the granodiorites of the Koytosh intrusive lie in the normal alkaline area, while the basic dykes occupy medium alkaline areas and their composition is completely different, which means that there is no genetic connection between the dykes and the intrusive (Fig. 2). They differ not only in composition, but also dikes cut ore bodies (Fig. 3). In addition, it also differs in absolute age. Koytash granodiorites belong to the Permian period (264+2 million years ago), and diorite porphyrites belong to the Triassic period (247+2 million years ago) (Akhundjanov, 2016).

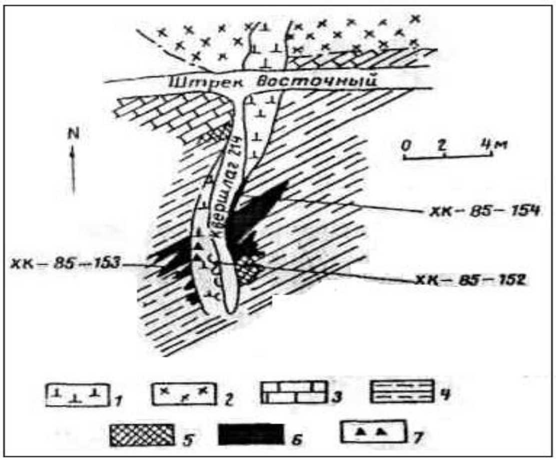
When comparing the values of TiO2 to SiO2, the content of TiO2 in dykes ranges from 0.61-2.15%, and in granodiorites from 0.14-0.75%. A similar situation is observed in the remaining iron, magnesium and other oxides (Fig. 2).

In general, these dykes can be considered from the genetic point of view as products of inner plate magmatism, because they contain deep xenoliths of different composition [1,3-5, 9-12].



Explanation. Round-shaped base dykes, triangular-shaped granodiorites of Koytash intrusive

Figure 2. The position of chemical composition of Koytash granodiorites and lamprophyre dykes in SiO2 – (Na2O+K2O), AFM SiO2-TiO2 and SiO2 – (Fe2O3+FeO) diagrams.



1-diorite porphyrite (R1), 2-granodiorite (S3-R1), 3-marbled limestone (S2), 4-rogovik (S2), 5-skarns and low-sulphide skarn rocks, 6-skarn-sulphide (pyrrotine-chalcopyrite- pyrite) body, 7-ore xenoliths in diorite porphyrite.

Figure 3. Relationship of Koytash granitoids, basic dykes and ore bodies (Koytash-Ugat zone, horizon 700 m). (according to Khamraboev et al., 1993)

The structure and composition of the earth's crust. The structure of the earth's crust and upper mantle of the Nurota region has been studied very shallowly using geophysical methods, there is a single "Qorabekaul-Koytash" GSZ profile [6]. In addition, the "Romitan-Darbazatau" GSZ-MOVZ profile passed from the north-west of the region [7,8]. According to this profile, the structure of Darbozatog is complex and consists of 3 blocks of different density and earth cracks. At a depth of 12-19 km, a body with density sef= 2.9 g/cm3 and longitudinal wave speed Vef= 2.68 km/s was identified. The Moho surface is observed at a depth of 42-45 km [9].

The total length of the Karabekaul-Koytash profile is 323 km, it crosses the Amudarya and Zarafshan intermountain depressions and the southern slope of the Northern Nurota (Fig. 4). The profile is characterized by different varying velocity-dimensional properties of the layers. In particular, in the southwest of the profile, the Moho surface lies at a depth of 45 km, decreases towards Nurota and reaches 40-41 km. The boundaries of K1 and K2 are conformal to the Moho surface and lie at depths of 17-21 and 30-32 km. The results of the profile are presented in Table 2.

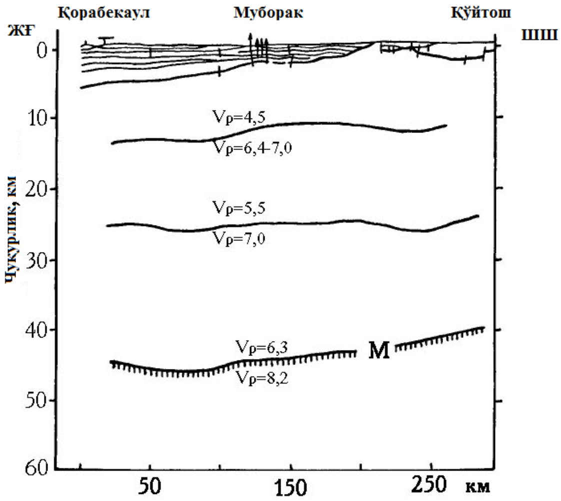
Table 2

Results of the Karabekaul-Koytosh GSZ profile (Ergashev et al., 1988)

Чуқурлик, км	Бўйлама тўлқинлар тезлиги, км/сек	Қатламлар қалинлиги, км
0-6,6	5,3-5,5	6,0-6,5
6,6-8,0	6,15-6,45	1,5
8,0-12,4	5,3-5,5	4,5
12,4-16,3	6,7-6,9	4,0
16,3-26,0	5,9-6,0	10,0

26,0-36,2	6,7	10,2
36,2-46,0	7,2-7,3	10,0
46,0-53,0	7,7	7,0
53,0	**Мохо 7,7-8,4**	

As can be seen from Figure 4 and Table 2, "high-speed" layers (Vp=6.15-6.45 and 6.8-6.9 km/sec) are observed against the background of the general "low-speed" cross-section, especially such "norms" It is characteristic of the Chotkal-Kurama region.



JG'-south-west, ShSh-north-east.

Figure 4. Seismic section of the earth's crust along the Karabekaul-Koytosh GSZ profile (Ergeshov et al., 1988).

T. E. Ergashev (1988) revealed that there are high-velocity layers in the geophysical fields at a depth of 4-6 km and 10-15 km in the upper part of the earth's crust, and they are made of gabbro-norite, diorite and plagiogranite (r=2.7-2.9 g/cm3, nr=6.45-6.9 km/s) was stated by I.Khamrabaev. Similarly, high-speed layers were identified by I.P. Sidorova and D.M. Dadaeva at a depth of 30-43 km.

The composition of such "abnormalities" determined by the above geophysical methods can be determined directly using xenoliths found in igneous rocks [9].

Xenoliths in the basic dykes of the Koytash mine field. It is known that the composition of the earth's crust and upper mantle is determined using xenoliths inside igneous rocks. In the Nurota area, xenoliths were studied in sour intrusive rocks and dykes of different compositions (I.V. Mushkin, I.K. Khamrabaev, E.P. Izokh, Z.A. Yudalevich, I.M. Isamukhamedov, R. Akhundjanov, A. M. Musaev, Kh. D. Ishbaev, A. V. Golovko, F. K. Divaev, etc.).

Below is a brief summary of the main types of xenoliths:

Ultramafites are found mainly in the form of crushed fragments, among which lertzolites consisting of olivine, clinopyroxene, sometimes hypersthene, amphibole, biotite and chromspinelides are distinguished (Khamrabaev, 1990). Usually they are found in a small rounded shape, which means that they were brought out from a great depth. Olivine is composed of chrysol and clinopyroxene is diopside.

Clinopyroxenite xenolith was found for the first time in basic dykes near the village of Ugat (Ishbaev, Shukurov, 2014). The size is 4x6 cm, and the side stands out in a dark green color on a rock gray background. The type of clinopyroxene is augite, close to titanaugite. A characteristic feature is that, in addition to pyroxene, there is also a titanium rgovaya obmanka. The amount of titanium oxide in the chemical composition is equal to 3.17%. Anorthosite, plagioclasite are rarely found in diorite porphyrites in the Koytash mining area with a cross-sectional size of 2-3 cm. They are gray, fine-grained, and have a faint porphyry structure. It contains plagioclase-bitovnite (An65-75, 90%), chloritized amphibole (2-3%), potassium feldspar (5-6%) and ore, accessory minerals (~1%).

Horned gabbro, gabbro-norites are very common in diorite porphyrites and have a dark gray to gray fine granular texture of 8x4 cm. It contains plagioclase (50-55%), amphibole and zonal type of basaltic hornblende (40-45%). In some places, hornblende gabbro passes into hornblende (40-50% amphibole and 30-35% plagiclase).

Kersutite gabbro is rare and is typically a 5x7 cm green-gray medium-grained rock containing basic plagioclase, pyroxene, and kersutite. Gabbroophitic texture, sometimes poikiloophitic.

Charnockite is found in a pale gray isometric xenolith dyke measuring 5 cm across. It contains plagioclase - 50-55%, potassium feldspar - 20%, quartz - 10%, monocline - 5% and rhombic pyroxene - 2%, biotite - 3%, magnetite, ilmenite, sphene and apatite - 3%. has a heterogranoblastic structure.

The diorite porphyrite dyke contains numerous kersutitic amphibole, pyrope-almandine garnet and basic plagioclase megacrysts.

Therefore, many xenoliths are found around the diorite-porphyrite dykes: depth and basement xenoliths (metaultramaphites, gabbroides, pyroxenites, hornblendites, gabbro-anorthosite, basalts, bipyroxene and garnet-pyroxene gneisses, plagiogneisses, granulites, charnockites, amphibole, garnet, plagioclase megacrysts and b.), xenoliths (granitoids, quartzites, sandstones, siltstones, crystalline shales, marbles, etc.) taken from the place of formation of dykes [9].

The composition of the upper mantle of the Northern Nurota area can be predicted by the superbasic rocks found in the Triassic alkaline basaltoids, gabbroids and lamprophyres around Hayatboshi peak [4, 9, 12].

The depth structure of the Koytash mining area of the Nurota region is characterized by the following features: a) the thickness of the earth's crust is relatively short (45 km); b) the internal structure of the earth's crust is different, that is, layers of different densities and speeds are repeated; v) positive magnetic and gravitational anomalies (especially Osmonsoi-Koratash zone of Northern Nurota); g) The lower layer of the Earth's crust consists of kersutite-augite gabbro, plagioclasite, charnockite and glimmerite, which are considered as re-formed products of upper mantle pyroxenites [12].

In general, the presence of more gabbroid xenoliths and less pyroxenite inclusions in basal dykes suggests that the dykes formed in the lower crust around the Moho boundary zone.

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