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The Study of the Location, Amount, and Composition of the Rudal Composition of The Alichalyk Field, as Well as the Justification of the Experimental Method and Research Objects of the Obtained Samples

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Abstract

This article examines the location and quantities of the research object and its composition. The object is the Olchali mine, located in the Namangan region. The cherry plot is located on the northeastern side of the Kurama mountain range, in the lower reaches of the Govasai River. A special methodology for the technological study of mining ore has been developed based on many years of research. The study involved a mineralogical-petrographic study of the material composition and textural characteristics of all types of rocks, the degree of metasomatic changes, the identification of ore-bearing mineral associations, and their interrelationships.

Keywords: Category R1, shtocwerk, pyrite, chalcopyrite, gabbro, gold, silver, copper, extrapolation, Rocks, metasomatic, subvolcanic, syenito-diorites, diabase porphyrites, quartz porphyry.

Introduction

The Alichalyk field, located in the Namangan region, has been discovered. The cherry plot is located on the northeastern side of the Kurama mountain range, in the lower reaches of the Govasai River. The Alichalyk section is located in the gabbro massif, consisting of diabase porphyry, syenite-diorite, multi-subvolcanic rocks of quartz porphyry, and fragmented rocks of the complex gabbro-diorite-monzonite series.

The marginal parts of the massif are surrounded by subvolcanic rocks containing diabase porphyrite and quartz porphyrite. The northwestern quartz vein is located in the central part of the

study area. The zone extends in the direction of (320-3300) with an angle of 60-800 to the east. [2]

The quartz vein was initially cut through borehole wells during copper exploration (2012-2017). During the exploration work, ore body No. 1 was identified in the Northwest zone, and the predicted resources of category R1 were calculated as follows: ore - 281.7 thousand tons, gold - 1211.0 kg, average gold content - 4.3 g/t. As a result of the work done, the predictive resources of the R1 type were transferred to the reserve of the C1 type. The length of the ore body is from 55 to 135 meters in direction, from 40 to 77 meters in extent, and from 0.66 to 4.2 meters in thickness. The copper ore stockwork is located in the northern wing of the section.

Seven drilling wells were drilled on profiles 8-8-19 with an interval of 75-160 meters for the purpose of studying the copper ore shtocwerk. The drilling wells crossed pyrite and chalcopyrite, mineralized gabbro rocks. Copper mineralization ranges from 0.2% to 0.33%, and thickness from 11.0 m to 131.1 m. The copper ore shtocwerk extends 575 meters north to south and 430 meters east to west.[1-2]

Based on the results of the work performed on the Alichalyk section, industrial reserves in the C1 category of ore body No. 1 of the Northwest zone were calculated as follows: ore - 28.34 thousand tons, gold - 161.6 kg, average gold content is 5.7 g/t, silver - 0.16 tons, average silver content is 5.6 g/t, and reserves below the industrial level in the C1 category are as follows: ore - 10.95 thousand tons, gold - 56.9 kg, average gold content is 5.2 g/t, silver - 0.03 tons, average silver content.

Furthermore, on the copper ore stockwork at the Alichalyk junction, the calculated resource of the R1 class was calculated as follows: ore - 14355.88 thousand tons, copper - 67.47 thousand tons, average copper content - 0.47%, molybdenum - 430.7 tons, average molybdenum content - 0.003%.

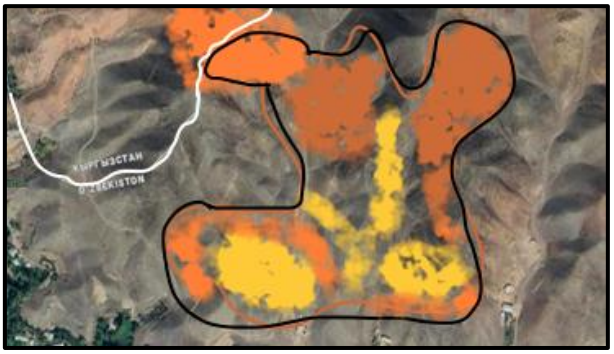

Figure 1. Aerial view of the " Alchaly***" section.***

The copper ore stockwork is located in the northern wing of the section. Copper mineralization ranges from 0.2% to 0.33%, and thickness from 11.0 m to 131.1 m. The copper ore stockwork extends 575 meters from north to south and 430 meters from east to west.

In the ore body No. 1 of the Northwestern zone of the Alichalyk deposit, industrial reserves in Category C1 are as follows: ore - 28.34 thousand tons, gold - 161.6 kg, average gold content is 5.7 g/t, silver - 0.16 tons, average silver content is 5.6 g/t, and reserves below the industrial level in Category C1 are as follows: ore - 10.95 thousand tons, gold - 56.9 kg, average gold content is

5.2 g/t, silver - 0.03 tons, average silver content is 3.1 g/t. Furthermore, the research work area is 6.0 square kilometers.

For the initial assessment of the ore body No. 1 of the Northwest Zone and the determination of gold mineralization in its wings, 3,182 samples were taken in 1000 g and 100 g forms.

The industrial gold mineralization of the Northwestern Alichalyk section is localized in quartz, quartz-carbonate veins, and partially hydrothermally altered, mainly ground, quartzified gabbro. The dissemination of the veins was submeridional and meridional, and was studied through 25-50 meter deep drilling wells and underground mine workings.[3]

The plane of projections is oriented subparallel to the average direction of the zones. The lines of emergence of ore bodies (zones) on this vertical plane, the average points of intersection of ore bodies with mine workings and drilling wells, the parameters of ore bodies (zones) at intersection - horizontal power, gold, silver and conditional gold content in sections, and the presence of reserves in the accounting blocks were studied.

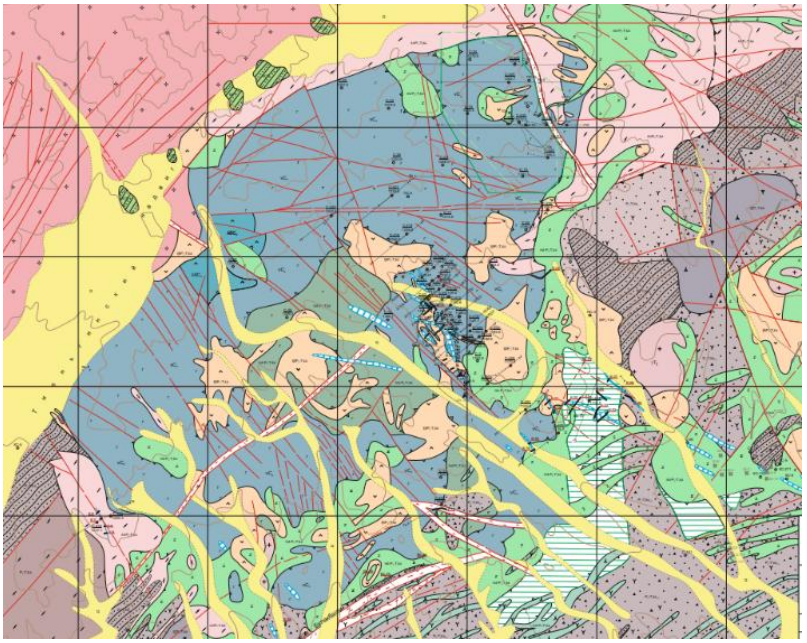

Figure 2. of sample selection points

Marksheyder

On the structural plane, contouring of ore bodies along the expansion and descent was carried out in the vertical projection of the zone. 28) by marginal sections containing 3 g/t or more of conditional gold. In this case, as a rule, the method of limited extrapolation was used, i.e., the boundaries of elongation, descent, and elevation of the block were constructed at half the distance between the extreme air-conditioning section and the first non-air-conditioning section of the non-industrial part of the zone (vein).

During the study, a mineralogical-petrographic study was conducted on the material composition and texture characteristics of all types of rocks, the degree of metasomatic changes, the separation of ore-bearing mineral associations, and their interrelationships. The main attention was paid to the study of gold, silver, and copper-containing minerals, the determination of their quantitative and qualitative characteristics, the determination of their relationships with each other and with other minerals (presence of formations, size, nature of deposition), and the size of their grains.

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Alchaly ore occurrences are located on the boundary of middle-aged gabbro and diorite massifs, penetrated by numerous subvolcanic bodies of syenito-diorites, diabase porphyrites, and quartz porphyry. Subvolcanic bodies of northeastern fault disruptions and quartz porphyry, contact zones of gabbrolic syenite-diorites were considered as ore-controlling structures in the "Alchaly" ore occurrence, which is promising for copper-porphyry and silver-polymetallic deposits.

The main ore-controlling structures in the eastern section are radial faults extending inclined from the Alchaly Paleovolcano and northeastern faults forming a complex structural mosaic of the section. Contact zones of subvolcanic bodies of diabase porphyrites with sandstones also played a certain role in mineralization. Many ancient fossils can be found in this position.

Studies have shown that it manifests itself to some extent in copper-porphyry form and gold-arsenic-pyrite compounds in the Alchaly field.

In the eastern 2, 3, 7, and 24 zones of the Alichalyk ore field, the most mineralized areas form a belt of northeast orientation with a width of 500 meters. Tectonic structures in this direction have been fragmented within the band. Thus, three types of mineralization are more stable in the Eastern section:

gold-bearing copper-porphyry, gold-silver and silver-polymetallic (silver-polymetallic porphyry). The gold content ranges from 1 to 1.5 g/t. Structural, tectonic, volcano-tectonic, geophysical, geochemical, mineralogical-geochemical, and geological-archaeological features can be distinguished based on the morphostructural and genetic features of the study area and the form of their manifestation. In terms of their occurrence, the Alichalyk area is considered a promising area, with high gold content, typically associated with chalcopyrite and quartz-sericite metasomatites, less with galena. The highest content is observed in various types of metasomatites saturated with quartz, quartz-ankerite-containing veins.

Silver, lead, copper, and molybdenum spatially correspond to gold, and they also do not go beyond the boundaries of the zone. Silver content ranges from 1 to 70 g/t (maximum 100 g/t); copper content ranges from 0.02 to 0.04% (in some samples up to 0.4%), lead content from 0.02 to 0.035% (in some samples from 0.1 to 0.3%), and gold content at a thickness of 5 meters is 4.3-4.9 g/t. Determination analyses of microscopic structure were performed. The main focus was on determining the internal structure of the samples and the results of mineral interaction. The structure of the samples is hypidomorphic granular, coarse-grained, poikillite, and monzonite. The rocks are composed of the following minerals: Main ones: plagioclase - 55%, potassium feldspar - 30%, pyroxene - 15%. Accessory: appetite, ore mineral. Secondary: sericite-25%, chlorite, biotite, epidite.

Plagioclase is moderately substituted with sericite, single leaflets of biotite and single prismatic epidote grains, sphene clusters, pyroxene chlorite is slightly substituted with sericite, and along the contour junction gaps it is substituted with thin-grained biotite and fine-meshed ore substance along the grain (Fig. 1, Fig. 2).

Figure 3. Analysis of the samples obtained using a microscope. (The stains of chalcopyrite and pyrite. Increase 50 times.)

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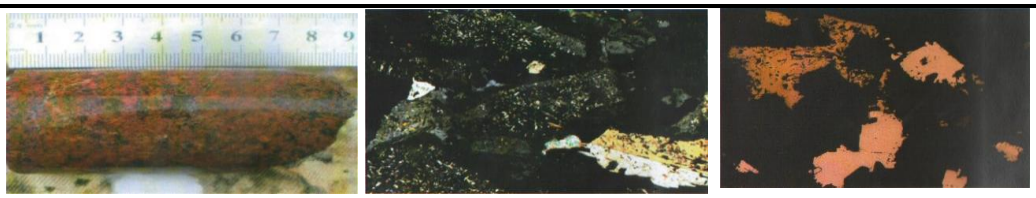

Figure 4. Analysis of the samples obtained using a microscope. (Expanded microstructure of chalcopyrite. Increase 100 times.)

Thus, spectrotynometric analyses are suitable for qualitative assessment of the gold content of the tested samples (settlements, zones of hydrotemically altered rocks), and it has been established that the gold content is sufficient, and the presence of gold, silver, copper, molybdenum, and other valuable components in the samples has been proven.

Spectral analysis of 25 elements was conducted at the Central Laboratory of the State Committee of the Republic of Uzbekistan on Geology and the Central Analytical Laboratory of JSC "Almalyk Mining and Metallurgical Combine."

Table 1 **Analysis of the average ore sample based on spectral analysis results**

Elements	Amount, (n ·103%)	Elements	Amount, (n ·103%)
Ba	10,0	Ni	<0,6
Be	0,15	Sn	<0,6
V	20,0	Pb	3,0
Bi	20,	Ag	0,3
W	<0,3	Sb	20,0
Ga	2,0	Ti	300
Ge	<0,1	Cr	<1,0
Cd	<0,1	Zn	<3,0
Co	3,0	Au	<0,03
Mn	700	Nb	<0,4
Cu	>1,1%	Ta	<10,0
Mo	700	Li	<3,0
As	5,0		

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