



Journal Website:

<https://theamericanjournals.com/index.php/tajet>

Copyright: Original content from this work may be used under the terms of the creative commons attributes 4.0 licence.

Ore Control Factors And Searching Property Of Gold Mining Of The Karakchatau Shear Zone (Ridge South Nuratau)

J.J. Movlanov

Director, Center Of Geoinnovation Technologies University Of Geological Sciences, Tashkent, Uzbekistan

A.T. Jamolov

Doctor Of Geological And Mineralogical Sciences, State Geology Committee Of The Republic Of Uzbekistan, Tashkent, Uzbekistan

N.J. Jurabekov

Student, University Of Geological Sciences, Tashkent, Uzbekistan

A.B. Khaydarova

Student, University Of Geological Sciences, Tashkent, Uzbekistan

ABSTRACT

In complex studies of geological and structural, morpho-structural analysis, mineralogical mapping of quartz formations, detailed geochemical works and analysis of geochemical fields, predictive and prospecting signs of gold ore taxon have been developed ore zone, ore field, deposit, ore body by groups: morphostructural, stratigraphic-lithological, structural-tectonic, magmatic, geophysical, metasomatic, mineralogical, geochemical and geological-genetic model of a gold-bearing ore-forming system in the zone of collapse. Favorable geological and structural conditions for the localization of gold mineralization in the Karakchatau mountains are associated with areas of manifestation of long-term tectonic-magmatic activation in metalliferous sediments of contrasting lithological composition. The confinement of the occurrences of gold mineralization to the blocks formed by transverse faults in the areas of their intersection with the Karakchatau shear zone was noted. The ore-localizing ones are mainly intrablock and non-extended interblock tectonic structures.

KEYWORDS

Karakchatau Shear Zone, South Nuratau, Geological And Structural Conditions, Ore Field, Deposit, Gold, Mineralogy, Geochemistry.

INTRODUCTION

The Karakchatau mountains are an integral part of the South Nuratau ridge, and, as the

main mountain system, are stretched in the west-northwest direction. In the west they

pass into low mountains and are separated from the Aktau mountains by the valley of the stream. Aktepa, in the east, the Karakchatau mountains also end in low mountains.

Among the urgent tasks aimed at expanding the mineral resource base of the Republic of Uzbekistan for gold, is the task of identifying hidden and blocked at accessible depths of mineralization in mining areas with operating mining enterprises. The Karakchatau mountains are among the areas with the potential for hidden gold mineralization of the Nurata mining region.

As a result of prospecting work for gold 1960-1980 it was found that the main number of occurrences of gold mineralization are located within the Karakchatau zone of crumpling. According to the genetic type, they belong to postmagmatic hydrothermal, according to the composition of gold-producing mineral associations - to the gold-quartz and gold-sulfide-quartz geological-industrial types, the morphotype of linear vein-veinlet zones and stockworks in terrigenous strata of crumple zones, similar to the gold mineralization of the well-studied Karatau gold ore zone.

THE MAIN FINDINGS AND RESULTS

The gold content of the Karakchatau mountains is extensive, which is reflected in the abundance of gold ore occurrences in the absence of industrial deposits identified to date. Meanwhile, the wide development of secondary dispersion halos of gold and the accompanying arsenic, diffuse contrasting gold content, established in the bedrock outcrops of metaterigenous rocks, often high-carbonaceous and saturated with quartz-vein mineralization, a complex of ore-controlling geological-structural prerequisites for the formation of industrial metal concentrations, give reason to believe that that the gold-ore

potential of this territory is not fully explored and is represented by non-eroded (concealed) mineralization. Possibilities of its identification are associated with the study of the geological and structural conditions for the location of gold mineralization and are based on the use of a complex of geological and structural, morphostructural, mineralogical and geochemical characteristics.

In 1952-1953 V.M. Jeleznov and V.F. Popov, based on the results of schlich sampling, identified areas with an increased content of cinnabar, gold and scheelite in schlichs. V.A.Tabachkov in 1960, for the first time for this area, identified ore occurrences of mercury in the bedrock - Buratbulak and Hamdam. In 1962-1963 a metallometric survey was carried out on a scale of 1:50,000 and scattering halos of Au, As, Hg, Cu were revealed.

1975-1981 a number of promising areas for discovering hidden gold mineralization were identified - Tusun, Alyamdi, Alyamdi Yujniy, Koksay. Naymanbulak, Buratbulak, Sadulabulak, but within the studied depths and areas, the gold mineralization of industrial parameters has not been established. There are also many scattered points with a gold grade from tenths to first ppm, associated with areas of hydrothermal alteration, silicification, crushing, limonitization, and increased graphitization of bedrocks in various tectonic structures. The primary occurrences of minerals in the Karakchatau mountains are also represented by ore occurrences of cinnabar and titanium.

During the field period, we carried out geochemical studies of individual areas of the Karakchatau mountains as part of the field geochemical team of the Institute of mineral resources.

The Karakchatau mountains are an integral part of the South Nuratau ridge, and they are stretched in a northwest direction. The main regional tectonic structure that controls the placement of gold mineralization in the Karakchatau mountains is the Karakchatau shear zone. It can be traced on the southern slopes of the mountains, including the most ancient Cambrian-Ordovician formations. The thickness of the collapsed zone along the strike varies from 1.3 km to 2 km.

The location of ore occurrences and points of gold mineralization within the Karakchatau Mountains has a distinct stratigraphic control - predominantly confined to deposits of the cambrian and ordovician age. The following lithological features of the cambrian - ordovician strata are favorable for ore deposition: increased permeability of rocks, contrast of the section, and rhythmic alternation of individual facies. The increased permeability of rocks is a consequence of specific physical and mechanical properties (for example, increased brittleness, plasticity), which, under dynamic loads, lead to the formation of highly permeable zones of fine fracturing and detachment of formations.

Structural factors are the main ore-controlling factors in the location of occurrences of gold mineralization in the Karakchatau mountains. Among them, regional and local are distinguished, which determine the ore-controlling significance of ruptured and folded structures. According to the ore-controlling value, the rupture structures of the territory are divided into ore-producing, ore-supplying and ore-distributing, ore-localizing.

The main ore-controlling importance of magmatic factors in the distribution of gold mineralization in the Karakchatau mountains lies in the ore-generating role of magmatic processes. The spatial distribution of gold

mineralization is controlled by the over-intrusive positions of non-eroded igneous bodies, the positions of their exocontact parts, and the spread of dike fields and belts.

Mineral control prospecting signs are observable facts indicating the presence or the possibility of identifying mineral deposits in a certain place: traces of processes and phenomena accompanying the formation, alteration and destruction of deposits, special physical, mineralogical and chemical properties of a mineral and host rocks, according to which it is possible to discover a deposit. Direct prospecting mineralogical features include bedrock outcrops of quartz-vein formations and vein-veinlet quartz-sulfide mineralization with increased gold contents according to sampling data (from 1 conventional units (c/u) and more), placer aureoles of native gold. There are few such signs in the Karakchatau mountains and they are reflected in the accompanying cartographic materials. Usually, direct mineralogical signs accompany eroded mineralization with significant parameters of ore bodies, but such mineralization has not been revealed in the Karakchatau mountains. When searching for hidden and weakly eroded mineralization, it is of great importance to collect and take into account additional mineralogical information of indirect prospecting signs. Indirect prospecting mineralogical signs include signs that record traces of ore-forming processes that form the predicted mineralization of gold-quartz and gold-sulfide-quartz geological-industrial types.

Direct geochemical searching property of gold ore mineralization of the Karakchatau mountains are: points with increased gold contents and bedrock outcrops (from hundredths of a ppm Au and more); secondary halos of dispersion of gold and arsenic, inextricably linked with gold in ore-forming

processes; high contrast of geochemical halos of ore-forming elements. Indirect exploratory geochemical signs are associated halos of elements of gold mineralization indicators - As, Ag, Pb, Cu, Hg, Cd, Zn. In the Karakchatau mountains, they do not have areal distribution, therefore, they were not used in the analysis of the prospects for gold content. High-contrast mercury halos are associated with manifestations of mercury mineralization. The results of gold-metric analysis of metallometric samples show the presence of gold from 0.005 to 0.04c/u. Increased content in halos $> 0.04\text{c/u}$ is noted as point anomalies. The distribution of As is equally uneven in contents up to 0.009-0.05%.

The analysis of the distribution of secondary dispersion halos of Au and As shows that within the Karakchatau zone of crumpling, there is a spatial overlapping of arrests (areas) with the development of geochemical halos of Au and As. while on the rest of the Karakchatau mountains, they often show disunity in distribution. Within the arsenic halos and. gold often recorded increased gold content according to the results of sampling of primary porol in the amount of 0.01-0.1c/u, less often - arsenic in the content of 0.02-0.06%. Based on the results of sampling of bedrocks and surface mine workings, g of ditches in contents $> 0.1\text{c/u}$, a distinct spatial confinement of most of the point gold anomalies to the Karakchatau zone is noted. Statistical analysis of the distribution of gold grades by mineralized points shows that the grade of 0.1-1.0c/u is 15%. Higher gold grades are rare, reaching in some samples values up to 4.0c/u and more. The latter are associated with areas of clarification and limonitization of rocks, manifestations of vein-vein mineralization within tectonic zones of increased fracturing, crushing, brecciation of rocks.

Assessment of the gold potential of the Karakchatau shear zone on the basis of the considered ore control factors and prospecting indicators will allow identifying promising areas for setting up prospecting works for gold and will provide an increase in the predicted resources of gold mineralization in this region, which is the practical side of the work performed.

CONCLUSION

In the Karakchatau shear zone, which is a large linear geochemical structure, complex geochemical anomalies are widely developed in secondary dispersion halos and primary halos (in the studied local areas) of Au and associated ore-forming elements - As, Ag, Pb, Sb. The supra- and upper-ore level of the erosional section of most of the studied gold-bearing zones is assumed with the prospects for identifying ore bodies at depths of 50-150 m from the modern surface.

REFERENCES

1. Geological Dictionary: in 2 volumes / Kh.A. Arslanova, M.N. Golubchin, A.D. Iskanderov and others; ed. K.N. Paffengolts. - 2nd ed., Rev. - M.: Nedra, 1978.
2. Koloskova S.M. Using the typomorphism of ore-bearing minerals in the separation of natural types of ores and technological mapping. Materials of the Republican scientific-technical seminar. Tashkent, 2005. P. 68-71.
3. Pirnazarov M.M., Kazakbaeva S.M., Zavyalov G.E. Some features of metallogeny of the South Nuratau mountains from the standpoint of geochemical evolution of gold-rare metal ore-magmatic systems // Modern problems of metallogeny. - Tashkent: Fan, 2002. - P. 73-76.

4. Pirnazarov M.M., Zavyalov G.E. and other Geological and structural features of the location of gold mineralization in the eastern part of the South Nuratau ridge // Geology and mineral resources, 2003, No. 5. - P. 22-26.
5. Shekhtman P.A. and others. "Detailed structural and forecast maps of hydrothermal deposits". Moscow, "Nedra", 1979, 280p.
6. Fedorchuk V.P. "Expert geological and economic assessment of ore deposits". Moscow, "Nedra", 1991, 318p.