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# GEOLOGICAL STRUCTURE AND MINERALIZATION CHARACTERISTICS OF THE CHINORSOY AREA

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Introduction. The Khandiza ore field, which encompasses the Chinarsay ore zone, is located in the Southwestern Tien-Shan, within the passive margin of the Epibaikalian platform, complicated by the Hercynian suboceanic riftogenic volcano-plutonic belt [1, p. 29].

The primary feature of the region's magmatism is the Upper Paleozoic volcanism and its associated plutonism, which form a series of volcano-plutonic associations (basalt - andesite – rhyolite - gabbroid, andesite - gabbro - diabase, trachybasalt - trachyandesite - monzonite - syenite). The products of this volcanic activity and their related plutonic formations are mainly found within the Khondiza, Chakchar, Takaular, and South Surkhantau volcano-tectonic structures [2].

These magmatogenic structures correspond to the intersection nodes of deep fault zones, which are areas of intensive bending and the most active volcanic activity. They correspond to the central parts of volcanic-tectonic structures (volcanogenic graben-synclines) complicated by sinvolcanic muds, calderas, volcanic-domed uplifts, central-type volcanic apparatuses, and subvolcanic intrusions of variegated composition.

In the Khondiza ore field, the Cambrian crystalline basement is widespread and is overlain by Carboniferous volcanogenic-sedimentary strata and Meso-Cenozoic terrigenous formations. Triassic deposits in the area have a sharply subordinate distribution, occurring only in isolated outcrops at the contact zones between Carboniferous and Jurassic deposits. These deposits consist of sandstones, conglomerates, and bauxite-like rocks, with a thickness of 3–10 m.

Jurassic terrigenous deposits are widespread in the ore field, appearing to surround it from the west, northwest, and east. They consist of conglomerates, gravelites, limestones, clays, sandstones, siltstones, coal shales, and Lower Jurassic coals.

In the area, Quaternary deposits primarily consist of alluvial, deluvial, proluvial, and eluvial deposits. Among these, boulders, gravel, crushed stone, loams, and unsorted materials are commonly developed. The thickness of the period's deposits ranges from 0.1 to 100 meters.

Previously conducted geological exploration work in the region primarily analyzed the mineralization of Lower Carboniferous siliceous-carbonate deposits in the Khondiza ore field, which was first identified in 1957 during geological survey and exploration at a scale of 1:25,000. Since 1958, detailed geological exploration has been conducted on the ore field, and in 1961, thematic work on studying non-surface formations was conducted on this ore field. It was established that the main deposits of polymetallic ores are located in volcanogenic-sedimentary deposits, and the site is of industrial significance [2,3].

In 1972–1976, in order to expand the prospects of the Khondiza ore field, detailed exploration work was carried out on its northeastern flank, as well as in the central part and the flank of the ore field (including the Chinarsay section), aimed at identifying colched-polymetallic mineralization using a complex of mining drilling operations.

As a result of the work conducted at the Chinarsay field, a new gold-silver mineralization occurrence for the ore field was identified for the first time, and the Chinarsay ore occurrence was recommended for the study of gold and silver.

Search and exploration work in 1975–1977 was accompanied by the compilation of a 1:10,000 forecast map of the Khondiza ore field. As a result of these works, four zones of hydrothermal altered rocks were identified and studied for the first time, corresponding to all major ore-bearing areas. It has been established that metasomatites are extensively developed due to volcanogenic rocks and are controlled by interformational and intraformational disturbances. A general zonality has been identified in their structure, which is primarily expressed in the shift of quartz rocks from the center to the periphery [1].

According to specialists, the formation of mineralization in the ore field is associated with the manifestation of volcanic activity and occurred in four stages: exgallation sulfur-colchedon; metasomatic polymetallic; metasomatic colchedon-polymetallic; and late metamorphogenic polymetallic.

Analysis of the influence of ore-controlling factors showed that coarse-grained tuffs of rhyolite porphyry and tuffaceous tuffaceous tuffaceous porphyry of rhyolite-dacite are most suitable for localizing mineralization. The richest mineralization occurs in quartz-sericite and sericite-chlorite metasomatites.

The analysis of ore-controlling factors was carried out based on the materials of the ore field structure (A. Shmelev, 1973), preliminary exploration of the Central section (G. Zaletova, 1973), detailed assessment of the Central section (G. Zaletova, 1974), and detailed prospecting of promising sections (G. Zaletova, 1976).

The predictive mapping of the Khondiza ore field is based on the method of geological analogies, the essence of which lies in analyzing the patterns of localization of a specific industrial mineralization and subsequently identifying similar positions in other areas.

The phased study of ore-bearing zones in the region continued on a large scale from 1979 to 1982. As a result of the work, the ore zone was studied in detail for the first time due to surface openings [3].

The precise stratigraphic control of mineralization was confirmed, which was manifested in the dependence of mineralized zones on the volcanites of the Middle Vakhshivar small suite. The following characteristics of this zone were identified. The main volume of mineralization occurs not in tuffs, but mainly in rhyolite and rhyolite-dacite lavas. It was also established that the mineralization zones coincide with the areas of intensive shale formation of volcanites and are enriched with gold and silver at the intersections of longitudinal zones with submeridional quartz-feldspar veins and veins.

Thus, the geological features of the area are characterized by their uniqueness, and an analysis of the conducted geological exploration shows that sedimentary-volcanogenic rocks of the middle part of the Vakhshivar formation are of significant importance, while deposits of the lower and upper subgroups of the formation are widespread in the southwestern and northeastern parts of the area, which plays an important role in the processes of polymetallic mineralization in the area.

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