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Gold-bearing structure of Greater Altai: geotectonic position and research criteria

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Greater Altai is a part of the Central Asian mobile belt and is located on the northwest flank of the Altai-Alashan mobile zone that sail round the south of the Siberian platform. In this region focus on large and unique stocks of deposits of copper, lead, zinc, gold and other minerals, which are based on a powerful infrastructure of mining and metallurgical enterprises. The most important task now is to open new deposits. Scientific research is a continuation of the fundamental works on the problem of "Greater Altai" (geology and metallogeny), initiated by the G. N. Sherba [1]. In this paper, new ideas for the development of geology and the formation of ore-bearing structures of the Altai were considered by a theoretical position of global mobilism. Special importance is attached to the paleometal renovations of gold-bearing structures. New data about the ore-controlling role of Zaysan suture zone were given. The main types of gold deposits of Greater Altai formed in different geodynamic conditions, and genetically related to certain ore-forming formations, which different in age and composition of mineralization. The deposits are characterized by uneven distribution in the ore and metallogenic zones.

Gold deposits formed in the central part of the Greater Altai in Hercynian collision stage (C_1-C_3), in the process of horizontal displacement and tuck of the Kazakhstan and Siberian lithospheric plates, which is the area of the junction of Zaisan suture zone. Zaysan suture zone - is a large tectonic and metallogenic structure of collision type, arcuate shape and considerable length (length more than 800 km, the width of 60-80 km). In the modern form suture zone covers the West Qalba, Charsk metallogenic zone, Zhanan-Boko-Zaisan gold-bearing zone, and South Altai ore district, which are combined into a large East-Kazakhstan gold bearing belt. There are combined a major ore district, ore nodes and deposits (Bakyrchik, Suzdal, Kuludzhun, Maraliha et al.), and at a location in China known industrial object Dolonosay and Sarybulak.

Ore-controlling meaning is given to the system of diagonal deep faults, blocks of metamorphic rocks, serpentinized ultramafic protrusions, small gold-mineralized intrusions and small intrusions and dikes of basic and medium-acid composition ($C_{2-3}-C_3$). Unique deposits of gold-sulphide-carbon type (Bakyrchik, Bolshevik etc.) were formed in a narrow zone of dinamometamorphism under influenced of Kyzyl deep fault and enclosing a favorable environment of increased carbon level (Bukon suite C_{2-3}). Ore bodies are localized in zones of brecciation, crushing, shearing and thrust structures on the deposits [2]. Ore bodies on Suzdal gold-sulphide type deposit are controlled by discontinuous structures, and is localized in volcano-terrigeneous deposits with increased carbon level (Arkalyk suite C_1V_{2-3}). The zone of gold-quartz-listvenit mineralization on Maraliha deposits located mainly in the amphibolite-schist thicker (PR?) and controlled by stem fault zone with protrusions of ultramafic rock, gabbro dykes and plagiogranite porphyry. Geophysical, ore-petrological, mineralogical, and geochemical criteria of prognosis of gold mineralization were identified.

Determination of East Kazakhstan belt as a major metallogenic unit opens up new possibilities for the prediction and research of gold objects, including hidden at depth and under the cover of unconsolidated sediments.

References:

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