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STATISTICAL REGULARITIES OF THE LOCATION OF GOLD OBJECTS IN THE DOMESOZOIC STRUCTURAL AND FORMATION COMPLEXES OF UZBEKISTAN

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ANNOTATION

In the last 15-20 years, the problems of increasing the efficiency of forecasting during regional geochemical works, interpretation and assessment of different-rank ore-generating geochemical anomalies in complex landscape-geological conditions, geochemical zoning of territories have been given much attention in publications of leading geochemists of the Commonwealth of Independent States countries. At the same time, the technologies of geochemical zoning have not yet been regulated in Russia; in Uzbekistan, a small number of works have been carried out in this direction in the last 20 years. Application of advanced innovative technologies for the interpretation of geochemical information: methods for the isolation and interpretation of informative geochemical signals in conditions of high interference (closed and semi-closed territories); methods for geometrization of productive anomalous geochemical fields by structural and concentration geochemical characteristics, assessment of ore-formational affiliation and predicted resources of expected ore objects.

KEYWORDS: ***geochemistry, metallogenic province, metallogenic region, pre-Mesozoic basement, mountainous and foothill areas, geochemical halos and anomalies, forecast, geochemical map, predictive metallogenic analysis of minerageny, ore content, minerals, chromites, promising positions.***

DISCUSSION

In the process of predictive metallogenic analysis for gold from the standpoint of plate tectonics, a database was created on 345 gold and gold-bearing objects of the Republic of Uzbekistan, formed by various geodynamic processes, including: 69 deposits, 216 ore occurrences with unclear prospects and 60 ore occurrences, which received a negative assessment. the results of geological exploration. Metallogenic zoning of the Republic of Uzbekistan for endogenous gold mineralization was based on a geodynamic map at a scale of 1:500.000 (to E.R.Bazarbaev, A.A.Zemlyanov, 1997). Three gold-bearing metallogenic provinces – Centrally Tien Shan, South Tien Shan, Southwest Tien Shan - in geodynamic structures correspond to the Kirghiz-Kazakhstan microcontinent, sedimentary formations of the Turkestan and Ural paleo-oceanic spaces (nappe-fold area), Karakum-Tajik metallogenic zones reflect the ore-geochemical specialization of large blocks for gold (Fig. 1). 14 metallogenic zones were identified, three of them with intensive gold mineralization (Kuramin, Kyzylkum, Zarafshan-Turkestan), 11 metallogenic zones with extensive gold and gold-bearing mineralization. Three metallogenic zones in the Centrally Tien Shan metallogenic provinces are represented by magmatic arc mega blocks - these are areas of areal volcano-plutonic activation on the active continental margin. In the South Tien Shan metallogenic provinces, eight metallogenic zones are identified in the volume of covers formed in various geodynamic settings. In the Southwestern Tien Shan metallogenic provinces, three metallogenic zones are confined to the structures of the nappes of the paleocean, back-arc rifting, and microcontent. There are four gold ore regions within the metallogenic zones of intensive gold mineralization - Angren, Bukantau, Centrally Kyzylkum, Nurata.

For each metallogenic provinces, the general and individual features of metallogeny, a certain evolutionary sequence of the manifestation of gold and gold-bearing formations and age regression series (systems) of ore formations with industrial gold mineralization were established. In the Mid-

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Tien-Shan metallogenic provinces (Chatkalo-Kuramin region), a number of researchers consider two stages of the formation of industrial gold mineralization (Zavyalov G.E., Islamov F.I., Arapov V.A., etc.) one age series of gold-bearing formations (Horvat V.A., Klempert S.Ya., Rakhmatullaev Kh.R., Bertman E.B. and others). In the Southwesttianshan metallogenic provinces (South Uzbekistan region), two families of ore formations have been identified, with which gold mineralization is associated (Terletsky O.G., Dzhantuganov N.I.). Statistical data on the distribution of deposits and ore occurrences of gold by ore-formational affiliation within the metallogenic provinces indicate that the predominant part of gold ore objects is concentrated in the South-Tianshan (ore formations 7-14) and Central Tien Shan (ore formations 1-6) metallogenic provinces, extensive gold content is characterized by the Southwest Tien Shan (ore formations 15-19) with an approximate ratio of the areas of outcrops of pre-Mesozoic rocks of 4:2:1. The main part of the industrial gold resource of the Mid-Tien-Shan metallogenic provinces is concentrated in porphyry copper and volcanogenic-hydrothermal deposits, in the South Tien Shan - in plutonic-hydrothermal (rare metal-gold and arsenic-gold ore vein-vein formation) and metamorphic arsenic-vein-vein formations (gold-vein-vein formation)) deposits. There is a significant number of underexplored gold ore occurrences.

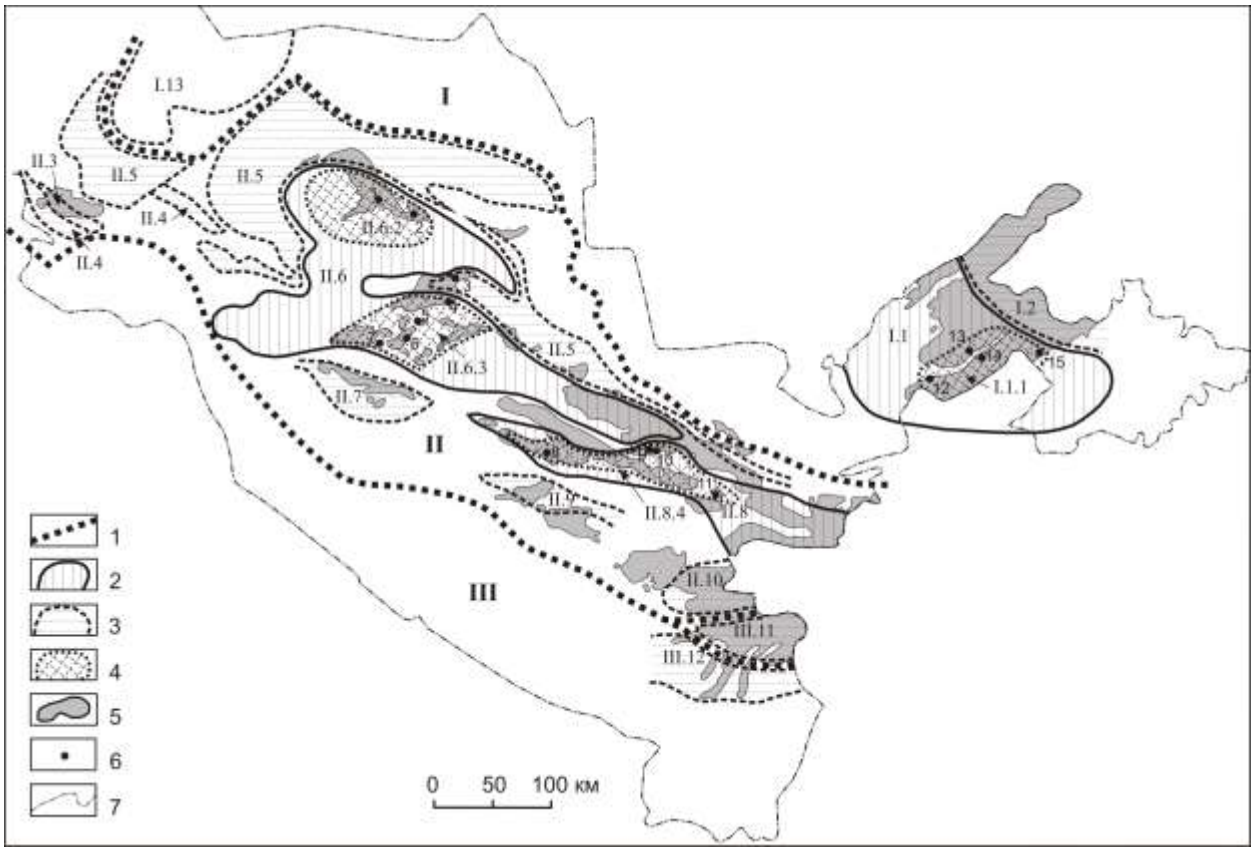

Fig. 1. - Scheme of metallogenic zoning of endogenous gold mineralization in Uzbekistan (according to Golovanov I.M., Horvat V.A., Koloskova S.M., Zavyalov G.M., Rakhmatullaev Kh.R., Dzhantuganov N.I., etc., 1997).

1-4 - metallogenic subdivisions and their numbers (the first digit is a metallogenic province, the second is a metallogenic zone, the third is a gold-ore region): 1 - metallogenic provinces (I - Mid-Tien-Shan or Kirghiz-Kazakhstan, II - South Tien Shan or Turkestan, III - Southwest Tien Shan or Karakum-Tajik), 2 - metallogenic zones of intensive gold mineralization (I.1 - Kuramin, II.6 - Kyzylkum, II.8 - Zarafshan-Turkestan, 3 - metallogenic zones of extensive gold and gold-bearing mineralization (I.2 - Chatkal, II .3 - Sultanuvai, II.4 - Sheikhdzheilin, II.5 - Turkestan-Alai, II.7 - Kuldzhuktau, II.9 - Katarmai-Yagnob, II.10 - Chakylkalyan, III.11 - Gissar, III.12 - Baysun , I.13 - Potential Beltau), 4 - gold ore areas (I.1.1 - Angren, II.6.2 - Bukantau, II.6.3 –Central Kyzylkum, II.8.4 - Nurata); 6 - gold and gold complex deposits (1 - Kokpatas, 2 - Tour bai, 3 - Tamdybulak, Balpantau, 4 - Muruntau, Mutenbay, 5 - Amantaytau, 6 - Daugyztau, High-voltage (Au-Ag) 7 - Adzhibugut, 8 - Sarmich, 9 - Guzhumsay, Intermediate, 10 - Charmitan, 11 - Marjanbulak, 12 - Kalmakyr, Dalnee (Au-Cu), 13 - Kyzylalmasay, 14 - Kochbulak, 15 - Chadak); 7 - border of the Republic of Uzbekistan.

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The patterns of location of gold ore objects in various geodynamic settings of the development of the lithosphere of Uzbekistan are presented in statistical data demonstrating the spatial distribution of the class of industrial objects (69 gold deposits) and indicator mineralization (60 ore occurrences that received a negative assessment according to the results of geological exploration) relative to certain structural and formational complexes of rocks, major and minor tectonic structures. A structural-formational complex is understood as a set of geological formations and tectonic elements that have formed in a specific geodynamic setting.

The distribution of positive and negative standards of gold ore objects over sedimentary structural-formational complex shows the dominant spatial relationship of gold deposits and disseminated mineralization with complexes of basement and rifting zones on continents (types 1, 3, 4), sedimentary and volcanogenic-sedimentary strata of the paleo oceanic basin (types 6, 7) within the integumentary fold area. Analysis of the lithological columns of the structural-formational complex allows us to note the features of the environment favorable for ore localization: fragility-plasticity, the presence of physicochemical barriers, the contrast of the section, an increased background of ore-generating elements (donor formations). In the South Tien Shan metallogenic provinces, these are metalliferous sediments of the oceanic bottom in the area of the spreading basin, oceanic uplifts with local differentiated volcanism of the tholeiitic series, and ensimatic island arcs. The main part of gold deposits is located in chemogenic-volcanogenic-terrigenous sedimentary formations of the Proterozoic-Lower Paleozoic age in the South Tien Shan metallogenic provinces and volcanogenic formations of the Middle Carboniferous of the Central Tien Shan metallogenic provinces.

The ore-controlling significance of magmatism is determined by several aspects: 1) the possibilities of inheritance by magmatic melts of metallogenic specialization of intruded strata; 2) as energy centers carrying out the thermofluid transformation of rocks, the causative agent of convection of meteoric or metamorphogenic waters with the remobilization of ore-generating elements from the host rocks and concentration in certain zones of contact metamorphism; 3) the existence of mechanisms of intramagmatic differentiation of matter (liquation, crystallization and emanation differentiation), contributing to the emergence of different-level foci of residual low-temperature melts enriched in volatile components and low-grade ore elements. For gold deposits, a paragenetic relationship with intrusive magmatism has been established. The highest frequency of communication is manifested in the geodynamic settings of the formation of intrusions within the magmatic arcs of the Central Tien Shan metallogenic provinces (type 5), areas of compression and focal metamorphism (palingenic granitization) in the South Tianshan metallogenic provinces (type 7), late- and post-collisional magmatic activation (types 8, 9) on throughout the territory of Uzbekistan. For deposits, a paragenetic connection with the bodies of monzonite-granite (type 10) intrusive formation is most often manifested, for disseminated mineralization - with granite. There are few examples of the placement of gold mineralization in intrusive rocks (objects of the Zarmitan gold-ore zone, etc.), more frequent cases of placement in transitional endo- and exocontact zones, usually objects of rare-metal-gold ore formation. The confinement of deposits and diffuse mineralization to the exo-contact zones of plutons (types 4-6) is more often observed. Dikes of a certain composition and age are often indicators of areas of tectonic-magmatic activation, for example, a close spatial relationship of industrial mineralization with fields of different-age dikes of "variegated" composition has been established.

This group took into account the positions of gold deposits and diffuse mineralization in relation to:

nappes on the border of the covers, to the zones of influence of which, in the event of their prolonged activation, deposits may be confined (Sarmich in the Karatau zone of crumpling);

- thrust structures of different initiation times (Late Caledonian S_2 and Hercynian C_{1-2}), which are sometimes ore-localizing (Muruntau) or screening (Koktatas), or gold mineralization is localized in plumage structures (Guzhumsay, Intermediate);

- local faults and zones of collapse, mainly intrablock pre- and syncollisional (from C_2 to P_{1-2}) with the functions of ore-supplying, ore-distributing and ore-localizing structures, they are often marked by dike belts of "variegated" composition. Most of the deposits are characterized by a significant distance from regional tectonic structures (> 5 km) and placement in local structures.

Statistical data on the frequency of occurrence of geochemical halos Au, Ag, W, Mo, Cu, As, Pb, Zn, Sb in the classes of positive and negative standards of gold ore objects show that deposits are usually accompanied by complex halos of indicator elements, which is a consequence of the multi-stage and intensity ore-forming processes. Mercury halos have been studied only in some gold deposits. The occurrences of dispersed mineralization usually contain formations of 1-2 gold-bearing stages, which correspond to a limited range of ore-forming elements.

The created set of medium-scale geochemical maps of the new generation will help to increase the reliability of conclusions in the selection of objects for further exploration for precious, nonferrous and rare metals and will serve as a geochemical basis for metallogenic analysis, remote

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sensing, regional geological work, and other areas of study of the potential of endogenous useful minerals of noble (Au, Ag, platinoids), nonferrous (Cu, Ni) and rare (W, Mo, Sn. Ta, Nb, Be, Li) metals in the depths. Practical recommendations on the prospects for ore content and methods of studying predicted geochemical nodes and zones in closed areas.

LITERATURE

1. *Ezhkov Yu.B., Rakhimov R.R., Koloskova S.M., Kozyreva N.N. Endogenous mineral zoning of the gold-sulfide-quartz formation in the Sredinny Tien Shan // Zap. Uzbek. dep. WMO. Issue 38 .-- Tashkent: Fan, 1985 .-- P. 20-23.*
2. *Ezhkov Yu.B., Rakhimov R.R., Kazakbaeva S.M. A new type of gold-bearing rare metal mineralization in Uzbekistan // Uzbek Geological Journal, 1998, No. 3. - P. 57-64.*
3. *Usmanov F.A. Statistical metallogeny: current state, problems, prospects // Main problems of geology and development of the mineral resource base of the Republic of Uzbekistan. - Tashkent: State Committee. RUz on printing, 1997. - Book 1. - P.7-8.*
4. *Statistical analysis of the relationship between the metallogeny of Central Asia and the deep structure and geophysical fields / Khamrabaev I.Kh., Seyduzova SS, Usmanov FA. et al. // Connection of metallogeny with the deep structure of the earth's crust in the central part of Central Asia. - Tashkent: Fan, 1987 .-- S. 82-114.*
5. *Khamrabaev I.Kh., Usmanov F.A., Seiduzova S.S. Metallogeny and deep structure of West Tien-Shan lithosphere // Global tectonics and metallogeny. - 1991. - Vol.4. - No. 1, 2. - P.85-95.*
6. *KOLOSKOVA S., MOVLANOV J. Karakchatau Dağları'ndaki (Batı Özbekistan) altın cevherleşmesi içerisindeki farklı köken ve bileşimli mineral parajenezlerine ait kuvars minerallerinin tipomorfi k özellikleri //Maden Tetkik ve Arama Dergisi. – 2019. – №. 159. – C. 121-131.*
7. *ARAMA M. T. V. E. Karakchatau Dağları'ndaki (Batı Özbekistan) altın cevherleşmesi içerisindeki farklı köken ve bileşimli mineral parajenezlerine ait kuvars minerallerinin tipomorfik özellikleri.*
8. *8.Мовланов Ж. Ж. и др. ИЗУЧЕНИЯ УСЛОВИЙ РАЗМЕЩЕНИЯ ЗОЛОТОГО ОРУДЕНЕНИЯ ЗАПАДНОЙ ЧАСТИ ЮЖНО-НУРАТИНСКИХ ГОР С ИСПОЛЬЗОВАНИЕМ ДИСТАНЦИОННЫХ ОСНОВ //Сборник тезисов докладов шестнадцатой Всероссийской открытой конференции" Современные проблемы дистанционного зондирования Земли из космоса". – 2018. – С. 378-378.*
9. *Мовланов Ж. Ж., Пирназаров М. М. К ВОПРОСУ КОМПЛЕКСИРОВАНИЯ КОСМОСТРУКТУРНЫХ И ГЕОХИМИЧЕСКИХ МЕТОДОВ ПОИСКОВ ПРИ ПРОГНОЗИРОВАНИИ ОРУДЕНЕНИЯ НА ЗАКРЫТЫХ ТЕРРИТОРИЯХ //Геология и минерально-сырьевые ресурсы Северо-Востока России. – 2016. – С. 121-124.*
10. *Мовланов Ж. Ж., Абдуллаев Л. А. Изучение условий размещения золотого и вольфрамового оруденений в западной части Южно-Нуратинских гор с использованием новых цифровых материалов теледетекции //Материалы 17-й Всероссийской открытой конференции" Современные проблемы дистанционного зондирования Земли из космоса". – 2019. – С. 392-392.*
11. *Мовланов Ж. Ж., Абдуллаев Л. А. Составление космофотогеологической карты с рудоконтролирующими факторами на Койташском рудном поле в Северном Нуратау //Материалы 17-й Всероссийской открытой конференции" Современные проблемы дистанционного зондирования Земли из космоса". – 2019. – С. 393-393.*
12. *Пирназаров М. М. и др. ГЕОХИМИЧЕСКИЙ ПРОГНОЗ ПЕРЕКРЫТОГО ЗОЛОТО-РЕДКОМЕТАЛЬНОГО ОРУДЕНЕНИЯ ВОСТОЧНО-БУКАНТАУСКИХ ГОР (ЗАПАДНЫЙ УЗБЕКИСТАН) С УЧЕТОМ ЛИТОЛОГО-СТРУКТУРНЫХ ДАННЫХ //Научно-методические основы прогноза, поисков и оценки месторождений благородных, цветных металлов и алмазов. – 2017. – С. 110-110.*
13. *KOLOSKOVA S., MOVLANOV J. Typomorphic features of the quartz of various mineral paragenesis from the gold mineralization in Karakshatau Mountains (West Uzbekistan) //Maden Tetkik ve Arama Dergisi. – Т. 159. – №. 159. – С. 117-127.*
14. *Koloskova S., Movlanov J. TYPOMORPHIC FEATURES OF THE QUARTZ OF VARIOUS GENETIC TYPE AND COMPOSITION OF MINERAL PARAGENESIS OF ORE-GRADE GOLD IN KARAKCATAU MOUNTAINS (WEST UZBEKISTAN) //Maden Tetkik ve Arama Dergisi. – №. 158. – С. 10-20.*