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Regional geological and mineralogical zonality of Uzbekistan's gold deposits

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The studied gold deposits are located in three main regions, which are characterized by specific geological (stratigraphic, lithological, structural), mineralogical and geochemical features of formation of mineralization (from west to east): 1) Central Kyzyl-Kum and Ziaetdin mountains, 2) Nurata mountains and 3) Chatkal-Kurama mountains

In Central Kyzyl-Kum, gold deposits are located in old carbonate-volcanic-terrigenous and carbonate-terrigenous formations. The Adzhibugut deposit is located in the Taskazgan suite (Upper Proterozoic, Upper Riphean), Muruntau, Daugyztau are in the Besapanskoy subsuite (Kosmanachi thicker - Upper Cambrian-Middle Ordovician), Kokpatas is in the Kokpatas suite (Upper Proterozoic, Middle-upper Riphean) [1, 2].

In the Ziaetdin region (Karakutan ore field), gold deposits are also associated with old stratum – Katarmay (Upper Proterozoic - Upper Riphean) and Bulyamush (Vendian) suites.

Carbonate-terrigenous and terrigenous rocks of the Mardjanbulak (Vendian-Lower Cambrian) and Besapan stratums (Vendian-Lower Silurian), Kalsarin (Upper Cambrian-Lower Ordovician), Badamchali (Lower-Middle Ordovician), Kurbanazi (lower-middle Ordovician), Ilonchisay (middle-upper Ordovician), Nakrut (Lower Silurian), dzhazbulak (Lower Silurian) and other suites as well as granosyenites of Koshrabad intrusive (C₂) are ore-bearing formations in the Nurata region.

Gold mineralization is located in the andesitic, trachyandesitic, andesite-dacitic, dacitic volcanic formations (Middle Carboniferous-Lower Permian) and two-mica granites of the Caledonian in the Chatkal-Kurama region.

Thus, the age of host rocks at the gold deposits tends to rejuvenate in the direction from the west to the east.

The major gold concentrations are associated with an early gold-pyrite-arsenopyrite paragenetic mineral association (PMA) in the deposits of the Central Kyzyl-Kum (Muruntau, Kokpatas, Daugyztau, Tamdybulak, Balpantau, Adzhibugut) and Ziaetdin Mountains (Karakutan ore field, Yangi-Davon).

Gold mineralization is associated with both early (gold-pyrite-arsenopyrite) and late (gold-hessite and gold-silver) PMA in Nurata region (Mardjanbulak, Sarmich, Koshar, Charmitan and Guzhumsay deposits).

In the Chatkal-Kurama region (Kochbulak, Kyzylalma, Kayragach, Chadak deposits), gold is included mainly in the later PMA. Among them, gold-silver and gold-hessite are the most productive PMA.

Thereby, in the direction from the west to the east the ore-hosted rocks become younger (from Proterozoic to Lower Permian), and early productive paragenetic mineral associations (gold-pyrite-arsenopyrite) are replaced by later gold-silver and gold-hessite associations.

References:

[1] Ore deposits of Uzbekistan (2001), Ташкент HYDROINGEO, 661.

[2] Stratigraphic dictionary of Uzbekistan (2001), Ташкент HYDROINGEO, 580.

