

Gold-sulfide jasperoids of East Kazakhstan

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Zaisan structural zone refers to traditional auriferous region of East Kazakhstan [1]. This zone includes paleozoic ofiolites and volcanic-sedimentary sequences, those were formed as the result of oblique collision of Kazakhstan and Siberian paleocontinents [2]. Terrigen-carbonate sedimentary sequences are characterized by high contents of gold, but the ore deposits are associated with the introduction of granodiorite-plagiogranite collision magma (Kunush complex, 310-300 Ma). In result of acid magmas and carbonates interaction were formed Carlin-type gold-sulfide jasperoids [3]. This type includes the Suzdal deposit, and a number of promising gold objects (Baibura, Jhaima, etc.) [2]. In the article it is given the characteristic of Baibura ore field. Native gold from this ore field jasperoids is uniform in morphology and geochemical features. The most part of gold granules is of medium and fine dimension, preferably <0.25 mm. Gold granules are not rounded, of yellow color and interstitial, rarely crystal, morphology. Grade of gold indicates the unity of its source and the one-step process of its formation, lying in a narrow range of values 923-959‰. It was indicated the impurity of mercury in amounts up to 0.7%. Presence of mercury confirms ore field belonging to the Carlin-type gold mineralization.

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Rare elements of diamond-forming melt chambers formed in the mantle peridotite (estimation with use of experimental K_D at 7.0-8.5 GPa)

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Based on the experimental data at 7.0-8.5 GPa [1] rare elements (RE) in the diamond-forming mantle peridotite-carbonatite and eclogite-carbonatite systems are characterized by similar partitioning coefficients (K_D^{RE}) mineral-melt. These values are also closely comparable with those for the silicate and carbonatite melts in equilibrium with mantle silicate minerals [2].

It can be assumed that a chamber of diamond-forming melts was formed within the host garnet lherzolite mantle when it was affected by a reactive "metasomatic agent" [2, 3]. It is of interest to identify those RE that came to diamond-forming melts with the mantle components, as well as those RE that were infused by the "metasomatic agent".

The contents of RE in diamond-forming carbonatite melt chambers were calculated based on the real content of RE in minerals of peridotite and eclogite parageneses in diamonds and diamond xenoliths of several kimberlite pipes [4-6] and experimental K_D^{RE} . The main contribution of RE in them is made by the mantle component. Parental melt of diamonds and inclusions in them are depleted by medium (Sm, Eu, Gd) and heavy RE (Tb, Dy, Ho, Er, Yb, Lu, Hf), in contrast to primitive peridotite [7]. They are enriched in light (Sc, Rb, Sr, Ba, La, Ce, Pr, Nd) RE and Nb, but their content by 1-2 orders of magnitude lower than in the primitive mantle peridotite. High Sr can be associated with "the metasomatic agent". Support: Grants of the President # MK-1386.2013.5, the Ministry of education and science of Russia (agreements 8317, 8378) и RFBR grant 11-05-00401, 12-05-33044, 13-05-00835.

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