Types of auriferous mineralization related to Precambrian granitoids of the Ukrainian Shield

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Investigators of the metallogeny of the Ukrainian Shield have established a connection between auriferous mineralization, the host granitoids and ultra high grade metamorphism exists. They were able to classify the stages of formation and estimate the gold-bearing potential of hydrothermal systems originating from the granitoids produced by ultra high grade metamorphism of the Ukrainian Shield.

The parageneses and the special factors governing the gold-bearing potential of mineralized Precambrian granitoid systems evolved by crustal melting in areas of ultra high grade metamorphism in the Ukrainian Shield have been related to quantitative and genetic studies of the accessory minerals in these systems. Analysis of zircon generations, and quantitative statistical analysis of associated accessory minerals and others phases have been used. Using these criteria the following auriferous parageneses in the different granitoids can be recognised: A. gold-chalcopyrite-tetrahedrite-molybdenite with sphalerite or gahnite (zinc spinel); B. gold-pyrite; C. gold-pyrrhotite-chalcopyrite and, D. gold-arsenopyrite. The most prospective are the A and C associations in the normal granite suite of the central part of the Ukrainian Shield (Kirovogradsky, Bobrinetsky and Voznesensky massifs – Akhtovo deposit) and the granitoids of plagiogranite-tonalite type (Shevchenkovsky complex in Western Priazovie). Its model age is 2,780 Ma (U-Pb method, Shcherbakov et al. 1984). For granitoids of the late stage, the most prospective auriferous mineralization in the arsenopyrite-bearing paragenesis is related to normal granites (Demurinsky and Mocromoskovsky complexes), and also in some diorite-plagiogranite massifs and in leucocratic subalkaline granites (Obytochnensky and Anadolsky complexes in Priazovie). Its model age is 2,150-2,020 Ma (K-Ar method, Ivantyshyn 1965).