

COMPLEX APPLICATION OF THE METHODS OF PRACTICAL THERMOBAROCHEMISTRY AND GEOINDICATION: DECRYPHERING OF AERIAL COSMIC PRODUCTION IN THE STUDY ORE GENERATING SYSTEMS

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In the Baley ore region of the Transbaikalian area, during the studying of the gold deposits the methods of practical thermobarochemistry were used in conjunction with geoindicational decoding of aerial cosmic production.

Two types of ore-mineralisation were established: pneumatolytic-hydrothermal (moderate-sulphide medium-depth formation; 470–60 °C, 120–40 MPa) and proper hydrothermal (low sulphidation low-depth formation; 310–50 °C, 3–4 MPa; data of Lyakhov *et al.*).

The mineralisation is genetically connected to the series of the observed, radial-circular volcano-plutonic structures of the central type with a diameter up to 20 km. Among them the domed and depressive forms are singled out (Kolodiy). The mineralisation of medium-depth formation is also connected to the domed forms, and low-depth mineralisation is connected with the volcano-depressive forms. Known are the zones combined with the fractures. Topographic mineralogical analysis (Popivnyak) showed that the high temperature mineral associations change into the low temperature ones from the centre of the structure to the peripheral areas.

Temperature gradients are about 20 °C per 100 m from the deep horizons to the surface, and 5–7 °C per 100 m laterally. Spatial directivity of paleotemperature vectors is under the control of radial faults and is focused on the central stocks.

Gold occurrences formed in the average temperature range (300–200 °C) and are localised in the middle part of

volcano-plutonic structures at a certain distance from the central stocks.

Complex assessment made possible to correct exploration works and to establish new gold-bearing bodies (Kolodiy).

In Ukraine, in the limits of the Kirovograd block the domed radial-circular structure with the diameter about 150 km was discovered by decoding of aerial cosmic production and by morphotectonic analysis. Gold mineralisation spatially coincides with certain parts of the structure. The conditions of gold mineralisation in the western and eastern parts are similar. In both of them the process of mineral formation is characterised by cyclic penetration of fluids into the zones of ore localisation during five stages. Gold deposition took place at 270–225 °C (the eastern part; Nikolenko, Popivnyak) and 280–220 °C (western zone; Popivnyak, Karamysheva, Kovalevsky) in the intensively boiling fluids. Complex approach made it possible to outline the areas perspective for gold.

We must note that in the coal-bearing seams of the Donbas the gold mineralisation is also connected with the formation of the radial-circular structure (Ekhivanov).

Analogous complex approach made it possible to determine the Beregove ore field of the Transcarpathians as a volcanic radial-circular structure, leading to the discoveries of new ore zones (Kolodiy).