

GOLD-ARSENIC-ANTIMONY IN BLACK SCHISTS OF THE SOUTH SLOPE OF THE GREAT CAUCASUS (GEORGIA)

AREVADZE D. YAROSHEVICH V. Caucasian Institute of Mineral Resources Tbilisi, Georgia

On the South Slope of the Great Caucasus the deposits of black schists' formation of Jurassic age are widely spread. They concentrate numerous manifestations and deposits of copper-pyrite-lead-zinc and tungsten antimony-arsenic-mercury-gold types. The Lukhuni Deposit typifies the last one. In the ores of Lukhuni gold-arsenic deposit 3 main mineral associations of sulphides are distinguished: impregnated, pyrite-arsenopyrite (gold bearing), veined and of stockwork-metasomatic realgar-orpiment type. The content of Au in pyrite-arsenopyrite concentrate reaches 1000 g/t. Gold in crystals is distributed irregularly and does not form a self-dependent phase. In accordance with the results of isotopic and fluid inclusion study investigations, initial ore depositing hydrothermal fluid had magmatogene genesis and was characterized by bicarbonate-chloride, sodium-calcium salt composition (salinity up to 90 g-equiv NaCl). It was saturated by carbone dioxide ($X_{CO_2} \sim 18$ mol %) adopted mainly from sedimentary rocks as well as by hypogene sulphur and metals (As, Sb, W, Au), which are present in the fluid in the form of mono – and polynuclear thiocomplexes.

Heterogeneration of the fluid on essentially aquatic ($X_{CO_2} \sim 10$ mol %) and carbon dioxidic ($X_{CO_2} \sim 50$ mol %) was one of the main reasons of mineral deposition. Formation of arsenopyrite-pyrite-mineralization occurred at $T \sim 395^\circ\text{C}$ and $p \sim 1,1$ kbar.

In this case host schists were the source of iron, and the main quantity of arsenic, gold and sulphur was supplied by hydrothermal fluid. Antimounte has been crystallized under decreasing of T-P parameters of fluid up to 365°C and 1 kbar, and realgar and orpiment – at temperature below 290°C and pressure – 0,9 kbar.