FLUID INCLUSION STUDY OF THE AKTEPA SILVER DEPOSIT, KURAMA RIDGE UZBEKISTAN

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The Aktepa deposit is located in the northeastern part of the Kurama ridge, in a block between the Kumbel and Julysai faults. The silver ores are situated in eight separate vein systems within a Devonian gabbro massif (3.8 x 3.3 km), which is surrounded by an Upper Paleozoic acid volcanic suite (C3-P1) and intruded by syenites. Vein-type ore mineralization contains more than 50 minerals: native silver and arsenic, Ni-, Co- and Fe- arsenides associated with minor Ag-, Sb-, Hg-intermetallides, Cu-, Fe-, Ni-, Co-, Ag- sulfides and sulfosalts, within a gangue including calcite, siderite and quartz. The geological and mineralogical features correspond to those of the five-element g-As type of ore deposit (Kabo et al., 1992).

Fluid inclusions in calcite and siderite have been studied by microthermometry, acoustic decrepitation and bulk gas composition analysis.1024 fluid inclusions in 47 samples from the surface, drill cores and underground exposures covering 400m vertical distance were studied.

Based on modes of occurrence within carbonate grains, three types of inclusions have been defined, according to classifications of Ermakov (1972) and Roedder (1984):

(1) primary (syngenetic)
(2) primary-secondary (pseudosecondary) (sub-syngenetic)
(3) secondary (epigenetic)

The primary and pseudosecondary fluid inclusions are two-phase. Secondary inclusions are both two-phase and one-phase and one-phase (liquid). All two-phase inclusions homogenized into liquid.

There are two stages of carbonate deposition in association with ore minerals with temperatures of (1) 253-200°C and (2) 219-50°C. The second stage includes two substages: (2a) 219-163°C; (2b) 163-50°C. The bulk of ore minerals are associated with substage 2a (the mean temperature of homogenization is 187°C).

The aim of the acoustic decrepitation studies was to distinguish between barren carbonate veins and those containing silver ore. It is shown that there is a direct correlation between decrepitation intensity and ore mineral abundance. In mineralized samples with silver grade from 100 to 1000 ppm, 48360 signals were registered (mean values from 3g calcite samples); in samples with silver grade more then 1000 ppm (up to 22545 ppm) 93500 signals were detected, but in samples with silver grade less than 100 ppm, only 28500 signals were measured. The decrepitation took place in the temperature range from 140 to 500°C with peaks between 200-280°C.

The bulk composition of the gas phase in fluid inclusions has been studied using gas chromatographic analysis. The gases H_2O, CO_2, N_2, O_2 and H_2 were detected. CO_2 is dominant in the deep level ore bodies, but N_2 and O_2 are more abundant in higher level ore bodies.

These data show that Aktepa is one of the lowest temperature deposits among the Ag-As type of five-element ore deposits. For comparison, fluid inclusion studies of native-silver-bearing mineral assemblages in Great Bear Lake (Changkakoti et al., 1986) report a range of homogenization temperatures from 220 to 480°C.

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