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MINERAL-FORMING CONDITIONS OF THE GOLD MINERALIZATION  
IN ORE OCCURRENCE SINIL'GA, THE SUB-POLAR URALS  
(ACCORDING TO THE FLUID INCLUSIONS STUDY)

Investigation of fluid inclusions in vein quartz and rock crystals in gold-bearing quartz veins has allowed the deciphering of conditions of the gold mineralization formation in the ore occurrence Sinil'ga. For comparison, there were also studied fluid inclusions in goldless quartz veins, widely spread at the same ore occurrence. It has been revealed that gold-bearing quartz veins are characterized by the higher temperature of their formation — 290—390 °C. The liquid phase of these inclusions is represented mainly by the water-salt system NaCl—KCl—H<sub>2</sub>O. The salinity of solutions makes 9.5—17.5 wt % (NaCl equivalent). Usually, the gas phase prevails in inclusions over the water phase. This gas contains mainly CO<sub>2</sub>, with CO<sub>2</sub>/H<sub>2</sub>O ratio being always greater than 1.0. Rock crystals were formed in gold-bearing quartz veins at the final stage of mineralization at temperature 270—290°. Liquid phases of inclusions in these crystals also correspond to the water-salt system NaCl—KCl—H<sub>2</sub>O, with salinity 7—12 wt % (NaCl equivalent). Gold-free quartz veins were formed at the lower temperatures estimated as 290—325 °C. The liquid phase of inclusions consists mainly of such water-salt systems as NaCl—MgCl<sub>2</sub>—H<sub>2</sub>O and MgCl<sub>2</sub>—H<sub>2</sub>O, with salinity 12—22.5 wt % (NaCl equivalent). Usually, in this case, the water phase prevails in inclusions over the gas phase, the ratio CO<sub>2</sub>/H<sub>2</sub>O almost always lesser than 1.0. Isotopic data have allowed revealing probable sources of carbon dioxide and water in inclusions.

*Key words:* gold mineralization, fluid inclusions, gas composition, Raman spectroscopy, gas chromatography.