

NEW DATA ON PGE MINERALIZATION IN PORPHYRY COPPER DEPOSITS OF ALMALYK DISTRICT (UZBEKISTAN).

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Almalyk porphyry copper district (Kalmakyr, Dalnee and Sarycheku deposits) is located in Kurama ridge (Western Tien Shan), in the late Paleozoic volcanic province. It is one of the largest Cu-Mo-Au districts of former Soviet Union. PGE have been studied as possible by-products. Two types of PGE mineralization have been studied in ore and sulfide concentrates of Almalyk porphyry copper deposits using ICP-MS and electron microprobe techniques: 1) ^{187}Os formed by radioactive decay of ^{187}Re in molybdenite. New methods for rapid on-line ^{187}Os analysis have been developed (flow injection system - OsO_4 vapor generation - inductively coupled plasma mass spectrometry). Os contents in molybdenite concentrates are about 2.7-2.9 ppm and strongly depend from Re contents. Re-Os ages have been determined in the range of 313-321 Ma, in good agreement with published Rb-Sr dates. 2) Au-Pd-(Pt)-bearing telluride mineralization. Pd contents in some sulfide concentrates reach 2.8-3.1 ppm. Merenskyite ($(\text{Pd,Pt})\text{Te}_2$) is the main Pd-bearing mineral (wt. %: Pd 25.14-26.6; Pt 0.79-3.85; Au 0.1-0.2; Cu - 0.35-1.52; Te - 69.48-70.75; Sb 0.01-0.36; Bi 0.01-0.08). This is the first occurrence of merenskyite in Uzbekistan. The telluride assemblage consists of petzite, krennerite, native tellurium and tetradymite associated with native gold (92.5% Au). Fluid inclusions (FIs) were studied in order to determine conditions of porphyry copper and Au-bearing mineralization. Early fluids were high temperature brines of magmatic origin (Th 500°C). A complex assemblage of daughter minerals (halite, sylvite, pseudocotunnite, chalcopyrite, sphalerite, hematite, anhydrite) is characteristic for that type of FIs. Progressive mixing with meteoric waters and cooling gave a wide range of FIs (Th 150-350°C, salinity 5-35 wt.% NaCl eq.).