FIRST FINDING OF PT AND AU MINERALS IN THE CHROMITITES OF THE RAY-IZ OPHIOLITIC COMPLEX, POLAR URALS

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Literature data indicate that chromite deposits of the Ray-Iz ophiolite complex (Polar Urals, Russia) contain abundant Ru-Os-Ir minerals, mainly sulphides and alloys, as typical of chromitites hosted in the mantle unit of ophiolites. Such mineralogical observation is consistent with geochemical data, indicating that the chromitites are characterised by negative slope of the chondrite-normalized PGE patterns and very low contents of Pt and Au. In this abstract, we report the first occurrence of native Au and Pt-Fe alloys, accompanying the classical paragenesis composed of Os-Ir-Ru alloys and laurite, associated with massive chromitites from Ray-Iz. Generally, Au and Pt minerals occur as small grains, from 3 up to 20 microns in size, mostly included in chromite as polygonal crystals. Electron microprobe analysis revealed that Au does not contain impurities, whereas the Pt-Fe alloys show variable composition. Basing on stoichiometry considerations, two main compositional groups of Pt-Fe alloys can be defined: 1) isoferroplatinum with average composition corresponding to (Pt2.79Pd0.04Rh0.06Os0.04Ir0.06)2.99(Fe0.94Cu0.7)1.01, and 2) tetraferroplatinum with the general formula (Pt1.01Pd0.01Rh0.02Ir0.04)1.08(Fe0.76Cu0.11Ni0.05)0.92.

The finding of Au and Pt specific phases in the Ray-Iz chromitites is in apparent contrast with the geochemical and mineralogical data so far observed. This could be due to the very random distribution of these unusual minerals in the chromitite deposits. The mode of occurrence of the native gold indicates that it formed prior or during the chromite precipitation.