

A NEW TYPE OF PD-PT ORES IN THE FEDOROVO-PANSKY MASSIF, KOLA PENINSULA, RUSSIA

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The layered massif contains low-grade sulphide Pd-Pt-Cu-Ni ores. A new type of Pd-Pt sulphide- and chromite-free ores has been discovered in basic rocks which mainly overlie the low-grade sulphide ore bodies.

Maximum concentrations of noble metals in the ores are (ppm): Pd 17.05, Pt 6.26, Au 2.58, Ag 1.1, Rh 0.42, Ru 0.033; the sum of Pd, Pt, Au and Rh is 24.33. The contents of S, Cu, Ni and Co vary (%): 0.01-0.10, 0.01-0.37, 0.007-0.35 and 0.001-0.12; trace elements contents (ppm): Cr 5.5 – 320, V 10-380 V, Se 0.5-6.0. These ores, in comparison with the low-sulphide ones, are low in Cu, Ni and Ag, and have higher Ni/Cu, Pt/Pd. Au/Pd and Se/S ratios.

It is proposed that the concentration of noble metals in the low-grade sulphide ores was caused by liquid-phase separation. In contrast, the origin of Pd-Pt ores in sulphide- and chromite-free rocks is related to the action of fluids, which percolated upwards through completely unconsolidated rocks, reacted with residual sulphide melts and extracted the noble metals. The metals were subsequently deposited outside the ore bodies.

The new ore type is interesting for two reasons. Firstly, it may provide a clue to the existing genetic problems, and secondly, it expands the noble metals resources in the layered intrusions.