PLATINUM-GROUP METALS IN NICKEL ORES OF SOME WEATHERED DEPOSITS ASSOCIATED WITH ULTRAMAFIC MASSIFS, URALS

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Nickeliferous weathering profiles of mafic-ultramafic complexes in the Urals can become one of an unusual source of the platinum metals in Russia. The samples examined in this study were obtained from several localities in the Southern and Central Urals (The Sacharinskoe, Elizavetinskoe and Ufalei nickel deposits). Studies show that the minor amounts of the platinum metals contained in unweathered ultramafic rocks of that deposits may be concentrated during weathering. The total noble metal concentration in the samples from the study area weathered rocks averages about 1,0-2,5 ppm. Therefore weathering process has concentrated the platinoids ten- to fiftyfold from fresh ultramafic rocks that contained only clark PGE concentrations. Both theoretical and experimental evidence substantiate this mechanism. All platinoids enrich in a different degree concerning the country rocks. Palladium has especially high coefficients of enrichment, platinum and rhodium have lower. The platinum metal relative proportion in nickeliferous weathered rocks is (PdPtRhRuOsIr). Especially it should be noticed that weathered ore PGE proportion (PdPtRhRuOsIr) is identical to that of many sedimentary rocks (black shales, coals and others). The relatively high content of Pt and Pd has been supported by the presence of specific platinum-group minerals (pure native platinum and palladium and some tellurides, in which Pd strongly predominates over Pt), some minerals are Pd tellurides with a low Pt, Bi, Sn content. Os, Ir, Ru are strongly associated with chromspinelide.