

Platinum group minerals (PGM) from Novoselsti placers (eastern Bulgaria): evidence for an Ural-Alaskan-type intrusion?

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Sub-economic PGE mineralization has been described in three different types of deposits of Bulgaria: 1) the Elatsite porphyry copper, characterized by an enrichment in Pd and Pt and the presence of abundant PGM of the merenskyite-moncheite series, associated with magnetite-chalcopyrite-bornite assemblage, 2) the mantle hosted podiform chromitites of the Dobromirski complex in the Rhodope Mountains that contains Ru-Os-Ir PGM, typical of ophiolitic chromitites, and 3) PGE nuggets from placer deposits located in SW and SE Bulgaria. PGE nuggets from placer deposits world wide have derived from the erosion of mafic-ultramafic rocks although, in some cases, it is very difficult to recognize their original lode-sources. According to literature data, the placers related with ophiolites contain predominant Ru-Os-Ir nuggets, whereas Pt-Fe alloys accompanied by minor Ir and Os alloys characterize placers related with Ural-Alaskan-Type complexes. In this contribution we present new mineralogical data obtained on several nuggets from the Novoselsti placers, in the eastern Srednogie of Bulgaria. The nuggets vary in size from about 100 μm up to 2 mm and, in most cases, display a rounded shape. They mostly consist of Pt-Fe alloys and rare osmium. The Pt-Fe alloys vary in composition from native platinum to isoferroplatinum (Pt₃Fe), with negligible contents of Ni and Cu. Osmium occurs exclusively as small inclusion within the Pt-Fe alloys. It contains appreciable amount of Ir, but very low Ru. The Pt-Fe alloys also contain inclusions (< 10 μm) of erlichmanite, cuprorhodsite, malanite, Ir-Rh-S and Pt-S, occasionally accompanied by amphibole and albite. Mineralogical data obtained so far point to an Ural-Alaskan type intrusion as the most probable primary source of the nuggets. Although nuggets of Pt-Fe alloys have been reported from various placer deposits of Bulgaria, no one igneous complex with Ural-Alaskan type affinity has been identified so far.