

Platinum-group element and osmium-sulfur isotopic compositions of Ni-Cu-(PGE) ores from Rožany, Bohemian Massif

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The Bohemian Massif hosts numerous historical (e.g., Sn-W, Pb-Zn-Ag), but also present-day important (Au and U) ore mineralizations. Beside these, there are a few occurrences of Ni-Cu mineralizations bound to (ultra)mafic rocks (peridotite, gabbroic rock) which are locally associated with subeconomic platinum-group element (PGE) enrichment. The most important is that found in the Ransko gabbro-peridotite massif [1] in the Eastern Bohemia, but elevated PGE contents were also previously reported from Rožany-Kunratic Ni-Cu mineralization hosted by dolerite dykes cross-cutting the Lusatian Pluton of the Cadomian age (~570–540 Ma) in the Northern Bohemia [2].

Here, we present new constraints on PGE concentrations together with osmium and sulfur isotopic data for Ni-Cu massive ore from Rožany. The ore is characterized by the predominance of pyrrhotite over chalcopyrite with minor presence of Ni-Fe sulfides (violarite, pentlandite). The pyrrhotite-dominated ore contains high Os-Ir-Ru and Re contents (up to ~70 ppb in total and 61 ppb, respectively) paralleled by elevated Pd (up to 67 ppb). On the other hand, chalcopyrite-dominated ore is characterized by enrichment of Pd+Pt (up to 177 ppb) over Os-Ir-Ru (up to 12 ppb in total). Disseminated Ni-Cu mineralization within dolerites shows generally similar PGE and Re distribution to chalcopyrite ore. Barren dolerite primitive mantle-normalized PGE distribution shows enrichment in Pd and Pt, but in comparison to common basaltic rocks, no fractionation among Os, Ir and Ru. Osmium isotopic compositions of all analyzed ore types yield rather homogeneous ¹⁸⁷Os/¹⁸⁸Os ratios between 0.2073 and 0.3645 with the highest values found in pyrrhotite-rich ores. This low variability is paralleled with homogeneous δ³⁴S values of separated pyrrhotite and chalcopyrite in the range of –2.7 and +0.1 ‰. Such combined Os–S isotopic systematics suggest homogeneous, dominantly mantle-derived source of PGE with only negligible role of crustal contamination.

[1] Pašava *et al.* (2013), *Mineralium Deposita* **38**, 298–311.

[2] Pašava *et al.* (2001), *Proc. of 6th SGA meeting*, 627–633.