

PGE reefs in the Penikat Layered Intrusion, Northern Finland

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The Penikat Layered Intrusion, about 2440 m.y. old, is located in northern Finland. It is 23 km long and 1.5 to 3.5 km wide and it contains two main units: the marginal series and the layered series, the latter being further divided into five megacyclic units (MCU).

Three main PGE-enriched zones have been found in the Penikat Intrusion: the Sompujärvi (SJ), Ala-Penikka (AP) and Paasivaara (PV) Reefs, all of them are associated with MCU IV and only the SJ Reef occurs, in places, in the upper part of MCU III. The SJ Reef concentrations have been found to occur in association with either chromite, base metal sulphide disseminations or in silicate rocks without the disseminations mentioned above. The AP and PV Reefs are connected with base metal sulphide disseminations.

The late or post-magmatic fluid phase has been an important factor in the formation of all three PGE reefs. The volatile components of the magma diverged under appropriate conditions to release platinum metals and created the PGE reefs.

Two types of magma have intruded to the Penikat chamber: 1) boninitic or siliceous high-magnesian basalt (SHMB) affinity and 2) tholeiitic affinity. The source of the PGEs in all three reefs was the SHMB series of magmas, in which the PGEs moved upwards in the fluids of the residual magma along with volatile components.

References:

Halkoaho, T., Alapieti, T. and Huhtelin, T., 2005. The Sompujärvi, Ala-Penikka and Paasivaara PGE Reefs in the Penikat layered intrusion, Northern Finland. In: Alapieti, T.T. and Kärki, A.J. (eds.) FIELD TRIP GUIDEBOOK. Early Palaeoproterozoic (2.5-2.4) Tornio – Näränkäväära layered intrusion belt and related chrome and platinum-group element mineralization, Northern Finland. Prepared for the 10th Platinum Symposium in Oulu Finland 2005. Geol. Surv. Finland. Guide 51a, pp. 33-76.