



Mantle reservoirs (EM-1, OIB, E-MORB and N-MORB), long duration and polystages history for PGE-bearing paleoproterozoic layered intrusions in the N-E part of Fennoscandian Shield.

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Paleoproterozoic layered PGE –bearing intrusions located in the N-E part of the Fennoscandian Shield and have a total area about 2000 km². Long multidisciplinary studies using isotope Nd-Sr, U-Pb and ³He/⁴He systematics permit create a big bank of geochemistry data for different part of the intrusions: barren and main Cu-Ni-Cr-Ti-V and PGE phases, dykes complexes and host rocks. Based on U-Pb isotope data (on baddeleyite and zircon) and Sm-Nd mineral isochrones (on rock-forming and sulphides minerals) there is distinguished long magmatic duration from 2.53 to 2.40 Ga. Using precise U-Pb and Sm-Nd data for different part of the intrusions there are established four main impulses: 2.53, 2.50, 2.45, and 2.40 Ga of magmatic (LIP) activities for gabbro-norite, anorthosite et. set. rocks. The primary reservoir for all precious and multimetal massifs are considered as enriched mantle EM-1 using $\epsilon_{Nd} - I_{Sr}$ system with negative ϵ_{Nd} values and low I_{Sr} data for whole rocks of the intrusions. Dyke complexes are presented as three groups: high Ti-ferrodolerites, low Ti and low Fe-gabbro-norites. Complex isotope (U-Pb, Sm-Nd) and geochemistry (REE, ϵ_{Nd} , I_{Sr}) data investigations reflect OIB, E-MORB and N-MORB reservoirs for its origin (Nerovich et al., 2014). Isotope ³He/⁴He and ³He concentrations for accessory minerals (ilmenite, magnetite et. set) from the layered paleoproterozoic intrusions reflect significant lower mantle component and upper mantle contribution. According to the model of binary mixing (Jahn et al., 2000) there were calculated mantle and core component into plume magmatic reservoir connected with the origin of the PGE paleoproterozoic intrusions. The mantle contributions lie in the interval from 85 to 93% and core component are very less.

All investigations are devoted to memory of academician RAS, professor F.Mitrofanov (Russia), he was a leader of scientific school for geology, geochemistry and metallogenesis of ore deposits.

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