



New Sm-Nd ages and isotopic composition of Nd for rocks and minerals of the Fedorova-Pansky layered intrusion, N-E Baltic Shield.

P. Serov

Geological Institute KSC RAS, Russia (mozay@nm.ru)

Two belts of PGM-bearing layered mafic-ultramafic intrusions are known within Fennoscandia. The Northern group includes Mt. General'skaya, Federov-Pana Massif, Monchepluton, and Imandra lopolith. The Southern group includes the Tsipringa, Lukkulaivaara, Kivakka, and Burakovka intrusions, as well as several layered intrusions of Finland (Koilismaa, Kemi, Nyarankavaara, Koitilainen, Penikat, Akanvaara, and others). The rocks of these massifs belong to pyroxenite-gabbro-norite-anorthosite formation and have similar isotope-geochemical characteristics: (1) U-Pb age (zircon and baddeleyite) within 2528-2396 Ma; (2) LILE-rich mantle source (according to REE data; ISr 0.702-0.704; and $\epsilon\text{Nd}(T)$ from -0.2 to -2.6); (3) model Sm-Nd ages $T(\text{DM})$ of ~ 3 Ga. These characteristics indicate that the Proterozoic layered intrusions of Fennoscandia have a common source and were likely formed by a mantle plume [T. B. Bayanova, 2004].

The Fedorov-Pana layered intrusion is one of the most promising objects for low-sulfide PGM ores in Russia [Mitrofanov et al., 1999]. The intrusion (3-4 km thick) is located in the central Kola Peninsula and extends northwestward over 70 km. The rocks dip southwestward at 30-35°. The massif consists of four blocks: Fedorova Tundra, Last'yavr, Western Pana (WPB), and Eastern Pana.

The aim of this article is to present new Sm-Nd data on the rock-forming minerals and rocks from the Western Pana and Fedorova Tundra blocks of the intrusion.

The new Sm-Nd age and geochemical characteristics of the studied rocks, as well as U-Pb zircon data for these rocks for comparison. The Sm-Nd data are very similar to the U-Pb data but are generally characterized by larger errors.

The Sm-Nd model ages (T_{DM}) for rocks of the Fedorova Tundra vary between 3.25 and 2.93 Ga and defines slightly older than WPB rocks (2.97-2.91 Ga). The new Rb-Sr whole rock analysis show that ISr values varies between 0.702-0.704. In the $\epsilon Nd(T)$ -ISr diagram, the data points of all Fennoscandian PGM-bearing layered intrusions for which are within the EM1 field.

The new Sm-Nd isochron data on rocks and rock-forming minerals are supported by the similar U-Pb zircon ages. The obtained crystallization age for the Fedorova Pana Massif is older than previously reported ages. The orthopyroxenites and gabbro from Fedorova Tundra defines an oldest age of 2521 ± 42 Ma and 2516 ± 35 Ma respectively.