



Geochronological Sm-Nd dating of the Pados Cr and PGE-bearing Massif (North-West Baltic Shield): New minerals and rocks isochrones

S. Shapkin and T. Bayanova
(sergey.shapkin@rambler.ru)

The Pados massif is situated at the North-West of the Baltic Shield. It intrusion occurs in the western part of the Kola Peninsula and belongs to the Notozero ultramafic igneous complex

The rocks of the intrusion are constrained from north by the Palaeoproterozoic thrust of the Lapland granulite belt, and by the Archaean Belomorian TTG complex from south. The length of the ultramafic series of the intrusion is about 6 km, and the thickness is 1.5-2.5 km. Total area is 13.41 square kilometres. The rocks dip northwestward with monoclinal folding at 45-80°.

The intrusion is composed of orthopyroxenite, bronzitite, and olivine orthopyroxenite with minor gabbro, dunite and harzburgite. There are mesogabbro, leucogabbro, and hornblende dykes in the rhythmically layered series, which have the concordant relationships with the mafic-ultramafic rocks of the intrusion. There are four chromite-bearing horizons with PGE mineralization in the intrusion.

The aims of the studies are to present new Sm-Nd data for the rock-forming minerals and WR from the Pados massif.

The mineral Sm-Nd isochron for the pyroxenite corresponds to the age of 2149 \pm 110 Ma, $\epsilon_{\text{Nd}}(\text{T}) = +3.3$. This age can be interpreted as the emplacement time of the bulk differentiates of the intrusion. The large error of the age determination is probably related to the narrow range of 147Sm/144Nd ratios. Some younger age that is within the error close to that one was obtained for the dike hornblende and equals 2086 \pm 64 Ma. This age can be regarded as the emplacement time of the dike complex synchronous to the intrusion.

Two rutile monofractions have been separated to study the time of metamorphic events in the gabbroic slab by Sm-Nd methods. It has not been possible to obtain main rock-forming igneous minerals because these were found strongly altered and pierced by different secondary inclusions in thin sections. Thus, the Sm-Nd age of 1872 \pm 76 Ma can be interpreted as the time of metamorphism. The U-Pb investigations of the gabbroic rocks have shown that the resultant age of 2083 \pm 7 Ma can be interpreted as the time of gabbro emplacement. The U-Pb rutile age of 1804 \pm 10 Ma can be regarded as the time of metamorphic events over gabbroic rocks. Thus, the isotope-geochemical investigations have allowed to establish the emplacement age for the main mass of the Pados-Tundra rocks (2.15 Ma) and to restrict the time of dike complex emplacement (2.09 Ma). The isotope Sm-Nd and U-Pb data for the rutiles from the gabbroic rock show the age of metamorphism (1.87-1.89 Ma). The protolith Sm-Nd age (TDM) for the Pados-Tundra pyroxenite calculated on the basis of the one-stage model for DM is 2.34 Ga. TDM for the Pados-Tundra hornblende dike is 2.55 Ga, and for the gabbro is 3.1 Ga.

The interval of the protolith formation from 3.1 to 2.3 Ga and $\epsilon_{\text{Nd}}(\text{T})$ from -0.4 to +3.3 point out the prevalent mantle component and almost no crustal component.

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