Geophysical Research Abstracts
Vol. 16, EGU2014-832, 2014
EGU General Assembly 2014

Isotope-geochemical Sm-Nd, ENd and TDM data of the layered paleoproterozoic PGE massif Monchetundra (Kola peninsula)

Evgeniy Kunakkuzin (1,2), Elena Borisenko (2), and Pavel Serov (2)

(1) Murmansk State Technical University, Murmansk, Russian Federation (kunakkuzin_evgeniy@mail.ru), (2) Geological Institute, Kola Science Centre RAS, Apatity, Russian Federation

Monchetundra massif is located in the central part of the Kola Peninsula and it is the south-eastern part of the Main Ridge Intrusion. The massif is subdivided into two up to five syngenetic zones by different researchers (Nazimova, Rayan, 2008, Nerovich et. al. 2009, Layered intrusions. . . p.1, 2004). According the isotope-geochronological and isotope-geochemical data it can identify at least four groups of rocks distinguishing by ages.
The aim of this study is to identify the isotope-geochemical Sm-Nd (ENd and TDM) data of the mafic rocks of the massif Monchetundra. For the interpretation of these data it was selected 40 analyzes of rocks sampled during field works within Monchetundra massif in 2011-2012 and from the published data (Nerovich et. al., 2009, Bayanova et. al., 2010, Layered intrusions. . . p.2, 2004).
The earliest group of rocks is dated by U-Pb zircon in 2521 $\pm$ 8 Ma (Bayanova et. al., 2010). It consist of metagabbroids of wide composition range from anorthosite up to gabbro, which also called «amphibole-plagioclase rocks» (Nerovich et. al., 2009) due to their strong metamorphic changes. These rocks are characterized by ENd values from -0.02 up to -2.23 (at the time of rocks formation) as well as mesoarchean and paleoarchean values of model ages.
The second group of rocks is composed of medium- grained and coarse-grained mesocratic gabbronorites of trachytoid texture and their amphibolized varieties. The rocks of this group were dated in 2505 $\pm$ 6 Ma and 2501 $\pm$ 8 Ma (Layered intrusions. . . p.1., 2004). Values of ENd for these rocks vary from -1.70 up to +1.42, model ages correspond to the range from 2.7 up to 3.5 Ga.
Leucocratic gabbronorites, gabbronorite-anorthosites of massive texture and their metamorphosed varieties with garnet and amphibole constitute the third group of Monchetundra massife rocks. The formation age of these rocks has been determined on zircon and baddeleyite by U-Pb method and it is 2471 $\pm$ 9 Ma, 2476 $\pm$ 17 Ma, 2456 $\pm$ 5 Ma and 2453 $\pm$ 4 Ma (Bayanova et. al., 2010, Mitrofanov et. al., 1993). Value of ENd for this group rocks vary from -3.38 to +2.08, and the values of the model ages range between 2.7 and 3.4 Ga.
Dyke-shaped bodies of melanocratic troctolites are found within the southeastern slope of Monchetundra massif. These rocks are characterized by positive values of ENd varying from +2.01 to +3.28, and the values of model ages are close to 2.7 Ga.
Gabbro-pegmatites occur at the upper part of the Monchtundra massif and are characterized by negative ENd values from -1.26 up to -0.63, and model ages of protolith range from 3.0 to 3.2 Ga.
Isotope-geochemical Sm-Nd (ENd and TDM) data indicate the origining of gabbro massif from EM-1 mantle plume reservoir and this fact is confirmed by the ENd-ISr diagrams in accordance with published data (Bayanova et. al., 2009).

The research is conducted with the financial support of RFBR 13-05-00493, OFI-M 13-05-12055, 14-05-93965 and 14-05-00484.