Geophysical Research Abstracts, Vol. 9, 01153, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-01153

Polychronic and long-time interval of the formation Proterozoic PGE 8211; bearing Fedorovo-Pansky intrusion

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Based on summarizing more than 30 isotopes U-Pb and Sm-Nd ages for Proterozoic PGE-bearing layered intrusions in the Northern belt (Balashov et al., 1993; Bayanova, 2004, 2006), it is should be emphasized that the age for the layered intrusions of the Southern belt is 2440 Ma (Vogel et al., 1998) in comparison with the Northern belt where extreme 2.5 Ga and 2.4 Ga values are widespread.

All the layered intrusions belong to pyroxenite-gabbronorite-anorthosite sequence. The protolith of the sequence has the model TDM ages from 2.8 Ga to 3.1 Ga, with negative εNd values from -1.1 to -2.4. Additional initial Sr data for rocks of the intrusions lie in the interval from 0.703 to 0.704 and reflect a mantle source, in the diagram εNd-Isr the rocks show enriched mantle EM-1 reservoir. Noble gases with ^{4}He /^{3}He isotopes ratios for rocks, rock-forming and accessory minerals from the intrusions reflect also contribution of the mantle source.

Precise U-Pb isotope ages on zircon-baddeleyite for gabbronorite and anorthosite from Fedorovo-Pansky and Mt.Generalskay massifs and dykes from Imandra lopolith of the Nortern Kola belt show long-time interval of sequence from 2.52 Ga to 2.39 Ga, i.e. more than 130 Ma.

All intrusions in the Baltic Shield were derived from intraplate magmatism. Proterozoic layered intrusions are known on the Baltic Shield, and Superior and Wyoming provinces of the world, and according to Heaman (1997) they were derived from the mantle plume which caused the break up of the oldest supercontinent. By the example of various rocks from the different blocks of the Fedorovo-Pansky massif which were dated by U-Pb and Sm-Nd methods, it is possible to conclude about polychronic and

long duration of massif formation. There are four distinguished phases including three PGE-bearing and one barren.

So based on previous and new precise U-Pb zircon-baddeleyite and Sm-Nd mineral isochron ages for the Western Pansky and Fedorov blocks, four phases in the long-time (70 Ma) interval of formation from 2.52 Ga to 2.45 Ga Fedorovo-Pansky massif can be defined. Thus, earlier barren orthopyroxenite and olivine gabbro phase has the age of 2526-2516 Ma, but main 2500-2485 Ma basal gabbronorite, 2470 Ma gabbropegmatite, and 2447 Ma anorthosite contain PGE-bearing deposits. The PGE mineralogical, geological and isotope data for the different rocks of the layered Proterozoic Fedorovo-Pansky allow to conclude about polychronic PGE mineralization and long 70 Ma time interval of massif formation.

This study was supported by the RFBR 04-05-64179, Scientific School 1413.2006.5 and State Program 02.445.11.7403.

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