



New paradigm for layered paleoproterozoic PGE intrusions of the Fennoscandian Shield: duration and multistage magmatic activity

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Layered mafic-ultramafic paleoproterozoic PGE intrusions are widespread in the N-E part of Fennoscandian Shield and belongs to two belt: North (Kola) and South (Finland and Karelia). Precise isotope-geochemical data using U-Pb (on zircon and baddeleyite) and Sm-Nd (rock-forming and sulfides minerals), systematic reflect long magmatic activity (with 2.53, 2.50, 2.45, 2.40 pulses) and duration of mantle event from 2.53 to 2.40 Ga.

The Kola belt barren phases were dated in Fedorovo-Pansky massifs with 2.53 Ga for orthopyroxenites and olivine gabbro based on U-Pb (on zircon) and Sm-Nd (rock-forming minerals) data. Main PGE-bearing phases of gabbro-norite (Mt. Generalskaya) norite (Monchepluton) and gabbro-norite (Fedorovo-Pansky) massif have yielded 2.50 Ga on U-Pb and Sm-Nd dating. The second PGE-bearing phases with 2.45 Ga belong to anorthosite of Mt. Generalskaya, Fedorovo-Pansky and Monchetundra massifs. The same ages have layered PGE-bearing intrusions of Finland – Koitelainen, Penikat et. set. and Oulanga group in Karelia (Bayanova et al., 2009). The final mafic magmatic activity connected with dykes of Imandra lopolith with 2.40 Ga. Isotope geochemical ϵ_{Nd} - ISr indicators for layered intrusions (more than 70 analyses) reflect enriched mantle EM-1 type reservoir with ISr values from 0.703-0.704. Isotope $^3He/4He$ data for accessory minerals (ilmenite, magnetite et. set.) have significant lower and upper mantle contribution. The model Sm-Nd ages of protolith lies in 3.2-2.9 Ga and primary magma source as fertile according to (Arndt, 2010). The geological and isotope-geochemistry data for layered paleoproterozoic PGE-intrusions permit considered Fennoscandian Shield with Superior and Wyoming as a big magmatic LIP, which related with breakup of oldest Kenorland Supercontinent.

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