Paper Number: 2832

Paleoproterozoic Monchetundra massif (Fennoscandian shield): geological relationships and geochemical features of rocks

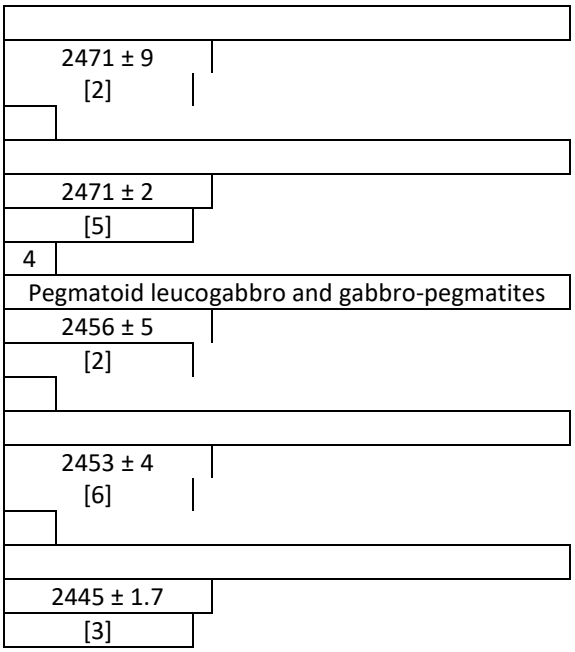
Borisenko E.S., Kunakkuzin E.L., Bayanova T.B.
Geological Institute of KSC RAS, Apatity, Russian Federation, elena.s.borisenko@gmail.com

---

The Monchetundra massif (the MM) is located in the north-eastern part of the Fennoscandian shield (Kola Peninsula, Russia) and belongs to the Paleoproterozoic East-Scandinavian Large Igneous province enclosing Cr, Ni, Cu, Co, Ti, V and PGM-bearing deposits [1]. Geology and internal structure of the MM is a combination of both mafic rocks differing in formation age (table 1) and a complex of mafic dykes, formed during multiple intrusions.

Table 1. The main varieties of mafic rocks in the Monchetundra massif

	Group of rocks	U–Pb age, Ma	References
1	Metagabbroids	2521 ± 8	[2]
		2516 ± 12	[3]
2	Trachytoid gabbro–norites	2505 ± 6	[4]
		2501 ± 8	[4]
		2507.5 ± 7.7	[5]
		2504.4 ± 2.7	[5]
3	Massive leucocratic gabbro–norites and gabbro	2476 ± 17	[2]



Because the prominent intrusive contacts between different types of rocks within the Monchetundra massif are identified only for dykes of dolerites, bodies of gabbro-pegmatites and melanocratic troctolites, this massif was believed to compose of syngenetic series of mafic rocks. Contact between massive and trachytoid varieties of the massif mafic rocks was found currently. It is marked by the appearance of lenticular and bedded bodies of massive leucogabbro in trachytoid gabbronorites. Such relationships between these rocks seem to have formed during an emplacement of younger rocks, which intruded the underlying trachytoid gabbronorites forming in them thin stratiform and lenticular bodies [5].

The main varieties of the Monchetundra mafic rocks differ in age of formation, textural and structural features and have similar geochemical characteristics. The general similarity of REE patterns of all mafic rocks suggest that they seem to have derived from a common source and isotope-geochemical Nd-Sr data is typical for rocks enriched in lithophile elements of a mantle source. Variations of isotope-geochemical data between different groups of mafic rocks are likely to be associated with the evolution of the mantle source during long-lived plume action.

References:

[1] Mitrofanov, F.P., Bayanova, T.B. et al. (2013) Geology of Ore Deposits T 55 №5: 305-319
[2] Bayanova, T.B., Nerovich, L.I et al. (2010) Doklady Earth Sciences T. 431 №1: 288-293
[3] Nerovich, L.I., Bayanova, T.B. et al. (2014) Geochemistry International. Vol. 52. №7. pp.605 – 624
[4] Layered intrusions of the Monchegorsk ore region: petrology, mineralization, isotope features, deep structure: 2 parts / Ed. Mitrofanov F.P., Smolkin V.F. - Apatity: Kola Scientific Center, RAS, 2004
[5] Borisenko, E.S., Bayanova, T.B. et al. (2015) Doklady Earth Sciences Vol. 465 P. 1: 1107–1111
[6] Mitrofanov, F.P., Balagansky, V.V. et al. (1993) Doklady RAN, 331, 1, p. 95-98

The studies were supported by the RFBR projects no. 16-05-00305, 15-35-20501.