Paleoprotherozoic Ti-V-Fe-bearing anorthosite of Kandalaksha-Kolvitsa complex (Baltic shield): U-Pb and Sm-Nd ages and REE distribution in zircons

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Kandalaksha-Kolvitsa complex located in the N-E part of Baltic shield and consists of three parts. Marginal zone (mesocratic metanorite) lies at the base of the massif. Main zone is composed of leucocratic metagabbro. The upper zone is alteration of mataanorthosite and leucocratic metagabbro. All rocks were subjected to granulate metamorphism.

Three fractions of single zircons from anorthosite of the Kandalaksha massif gave U-Pb age 2450± 3 Ma. Leucocratic gabbro-norite were dated by U-Pb on single zircon, with age up to 2230±10 Ma. This age reflects the time of granulite metamorphism according to [1]. Two fractions of rutile have been analyzed by U-Pb method and reflect age of 1700 ± 10 Ma. It is known that the closure temperature of U-Pb system rutile 400-450 ° C [2], thus cooling of the rocks to these temperatures were about 1.7 Ga. These data suggested two stages of metamorphic alterations of the massif.

Two fractions of single zircons from metagabbro of the Kolvitsa massif yield U-Pb age 2448 ± 5 Ma and reflects the time of magmatic crystallization. Distribution of REE (ICP-MS) in zircon have a typical magmatic nature: a positive Ce, negative Eu anomaly and HREE flat spectrum. Titanium content in zircons was measured for the calculation [3] of their crystallization temperature with 869^{0}C. These data are evidence of magmatic origin of zircon. Metamorphic minerals (amp,grt,rt) were analyzed using Sm-Nd method and reflect 1.9 Ga. This age is interpreted as the peak of granulite metamorphism, which is widely expressed in the Kola region.

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[1] Mitrofanov,Nerovich (2003) *Petrology*. **11**. 4. 381-390. [2] Mezger et.al. (1989) *EPSL*. **96.** 106-118. [3]Watson (2006) *Contrib. Miner. Petrol*. **151**. 413-433.