

**LATE ARCHAEOAN ECLOGITES OF THE KOLA PENINSULA
(NE BALTIC SHIELD): U-Pb AND Sm-Nd DATA**

KAULINA, T & APANASEVICH, E.

Geological Institute of Kola Science Centre of RAS (Fersman street. 14, 184209, Apatity, Russia)
e-mail: kaulina@geoksc.apatity.ru

Eclogites, which supposed to be Archaean were documented in two places of the Belomorian Mobile Belt: the Gridino area (northern Karelia) (VOLODICHEV et al., 2004) and the Salma area (Kola Peninsula) (KONILOV et al., 2004). The NORDSIM U-Pb zircon dating of Gridino eclogites yielded an age of 2720 ± 8 Ma (VOLODICHEV et al., 2004). Salma eclogite rock assemblage (eclogite, eclogite residue and adakite) was dated by U-Pb and Sm-Nd methods. Petrologic description of the rocks is given in (KONILOV et al., 2005, this volume). U-Pb dating of metamorphic isometric zircons (common for high-pressure rocks) yielded an age of 2695 ± 26 Ma which coincides within error limits with the age of Gridino eclogites. This age is interpreted to date zircon growth at slab dehydration during deep subduction. Zircons from eclogite-residue are of different type – short prismatic grains with inclusions and high Th / U ratio (1 – 1.5), which is typical for zircons from mafic rock. These zircons were probably formed during slab melting. Their U-Pb age is 2684 ± 80 Ma. Large error is caused by tendency of points to scatter inside the triangular between 2.7 - 1.8 - 0 Ga. Such picture reflects two episodes of radiogenic lead loss: during Svecofennian and modern time; this interpretation implies that the obtained age corresponds to the minimal age of eclogites. Zircons from adakite vein contain cores and could not be dated by conventional U-Pb method. Age determinations for them were carried out using LA-ICPMS (Australia). U-Pb ages of 2875 ± 11 (cores) Ma and 2755 ± 11 Ma (rims) were interpreted as magmatic age of adakite vein and a metamorphic event, respectively (BELOUSOVA et al., 2004). The large difference in age of adakite and eclogite most likely suggest that zircon cores could be assimilated from already existed tonalite crust. Rutile ages of 1.79 - 1.80 Ga – the same as for rutiles throughout the Belomorian Belt (BIBIKOVA et al., 2001) – correspond to the time of rock cooling below T of 450 °C, the closure temperature for U-Pb rutile system. The preliminary Sm-Nd data for garnet and whole rock yielded ages of 1.86 - 1.96 Ga. The most meaningful ages were obtained for samples from eclogite residue and garnetite, where whole rock consists mainly of garnet. These ages reflect re-equilibration of Sm-Nd system during Svecofennian metamorphism. Planned U-Pb dating of garnet and SHRIMP dating of zoned zircons will provide more detailed information on timing of metamorphic and cooling history. Nevertheless, the obtained data obviously show the Archaean time of the eclogite formation, confirming manifestation of deep subduction in the Late Archaean.

References

- BIBIKOVA, E. V., SLABUNOV, A. I. & BOGDANOVA, S. (2001): *Geochemistry*, 8, 842-857.
 VOLODICHEV, O. I., SLABUNOV, A. I. & BIBIKOVA, E. (2004): *Petrology*, 12, 540-560.
 BELOUSOVA, E. A., NATAPOV, L. M. & GRIFFIN W. (2004): *GEMOC Report IMP-2004.1*. GEMOC. 26 p.
 KONILOV, A. N., SHCHIPANSKY, A. A. & MINTS M.V. (2004): 32 IGC Florence 2004. Abstracts. I, 108.