

## ARCHAEAN ECLOGITES FROM THE CENTRAL PART OF THE BELOMORIAN MOBILE BELT, KOLA PENINSULA, RUSSIA

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Until recently the most ancient crustal eclogites of 2 Ga old were reported from the Usagaran Belt, Tanzania (MÖLLER et al., 1995). However, last year VOLODICHEV et al. (2004) reported the first finding of Archaean eclogite with U-Pb zircon ages of 2.72 Ga, occurring along with the tectonic mélange zone in the western shore of White Sea. Here we present for the first time some preliminary data on the other kind of eclogites discovered in the central part of the Belomorian Belt. This type of eclogites is largely emplaced amongst the Belomorian grey gneisses of TTG affinity. We refer to it here as the Salma eclogite, which macroscopically appears as a massive mafic rock containing visible pink garnet porphyroblasts with obvious plagioclase-rich reaction coronas and both light green clinopyroxene-plagioclase and black hornblende-plagioclase as matrix phases. In thin section, the most common mineral assemblage within the Salma eclogite is garnet + diopsidic clino-pyroxene + plagioclase + hornblende ± kyanite ± quartz. Clinopyroxene is characterized by a vermicular symplectite of albite-rich plagioclase, known from many eclogites. In a few cases amongst the symplectite colonies we have found relicts of omphacite containing 32 mole% jadeite (~4.0 wt% Na<sub>2</sub>O). Corona textures around garnet and between garnet and quartz are retrograde, with secondary low-Na clinopyroxene and plagioclase supporting thus to the decompression origin of the Salma retrogressed eclogite. Peak metamorphic conditions found in the Salma eclogite reached about 700 °C and 14 - 15 kbar. The thermobarometric study on the retrograde P-T evolution yields lower pressures of only 10 to 11 kbar, but the same temperature (GCPQ geothermobarometer). This implies that the uplift of the Salma eclogite bodies was caused by near-isothermal conditions. Zircons from the retrogressed eclogite show discordant U-Pb ages of ~2.7 Ga obtained by conventional technique (KAULINA, this volume).

Of particular interest is the occurrence of frozen partial TTG melts within the Salma eclogite bodies. These are turned into the Grt - Ky ± Crd gneisses which were formed under 690 °C (Bt-Grt geothermometer) and 9.7 kbar (GPKQ geobarometer). Their subsequent metamorphic evolution is recorded by forming of cordierite collars around garnet grains that took place under 530 - 600 °C (Bt-Grt and Crd-Grt geothermometers) and 6.0 - 6.8 kbar (GPKQ geobarometer). Zircons from the frozen partial melt have been dated by LAS ICP-MS technique in the ARC GEMOC, Sidney, Australia and have yielded two age populations, 2875 ± 11 Ma and 2755 ± 10 Ma (BELOUSOVA et al., 2004). Thus, the Salma eclogites appear to be the oldest now known crustal eclogites worldwide.

### References

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