

## Monazite–zircon–fluorapatite associations in the Melechov granite massif, Czech Republic

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The Melechov massif consists of a series of peraluminous two-mica granite intrusions. Relative ages are Stvoridla < Melechov < Kouty. The Stvoridla granite is surrounded by the Melechov, which in turn is surrounded by the Kouty. The cores of large (> 50–100 µm) FAp grains from the Stvoridla granite are enriched in Mn, Fe, Na, and REE relative to their rims as well as to the small FAp (< 50–100 µm) grains. The large FAp contain rare Zrn inclusions. The Kouty and Melechov granites contain three populations of FAp. Pop I consists of large FAp grains, with rare Xn and abundant Mnz and Zrn inclusions, Mnz/Zrn intergrowths, and Mnz and Zrn rim grains. Pop II is identical except that it contains no inclusions or rim grains, except rare Zrn. Similar to FAp from the Stvoridla granite, the core of the FAp grains of both Pop I and II is enriched in Fe, Mn, Na, and REE relative to the rim. Pop III consists of small FAp grains, which have no inclusions and resemble, compositionally, the rims of the large FAp grains. No systematic compositional difference between Mnz and Zrn in the FAp and in other phases was found. The extreme enrichment of the Pop I FAp grains with Mnz, Zrn and Xn probably resulted from a combination of magmatic and mass transfer processes, and in rare cases, metasomatic processes, active during growth of the large FAp. Formation of Pop III FAp occurred at a later stage, concurrent with large FAp grain rim growth.

## ALKALINE plume processes from Arhaean to Paleozoic time in geological history of the N-E Baltic Shield

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The Arhaean plume is connected with 140 Ma duration of the formation lamprophyre dykes, alkaline granite (Ponoy, Zapadnokeivsky, Belaya Tundra, Saharjok). The U-Pb ages based on zircon and baddeleyite from carbonatite Siilinjärvi (Finland) and alkaline granites shows interval 2.75-2.61 Ga. The alkaline granite and nepheline syenite belongs to type A-granite and has low Y/Nb and Yb/Ta ratios typical to enriched mantle EM2. Nepheline syenite of Saharjok massif corresponds to analogous of the OIB-magma (Zozulya and Bayanova, 2002). <sup>3</sup>He/<sup>4</sup>He ratio for ilmenite from Ponoy granite is 0.6x10<sup>-6</sup> and reflects mantle source (Vetrin et al., 2000). Timing and duration 2.75-2.61 Ga of the alkaline magmatism of the N-E Baltic Shield increase Arhaean isotope data knowing in the world (Blichert-Toft et al., 1996). About 20 alkaline massifs with carbonatites and kimberlites are distinguished in Paleozoic time in N-E Baltic Shield. Interval 20 Ma of alkaline magmatism was dated by Rb-Sr system on minerals (Kramm et al., 1993). New Sm-Nd and Rb-Sr ages on rock-forming minerals from diamond-bearing kimberlites and U-Pb ages on zircon and baddeleyite have enlarged alkaline magmatic activity up to 100 Ma (from 460 to 360 Ma). The highest <sup>3</sup>He/<sup>4</sup>He ratio 3.3x10<sup>-5</sup> for olivinite of Sebljavr massif shows contribution of lower mantle plume (Tolstikhin et al., 1999).

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