TIMING AND GEOCHEMISTRY OF POTASSIC MAGMATISM IN THE EASTERN PART OF THE SVECOFENNIAN DOMAIN, NW LADOGA LAKE REGION, RUSSIAN KARELIA

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The Puutsaari intrusion is a potassium-rich magmatic complex in the eastern part of the Svecofennian domain close to the Archaean border. The intrusion is generally undeformed in contrast to 1880-1875 Ma-old country rock tonalitic migmatites and diatexitic. The main rock types are (1) mafic rocks of a gabbro-norite - diorite quartz monzodiorite series, (2) quartz diorite tonalite granodiorite and (3) coarse-grained microcline granite. The three rock-types intruded coevally forming a peculiar three-component mingling system. The mafic rocks, enriched in K, P, Ba, Sr and LREE, have marked shoshonitic affinities. On a regional scale they demonstrate transitional geochemistry between less enriched synorogenic 1880 Ma-old gabbro - tonalite complexes and strongly enriched 1800 Ma post-collisional shoshonitic intrusions. The microcline granites, as well as the tonalite - granodiorite rocks, are geochemically similar to crustal anatectic granitoids of the NW Ladoga Lake area. The three rock groups do not form a single trend on Harker-type diagrams and are unlikely to be related by fractional crystallisation. Zircons from the Puutsaari microcline granite and from the mafic rock series have been dated by ion microprobe (NORDSIM) at 1868.2+/-5.9 Ma and 1869+/-7.7 Ma, respectively. Most zircons recovered from a granite sample had zoned or homogeneous cores and unzoned fractured rims. No statistically significant variation of zircon core and rim ages from the granite was established. Zircons from the mafic rock are unzoned. It is suggested that the mafic rocks at Puutsaari were derived from an enriched mantle shortly after the main Svecofennian collisional event and the roughly 1.88 Ga regional metamorphic culmination. The emplacement of the
mafic melt caused anatectic melting of various crustal protoliths and produced coeval granitic and tonalitic compositions.