

Chronostratigraphic aspects of the Archean Suomussalmi-Kuhmo-Tipasjärvi greenstone complex

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The Archean greenstone belts in Finland have been under elaborate research during past decades. However, the research has been concentrated mainly on the mafic and ultramafic volcanic rocks. Suggested stratigraphic interpretations have mainly based on spatial relationships of the volcanic rocks, on their chemical compositions and sporadic age determinations.

The purpose of this study was to construct a detailed chronostratigraphy for the Suomussalmi-Kuhmo-Tipasjärvi greenstone complex, which is the largest Archean greenstone complex in Finland. Systematic sampling from felsic and intermediate metavolcanic rocks was done across individual belts, and zircon grains were dated from each samples with single grain analysis methods. The aim was to distinguish volcanic and sedimentary events within individual belts and between the different belts.

The main conclusions are:

- 1) The felsic and intermediate volcanic rocks in the Suomussalmi-Kuhmo-Tipasjärvi greenstone complex have formed in several stages (ca. 2.94 Ga, 2.84 Ga, 2.82 Ga, and 2.80 Ga);
- 2) Age variation can be seen between the different greenstone belts and in inside individual belts. For example the Tipasjärvi greenstone belt contains three felsic-intermediate volcanic successions: ca. 2.84 Ga, 2.82 Ga, 2.80 Ga;
- 3) The granitoid plutons in the immediate vicinity of the greenstone complex are contemporaneous with the volcanic episodes;
- 4) The belts contain metasedimentary rocks with detritus deposited tens of millions of years after the cessation of the youngest volcanism. Metasedimentary rocks contain also significantly older material than the volcanic rocks within the belts.