

## Geochemistry of the hydrothermally altered rocks in Orijärvi, SW Finland

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The Orijärvi area in SW Finland is known for its unusual mineral assemblages such as the cordierite-anthophyllite rocks associated with the Cu-Zn-Pb deposits (Eskola 1914). These are now regarded as metamorphic equivalents of volcanic rocks altered prior regional metamorphism. The hydrothermal processes have almost completely destroyed the primary structures, textures and minerals, which makes the identification of primary volcanic rock types difficult.

In this study we use chemical compositions in order to interpret the alteration processes and to identify the alteration protoliths. Immobile element concentrations and ratios of the altered rocks are compared to those in the unaltered rocks outside the alteration domain (Väisänen & Mänttari 2002).

Preliminary results of our work show that the altered rocks mainly are calc-alkaline volcanic rocks in a volcanic arc setting. The cordierite-anthophyllite rocks plot in the basalt field in the Co-Th diagram and in the andesites/basaltic andesites fields in the Nb/Y-Zr/TiO<sub>2</sub> diagram. These suggest that the cordierite-anthophyllite rocks were originally mafic and intermediate volcanic rocks. Fluorine turned out to be a very mobile element during alteration and occasionally shows anomalously high concentrations in the altered rocks.

### References:

- Eskola, P. 1914. Bulletin de la commission géologique de Finlande 40. 279 p.  
Väisänen, M., Mänttari, I. 2002. Bulletin of the Geological Society of Finland 74, 185-214.