

## **Evidences of magma-mixing for post-metamorphic alkali ~ highly potassic dyke rocks on LHC, East Antarctica**

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The Lützow-Holm Complex (LHC) is a high grade metamorphic terrane within the East Antarctic Shield, on the Dronning Maud Land. The Complex was composed mainly of amphibolite to granulite facies metamorphic rocks, and partly emplaced by some igneous rocks intruded at different stages of tectonism during and after the peak metamorphism.

Some intermediate to mafic rock dykes were found as one of such intrusions on Rundvågshetta, an exposure in southern part of the LHC. One of them ran 2 km from north to south as a thin sheet less than a few meters thickness dipping east steeply. The dyke rocks are holocrystalline, and consist dominantly of alkali-feldspar, and subsequent biotite, augite, hornblende, titanite, apatite and minor amount of plagioclase and quartz: these mineral abundances vary according to their occurrences. Such minerals, especially biotite flakes are commonly aligned to parallel to boundary between the dykes and the host gneisses. The dyke rocks are grouped into minette, based on their mineral assemblages with compositional characters, especially their K-rich feature.

In the dyke rocks, relatively mafic rocks contain apatite with much fluorine; on the other hand, less mafic rocks have apatite with Cl-rich core and F-rich rim. Compositional gap in apatite crystals is large and not transitional. Such occurrence indicates that apatite was formed in Cl-rich circumstance first and then enlarged in F-rich conditions in the less mafic rocks. This suggests compositional progression of magma from chlorine to fluorine in the less mafic condition during apatite crystallization. The less mafic rocks have relatively abundant Cl than the mafic rocks on the compositional characters of whole rock though they form a suite dyke rocks. It is thought that the dyke rocks have generated after mingling of intermediate to felsic magma into potassic-mafic magma before emplacing into the host metamorphic terrane of LHC.