

## Petrologic characteristics of rocks from Chokai AD 871 and 1801 activities, NE Japan

# Junko Nakamura[1]; Masao Ban[2]; Shintaro Hayashi[3]

[1] Earth and Environmental Sciences, Yamagata Univ.; [2] Earth and Environmental Sci., Yamagata Univ.; [3] Dep. of Earth Sci., Akita Univ.

Chokai volcano is a Quaternary stratovolcano (ca. 0.6 Ma to present) in back arc side of the northeast Japan arc. The latest and second latest magmatic activities of the Chokai volcano have taken place at AD 871 and 1801. We examined the petrologic characteristics of rocks of these activities and revealed the temporal variation of them. AD 871 products can be divided into lower lava flow (871L), upper lava flow (871U) and the Kohjingatake lava dome (KLD) in the ascending order. The Shinzan lava dome (SLD) was formed at AD 1801 activity. Host rocks are medium-K andesite to dacite and have plagioclase, clinopyroxene, orthopyroxene and Fe-Ti oxides as phenocrysts, with or without olivine, hornblende. Mafic inclusions, which are observed in all units, are basalt to andesite that have plagioclase, clinopyroxene, orthopyroxene, olivine and hornblende (+) as phenocrysts. Inclusions with coarser grained groundmass minerals can be rarely observed in 871U. Petrographic and mineralogic features observed in host and mafic inclusions, such as disequilibrium phenocrysts and resorbed textures, suggest magma mixing/mingling. Except for the coarser grained inclusions, most of the host rocks and mafic inclusions are plotted on the same linear trends in silica variation diagrams, which is suggesting most of the rocks are formed by the magma mixing/mingling between mafic and felsic end-members. During the AD 871 activity, silica contents of the host rocks increased temporally from 56-58% (871L), 62-63% (871U), to 66-69% (KLD). The silica contents of the SLD host rocks go back to be 61-62%. Silica contents of the mafic inclusions vary corresponding to the variation of those of the host rocks; these are 51-54% in 871L, 53-56% in 871U, 56-58% in KLD and ca. 54% in SLD. Exceptionally, the compositions of the coarser grained inclusions fall on the range of high magnesian andesite. Although wide variations can be observed in whole rock compositions, chemical compositions of minerals derived from each of the mafic and felsic end-members are similar among units. Olivine and plagioclase phenocrysts derived from the mafic end-member shows forsterite ca. 78 and anorthite ca. 90 each, while clinopyroxene, orthopyroxene and plagioclase from the felsic end-member has Mg# of 74-75, Mg# of 66-67 and anorthite 42-50, respectively. The estimated magmatic temperature of the felsic end-member is 870-880 degrees C. Thus, the temporal variations of whole rock compositions can be explained by the different percentages of the basaltic magma involved in the mixing, and it is likely that the both of the end-member magmas may have been stored in the deeper and shallower parts of the crust through the activities.