

Progress of magma mixing by analysis of heterogeneous fragments from Rawan pyroclastic flow at 9 ka, Me-akan volcano, eastern Hokkaido

*Yuma Endo¹, Keiji Wada¹, Eiichi Sato²

1. Earth Science Laboratory, Hokkaido University of Education at Asahikawa, 2. Institute for Promotion of Higher Education, Kobe University

At Me-akan volcano, eastern Hokkaido, pyroclastic activity of plinian fall and pyroclastic flows including pumice and scoria have occurred at 13000-12000 years ago, forming Nakamachineshiri crater with 1.1 km diameter (Wada, 1989). At about 9000 years ago, pyroclastic flow containing pumice, scoria and heterogeneous juvenile ejecta such as banded pumice was flowed down along the Rawan river southwestern of Nakamachineshiri crater. We call this Rawan pyroclastic flow. We analyzed the chemical composition of groundmass glass and plagioclase phenocrysts and groundmass in two specimens of each pumice, scoria and banded pumice in detail.

The groundmass composition of scoria shows $\text{SiO}_2=61\text{-}70\text{wt.}\%$ and has fixed chemical trend, whereas that of pumice concentrates to $\text{SiO}_2=77\text{-}79\text{wt.}\%$. The scoria part in the banded pumice varies from $\text{SiO}_2=61\text{-}76\text{wt.}\%$ and shows wide compositional range connecting with scoria and pumice compositions. The pumice part in the banded pumice is slightly higher SiO_2 composition (78-80wt.%) than pumice fragment. Plagioclase phenocryst of scoria and pumice shows almost the same bimodal An content distribution of An58-60 peak and An72-92 wide peak. The lower An plagioclase phenocrysts of both scoria and pumice show the same texture, but the high An plagioclase phenocrysts are different origin between scoria and pumice; rapid crystallization from mafic magma for scoria and long storage in magma chamber for pumice.

These results suggest that each magma produced scoria or pumice was already mixed in the single or plural magma chamber, and mafic magma produced scoria was injected into felsic magma produced pumice to mingle and mix in the conduit. Diffusion rate of mafic magma is faster than that of felsic magma, mixing proceeds inside of mafic magma incorporating felsic magma in central part in the conduit, producing the banded pumice.

Keywords: Me-akan volcano, magma mixing, banded pumice