Mixing processes of basaltic magmas recorded in zoning profiles of minerals of Akanfuji from Me-akan volcano, Eastern Hokkaido, Japan

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Me-akan volcano is located in the Akan volcanic field, eastern Hokkaido, Japan, and ~250 km inland from the Kuril trench. The volcanic activity of Me-akan volcano began at least a few tens thousand years ago, and eight volcanic bodies with different peaks have been formed.

Akanfuji (1,476 m), which is the newest volcanic body in the Me-akan volcano, started its eruptions about 2 ka, and the volcanic activity continued for 1,000 years. The eruption products of Akanfuji are composed of scoria fall deposits and lava flows associated with the scoria eruptions. The scoria fall deposits are distributed from northeast to south from present vent. We described the scoria fall deposits to interpret the complex depositional sequence. As a result, 17 scoria fall layers were recognized for 1,000 years.

Akanfuji had erupted basalts through its history. Two types of basalts (types I and II) are recognized on the basis of phenocrysts assemblage. Type I is orthopyroxene (opx) bearing olivine (ol)-crynopyroxene (cpx) basalt and Type II is cpx bearing ol-opx basalt. Both types show mineralogical evidences of magma mixing, which are reaction products such as cpx overgrowth around opx phenocrysts, wide range of core compositions, and coexistence of normal and reverse zonings in plagioclase (Fig. 1), olivine, and pyroxenes. Zoning profiles of plagioclase phenocrysts show timing of magma mixing. We can estimate the time from mixing of the basaltic magmas to the eruption.

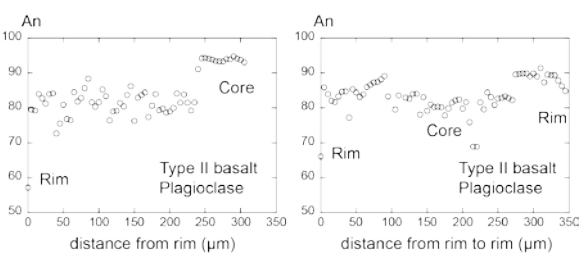

Fig. 1. Zonig profiles of plagioclase phenocrysts (Type II basalt).