

## **Genetic relationship between tholeiitic and calc-alkaline suite magmas at Chokai volcano in the NE Japan rear-arc**

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Island arc magmatism is characterized by the coexistence of tholeiitic (TH) and calc-alkaline (CA) series magmas. The genetic relationships between the TH and CA suits magmas at the volcanic front volcanoes in the NE Japan arc was discussed as the isotopically radiogenic TH was generated by melting of the lower crustal amphibolite, whereas CA was formed by magma mixing between an unradiogenic mantle-derived basalt and a radiogenic felsic magma related with the TH magma. Chokai volcano located in the NE Japan rear-arc. The volcanic activity is classified into three stages. The Stage 1 lavas are TH basalt-andesite, the Stage 2 and 3 lavas are solely CA andesite. The Sr-Nd-Pb-Hf isotopic compositions of the TH lavas have more enriched source than that for CA lavas. Compositional zoning of the plagioclase phenocrysts suggest both fractional crystallization and magma mixing accounted for the generation of the magma suites. The Sr-Pb isotopic compositions of the plagioclase in the TH and CA lavas are different. The Pb isotopic compositions in the high An plagioclase phenocrysts in the TH lavas exhibit more radiogenic Pb than that in the CA lavas. The bulk rock- and mineral- geochemistries indicate that the TH andesite was produced by fractional crystallization of the radiogenic TH basalts, whereas the CA andesite was formed by magma mixing between an unradiogenic basalt and a radiogenic felsic magmas. The results suggest that the TH basalt was generated primarily from the mantle but later assimilated the lower-crustal amphibolite to form TH andesite. The CA magmas were the mixture between fractionated TH with the mantle derived basalt. The magmatic processes beneath Chokai is similar with those in the volcanic front. A similar magma feeding system is widespread over the NE Japan arc.