

Volcanic geology and petrochemistry on the Kuchinoshima volcano, Tokara Islands, SW Japan

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Kuchinoshima volcano is one of the Quaternary active volcanoes of Tokara Islands, which are related to the subduction of the Philippine Sea plate beneath the Eurasian continent. Although many volcanic eruption deposits during the last 10,000 years have been recognized, there are no detailed geological and petrochemical studies. We present the geological and petrochemical characteristics of the volcano based on detailed field survey, petrographic investigation and bulk-rock chemical analysis.

The Kuchinoshima volcano is composed of several monogenetic volcanos. Most of these volcanos are clinopyroxene-orthopyroxene-amphibole andesites. Based on the results of volcano-stratigraphic investigation, the volcanic rocks of the Kuchinoshima volcano have been divided into three volcanic stages: in ascending order, the older Kuchinoshima, Ueura and younger Kuchinoshima stages.

On the results of bulk-rock chemical analysis, the rocks of the Kuchinoshima volcano show the major-element characteristics of calc-alkali and medium-K rock series. On the Harker diagrams, almost all the oxides and trace elements increase or decrease monotonously. It is suggested that those linear trends are not resulted from fractionation of magmas, but mixing between felsic and mafic magmas at each volcanic stage. This hypothesis is supported by the observation of the lava banded with white and gray part that are different chemical composition, and of occurrence of a reaction texture breakdown of amphibole to pyroxene suggesting magma mixing occurred during their growth.