

Evolution of Magma Plumbing System of Torishima Volcano, Izu Islands, Japan

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Torishima is an active volcanic island located on the Izu Arc, 570km south of Tokyo. Its activity is divided into two stages; the stratovolcano stage, and the central cone stage. The former stage is characterized by basaltic pyroclastics and lavas with abundant plagioclase phenocryst. The upper part of the volcano was covered by considerable amount of dacitic pumice and lapilli within last period of this stage. In the latter stage, erupted magma was restricted to basaltic andesite composition. We investigated petrographical and petrochemical feature of the Torishima volcanic rocks, and discussed the evolution of magma plumbing system of Torishima volcano.

In the stratovolcano stage, the chemical-variation trend of basaltic rocks is explainable basically by slight removal of plagioclase and moderate removal of mafic minerals. On the other hand, dacitic rocks were most likely to be formed by magma mixing of basaltic magma and rhyolitic melt derived from partial melting of mafic lower crust. In the central cone stage, basaltic andesite rocks can be derived by fractional differentiation from basaltic magma. Magma mixing played a supplemental role in this stage. These two stages are closely related to both chemical and magma plumbing system evolution.