

# Petrological review on the magma plumbing system of Izu-Oshima volcano

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Izu-Oshima is an active volcano located on the volcanic front of the Izu arc. It erupts low-K island arc tholeiite magma. During the past 150 years, it has erupted repeatedly at intervals of 30-40 years (1876-1877, 1912-1914, 1950-1951, and 1986-1987). Thirty years has already passed since its last eruption (1986-1987); therefore, the next eruption is expected in the near future.

In this presentation, the hypothesis that the next eruption of Izu-Oshima volcano is triggered by an aftereffect of the M9 Tohoku-Oki earthquake, which took place on March 11<sup>th</sup>, 2011, is considered. In both the 9<sup>th</sup> century and the period between the 17<sup>th</sup> century and the 20<sup>th</sup> century, volcanism of Izu-Oshima volcano seems to have been activated in association with earthquakes occurring near the volcano. While some eruptions occurred after earthquakes, others occurred before earthquakes. It is possible that regional tectonic stress can trigger both major earthquakes and intense volcanic activity, although this hypothesis should be tested at Izu-Oshima volcano and/or elsewhere.

Petrological studies of Izu-Oshima volcano will also be reviewed to understand its magma plumbing system and to provide useful information in order to prepare for its next eruption. The geochemical variations in aphyric volcanic rocks (liquids) of Izu-Oshima volcano fall between two endmember trends, namely higher- and lower-Al/Si trends. Higher- and lower-Al/Si trends can be explained by crystallization differentiation of H<sub>2</sub>O-saturated magmas at 9-km-deep magma chamber (~5 wt.% H<sub>2</sub>O in melt) and 4-km-deep magma chamber (~3 wt.% H<sub>2</sub>O in melt), respectively, based on melting experiments of hydrous basaltic magmas. Polybaric crystallization differentiation of H<sub>2</sub>O-saturated magmas proceeds beneath the volcano. The H<sub>2</sub>O-rich nature of the basaltic magmas beneath the volcano suggests that a future eruption of Izu-Oshima volcano could be highly explosive if dissolved volatiles in melt are not sufficiently degassed from magma ascending through the conduit.

Keywords: Izu-Oshima volcano, Magma plumbing system, Island arc tholeiite, Ca-rich plagioclase, Polybaric crystallization differentiation