

Time-series variation in the textures of ejecta of the An'ei eruption, Izu-Oshima

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In Izu-Oshima, a large-scale eruption called the An'ei eruption began in 1777. This eruption lasted for 15 years, and scoria and lava flows were strongly ejected before ash eruption period (Nakamura, 1964; Isshiki, 1984; Koyama and Hayakawa, 1996, Tsukui et al, 2009). As for scoria eruption, the transition of the intensity of eruption was unveiled (Ikenaga et al., 2018). Scoria eruption in the initial stage (Unit A) was somewhat weak and scoria is poor in plagioclase phenocrysts (Pl). After the small-scale scoria eruption (Unit B, rich in Pl), the climax stage (Unit C) occurred. Scoria in Unit C is richest in Pl and eruption column height of this unit is inferred to be approximately 10km. The change in the textures of scoriae among these 3 units, however, has not been investigated yet. It becomes clear in this study that there are differences in the textures of scoriae.

The scoria of Unit A (A-scoria) is rich in microlites and the groundmass glass has low transparency. The surface of bubbles is rough and many bubbles are connected each other. On the other hand, the scoria of Unit C (C-scoria) has almost no microlites and the glass is transparent. The shape of bubbles is spherical or ellipsoid, and the surface of bubbles is smooth. The connectivity of bubbles is low. The characteristics of the scoria of Unit B (B-scoria) are intermediate between those of A- and C-scoria. Considering the transition in the intensity of eruption, magma ascent rate of Unit A is expected to have been low than that of Unit C, and the crystallization of microlites and connection of bubbles in Unit A were probably caused because of low decompression rate.

The compositions of Pl, groundmass glass and melt inclusions in Pl of scoriae were measured using EPMA, and there are no difference in these compositions among 3 units. It is inferred from this result that the change in the intensity of 3 units was not caused by injection of undifferentiated magma into magma chamber, but caused by other processes, such as decompression of magma chamber after the eruption of Unit A. It is a future issue to reveal the cause of the change in intensity.

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