

桜島火山大正噴火の噴火様式とその時間変化

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Eruptive Style and its Temporal Variation through the 1914–1915 Eruption
of Sakurajima Volcano, Southern Kyushu, Japan

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The 1914–1915 Sakurajima eruption was the largest eruption in Japan in the 20th century and erupted andesitic magma was about 1.5 km³ DRE (Dense Rock Equivalent) in volume. Pumice fall and lava flows were generated from the fissure vents on the western and the eastern flanks of the volcano and pyroclastic cones were formed around the vents. Eruptive style changed with time. It is divided into three stages. After the initial, vigorous, Plinian eruption of about 36 hours (Stage 1), extrusion of lava associated with intermittent ash-emitting eruptions with or without detonations lasted for about 20 days on both sides (Stage 2), followed by an outflow of lava for more than 1.5 years on the eastern side (Stage 3). Consequently, the vast lava fields, which consist of a number of flow units formed on both sides of the volcano. Some units of lava show evidence of welded pyroclastic origin, suggesting clastogenic lava. In the western lava field, surface blocks characteristically consist of pyroclastic materials which show variable degrees of welding even within a single block. Typical eutaxitic textures and abundant broken crystals are also recognized under the microscope. Some flow units can be traced upstream to a pyroclastic cone. These features indicate that many flow units of lava on the western flank are clastogenic, which were generated by the initial, Plinian eruption of Stage 1. In the eastern lava field, evidence of pyroclastic origin is rarely discernable. However, the content of broken crystals varies widely from 20% to 80% in volume. Most lava flows, which were erupted in Stage 2 associated with frequent ash-emitting eruptions, contain broken crystals more or less than 50%. This fact indicates that magma in the conduit experienced repetitive fragmentation and coalescence due to intermittent explosions prior to outflow. Lava flows of Stage 3 contain much smaller amounts of broken crystals indicating gentle outflow of coherent lava. Relatively large-scale lava deltas developed toward the sea in the eastern lava field. Eyewitness account at that time reports that ocean entry of lava from several points started several months after the beginning of Stage 3. Although small-scale breakouts formed at the flow fronts of some lava on both sides, a large volume of the deltas can not be accounted for by secondary breakouts of ponded lava within the precedent flow lobes. It is considered that lava tube system fed lava to form the lava deltas.

Key words: Sakurajima Volcano, Taisho eruption, eruptive style, clastogenic lava

1. はじめに

桜島火山の大正噴火(1914~1915年)では東西山腹の割れ目火口列から約1.5 km³の安山岩質マグマが噴出した(Fig. 1)。これは日本で20世紀に起きた噴火の中では最大規模の噴火事例であり、詳細な目撃記録や写真が多

く残されている。大量の溶岩(大正溶岩)が流出して桜島が大隅半島と陸続きになったこと、噴火開始8時間後にM7.1の地震が発生したこと、および噴火後に鹿児島湾の中央部を中心に沈降が起きたことなどが知られている。最初期には東西の山腹で大規模なブリニー式噴火が

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