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中部九州阿蘇カルデラ形成後火山噴出物の噴火年代
K-Ar ages of post-caldera volcanic products from Aso volcano, central Kyushu, Japan

三好 雅也 [1*], 角野 浩史 [2], 宮縁 育夫 [3], 長尾敬介 [2]
Masaya Miyoshi[1*], Hirochika Sumino[2], Yasuo Miyabuchi[3], Keisuke Nagao[2]

[1] 京都大学地球熱学研究施設, [2] 東京大学地殻化学実験施設, [3] 熊本大学教育学部
[1]BGRL, Kyoto University, [2]GCRC, University of Tokyo, [3]Faculty of Education, Kumamoto Univ.

The geochronological and geochemical data of post-caldera volcanic products are expected to provide us key information about magmatic evolution process and magma plumbing system after the formation of caldera.

Aso volcano, situated in central Kyushu, produced four gigantic caldera-forming pyroclastic eruptions (Aso-1 to Aso-4) between 270 and 90 ka. On the other hand, the post-caldera volcanism (after 90 ka) is characterized by multiple effusive eruptions from several vents, and formed the present central cones inside of caldera (Ono and Watanabe, 1985). The drastic change of eruption style during caldera formation probably reflects the change of magma-plumbing system beneath caldera. To clarify the detailed temporal change of the magma-plumbing system, the absolute age dating of volcanic products is necessary. We, therefore, determined the K-Ar ages for several lava units of the post-caldera volcanic products from Aso volcano.

The argon isotopic ratio was measured using a noble-gas mass spectrometer MS-IV (modified VG-5400) in the Geochemical Research Center, Graduate School of Science, The University of Tokyo. In this study, the radiogenic 40Ar contents of samples were determined by using the sensitivity method. In this method, the unknown concentration of 40Ar contained in a sample is determined by comparing its 40Ar peak intensity with that of a standard air sample whose 40Ar concentration is known. The isotopic composition of the initial 40Ar/36Ar ratio of the sample that differs from the modern atmospheric value of 296 was determined with correction of mass-dependent fractionation based on measured 38Ar/36Ar ratio (Takaoka et al., 1989).

K-Ar ages of the following lava units were obtained.

1) Tateno lava: 60-50 ka, 2) Matsunoki lava: 80-70 ka, 3) Okamadoyama lava: 70-60 ka, 4) Hakusui lava: 40-30 ka, 5) Akase lava: 40-30 ka, 6) Otogase lava: 20-10 ka, 7) Eboshidake lava: 40-30 ka, 8) Karisako lava: 40-30 ka, 9) Narao-dake lava: 20-10 ka.

These obtained eruption ages are quite consistent with stratigraphic succession which was established by the previous geological studies (e.g., Ono and Watanabe, 1985).

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