

## Universality and individuality of magmatic processes in three caldera volcano, Aso, Aira, and Kikai volcanoes, SW Japan

\*Katsuya Kaneko<sup>1</sup>, Ayumu Nishihara<sup>3</sup>, Ryohei Kikuchi<sup>1</sup>, Kento Shinjo<sup>1</sup>, Kimihiko Nishimura<sup>1</sup>, Jun-ichi Kimura<sup>2</sup>, Qing Chang<sup>2</sup>, Takashi Miyazaki<sup>2</sup>, Takeshi Hanyu<sup>2</sup>

1. Department of Planetology, Graduate School of Science, Kobe University, 2. Japan Agency for Marine-Earth Science and Technology, 3. Geological survey of Japan, National Institute of Advanced Industrial Science and Technology

Petrogenesis of voluminous magmas in caldera volcanoes is one of important problems to understand caldera volcanism that largely affects societies and environments and are concerned with continental crust evolution. In order to clarify magmatic processes common to and different between the caldera volcanoes, we carried out petrological and geochemical study of VEI-7-eruption ejecta in three volcanic-front caldera volcanoes, Aso, Aira, and Kikai volcanoes, on the same subduction system, Kyushu island, SW Japan. These three caldera volcanoes caused VEI-7 eruptions discharging a voluminous silicic magma and a relatively less voluminous mafic magma.

The most important analytical results are obtained by Sr isotope micro-analysis of plagioclase phenocryst; the silicic and mafic magmas for each VEI-7 eruption have plagioclase phenocrysts with the same Sr isotope ratios without exception, suggesting that the silicic and mafic magmas were generated from the same source. The source material is inferred to be a mafic lower crust on the basis of compositional features of the magmas. Thus, it is concluded that in all the three caldera volcanoes, the silicic and mafic magmas for the VEI-7 eruptions are generated by low and high degree of partial melting of the mafic lower crust heated by mantle-derived hot basalts, respectively. On the other hand, magmatic processes are different between the three caldera volcanoes after the magma generation up to eruption. In Aso volcano the generated magmas erupted as they are; in Aira volcano the magmas assimilated a shallow crustal component before eruption; in Kikai volcano a mantle-derived magma mixed into the crustal magma. The three caldera volcanoes suggest that the generation of the silicic and mafic magmas by crustal melting is universal whereas magmatic processes after the generation are individual probably due to such as difference of crustal composition and condition.

Keywords: Caldera, Aso volcano, Aira volcano, Kikai volcano, Generation processes of magma