

## Multi-chronology of Setouchi volcanic rocks leading to reliable estimates of eruption ages

Yoshiyuki Tatsumi<sup>1\*</sup>, K. Tani<sup>1</sup>, K. Sato<sup>1</sup>, T. Danhara<sup>2</sup>, H. Hyodo<sup>3</sup>, H. Kawabata<sup>1</sup>, T. Hanyu<sup>1</sup>, D.J. Dunkley<sup>4</sup>

<sup>1</sup>IFREE, JAMSTEC, <sup>2</sup>Kyoto Fission-Track Co. Ltd., <sup>3</sup>Okayama University of Science,

<sup>4</sup>National Institute of Polar Research

Four Setouchi volcanic rocks from two different formations of Miocene age on Shodo-Shima Island, SW Japan, have been dated multi-chronologically using whole-rock and mineral K-Ar and Ar-Ar, zircon fission-track, and zircon U-Pb techniques, in order to better estimate their eruption ages. Statistical and chronological examination of the results suggests that the lower and upper formations formed at 14.3-14.4 and 13.4 Ma, respectively, which is fully consistent with the geological relationship. U-Pb dating tends to show a reliable eruption age if magmatic zircon exists and fission-track dating is also a method suitable for estimation of the eruption age if little thermal alteration exists. On the other hand, careful examination of the contribution of old basement rocks and alteration is required to apply Ar-Ar plateau and K-Ar ages to eruption ages. The ubiquitous occurrence of xenocrystic zircon, even in the least-differentiated high-Mg andesite, indicates the involvement of pre-existing crust in the magma. U-Pb ages of these zircons reveal the involvement of Late Cretaceous granitic basement, as well as older components.

Keywords: K-Ar, Ar-Ar, fission track, U-Pb, Setouchi volcanic rocks