Magmatic evolution of 4.3 Ma explosive volcanism in the Izu rear arc

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The Izu rear-arc volcanism was investigated by IODP EXP350 in spring 2014[1]. A total stratigraphy of 1800 m was drilled, and contains volcaniclastic material within tuffaceous mudstone. This study will focus on the explosive volcanism that erupted a 44 m thick unit dominated by lapilli-tuff and lapillistone between 682 and 727 mbsf that was deposited at approximately 4.3 Ma[2]. Here, we present oxygen isotopes for plagioclase to determine the magmatic evolution of the magmas that generated the lapilli-tuff to lapillistone.

The explosive volcanism is represented by mulitple deposits of evolved, clast to matrix supported, monomictic to polymictic, intercalated evolved tuff, lapilli-tuff and lapillistone. The basal contacts are erosive, bedding and cross-stratification are common, along with normal 'coarse-tail' to reverse grading. The clasts are composed of pumice, glass (transparent and brown), crystals or lithics. The matrix is pumice, glass and crystal bearing. The samples are andesitic based on the occurrence of feldspar, minor pyroxene and sparse amphibole. High Zr/Y ratios classify this lithofacies as proximally derived rear arc volcanism [1].

Evidence of erosive basal contacts, bedding and grading as well as the monomictic nature of the lapilli-tuff to lapillistone deposits indicates that they formed by eruption fed density currents[2]. The andesitic composition suggests the occurrence of significant magmatic differentiation, and we discuss the role of fractional crystallisation versus crustal modifications in the evolution of the magma.

[1] Tamura, *et al*., 2014. Izu-Bonin-Mariana rear arc: the missing half of the subduction factory. International Ocean Discovery Program Preliminary Report, 350. doi: 10.14379/iodp.pr.350.2014 [2] Tamura *et al*., 2015. Proceedings of the International Ocean Discovery Program, Expedition 350: Izu-Bonin-Mariana Rear Arc: College Station, TX. doi: 10.14379/iodp.proc.350.2015