

## Petrological characteristics of volcanic materials ejected during 2012-2013 explosive events on Ioto Island

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Ioto is an active volcanic island (8.5km long in NE-SW and 4.5km wide) located about 1250km south of central Tokyo. Since early February 2012, small explosive eruptions have repeatedly occurred at the Old Crater (Million Dollar Hole) in the western part of the island (JMA, 2013). Four (February 2012, March 2012, February 2013 and April 2013) ejected mud materials collected in the vicinity of the crater consist of free crystals (plagioclase, clinopyroxene, olivine, and Fe-Ti oxides), relatively fresh volcanic glass, altered volcanic glass, lithic fragment, altered lithic fragment and pyrite aggregate (Ikehata and Tamura, 2013). Among the mud samples, there is little difference in component of grains except for high abundance of altered lithic fragment in the mud ejected in February 2012.

Detailed SEM/BSE image observation of the relatively fresh volcanic glasses show that even these fresh glasses have pitted alteration and hydration features. The extent of hydration could be different among volcanic glass shards in geothermal field like Ioto because hydration rate depends on chemical compositions of volcanic glasses and groundwater, and soil temperature. To eliminate such hydration effects, heating (400 °C-12h) is conducted for the relatively fresh volcanic glasses before analyzing. As a result of the chemical analysis, all of these volcanic glasses are trachytic, and their chemical compositions are homogeneous within the analytical error. In conclusion, no juvenile materials existed in the mud samples, suggesting these explosive events were not phreatomagmatic but phreatic eruption.

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Keywords: Ioto Island, the Old Crater, mud, volcanic glass, phreatic eruption