

Fluid geochemistry of vent fields at submarine arc volcanoes in the Izu-Bonin arc

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We conducted geochemical studies on vent fluid samples which were collected from three submarine arc volcanoes in the Izu-Bonin arc; clear fluid up to 280°C venting from chimney structure along the caldera slope of Myojin Knoll, clear fluid up to 200°C emanating from mound structure along the caldera slope of Bayonnaise Knoll, and clear fluid up to 300°C emanating from flat hydrothermal precipitates or directly from sandy seafloor within the summit crater depression of Suiyo Seamount. The samples were collected by ROV (remotely operated vehicle) *Hyper Dolphin* (JAMSTEC) during NT14-06, NT12-10 and NT07-08 expeditions.

From analytical results of the collected samples, chemical composition of the hydrothermal fluid endmember was estimated based on so called magnesium diagrams. For each vent field, single hydrothermal end member represents all the collected samples. For the three vent fields, major elements composition of the hydrothermal fluid is likely to be controlled by fluid-mineral equilibria in the reservoir.

Enrichment in Ca is notable for the three vent fields in the Izu-Bonin arc compared with a trend among mid-ocean ridge hydrothermal fluids. This signature is contrary to that the hydrothermal fluids from the Brothers Seamount in the Kermadec arc showed K-rich signature. Since both Izu-Bonin arc and Kermadec arc are known as an intraoceanic arc, the different trend in fluid chemistry is considered reflecting different chemical composition of host rocks. Actually, volcanic rocks from submarine volcanoes in the Izu-Bonin arc are classified in low-K series, while those from Brothers Seamount showed mid-K signature.