

Pore fluid geochemistry affected by shallow-water hydrothermal activity at Wakamiko submarine volcano in Kagoshima Bay

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The Wakamiko submarine volcano in Kagoshima Bay has a crater of 4 x 2 km in size. High temperature fluid venting ($T = 200$ degC) from chimney-like structures was discovered at the northwest part of the crater seafloor of 200 meters water depth (31.40.07'N, 130.45.68'E) (Yamanaka et al, 2008). In addition to the high temperature vent, some fluid shimmering sites have been located. Pore fluids collected from these shimmering sites were revealed to show geochemical signature of the hydrothermal component (Ishibashi et al., 2008). As confirmed by a geochemical study of the vent fluid, the Wakamiko hydrothermal component is characterized by significant low Cl concentration, which is attributed to involvement of meteoric water (Yamanaka et al., in this meeting).

Since the Wakamiko crater is covered with unconsolidated volcanic sediment, pore fluids in extensive region could be affected by the hydrothermal component. In order to reveal distribution of the hydrothermal component, 275 pore fluid samples in total were collected and analyzed. The samples were collected by multiple coring or piston coring during KT06-2 and KT08-9 cruises using R/V Tansei-maru.

Strong influence by the hydrothermal component was found in some pore fluids. The one was found at 220 cm bsf of PC1 site that is collected from weak fluid shimmering site, and the other was found at 305 - 335 cm bsf of PC2 site that is in the vicinity of the high temperature vent. In addition to these sites, similar signature was found at KT06-2 MC-8 site, which is located far from the known active hydrothermal field.

Except for the active hydrothermal fields, influence by sulfate reduction was obvious even in surface sediment in most of the study sites. Stoichiometric ratio between decrease of sulfate concentration and increase of alkalinity was close to 1:2, which suggests decomposition of organic matter is utilized as reductant. This idea is accordance with high organic carbon concentrations in sediment within the Wakamiko crater.